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COMPARING ENVIRONMENTAL MANAGEMENT AND CITIES SUSTAINABILITY AS A BASIS FOR SUSTAINABLE DEVELOPMENT IN NIGERIA

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Abstract

Nigerians Over the last decade, there has been a greater awareness of the complex relationship that exists between the growth of cities and the state of the environment. However, much work remains to be done to improve the quality of cities' environmental conditions to achieve developmental goals. Like most developing countries, faces environmental management challenges such as waste management, water pollution, air quality, carbon emissions, conservation and preservation of nature, climate change, city transportation, housing development, park, and gardens. The evidence suggests that adequate measures have not been taken to balance development goals with the need to maintain environmental quality. This paper investigates the strategies associated with environmental management and the success of sustainable cities. The Likert scale was used in the study. The study also used simple regression and Chi-square goodness of fit to determine the relationship between the study variables. According to the findings, the critical p-value of 9.487729 is greater than the computed value x2 0.1844. The coefficient of r 0.0001 is greater than the critical value of 9.487729. The study discovered a strong link between environmental management and the long-term viability of cities. This research will provide a foundation for stakeholders, government, and environmental management challenges.

***Keywords**:* Environmental, management, sustainable cities, development, strategies

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INTRODUCTION

A successful, knowledgeable, and functional city is unable to operate optimally in isolation from its environment. In such a scenario, a city must balance its social, economic, physical as well as environmental needs. Making cities sustainable refers to creating career and business opportunities, safe and affordable housing, and building resilient societies and economies (Powe, 2020). Inadequate policies In Nigeria, operations for the coordination and monitoring of environmental management and sustainable development result in a lack of implementation of environmental protection regulations. (Chinago Budnukaeku, 2021).

Green initiatives have become a global challenge, taking environmental factors and measures into consideration for sustainable development (Mohd Isa et al., 2021). The urban population increasing while the rural population is declining, giving rise to imbalances in the development between urban and rural areas (Johnston, 2016) (Biswas et al., 2021). The environment includes water, air, land, all the plants, people, animals that inhabit them, and the interrelationships that exist between them (Romoke Monsurat et al., 2019; Ladan, 2010).

This paper assessed environmental management strategies in line with Sustainable Development Goal 11 and the New Urban Agenda targeted to enhance inclusive sustainable urbanisation, capacity for participatory, integrated, and sustainable human-environmental settlement planning and management across the globe (Powe, 2020). It is important to take note that, Habitat Country Programme Document HCPD 2015-2043. Allied currently, the United Nations Development Assistance Framework (UNDAF) and the United Nations Sustainable Development Cooperation Framework (UNDCF) (UNSDCF) to achieve the Sustainable Development Goal accorded some priority sustainable development projects (UN-Habitat, 2015).

In this regard, it is obvious to state that a lot of research had been carried out through insufficient research that simultaneously addressed sustainable cities and environmental management challenges. The objectives of this paper are to examine environmental management and focus on the strategies for achieving Sustainable Development Goal 11 and New Urban Agenda. Public participation has more recently been showing change towards waste management in Abuja the Nation's capital. Pollution, awareness of unavailability of other natural resources, the need for conservation, and addition, the relationship between environmental management and sustainable cities development currently receives attention. To achieve the objectives, conceptual challenges relating to sustainable development are identified. The policy responses over time were examined. Finally, the study argued that systematic adoption of environmental management strategies is one the first measure required to address cities sustainability and environmental objectives.

This study would significantly contribute to knowledge and help stakeholders, decision-makers, academia, environmental managers, and City planners to look forward and recognize cities as not just a place where the population is concentrated but as a class of people from different backgrounds. The best alternative to ensure environmental management and sustainable cities development is to attribute the concept of equity and distribution of social justice to making cities a conducive, pleasant environment to live, commute and work.

STUDY BACKGROUND

The rate of community waste poses a high concern to city sustainability in the less developing regions leading to environmental pollution in China's metropolis (Kuang & Lin, 2021). Nigeria has National and regional development policies of international standard. The Federal Government of Nigeria Formulated the National Integrated Infrastructure Master Plan between 2014 to 2043 (UN-Habitat, 2015).

The World Bank, the European Union, and the African Development Bank are the country's major development partners, Department for International Development, and the United Nations System to identify major infrastructure bottlenecks affecting the country's competitiveness and provide a capital allocation framework identifying the required investments to bring infrastructure to the country in line with the country's growth (UN-Habitat, 2015).

LITERATURE REVIEW

The study compared smart city ideas of a few countries using assumed ground theory, derived inductive logical motion summarised the structure, uniqueness, and prediction of the smart city (Shamsuzzoha et al., 2021). Habitat Country Programme Document HCPD 2015-2043, currently, the United Nations Development Assistance Framework (UNDAF) and the United Nations Sustainable Development Cooperation Framework (UNDCF) (UNSDCF) to achieve the Sustainable Development Goal (UN-Habitat, 2015). The study examines the factors confronting the implementation of green technology policy to measure and improve green campuses (Mohd Isa et al., 2021). The study investigates the Spanish and Portuguese language literature both in Latin America and in Latin America to update the outcome that emerged in the field and knowledge derived as a lesson for other regions (Edelman et al., 2017). The study describes how local authority management system' s condition and the potential for integrated environmental sustainability into strategic spatial planning.

The researchers examine the degree of the use of sustainability and resilience in formulating fundamental issues of development (Satterthwaite, 2016). The study examines the relevance of the green cities concept, its suitability, and the challenges of implementing green agenda in Nigeria (Ekong, 2017).

The study employed quantitative analysis and found that physical development plans and enforcement orders were weak in some urban areas resulting in uncoordinated open green space. The researchers examine the role of public infrastructure to determine the social sustainability of the two traditional communities in Kuala Terengganu (Harun et al., 2021). The study examined the changes in space formation using urban space converted from housing to Small and Medium Scale Enterprise, as well as Indonesia's major corridor city (Haryanto et al., 2020).

This study is guided by two research questions. The first question, is what existing scientific literature says about how environmental management policies inculcated into cities sustainability aimed to achieving sustainable development. Second question is how these findings be applicable to Nigeria's National Development Programs, with the aim of achieving sustainable development. These question examines in page 2 (UN-Habitat, 2015; Powe, 2020).

Environmental Management and Sustainable Cities Development

The major challenge for today's cities is to manage the heavy reliance on ecosystem services, which leads to the depletion of natural resources and biodiversity, as well as the effort to mitigate and adapt to climate change, while prioritising public health and quality of life (Powe, 2020). Sustainable urban development is a strategy centered on land, water use, housing, transport, water management, waste management, sanitation, education, healthcare, and energy.

The landscape is a dynamic entity in space that has a spatial form created by nature and cultural interference (Harun et al., 2021). Physical development of cities and towns in Indonesia experienced fast changes in old traditional space to accommodate modern activities (Haryanto et al., 2020). Environmental sustainability is a way of promoting clean energy, sustainable use of land and resources in urban development, protecting ecosystems and biodiversity in harmony with nature, promoting sustainable consumption and production patterns, building urban resilience, reducing disaster risk, mitigating and adapting to climate change (Edelman et al., 2017). Sustainable development is defined as development that meets the needs of the present without jeopardising future generation's ability to meet their own needs (Barrow, 2006). Urban sustainability indicators are tools that allow environmental managers, to gauge environmental impact such as policies, waste disposal systems, pollution, and access to services by citizens.

Conceptual Issues of Environmental Sustainability

One of basis for sustainable development is the identification that environmental management and sustainable cities development are completely different of each

other but are complementary and interconnected as well mutually correlated (Shamsuzzoha et al., 2021).

The ability and capacity, a country support or maintain itself, taking into account the complex interaction of environmental, social, and economic factors, as well as determinable natural resources, is referred to as sustainability (Winter, 2018; Brilhante & Klaas, 2018).

Agricultural lands meant for development and improving food security were converted to built-up areas (Weiland et al., 2021). Environmental behaviour is a manifestation of personability to contribute based on individual understanding (Bakar et al., 2020). Urbanisation is the symbol of the progress of civilisation in the cities of the world (Latip et al., 2020). Large numbers of urban governments in the low- and middle-income Commonwealth nations have the capacity to plan or to implement agreed plans as well as manage urban expansion as a major priority attached to such a country (Biswas et al., 2021).

Works of literatures has shown that challenges of environmental management are accrued to the limited resources on the carrying capacity of a delicate ecosystems. Resilience cities require development activities to meet human needs and must advance within acceptable environmental control. The adjustment between development and environmental management is the only alternative in which the objective of sustainable development can be achieved. To strive the relationship between development and environmental quality transpire to the concept of 'eco-development' This is an ecologically sound development process that focuses on reducing the negative impacts of cities on the environment, especially by improving air quality; provide safe, affordable, accessible, and sustainable transport systems, improving road safety notably through a larger public transport network.

Role of Environmental Management Agencies in Nigeria

- The Federal Ministry of Environment, Housing, and Urban Development provide innovative, efficient, and effective environmental regulation and waste management services to ensure a healthy, clean environment.
- National Emergency Management Agency coordinates resources towards efficient and effective disaster prevention, preparedness, mitigation, and response in Nigeria.
- Nigeria Conservation Foundation promotion nature conservation and environmental protection in collaboration with other agencies to build and sustain a more lasting union to safeguard the environment
- National Oil Spill Detection and Response Agency responsible for preparedness, detection, response to oil spillages, and use of oil in the guest to achieve sustainable development in Nigeria

- Forestry Research Institute of Nigeria ensures sustainable forest resource management and products, food production and security, forest-based industrial raw material provision, and biodiversity utilization.
- National Standards and Regulations Enforcement Agencies (NSREA) is the embodiment of law that focused on the protection and sustainable development of the environment and its natural resources and ensures compliance with environmental laws.
- National Biosafety Management Agency provides the regulatory framework to adequately safeguard human health and the environment from potential adverse effects of modern biotechnology for the benefit of Nigeria.
- Friends of the Environment Nigeria create awareness, enlighten and educate people about the environment.

Goal 11: Ensures that Cities and Human Settlements are Inclusive, Safe, Resilient, and Designed for Long-Term Sustainability

- Make accessible to all citizens have access to adequate, safe, and affordable housing and basic services and upgrade slums.
- To provide safe, affordable, accessible, and sustainable transportation systems, with an emphasis on optimizing transport infrastructure through a relatively large public transportation network.
- Strengthen global capacities for inclusive and sustainable urbanization and participatory, integrated, and sustainable human settlement management throughout the world.
- Promote the conservation and preservation of the natural and cultural heritage.
- Significantly reduce the number of deaths and the number of people affected by disasters, including water-related disasters, and reduce the direct and indirect economic losses through the protection of people in the affected areas.
- Reducing the negative impacts of cities on the environment, especially by improving air quality, municipal, and other waste management.
- Ensure universal access to green and public spaces that are safe, inclusive, and accessible for all, particularly for women and children, and for elders and people with disabilities
- Strengthening national and regional development planning, Supporting the establishment of positive economic, social, and environmental links between urban, peri-urban, and rural areas.
- Significantly increase the number of cities and human settlements implement
- integrated policies, plans, inclusion, resource efficiencies, mitigation and adaptation to climate change, resilience to disasters, and to develop policies in line with these goals.

- Support least developed countries in creating sustainable and resilient structures using local resources, particularly through financial and technical aid (Satterthwaite, 2016).

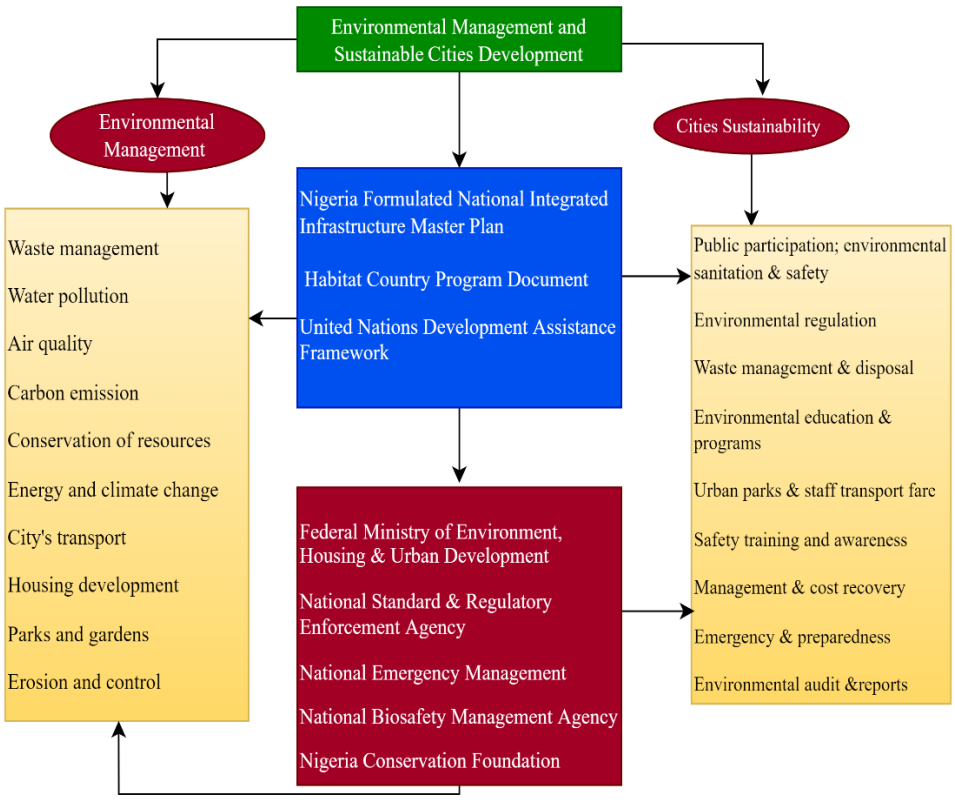

Figure 1: Environmental Management Strategy Plan
Source: Adapted from Federal Ministry of Environment Nigeria (2021)

METHODOLOGY

The section provides empirical research work similar to the study. For this study, researchers; drew materials from in-depth review of literature related to environmental management and sustainable cities development in line with Sustainable Development Goals 11, and New Urban Agenda. The study explores increasing access, and formulating ideas in developing countries of the Arab region specifically, Jordan (Shamout et al., 2021). The study adopted document quantitative analysis as a primary technique. The study employed the Likert scale, responses to variables, and a one-way Multi-Analysis of Variance to determine

the mean distribution of ten variable items of environmental behavior (Bakar et al., 2020).

The researcher used new techniques to propose solutions and collaborated with urban planning party officials to combat change (Latip et al., 2020). The paper assessed the role of management and the reality of urban plans and management. The researchers employed the relative importance index (RII) and revealed that noise and air pollution are considered the most significant environmental factors (Kuang & Lin, 2021). The study examines the pattern and changes in rural communities of Kuala Nerang, Kedah, Malaysia between 2001 and 2018 using the GIS application (Weiland et al., 2021). The study revealed a decline of 1.3% in agricultural land converted to residential, commercial, and roads. The researchers discussed the challenges of landscape violation using the available environmental laws and management agencies (Chinago Budnukaeku, 2021).

The study focused on globalization and sustainable growth, bioethics and poverty, organizational performance and sustainability, environmental management and individual progress, human and ecosystem health, and water resources (Goosen, 2012). The study provides a literature review on the issues related to the planning, development, and management of sustainable cities (Satterthwaite, 2016). The study employed Logit regression and coefficients to determine the existence variables. The study revealed positive and significant public participation. The study used Logit Model provided dependent parameters comprises of Willingness to Classification (WTC) and Behaviour Garbage Classification (BGC) as a wide choice technique (Shamsuzzoha et al., 2021).

Table 1: Environmental management and cities sustainability

S/N	Independent variables (X)	5	4	3	2	1	Total
1	Do the agencies aimed at reducing urban waste?	2	1	0	1	1	5
2	Does the agencies help in minimizing water pollution?	1	2	0	1	1	5
3	Does the agency contribute to the enhancement of air quality?	2	1	0	1	1	5
4	Does the agency handle the issue of carbon emission judiciously?	2	1	0	1	1	5
5	How often have the issues of conservation of resources been addressed?	1	1	0	1	2	5
6	Does the agency educate people on the effect of energy and climate change?	2	1	0	1	1	5
7	Does cities transportation contribute to air pollution?	1	2	0	1	1	5
8	Does the housing development by following per under the design plan?	2	1	0	1	1	5

9	How efficient is the management of Parks/gardens?	2	1	0	1	1	5
10	Does the agency consider causes of erosion/control?	2	1	0	1	1	5
	Total	**17**	**12**	**0**	**10**	**11**	**50**

5=Strongly Agreed, 4=Agreed, 3 = Neither Agreed-Nor-Disagree, 2=Disagreed, 1= Strongly Disagree

Table 1, is structured on environmental variables as an independent component to assess urban environmental quality. Likert was used to weight the level of each variable. 58% of respondents agreed with the operational performance of environmental management towards city's sustainability.

Photo 1a shows the nature and characters of urban population towards disposal of garbage's along the road. The agency took a rigorous clearing of corridor road to provide adequate space parking and road visibility. Photo 1b shows intensity of urban road congestion along Maraba-Abuja, the Nation's capital.

Photo 1a: Waste disposal along Abuja-Maraba

Photo 1b: Traffic congestion along Abuja-Maraba

Table 2 discusses the environmental management and cities sustainability to coordinate and educate the public on the factors that contributed to poor environmental quality. The defined a high level of assessment from the regulatory body indicates 45% compliance with management strategies.

Table 2: Environmental management strategies

S/N	Dependent variable (Y)	5	4	3	2	1	Total
1	Does the public participate in environmental sanitary & safety?	3	2	0	1	0	5
2	Does the agency take environmental regulation into action?	2	1	0	1	1	5
3	Does the agency manage waste/disposal?	3	2	0	0	0	5

4	Does the design environmental education programs simultaneously?	3	2	0	0	0	5
5	Does the agency provide adequate motor park transport fare for staff?	2	2	0	1	0	5
6	Does the agency provide adequate training & awareness of safety?	2	3	0	0	0	5
7	Does the agency Manage & recover the cost?	2	2	1	0	0	5
8	Does the agency equip to handle emergencies & preparedness	2	2	1	0	0	5
9	Does the agency updates issues/challenges?	3	2	0	0	0	5
10	Do the Audit and review reports?	3	2	0	0	0	5
	Total	**25**	**20**	**2**	**1**	**1**	**50**

5=Strongly Agreed, 4=Agreed, 3 = Neither Agreed-Nor-Disagree, 2=Disagreed, 1= Strongly Disagree

Table 3 provides a relationship between environmental management and sustainable cites development $x^2 = 0.1844 <$ critical value 9.487729. The observed value of 0.1844 is less than the critical value of 9.487729. This indicates that a relationship exists between environmental management and cities sustainability. The analysis shows that environmental management and cities sustainable cities development are cordially related.

Table 3: Environmental management and city's sustainability

S/N	O	E	O - E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
1	3	5	-2	4	0.8
2	3	3	0	0	0.0
3	3	5	-2	4	0.8
4	3	5	-2	4	0.8
5	2	4	-2	4	1.0
6	3	5	-3	9	1.8
7	3	4	-1	1	0.25
8	3	4	-1	1	0.25
9	3	5	-3	9	1.8
10	3	5	-2	4	0.8
Total	**$\sum x = 29$**	**$\sum y = 45$**	**$\sum xy = -18$**	**$\sum x^2 = 40$**	**$\sum y^2 = 8.3$**

Table 4: Relationship between environmental management and city's sustainability

S/No.	X	Y	XY	X^2	Y^2
1	3	5	15	9	25
2	3	3	9	9	9
3	3	5	15	9	25
4	3	5	15	9	25
5	2	4	8	4	16
6	3	5	15	9	25

7	3	4	12	9	16
8	3	4	12	9	16
9	3	5	15	9	25
10	3	5	15	9	25
Total	**$\sum x = 29$**	**$\sum y = 45$**	**$\sum xy = 131$**	**$\sum x^2 = 85$**	**$\sum y^2 = 207$**

Table 4 presents the coefficient of correlation between environmental management and cities sustainability. The result would be compared with that of Chi-square goodness of fitness to generalise the argument amongst the two results. The study revealed that; the Critical p-value = 9.487729 is greater than the observed value of 0.0001. Therefore, there is a strong correlation between environmental management and cities sustainability.

DISCUSSION

Based on reviewed literature and theories, literature provides the concepts, approaches, and strategies within the context of sustainable cities development. The study used a weighted score Likert scale analysis and based its findings on five agencies: The Federal Ministry of Environment, the Ministry of Housing and Urban Development, the Nigeria Conservation Foundation, the National Biosafety Management Agency, as well as the National Standards and Regulations Enforcement Agency.

This section discussed the assessment of all of the tables and the results. Table 1 is organised around environmental variables as a separate component for assessing urban environmental quality. The performance in mathematics was weighted using the 5-point Likert. (58%) agreed with the management strategies, while (42% disagreed) with the regulatory authority's efficiency in environmental management for the city's sustainability. We talked about environmental management strategies for coordinating, fostering, and educating the public about the factors that contribute to poor environmental quality.

The study shows a moderate level of policies adoption of 45% active toward environmental management (Table 2). The study used Chi-square goodness of fittest to identify a relationship between environmental management and sustainable cites development. The result shows that regression analysis $x^2 = 0.1844 <$ critical value 9.487729. The observed value of 0.1844 is less than the critical value of 9.487729 indicate that a relationship exists between environmental management and cities sustainability (Table 3).

The analysis shows that environmental management and cities development are cordially related. We calculated the coefficient of correlation between environmental management and cities sustainability (Table 4) in essence to compared the result of the two-method employed to generalise the uniqueness in applications.

According to the table, the Critical p-value = 9.487729 is greater than the observed value of 0.0001, indicating a strong relationship between environmental management and city sustainability. The null hypothesis H_0 was not true while, the alternate hypothesis H_1 proof be correct that a relationship exists. This is an indication that the component of cities development was dependent on environmental variables.

Water pollution, air quality, carbon emission, conservation, energy and climate change, cities transport, housing development, parks and gardens, erosion, and control were the independent variables, while, public participation, waste management and disposal, environmental programmes, loading, and parking space, training and awareness, emergencies and preparedness, reported issues, audit, are significantly managed.

CONCLUSION

Environmental management requires proactive measure to develop and must inculcate closely to suit conditions, which progressively have to improve without adequate environmental management measures. The projection and target for Sustainable Development Goals 17 Agenda in line with Goal 11 of which present a roadmap for future development trajectory globally is imperative for all nations. It is a fact that, to improve the quality of life and protect the urban and rural environment from uncoordinated uses, sustainability must be thoroughly taken into cognisance to ensure a cordial relationship between quality and sustainable cities development.

This study drowns more light on the new dimension and practice of environmental managers, urban planners, and other allied professionals within the context of sustainable urban development. Environmental managers and town planners look forward in recognising cities not just a place where population is concentrated, but as a class of people from different backgrounds and how the system will make their socio-cultural diversity key to contemporary city plans. The study revealed a significant relationship between environmental management and sustainable city development. Comparably, the methods employed indicate that a relationship exists between environmental management and cities sustainability

RECOMMENDATION

This study will throw lighter upon environmental management and the challenges. Environmental control, coordination, and urban development can ascertain the existing practice and forester for a better understanding of the relationship between environmental management and sustainable cities development. The study placed more emphasis on environmental management and awareness as a tool for educating the general public on the danger of inconsequential activities of urban dwellers. Environmental managers and cities

planners ensure that the urban environment is healthy for the dwellers and offer good quality services in response to challenges.

Environmental managers and cities planners ensure that cities give their inhabitants a sustainable healthy environment and employment. Environmental managers and city development planners require adequate services, enforcing environmental and urban planning laws. Implementing protective measures by looking at the needs of the community. Building a strong relationship between environmental management to ensure a sustainable cities development. Their relationship should influence the quality and sustainability of the community in which people live.

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