

# Issues In Development Of Sustainable Cities In Nigeria: A Study Of Enugu Metropolis

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**Abstract:** *As the world continues to urbanize in geometric progression, the importance of shaping sustainable cities has begun to receive widespread recognition. The increasing inhabitation of cities brings more carbon emissions to the cities. City dwellers are more frequently exposed to climate risks. The study examined the issues in the development of sustainable cities in Nigeria particularly Enugu with focus on Enugu Metropolis. The study aimed to analyze the trend in the growth of cities in Nigeria particularly Enugu Metropolis; determine how increasing urbanization affects rise of sustainable cities in Nigeria particularly Enugu Metropolis; examine the challenges to the rise of sustainable cities in Nigeria particularly Enugu Metropolis; and suggest the strategies for promoting rise of sustainable cities in Nigeria particularly Enugu Metropolis.. The study adopted qualitative research design. Data for the study were collected from secondary sources. The data collected were analyzed using content analysis. Findings revealed that industrial fumes, dust from quarry sites, and gas flaring among others are challenges to rise of sustainable cities in Nigeria particularly Enugu Metropolis. This causes depletion of the outer ozone layers and global warming, quantum loss of aquatic life and water quality; damages global ecosystems, and threatens the survival and future of cities. In the same vein, land-use changes, land use conversions, urban expansion, forest land clearance, and wetland reclamations for city developments facilitate the loss of natural vegetation and wildlife. The study recommended that there is need for city administrators to develop green cities plan for rise of sustainable cities in Nigeria particularly Enugu Metropolis; the growing proliferation of squatter settlements and slums should be addressed through reduction of inequalities; there should be utilization of green technologies such as renewable energy that generate green electricity, smart grid systems that connect the electric vehicle charging stations to the grid to efficiently supply electricity, and electric vehicles that reduce carbon emissions sharply by using green electricity, ensure the highest impact for city-level climate action and fosters green development as well as innovation and there should be increased waste management in the cities as well as trees planting to ensure environmental sustainability of the cities.*

**Keywords:** Sustainable Cities, Population Growth, Challenges, Environmental Sustainability

## 1.1 Introduction

In recent times, the need for raising sustainable cities continues to draw widespread recognition and has remained a major policy concern worldwide. In the view of Olubi, and Fadmiro (2022), sustainable city rise centers on making cities habitable for the present generations without limiting, jeopardizing, or imposing any form of discomfort or threat to the natural and (or) built environments, social systems, and future generations. A sustainable city is a city designed with consideration of environmental impact, inhabited by people dedicated to minimization of required inputs of energy, water, food and waste output of heat, air pollution (CO<sub>2</sub>) and water pollution (Aduku, Eboh and Egbuchulam, 2021). A city is sustainable if it works on socio-economic and environmental levels for its present population without compromising the benefits for the future generation. Sustainable cities provide opportunities for developing synergies, such as decoupling economic growth from environmental degradation, while at the same time creating employment and fostering clean energy innovation. The aim has been to achieve the basic human needs, while maintaining the core life-support systems in our environment (Hatuka, Rosen-Zvi, Birnhack, Toch, & Zur, 2018).

As the world continues to urbanize rapidly, the importance of shaping sustainable cities has begun to receive widespread recognition. This is particularly true in developing countries where urban growth is relatively high and the existing systems and infrastructure are not sufficient (Elekwa, 2020). Estimates show that more than half of the global population currently live in cities, and is expected to reach two-thirds by 2050. This global megatrend of accelerated urbanization, while bringing greater opportunities for growth and human well-being, increase the inter-relations between cities and climate change. Cities are now the main sources of global greenhouse gas emissions, responsible for 80% of global CO<sub>2</sub> according to UN-Habitat, while cities are the very ones most vulnerable to climate change. The rapid urbanization brings more carbon emissions to cities and induces increased urban dwellers, who are more frequently exposed to climate risks.

The process of urbanization is associated with socio-economic activities that transform rural areas into urban settlements, while also shifting the spatial distribution of a population from rural to urban centres. It includes changes in dominant occupations, lifestyle, culture and behaviour, and transformation of demographic and social structures, especially in the urban areas. A major consequence of urbanization is a rise in land area and population size of urban settlements (UN, 2018). Living in cities increases literacy rate, improves health conditions, provides easily accessible social and economic services and attracts chances for cultural and political participation (Egbe, 2021). Conversely, expansion in the urban areas causes rapid sprawl, pollution, inadequate housing, traffic congestion, slums, crime, and environmental degradation alongside production and consumption depletion. This is mostly

linked to inadequate structures and inefficient urbanization policies. Oftentimes, urban infrastructures and the entire urban environments are over-stretched, resulting in disharmony and environmental hazards. This mayhem impedes global prospects for sustainable cities.

It is predicted that by 2030, there will be 41 megacities of 10 million dwellers or more (World Bank, 2022). Egbe (2021) argued that urban areas are the home to the majority of the world population including 863 million slums dwellers. It contributes about 75% of the global GDP, and causes approximately 75% of carbon emission from energy consumption. Approximately 2 billion tons of wastes are being generated by city dwellers in each year, dumping much of it in the rivers and terrestrial sites at the outskirts of cities. Notwithstanding, considering the innovation and opportunities that occur in cities, it is difficult to ignore the sustainability challenges caused by the prevalent city dwelling in the urban world (Acuto, Parnell, Seto & Contestabile, 2018). At the Habitat III Summit in Quito, the UN's New Urban Agenda (NUA) strengthened the endorsement of the Sustainable Development Goal (to make cities inclusive, safe, resilient and sustainable) and the acknowledgement of the importance of localizing all agreements on global sustainable development by nation-states on the centrality of cities. Since 2015, there have been series of international agreements on the need to harness the capacity of cities to be innovative to achieve the global sustainable development agenda by 2030 (Acuto, Parnell, Seto and Contestabile, 2018).

A city is a permanent, self-sustaining concentration of people, government and services. It is the centre and melting pot for different categories of industries, government, religion, philosophy, education, etc. (Nwude, 2021). The interaction among players including planners, economists, governors, and builders among others commonly take place in cities. Cities play a key role in human development. Cities are the nucleus of knowledge, innovation and specialization of production of goods and services. Cities enhance innovative ideas. Cities concentrated by individuals create chances for them to interact and communicate, which facilitate creative thinking, technological inventions and knowledge diffusion. Cities promote trade activities. More choices of goods and services are available for consumers in Cities. They bring about changes and advancement in social, cultural, economic, technological and political activities. Cities are also the optimum solutions for global sustainability challenges in this epoch.

Evans (2019) noted that cities become sustainable when the challenges confronting mankind are fixed. On this basis, city administrators in Nigeria and other parts of the world have been experiencing difficulties in efforts to monitor the rapid demographic shifts, reinvent their economies, tackle the growing inequalities, regulate unyielding infrastructures and buildings, curb the greenhouse gas emissions at a great rate and adopt the rapidly evolving technologies. Urbanization comes with greater opportunities for economic growth and a higher standard of living in developing countries. It also increases the inter-relation between cities and health challenges. Though cities are sources of global greenhouse gas emission, accounting for about 80% of the world's CO<sub>2</sub> and, at the same time, they are the most vulnerable to climate risk. Yet, if properly designed towards sustainability, cities have possibilities to prevent and resolve climate issues and improve the standard of living of households.

Today, Nigeria has some of the world's most polluted cities and most steeply rising greenhouse gas emissions eg. Enugu, Lagos, Aba, Port Harcourt, etc. (Ekong, 2017). Generally, Particularly Enugu Metropolis have the challenge of high population growth rates; inadequate housing and infrastructure; an economy dominated by the informal sector activities, rising crime rates and inadequate water supply, waste disposal, traffic and human congestion (Eva, and Benjamin, 2021). At the moment, the population growth has been estimated at 4.48% (World Bank, 2022). The implications of the rapid urban growth have been described as varied with diverse consequences that are clearly seen in inadequate housing and infrastructure; an economy dominated by the informal sector activities, rising crime rates and inadequate water supply, waste disposal, traffic and human congestion.

Lagos for instance, the commercial capital city of Nigeria is one of the World's five least livable cities—it was ranked 137 out of 140 countries in livability ranking. As per resilience, a sizeable part of Lagos is reported to be vulnerable to flooding and ocean surge (World Bank, 2022). The issues of poor Sustainability in Particularly Enugu Metropolis have therefore become a huge problem that must be tackled for the potentials of investments to be fully harnessed in the cities. It was against this background that the study examined the challenges and prospects in the rise of sustainable cities in Nigeria particularly Enugu Metropolis.

#### Statement of the Problem

The problems and challenges posed by the rapid urban growth in Nigeria are immense and worrisome. More easily observable and perhaps very frightening are the general human and environmental pollution, declining quality of life and underutilized as well as untapped wealth of human resources. Housing and associated facilities (water, electricity, waste disposal) seem to be grossly inadequate. Millions live in substandard environment called slums by planners, plagued by squalor and grossly inadequate social amenities (schools, health facilities and lack of open spaces for recreation). This brings the issue of liveability in these cities to fore (Ekong, 2017). Liveability is the sum of the aspects that add up to the quality of life of a place including its economy, amenity, environmental sustainability, health and well-being, equity, education and learning and leadership. By every criterion, cities in Nigeria particularly Enugu Metropolis have low liveability indices as observed by many researchers (Ekong, 2017; Agwu, 2021; and World Bank, 2022) and bring to mind the sustainable cities challenge. Lagos, for instance, was assessed as the third worst city on earth to live essentially because of congestion, and inadequate services (e.g. water supply and waste disposal) (World Bank, 2022). This was the key finding of the 2016 Global Liveability Index published by the Economist Intelligence Unit (EIU). The Lagos experience is one that is replicated across most other Nigerian cities particularly Enugu Metropolis.

The growth and expansion of urban areas, especially in Nigeria, have come with wide-ranged social, economic, and environmental challenges. As large cities grow in developing areas, the needs of their populations for ordinary services such

as drinking water, sanitary services like trash collection and sewerage, roads, housing, public transport, education, and health go higher. This threatens the ability of cities to become viable pillars of sustainable development. It was against this background that the study examined the challenges and prospects in the rise of sustainable cities in Nigeria particularly Enugu Metropolis.

### 1.2 Objectives of the Study

The broad objective of the study was to examine the challenges and prospects in the rise of sustainable cities in Nigeria particularly Enugu Metropolis. The specific objectives of the study include:

1. To examine the environmental issues impeding the rise of sustainable cities in Nigeria particularly Enugu Metropolis.
2. To determine how population growth affects rise of sustainable cities in Nigeria particularly Enugu Metropolis.
3. To examine how poor urban governance impede the rise of sustainable cities in Nigeria particularly Enugu Metropolis.
4. To suggest the strategies for promoting rise of sustainable cities in Nigeria particularly Enugu Metropolis.

### 1.3 Hypotheses

The following hypotheses were formulated to guide the study:

HA1: Environmental issues significantly impede the rise of sustainable cities in Nigeria particularly Enugu Metropolis.

HA2: Population growth negatively affects the rise of sustainability in cities in Nigeria particularly Enugu Metropolis.

HA3: Inadequate facilities and lack of green cities plan are major challenges to the rise of sustainable cities in Nigeria particularly Enugu Metropolis.

HA4: Formulation and implementation of green cities plan are strategies for promoting rise of sustainable cities in Nigeria particularly Enugu Metropolis.

## 2. 1 Concept of a City

There is no generally accepted definition of the concept of a "city". The United Nations (2019) defined a city as a continuous urban built up with less than 200m between construction and bringing together more than 10,000 inhabitants (United Nations, 2019). The United Nations Environment Programme (2013) described a city as a permanent settlement with a large population size, high density of population and social differences. Cities are regions in a particular country where a large number of people live and work. They are central points of government, commerce and transportation activities (United Nations Department of Economic & Social Affairs, 2016). As a centre for human and economic activities, cities incubate the development of innovation and knowledge expansion. Cities create opportunities for technological change which is executed through government machinery, groups or organizations who devise new ways to meet social needs in a better way than the existing solutions (Ojo, Barau, & Pojwan, 2017).

Cities occupy 2% – 3% of the world's land and consume about 75% of its resources and produce a similar percentage of its waste (Lindfield & Steinberg, 2012). Resources like water, energy, food and other products are consumed within the confines of the city and released in the form of wastes (Guibrunet, 2013). Cities consume 67% – 76% of global energy use and emits between 71% – 76% of CO<sub>2</sub> emissions from the global final energy use. Cities give pressure to the ecosystem and expose it to degradation (Revi et al., 2014). They offer significant institutional and technical capacity to reduce the risk of environmental issues and increase sustainability. The disparity also exists in cities, whereby a certain population has greater access to resources. For example, inequality in standard of living; in most cases, municipal systems do offer urban residents with low-income. Residents rely on providers with high tariff for their water and electricity supply.

### Sustainable City

Sustainability means the ability of the natural environment to remain productive over time. It is defined as providing the present needs and, still, capable of sustaining to meet the needs of the future generation. In many countries, building sustainable cities has been considered as a starting point for the building of sustainable development (Mensah, 2019), yet it is essential to understand the concept of sustainable development as a prerequisite for understanding the concept of sustainable cities. The concept of sustainable development according to Mensah (2019) is a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept has traditionally been focused on an environmentalism framework that gives priority to the issues of ecology. The contemporary mainstream notion of sustainable development emphasizes the interface between environmental, economic, and social sustainability (Mensah, 2019).

The sustainable city goes beyond building a 'green city' with fine buildings. A city is sustainable if it works on socio-economic and environmental levels for its present population without compromising the benefits for the future generation (Channell, Curmi, Lubin & Rai, 2018). Sustainable cities are those cities that are environmentally friendly (Rode & Burdett, 2015). The greening of cities requires some, or preferably such issues as controlling diseases and their health burden; reducing chemical and physical hazards; developing high quality urban environments for all; minimizing transfers of environmental costs to areas outside the city and ensuring progress towards sustainable consumption. This can be achieved in terms of interlinked benefits of green city. Economically, the benefits include: agglomeration economies, lower infrastructure costs, reduced congestion cost while reducing carbon emissions and other environmental pressures. In terms of social benefits, there will be increase in employment creation, poverty reduction and improved equity and quality of life including improved safety and community cohesion while Environmental benefits embedded in economic and social issues like reduced poverty which help improved public health and potential for improving ecosystems within urban areas.

### Features of a Smart (Sustainable) City

A smart city is notable for salient features which include: adequate water supply, adequate power supply, sanitation, including solid waste management, efficient urban mobility and transport facilities, adequate and affordable housing facilities, robust ICT connectivity and digitization, good governance including e-governance, urban governance and citizen’s participation, and reduced carbon emissions.

**2.2 Theoretical Framework**

Everett, S. Lee (1966)’s push-pull theory, was adopted as the theoretical framework. According to him, the motivation to migrate from place of origin to the place of destination are affected by push factors that exist at the point of origin and act to trigger emigration; these include lack of economic opportunities, political persecution, among others (Agwu, 2021). The pull factors exist at the destination and include the availability of jobs, religious or political freedom and the perception of relatively conducive environment (Egbe, 2021). Egbe (2021) further maintained that pushes and pulls are complementary as according to him; migration can only occur if the reason to emigrate (the push) is remedied by the corresponding pull at an attainable destination. He submitted that the number of migrants is directly proportional to the number of opportunities at a given place and inversely proportional to the number of intervening obstacles. Therefore, the volume of migration from one place to another is associated not only with the distance between places and number of people in the two places, but also with the number of opportunities or obstacles between each place.

The significance of this theory to the study cannot be overemphasized since it helps us to understand that youth rural-urban migration is caused by the alienation of the rural areas from the basic social amenities of life. This can be explained from the fact that there is the over concentration of abundant social amenities like electricity, roads, water, street lighting, recreational centres, urban housing schemes abundant job opportunities and commercial activities against the rural areas which are left to perish in poverty, illiteracy, insecurity, lack of social amenities among others.

**3.1 Method**

The study adopted qualitative research design. Data for the study were collected from secondary sources like journals, textbooks, World Bank Statistics and periodicals. The data collected were analyzed using content analysis.

**Discussion**

The Trend in the Rise of Cities in Nigeria particularly Enugu Metropolis

Most of the increase in the overall trend in Nigeria’s population growth is taking place in cities. Table 1 below summarizes the trend in rise of cities in Nigeria particularly Enugu Metropolis from 1971 – 2020.

Table 1: Trend of City Growth in Nigeria 1971 – 2020

| Variables   | 1971 – 1980 | 1981 – 1990 | 1991- 2000 | 2001 – 2010 | 2011 – 2020 |
|---|-------------|-------------|------------|-------------|-------------|
| Urban population (% of the total population)              | 20.0209     | 26.1009     | 32.5009    | 39.5561     | 48.2307     |
| Population in the largest city (% of urban population)    | 16.5408     | 16.3991     | 17.1889    | 16.1344     | 14.0953     |
| Population in urban agglomerations of more than 1 million | 5864359     | 10506127    | 21311433   | 21311433    | 29760392    |

Source: World Development Indicators (WDI) (2022)

Since 1971 – 2020, the Urban population (% of the total population) of Nigeria has been on the increase. Between 1971 – 1980, the average Urban population (% of the total population) was 20.02%. It increases by 6.08% (increasing to 26.10) between 1981 – 1990. It further increases to 32.50% and 39.55% in 1991 – 2000 and 2001 – 2010 respectively. About 8.67% growth was recorded between 2011 – 2020. The population in the largest city (% of urban population) showed fluctuating growth rate over the years. Between 1971–1980, the rate was 16.54%. It decreases slightly to 16.40% between 1981 – 1990 before another increase of 0.8% (17.19%) was recorded between 1991–2000. The population in the largest city (% of urban population) reduced from 17.19% between 1991 – 2000 to 16.13% and 14.10% between 2001 – 2010 and 2011 – 2020 respectively. This fluctuating trend can be attributed to the migration of people from the megacities to neighbouring cities due to overcrowding, housing challenges and housing cost among other reasons as well as the migration of people from the cities to megacities. The Population in urban agglomerations of more than 1 million was 5864359 and 10506127 between 1971 – 1980 and 1981– 1990. Between 1991–2000, 2001–2010 and 2011–2020 was 21311433, 21311433 and 29760392 respectively.

Table 2 Population in the largest city (% of urban population), renewable energy consumption (% of total final energy consumption) and CO2 emissions

| Variables  | 1991 – 2000 | 2001 – 2010 | 2011 – 2020 |
|--|-------------|-------------|-------------|
| Population in the largest city (% of urban population)             | 17.18894    | 16.13441    | 14.09531    |
| Renewable energy consumption (% of total final energy consumption) | 86.70715    | 85.56051    | 86.40364    |
| CO2 Emissions  | 0.401854    | 0.677141    | 0.58322     |

The average population in the largest city decline from 17.18% between 1991 – 2000 to 16.13% between 2001 – 2010, and decline further to 14.09% between 2011 – 2020. This shows the migration of people from the largest cities to Peri-urban areas/cities. Renewable energy consumption (% of total final energy consumption) also shows a decline. It declined from 86.71% between 1991 – 2000 to 85.56% and 86.40% between 2001 – 2010 and 2011 – 2020 respectively. There is also increasing CO<sub>2</sub> emissions. The falling renewable energy consumption and the increasing CO<sub>2</sub> emissions pose threat to a sustainable city. Table 2 shows that a sustainable city is not yet most likely in Nigeria. Challenges in the Rise of Sustainable Cities in Nigeria particularly Enugu Metropolis

One of the central facts of development and social change in Nigeria is rapid urban growth. The enormity of the challenges that come with this backdrop has been documented (Egbe, 2021). However, the most significant challenges, which have far-reaching implications for economic, social, ecological, and political dimensions of cities' sustainability, are, as discussed. Environmental Issues impeding the Rise of Sustainable Cities in Nigeria particularly Enugu Metropolis

In Nigeria, cities are characterized by arrays of environmental-related challenges with unpleasant socioeconomic and ecological implications. It can be argued that factors such as the colonial antecedent, high rate of urbanization, and poor management practices are detrimental to urban life with obvious disharmonies between the populations and the environment. This adversely affects the carrying capacity of the urban areas in the country; hence the increasingly poor quality of the living conditions and the low liveability index of urban cities (Akogun & Akinsola, 2015). The upshoot of environmental degradation on a city's growth is not only of local or regional significance but of global effects; they are harmful to human beings, livelihoods, animals, and plants (Kabir *et al.*, 2019) as well as having far-reaching implications on the sustainability of the cities. Most often, the important ecological features that offer balance to the ecosystem are removed during urbanization without reconsideration for replacement and thus put extra pressure on the world's ecosystem. Cities are vastly developing without natural cycles for sustenance and balance; this not only exposes them to harsh weather, groundwater overdraft, and flooding but also puts survival at great risk (Egbe, 2021). For instance, waste management is a major challenge facing cities in Nigeria particularly Enugu Metropolis due to poor city development and patterns that allow dumping sites to give way to other developmental activities without any replacement or alternative. Residents in most cases are left with no other choice than to indiscriminately dispose of waste on open spaces, road medians, drainages, and rivers. This degrades the city's environments into places of offensive odour, poor urban outlook, and aesthetics, and causes an outbreak of disease (Olubi, 2019). Industrial fumes, dust from quarry sites, and gas flaring are other factors that endanger the future of the cities in Nigeria particularly Enugu Metropolis. This causes depletion of the outer ozone layers and causes global warming, quantum loss of aquatic life and water quality; damages global ecosystems, and threatens the survival and future of cities. In the same vein, land-use changes, land use conversions, urban expansion, forest land clearance, and wetland reclamations for urban and city developments that arise through urbanization facilitate the loss of natural vegetation and wildlife (Egbe, 2021).

Rapid Population Growth as a challenge to Rise of Sustainable Cities in Nigeria particularly Enugu Metropolis

Most cities in Nigeria particularly Enugu Metropolis are diverse in terms of their size, structure, spatial form, economy, wealth, local resources availability, and ecological impact but are phenomenal in population growth. Generally, the growth of cities in Nigeria Particularly Enugu Metropolis has been through both natural increase and unabating rural-urban migration (Egbe, 2021). The natural increase in the growth is as a result of rising birth rates vis-a-vis declining death rates, however, much of the demographic expansion of cities in Nigeria Particularly Enugu Metropolis is through rural-urban migration. The rapid increase in rural-urban population migration is largely a response to the real or perceived economic and social opportunities in the cities. The movement of people from rural to urban areas is also considered an essential element of their household strategies for increasing and diversifying incomes, mitigating the risk of dependence on agricultural production, and improving individual and general welfare through improved access to education and health facilities (Ojo, Barau, & Pojwan, 2017). As a result of rapid population growth, Nigeria has the largest number of cities with a population of over 20,000 in Africa. According to Adeboyejo (2013), the seventy-four largest cities particularly Enugu Metropolis have a total population of 36.6 million (24% of the country's total population) which is higher than the total population of Ghana (25.3 million) or 71 percent of South Africa's population. Although, cities in Nigeria Particularly Enugu Metropolis have benefited from this population growth as a necessary condition to unleash growth but have gained from urbanization at a price of environmental degradation and pollution, cities in Nigeria Particularly Enugu Metropolis need competent, accountable, and haphazard housing and informal settlement development, insecure land tenure, land shortage, deteriorating living conditions as well as the proliferation of deprived neighborhoods such as slums and squatter settlements (Aduku, Eboh and Egbuchulam, 2021). Most cities in Nigeria Particularly Enugu Metropolis have heightened the possibilities for economic development, innovation, and social interaction. Regrettably, the social, economic, and environmental challenges inflicted by rapid and unplanned agglomeration of people have exerted direct and indirect effects on these cities and the lives of people therein. Therefore, in cities in Nigeria Particularly Enugu Metropolis are a mere concentration of people and less of articulation of resources as well as the mediation of major functions of the global economy, unlike their counterparts in developed countries where urban growth is synonymous with a concentration of resources, development of trade, culture, information, and technology as well as industry with the cities contributing substantially to national economic growth (Adeboyejo, 2013).

Unplanned and Unregulated Physical Growth and cities Expansion as a challenge to Rise of Sustainable Cities in Nigeria particularly Enugu Metropolis

Unplanned urban expansion has seriously outstripped the capacity of cities in Nigeria Particularly Enugu Metropolis to provide adequate basic services to their citizens. Therefore, the cities are reputed to have been characterized by

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nonfunctioning infrastructural facilities, extensively dotted with illegal structures, uncontrolled physical growth and development, and poor city management (Hatuka, et al,2018). The unplanned and unregulated physical growth and expansion of the cities have become the dominant feature and a fundamental challenge to Nigerian cities. The problem is most pervasive in such cities as Lagos, Ibadan, Kano, and Onitsha (Egbe, 2021). It is, therefore, obvious that most of the major cities in Nigeria particularly Enugu Metropolis expand without incorporating the major element of physical planning. This has enormous demographic and environmental implications. Most Nigerian cities, just like their African similitude, have poor infrastructure facilities and deteriorating public utilities such as poor drainage and inadequate sanitation, inadequate water supplies, mounds of garbage and other solid waste, constrained mobility as a result of outdated physical layouts, or no planned layout, flourishing street trading, overcrowded, inadequate transport systems and inadequate and deteriorated road facilities resulting in overcrowding and congestion, and noise pollution (Acuto, Parnell, Seto & Contestabile, 2018). Despite the effort of successive administrations in Nigeria in ensuring qualitative developmental control through urban planning, the problems of unregulated growth and expansion is still a fact of life in many urban areas in Nigeria today (Acuto, Parnell, Seto & Contestabile, 2018). A master plan is a key planning tool that guides the growth and development of cities, it is, therefore, inexplicable that most cities in Nigeria particularly Enugu Metropolis lack master plans. Although some cities have this document, such plans bear so little relation to the reality of rapidly growing and poor to cities (Olokesusi, 2015). Moreover, such plans are grounded in legislation that is so outdated, that they are not implemented or are just simply ignored. The situation is not helped by bribery and corruption that have become "cankerworm" among planners and urban managers, it is therefore not surprising that new houses and shops spring up especially in open spaces, environmentally sensitive areas, and derelict lands and often without formal approval contrary to the dictates of the master plans (Ekong, 2017). One can look at the data below:

Table 3: Top 10 Smart Cities in Africa 2022

**ANALYSIS of 31 SMART CITIES**

- |                 |                   |
|-----------------|-------------------|
| 1. Amsterdam    | 17. Moscow        |
| 2. Barcelona    | 18. New York      |
| 3. Berlin       | 19. Osaka         |
| 4. Brisbane     | 20. Paris         |
| 5. Brussels     | 21. San Francisco |
| 6. Busan        | 22. Santiago      |
| 7. Chicago      | 23. Seoul         |
| 8. Copenhagen   | 24. Shanghai      |
| 9. Dubai        | 25. Shenzhen      |
| 10. Dublin      | 26. Singapore     |
| 11. Helsinki    | 27. Stockholm     |
| 12. Incheon     | 28. Sydney        |
| 13. Lisbon      | 29. Taipei        |
| 14. London      | 30. Tokyo         |
| 15. Los Angeles | 31. Vienna        |
| 16. Madrid      |                   |



Source: Olubi and Fadamiro (2022)

From the table above, the only Nigerian city among the top 10 smart cities in Africa is the Eko Atlantic City in Lagos State. Similar to all other megacities in the world, Africa’s largest cities are dealing with challenges such as traffic, pollution, inadequate housing, and public spaces. To fix the megacities inefficiencies, different countries in Africa are coming up with innovations and ideas to solve the problem and one of the best solutions they came up with is building smart cities

Table 4: Top 31 Smart Cities in the World (2022)

| Rank | Smart Cities           |
|------|------------------------|
| 1    | Cape Town              |
| 2    | Konza Technopolis City |
| 3    | Eko Atlantic City      |
| 4    | Tatu City              |
| 5    | Hope City              |
| 6    | Waterfall City         |
| 7    | Vision City            |
| 8    | Kigali                 |
| 9    | King City              |
| 10   | Modderfontein          |

Source: Smart Cities Index (2022) Online: <https://smarcitiesindex.org/smarcitiesindexreport2022>

From the table 4 above, no Nigerian city made it in the list of top 31 smart cities in the world.

Pervasive Socioeconomic Inequalities as a challenge to Rise of Sustainable Cities in Nigeria particularly Enugu Metropolis

Inequalities between rural and urban areas as well as within urban areas have been features of development and urbanization in developing countries (Agwu, 2021). This is particularly true of cities in Nigeria Particularly Enugu Metropolis where the social and economic development is challenged by sharp inequalities not only between urban centers and rural areas but also among different socio-economic groups residing within the same city. By implication, inequalities have pervaded every sphere of urban life in Nigeria and are reflected in significant differences in access to job opportunities and basic public services such as water and sanitation, electricity, education and health, transportation, housing, and communications. As a result, there is a growing gap between rich and poor neighborhoods. While the wealthy ones can move out to more spacious locations outside the city center where they even pay lower rent per unit of space, the poor often live in city centers with highly overcrowded dwellings in shacks that lack basic infrastructure and services. This dichotomy between the rich and the poor has solidified into a permanent divide creating new apartheid. By this divide, a Nigerian city can assume a bivalent status of the formal and informal city. While the informal city, usually occupied by the poor, is characterized by the housing of poor quality and with inadequate provision of water, sanitation, and drainage that put the lives and health of residents under continuous dangers; the formal city, usually the gated communities of the ruling elites, enjoys the advantages of city life usually at the expense of the informal city (Olokesusi, 2015).

Poor Urban Planning and Management Institutions as a challenge to Rise of Sustainable Cities in Nigeria particularly Enugu Metropolis

There is no denying the fact that effective urban planning and management are the antidotes to the mounting urban challenges across the globe, but the most fundamental and critical challenge faced by urban areas in most developing countries, particularly in Anglophone (Sub-Saharan) African countries is the crippling weakness of institutions of urban development planning and management (Egbe, 2021). This is particularly apparent in Nigeria where city authorities, urban planners, urban managers, and other stakeholders have failed to effectively deal with the aftermath of the rapid urbanization process. This ineffectiveness is often manifested in forms of low entrepreneurial, technological and managerial capabilities, inadequate finance, a large number of the parasitic individuals coupled with the inabilities of towns and cities to generate revenues to sustainably finance themselves (Egbe (2021). Despite many efforts aimed at ameliorating the urban problems through the enactment of the plethora of planning laws and regulations, the institutional base and infrastructure for effective urban planning and urban development management is still largely weak in Nigeria and their effectiveness is threatened by inadequate technical and administrative skills and as yet the limited political will of planners to act according to the dictates of the profession (Ojo, Barau, & Pojwan, 2017). Another fundamental challenge to effective urban planning and management in Nigeria is the lack of institutional structure at the local level. In contrast to the situation in developed nations, the role of the local government in towns' physical development has been neglected and has excluded the local populace from infrastructure planning and physical planning (Mensah, 2019). The national and state governments have not allowed the local government, as an agent of grassroots physical development, and their instruments to effectively function. This has become an obstacle to effective urban planning and management in Nigeria. After all, Planning is only as effective as the administrative system supporting it, and the political philosophy, willingness, and commitment of the state in which it operates allow it to be.

Developing Sustainable Cities in Nigeria particularly Enugu Metropolis: Issues for Policy Consideration

Having established that developing the capacity for effective urban governance is an important means to building and managing sustainable cities and given the prevailing socio-economic circumstances in Nigerian cities, the following are put forward for policy consideration in achieving and rise of sustainable cities in Nigeria particularly Enugu Metropolis.

#### Cities Planning and Decentralization

In the face of demographic, spatial, and environmental crosscurrents in Nigerian cities, it is evident that planning administration has not been effective in Nigeria. This is a reminder of the fact that so far, in most cities of developing world, planning has been unable to address much of city challenges such as the power relationships that have been at work to the detriment of a great majority of urban populace, the segregation of urban poor from the socio-economic fabric of the city, the unending environmental degradation or formation of the slum and the grafting of rigid and outdated planning law and regulations that encourage bribery and corruption (Mensah, 2019). The accusing finger is constantly being pointed at the weak and seemingly ineffective institution of urban planning in Nigeria (Aribigbola, 2013). The technical and political capacity of urban governments to deliver services depends on the space provided by existing rules and regulations. The traditional top-down approach to urban planning and management in Nigeria is not sufficient to achieve economically sustainable, liveable, socially, and aesthetically pleasing cities.

#### Reduction of Inequalities in Cities

The growing physical and social division between rich and poor neighborhoods has characterized Nigerian cities. This urban divide has not only brought social and economic divisions, but it is also responsible for exclusion and marginalization. In Nigeria, institutions are not fully contributing to equity. This is evident in the growing proliferation of squatter settlements and slums which arose from a combination of the poverty of the inhabitants, a deficient national policy framework, and the weak, inefficient, and corrupt systems of urban governance within which they find themselves (Olokesusi, 2015). It must be understood, therefore, that inequality in any form is a bane in achieving sustainable cities. Addressing inequalities requires political will, strong institutions, and well-targeted policies. This is reflected in most developed countries where urban policies promote inclusion, diversity, multi-action, positive discrimination, and pro-poor planning (Mensah, 2019). Urban governance in Nigeria must borrow a leaf from European cities where an abundance of initiatives has been introduced to promote social inclusion

#### Good and Effective City Governance

Good city governance speaks about the quality of urban governance. One of the cornerstones to good urban governance is participation by both men and women (Mensah, 2019). Mensah (2019) highlighted areas of knowledge by city administrators, they are thirteen in number as presented by the American Planning Association in recent times: • Knowledge of urban spatial structure or physical design and the way cities work. • Ability to analyze demographic information to discern trends in population, employment, and health. • Knowledge of plan-making and project evaluation. • Mastery of techniques for involving a wide range of people in making decisions. • Understanding of local, state, and federal government programs and processes. • Understanding of the social and environmental impact of planning decisions on communities. • Ability to work with the public and articulate planning issues to a wide variety of audiences. • Ability to function as a mediator or facilitator when community interests conflict. • Understanding of the legal foundation for land regulations. • Understanding of the interaction among the economy, transportation, health, human services, and land use regulations. • Ability to solve problems using a balance of technical competence, creativity, and hard-headed pragmatism. • Ability to envision alternatives to the physical and social environment in which we live, and, lastly. • Mastery of geographic information systems and office software. Competence in all these basic skills would go a long way equipping urban planners now and the future to transform our cities into sustainable ones with the application of the six principles of good governance mentioned earlier.

#### Driving green technology innovations at city scale

The utilization of green technologies such as renewable energy that generate green electricity, smart grid systems that connect the electric vehicle charging stations to the grid to efficiently supply electricity, and electric vehicles that reduce carbon emissions sharply by using green electricity, ensure the highest impact for city-level climate action and fosters green development as well as innovation.

#### Establishing climate resilience in urban planning and management

The starting point for establishing climate resilience requires a city to understand its exposure and sensitivity to a given set of impacts, and develop responsive policies and investments that address these vulnerabilities. With an introduction of climate change assessments, such as risk and vulnerability mapping, understanding of city-specific climate change impacts is improved and key inputs to urban planning and formulation of policies and programmes on sustainable city development are provided.

#### 4.1 Transport Facilities for Sustainable Cities

Mobility is an enabler for urban life in large and small cities alike. The creation of affordable, reliable, and low emission transportation for people – which is efficient and economical for freight and business – remains a key dimension in urban planning and city level industrial development. Having adequate transport infrastructure, together with inclusive and sustainable industrialization, is a precursor to economic development, job creation and prosperity. Therefore, the provision of sustainable mobility requires policy-makers and planners to understand and incorporate the needs of different societal stakeholders into policy frameworks for providing both public and private transport. Lagos state is doing well of recent in this regards through



the introduction of city transport services through BRT, construction of Lekki Deep Blue Sea Port, Lagos to Kano train services among others.

Prospects in the Rise of Sustainable Cities in Nigeria particularly Enugu Metropolis

From the foregoing, 'Green cities' otherwise known as sustainable cities combine greater productivity and innovative capacity with lower costs and reduced environmental impact. Relatively, high densities are a central feature of green cities, bringing efficiency, gains and technological innovation through the proximity of economic activities while reducing resource and energy consumption.

Urban infrastructure including streets, railways, water, and sewage systems come at considerably lower cost per unit as urban density rises. Measures to green cities can increase social equity and quality of life. Enhancing public transport systems, for example, can reduce inequality by improving access to public services and other amenities, and by helping to relieve vehicle congestion in poorer neighbour hoods.

Cleaner fuel for transport and power generation can reduce both local pollution and health inequality. Reducing traffic and improving conditions for pedestrians and cyclists can help foster community cohesion, an important aspect of quality of life. Children who live close to green spaces are more resistant to stress; have lower incidence of behavioural disorders, anxiety, and depression; and have a higher measure of self-worth. Greenspace also stimulates social interaction between children. It creates jobs on a number of ways: urban and semi-urban green agriculture, public transport, waste management and recycling.

The first attempt at applying the principle of sustainable development to city context was in 1991 when the United Nations Centre for Human Settlements (UNCHS) Sustainable Cities Programme attempted to define a sustainable city as one "where achievements in social, economic and physical development are made to last. Thus, the definition included the three pillars of sustainability; environmental, economic, and social sustainability.

Therefore, the context of achieving the sustainability of cities can be conceived as entailing the integration of three pillars: social development, economic development, and environmental management. Proper sustainable resource management can make cities to be sustainable. For example, arable land use, management of emission effects, energy management, and governance— city management laws and enforcement determines city sustainability. Sustainable resource management is grouped into different spares, called the pillars or issues of sustainability. The pillars have connected concepts that should guide our decisions and actions towards achieving sustainable cities. The concepts contained in the pillars of sustainability are to be applied to real-world situations to make cities sustainable. City sustainability fundamentally lies on these issues.

**Economic sustainability**

Economic sustainability suggests an economic system that meets the current needs without compromising the needs for the future. The basic concepts contained in economic sustainability include productive growth, generation of decent employment opportunities, production and distribution, and technology and innovation. Economic activities in an economic system are production, distribution and consumption (Ede, 2021). Economic sustainability demands that policies and decisions should be taken equitably to ensure sustainable productivity growth, decent work opportunities etc. while considering the other sustainability pillars. Sustainability of these activities will sustain cities economically. Policy efforts are on the increase to ensure economic sustainability. Most of the concepts contained in economic sustainability are included in the Sustainable development goals, for example, goals 2, 7 and 8 (zero hunger, affordable and clean energy, and decent work and economic growth) to guarantee sustainable cities (Mensah, 2019).

#### **4.2 Social sustainability**

Social sustainability implies empowerment, gender equality, equity, cultural identity, institutional quality, social stability among others that will bring about social development, which will cause city sustainability. It is a social arrangement that alleviates poverty without resulting in either environmental destruction or economic instability. In essence, the alleviation of poverty should be within the available environmental and economic resources capacity of society. This does not mean that the needs of everyone will be met, but that the enabling condition or social environment should be created for the people to realize their desires and facilitate their pursuit to achieve social success. Here, social success entails that individuals are not in subjection into conditions that deter them to achieve their goals. The concepts contained in social sustainability include education and health, food and nutrition, water and sanitation, green energy access, green housing and building and transportation. These are basic social needs in city centres especially megacities to keep them existing. With the fast increasing urban population, these concepts are under threat. Social sustainability demands that policies and decisions should be taken equitably to ensure sustainability in education and health, food and nutrition, water and sanitation, green energy access among others while considering the other spares of sustainability. City sustainability relies on social sustainability. Therefore, to achieve sustainable cities, the concept of social sustainability has to be achieved and made sustainable. Efforts in this regard can be seen in the sustainable development goals 2, 3, 4, 5, 7 and 9 (zero hunger, good health and well-being, quality education, gender equality, affordable and clean energy and industry, innovation and infrastructure) (Mensah, 2019).

#### **4.3 Environmental sustainability**

Environmental sustainability concerns the natural environment – how it should be kept productive and springy to be supportive of human existence at any time. It is about ecosystem quality and care for the natural environment. The natural resources have limits and, extracting from it beyond the limit and faster than it can regenerate will cause environmental issues that will cause environmental

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degradation. The increasing climate change – rising sea level, increasing greenhouse gas concentration among others, for example, is a threat to city sustainability. Increase in cities and megacities have generated increase in human social and economic activities, which, in addition to natural climate variability has to cause a threat to human life, animals, plant and the entire ecosystem. Management of the environment has become prominent in ensuring sustainable cities. The key concepts in environmental sustainability include forest and soil management, energy efficiency, water management, waste and recycling management and air quality conservation. According to this pillar, sustainability will be achieved if environmental sustainability concepts are addressed alongside the other pillars of sustainability. Proper management of the environment and the achievement of the concepts of environmental sustainability will bring about a sustainable environment, which is a requirement for city sustainability. To address the rising environmental challenges and ensure that cities are sustainable, the sustainable development goals 6, 7, 13, 14 and 15 (clean water and sanitation, affordable and clean energy, climate action, life below water and life on land) respectively are incorporated in the 2030 agenda of the General Assembly (Mensah, 2019).

### 5.1 Conclusion

Sustainable city building offers universal access to affordable water and higher job chances, reduced slums and city centres and improved health and education facility. Economic opportunities associated with sustainable cities are an increase in green industries and technological improvement. Sustainable city also brings about structural and economic change and enhances regional economic and political corporation. Research and development, better agricultural production techniques, and modern storage facilities are also economic opportunities for building sustainable cities. It paves way for the development and use of renewable sources of energy as well as enhances green technology transfer. However, the challenges of building sustainable cities in Nigeria particularly Enugu Metropolis are numerous and include housing challenges, water, inadequate/poor public infrastructure, poor institutional quality, and poor sanitation, high urban poor vulnerable to diseases, and increasing youth unemployment rate, increasing waste and inefficient recycling and waste management system, and changing consumption patterns. Nigeria is faced with the challenge of access to clean energy, and increasing use of “dirty” energy especially among poor households, and the challenge of reducing carbon emissions.

### 5.2 Recommendations

1. To promote the rise of sustainable cities, it is crucial to measure and assess policies, infrastructure, socio-economic factors, emissions and any other process that contribute to and profit from the city’s metabolism, prosperity and quality of life. This will allow planning authorities, urban managers, and government in general to identify areas of opportunities as well as concern, and to respond by developing realistic sustainable cities goals.
2. Since cities of different wealth levels impact on the environment differently, plan to introduce green cities must recognize these facts. A uniform plan for all cities should not be developed rather; city specific plans should be developed to depict culture, available resources and the environmental issues of individual city.
3. There should be utilization of green technologies such as renewable energy that generate green electricity, smart grid systems that connect the electric vehicle charging stations to the grid to efficiently supply electricity, and electric vehicles that reduce carbon emissions sharply by using green electricity, ensure the highest impact for city-level climate action and fosters green development as well as innovation.
4. Sustainable city can only be one for which the inflow of material and energy resources, and disposal of wastes, do not exceed the capacity of the city’s surrounding environment. In achieving environmental sustainability urban consumption must match or be below what the natural environment (forest, ocean, soil, etc) can provide and the resulting pollutants must not overwhelm the environment’s ability to provide resources to human and other members of the ecosystem.

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