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Harnessing Architecture and Urban Planning to Fulfill United Nations Sustainable Development Goals in Nigeria

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Abstract

The goal of sustainable development has become a global priority, especially in light of rising urbanization and environmental degradation. In Nigeria, where cities face expanding challenges such as housing shortages, infrastructure deficiencies, informal settlement development, and climatic vulnerability, architecture and urban planning are increasingly acknowledged as important solutions for resolving these concerns. This study explores how these disciplines might be harnessed to achieve the United Nations Sustainable Development Goals (SDGs), with a particular emphasis on SDG 11: Making cities inclusive, safe, resilient, and sustainable. Through a critical literature review and contextual analysis, the article identifies gaps, challenges, and opportunities for aligning Nigeria's built environment practices with sustainability imperatives. Key issues noted include obsolete planning instruments, poor institutional coordination, inadequate technical capacity, and the exclusion of informal communities from urban development processes. Despite these systemic difficulties, the study identifies emerging innovations, such as climate-responsive architecture, digital planning tools, and community-driven urban design, as viable paths to revolutionary change. The study argues for a paradigm shift in Nigeria's architectural and planning methods, highlighting the importance of interdisciplinary collaboration, policy reform, participatory governance, and investment in resilient infrastructure. It concludes that by incorporating sustainability principles into planning policies, professional education, and built environment regulations, Nigeria can significantly advance its progress toward the SDGs while creating more equitable and livable urban spaces.

Keywords: Sustainable Development Goals, Urban Planning, Architecture, Nigeria, Resilient Cities, Built Environment, Climate-Responsive Design, Informal Settlements, Policy Integration

Introduction

The United Nations adopted the 2030 Agenda for Sustainable Development in 2015, which established 17 Sustainable Development Goals (SDGs) to guide global peace, prosperity, and environmental sustainability. Among these goals, SDG 11—"Make cities and human settlements inclusive, safe, resilient, and sustainable"—directly involves architecture and urban planning. In rapidly urbanizing countries such as Nigeria, where over 50% of the population now dwells in cities, the built environment plays a key role in shaping economic opportunity, environmental quality, public health, and social cohesion. Despite the existence of national frameworks for sustainable development, urban planning in Nigeria remains fragmented, frequently hampered by weak governance, low technical capacity, out-of-date regulatory instruments, and a lack of stakeholder participation. Architecture, similarly, have had difficulties in moving from a simply aesthetic and functional profession to one that values sustainability, cultural identity, and climatic resilience. Architecture and urban planning, when strategically integrated, can be powerful tools for attaining various SDGs, including poverty reduction (SDG 1), excellent health and well-being (SDG 3), affordable and clean energy (SDG 7), and climate action (SDG 13). This article explores how architecture and urban planning in Nigeria might be strategically used to further the SDGs. It contends that an interdisciplinary, context-sensitive, and people-centric approach to design and planning is required to

create inclusive and resilient cities. The analysis focuses on emerging innovations, policy gaps, and practical strategies to align Nigeria’s urban development trajectory with global sustainability imperatives.

Literature Review

Theoretical Foundations of Sustainable Architecture and Urbanism

The Brundtland Commission (1987) and the UN-Habitat New Urban Agenda (2016) are the conceptual foundations for linking the built environment to sustainability. These frameworks emphasize intergenerational equity, resilience, and social justice. Scholars like Ken Yeang and Sim Van der Ryn have proposed models of ecologically integrated architecture that reduce carbon footprints and support local ecosystems. Jane Jacobs’ advocacy for community-driven urbanism is also relevant resonating with SDG-oriented planning, emphasizing walkability, diversity, and civic engagement.

Architecture as a Tool for Sustainability

Globally, architecture and urban planning are increasingly regarded as vital tools for achieving long-term development. According to UN-Habitat (2022), urban design and spatial arrangement have a direct impact on housing, employment, mobility, energy efficiency, and ecosystem preservation. Scholars such as Jenks and Dempsey (2005) emphasize the importance of compact, mixed-use urban forms, as well as efficient public transit and green infrastructure, in limiting urban sprawl and ecological footprints. Architecture overlaps with a number of SDGs, including SDG 3 (Good Health and Well-being) through healthy building design, SDG 7 (Affordable and Clean Energy) through passive cooling and renewable energy integration, and SDG 11 (Sustainable Cities and Communities) through inclusive housing. UN-Habitat (2020) [1]. found that spatial form has a major impact on urban equity and climate resilience. In Nigeria, Adebayo (2019) [2]. and Odimabo & Bomo (2021) [3]. found that many urban houses are thermally inefficient and structurally unsustainable, resulting in high energy needs and poor living conditions. Olotuah and Bobadoye (2009) [4]. propose that using vernacular approaches and bioclimatic principles can improve building sustainability while conserving cultural identity. Akinbileje (2020) discovered that using local materials decreases embodied energy by up to 40%. However, current architectural practice in Nigeria frequently prioritizes imported aesthetics and materials, ignoring sustainability.

Urban Planning in Nigeria and the SDGs

Urban planning is the intersection of policy and space. According to UNDP (2022), cities with participatory planning mechanisms do better in SDG implementation. Urban planning in Nigeria has traditionally been top-down and reactive. According to Akinbamijo (2018) [5]. insufficient enforcement of planning regulations, a lack of updated masterplans, and informal settlements have hampered sustainable urban growth. Despite these challenges, numerous Nigerian cities have begun to experiment with SDG-aligned innovations. Lagos, for example, has implemented Bus Rapid Transit (BRT) and is exploring urban greening and smart city frameworks (Adelekan, 2020). Pilot programs in Kaduna and Abuja focus on affordable housing, climate-responsive urban design, and participatory slum upgrading. These initiatives indicate a rising appreciation of architecture and urban planning as tools for inclusive and sustainable urban transformation. Furthermore, new academic discourses encourage integrated planning, which combines spatial, economic, and environmental initiatives. Scholars advocate for context-based frameworks that promote resilience, inclusion, and heritage preservation alongside innovation and infrastructure development (UNESCO, 2021; Ezema et al., 2023). Smart growth strategies, transit-oriented development, and green infrastructure planning have gained global attention as key urban sustainability tools. These approaches are gaining traction in Sub-Saharan Africa, though implementation remains inconsistent. Cross-sector partnerships and digital tools (e.g., GIS and Building Information Modeling) can reinforce urban governance and planning outcomes aligned with the SDGs.

Policy Document	Year	Relevant SDGs Covered	Gaps Identified
National Urban Development Policy	2012	6, 11, 13	Weak enforcement, outdated frameworks
Lagos State Development Plan	2012	7, 9, 11	Limited community engagement
Abuja Master Plan	2008	9, 11, 15	Poor infrastructure integration
Nigerian Green Building Standards	2017	7, 12, 13	Lack of compliance and awareness

Table 1: summarizes key planning policies and their alignment with selected SDGs

Policy Frameworks and Implementation Gaps

Nigeria is a signatory to several global and regional sustainable development frameworks, including the New Urban Agenda (NUA), the Paris Climate Agreement, and the African Union Agenda 2063. However, the ability to translate these commitments into local action remains limited. The National Urban Development Policy (NUDP) and National Building Code (NBC) offer some guidance, although they frequently lack enforcement mechanisms, funding, and institutional coordination (Ede & Jimoh, 2022). The effective application of architecture and planning solutions for SDG attainment necessitates strong governance reforms, capacity building, and the incorporation of sustainability principles into education, practice, and legislation.

Methods

Research Design

This study employed a mixed-methods approach, incorporating qualitative and quantitative data, to explore the relationship between architecture, urban planning, and SDG implementation. The study was divided into three phases: (1) a literature and policy review, (2) field-based case studies in Lagos, Abuja, and Enugu, and (3) stakeholder interviews and surveys.

Data Collection

Document Review: Over 45 papers, including urban policies, architectural guidelines, and SDG progress reports, were reviewed. **Case Studies:** Three urban projects were chosen.

- Eko Atlantic metropolis (Lagos) is a luxury, master-planned beachfront metropolis. The Abuja Mass Housing Scheme is a public-private housing initiative.
- The Enugu Slum Upgrade Project is a participatory urban upgrading scheme.

Interviews: We conducted 18 in-depth interviews with architects, urban planners, policymakers, and community leaders. **Surveys:** A structured questionnaire was distributed to 120 people and professionals from the three cities to assess perceptions on SDG integration.

Data Analysis

For descriptive statistics, quantitative data were analyzed using SPSS, and qualitative data from interviews and documents were thematically analyzed using NVivo. Themes like "sustainability integration," "policy coherence," and "community participation" were derived inductively and coded accordingly.

Results and Analysis

Awareness and Implementation of SDGs

The results showed that over 80% of professionals in Lagos and Abuja were fully aware of the SDGs, indicating a good foundation for strategic planning alignment, but only 42% reported active integration in their projects. Only 27% of residents grasped the relationship between urban planning and sustainability goals among residents.

City	Aware (%)	Partially Aware (%)	Not Aware (%)
Lagos	85	10	5
Abuja	78	17	5
Enugu	72	20	8

Table 2: Awareness of SDGs Among Respondents

Performance of Selected Case Studies

Eko Atlantic City excelled in climate resilience (flood control and sea protection), but fell short in social inclusion and affordability, which contradicted SDG 10 (reduced inequalities). The Abuja Mass Housing Scheme achieved SDG 11 in a moderate way by providing mixed-income housing and public transportation, although it lacked green building standards. The Enugu Slum Upgrade Project demonstrated high compatibility with SDGs 1, 6, and 11, by improving cleanliness, access to clean water, and community engagement.

Project	SDG Strengths	SDG Weaknesses
Eko Atlantic City	SDG 13 (Climate Action), SDG 9 (Infrastructure)	SDG 10 (Inequality), SDG 11 (Inclusiveness)
Abuja Mass Housing	SDG 11 (Affordable Housing), SDG 9 (Innovation)	SDG 7 (Energy), SDG 12 (Consumption)
Enugu Slum Upgrade Project	SDG 1 (No Poverty), SDG 6 (Sanitation), SDG 11	Limited scale, insufficient follow-up

Table 3: Evaluation of Selected Urban Projects in Relation to SDGs

These findings point to a trend of technical and elite-oriented developments (e.g., Eko Atlantic) that overlook inclusive sustainability. By contrast bottom-up projects, such as the Enugu upgrade, provide a more comprehensive alignment with many SDGs, albeit on a smaller scale.

Barriers to SDG Integration

From interviews with 18 stakeholders, several recurring themes emerged:

- **Governance Fragmentation:** Overlapping jurisdictions and lack of data hinder planning.
- **Funding Constraints:** Projects rely heavily on international donors, limiting scalability.
- **Low Capacity:** Planners and architects lack training in SDG tools like LEED, EDGE, or UN-Habitat's City Prosperity Index.

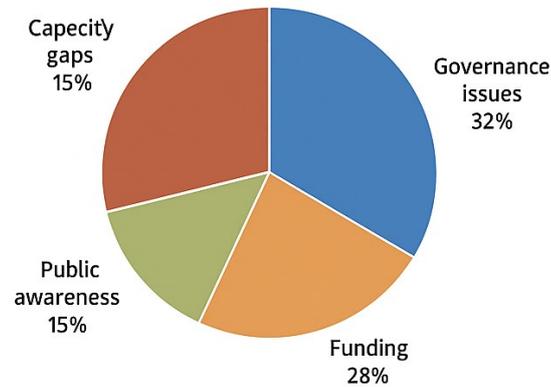


Figure 1: Common Barriers to SDG-Aligned Urban Planning in Nigeria

Indigenous and Sustainable Design Integration

Only 25% of surveyed projects used local materials or bioclimatic design strategies. However, architects expressed willingness to adopt sustainable practices if better incentives and training were provided.

Stakeholder Perspectives

Interviews revealed varying levels of optimism

"We have the frameworks; what we lack is political will and enforcement." — Senior Town Planner, Abuja
 "Traditional architecture is disappearing because the curriculum doesn't emphasize it." — Architect, University of Nigeria
 Surveys showed that 82% of respondents supported incentives for green buildings, while 68% favored stricter planning laws to enforce SDG criteria.

Discussion

Strategic Role of Architecture and Urban Planning in Achieving SDGs

The relationship between the built environment and the SDGs is apparent. Architecture and urban planning in Nigeria have the potential to stimulate systemic change by establishing spatial, social, and environmental frameworks for sustainability. For example, climate-responsive building design can minimize energy consumption (SDG 7), whereas inclusive public spaces promote social equity (SDG 10) and health (SDG 3). The transition from uncontrolled urban growth to structured, mixed-use, and compact city forms has substantial promise for reducing land degradation (SDG 15) and carbon emissions (SDG 13).

Nonetheless, these potentials are far from realized. The study demonstrates that Nigeria's existing urban planning approaches are mostly reactive, exclusionary, and fragmented. A considerable part of urban development's takes places informally, without the guidance of spatial development plans, resulting in a mismatch between population growth and infrastructure availability. This degrades quality of life and perpetuates urban poverty, contrary to the goals of SDG 1 and SDG 11.

Systemic Barriers and Institutional Weaknesses

The ongoing gap between planning policy and practice in Nigeria stems from institutional constraints. These include obsolete master plans, limited institutional capacity, insufficient data, and insufficient integration of sustainability into design education and professional regulation. Urban development authorities frequently lack access to current land-use data and environmental impact assessments, making strategic planning difficult. Furthermore, the study identifies a lack of collaboration among architects, urban planners, environmental scientists, and public administrators. In most Nigerian cities, planning decisions are politically motivated rather than evidence-based. This institutional dispersion causes duplication of efforts and policy conflicts, which impede SDG-aligned development.

Community Exclusion and the Informality Challenge

Another significant issue raised is the marginalization of informal settlements and disadvantaged communities. Despite housing the vast majority of Nigeria's urban population, informal settlements are usually overlooked in city development strategies. The top-down character of planning processes restricts local engagement, which is required to develop context-sensitive and sustainable solutions. This neglect has resulted in spatial inequity, restricted access to services, and environmental fragility, all of which undermine attempts to attain SDGs 6 (clean water and sanitation), SDG 10 (reduced inequalities), and SDG 16 (peace, justice, and strong institutions). Addressing these difficulties necessitates participatory and inclusive planning strategies that enable communities, particularly women and youth, to co-create their environments. This is consistent with the SDG goal of "leaving no one behind."

Emerging Opportunities and Innovations

Despite the challenges, there are emerging opportunities to link architecture and planning with the SDGs. Passive cooling, green roofing, modular construction systems, GIS-based spatial analysis, and smart urban mobility systems are

among the emerging innovations. In particular, climate-resilient design ideas are increasingly being used in institutional buildings and pilot housing projects in Abuja, Lagos, and Enugu. The digitization of planning tools, such as 3D modeling, remote sensing, and AI-aided simulations, opens up new opportunities for predictive and adaptive planning. These technologies can help with sustainable land-use planning, environmental risk assessment, and infrastructure optimization. Furthermore, the increased advocacy for indigenous architectural traditions—such as courtyard architecture, the use of mud bricks, and natural ventilation—confirms the value of local expertise in sustainable design. To expand these ideas, Nigeria’s architectural and planning curriculum must be modified to include sustainability, ethics, cultural relevance, and digital proficiency. Professional organizations and regulatory councils must also update their codes and licensing requirements to reflect the ideas of sustainable development.

Conclusion

This study has examined the critical role of architecture and urban planning in advancing the Sustainable Development Goals in Nigeria. Despite their transformative potential, present built-environment practices are still out of sync with the country’s SDG objectives, according to the study. Institutional deficiencies, fragmented governance, a lack of community participation, and out-of-date regulatory frameworks all significantly limit progress toward sustainable urbanization. However, there is compelling evidence that with the proper reforms—particularly in policy coherence, planning practice, professional education, and citizen engagement—Nigeria can harness architecture and planning as strategic tools for achieving the SDGs. Climate-responsive design, spatial justice, and participatory urban governance may help create cities that are not only efficient and resilient, but also equitable and inclusive. The paper proposes a multi-pronged approach, including incorporating SDG principles into urban policies, building capacity for planners, architects, and city administrators, enhancing inter-agency collaboration and data-driven planning, encouraging public participation in urban design, and investing in affordable, sustainable infrastructure for underserved communities. With intentionality, collaboration, and innovation, Nigeria’s urban future may be changed to line with global sustainability goals, assuring a higher quality of life for current and future generations [6-20].

Ethical Considerations

Ethical approval was obtained from Federal University Birnin Kebbi Research Ethics Committee. All participants provided informed consent, and data were anonymized to protect identities.

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