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A sustainable built environment in the southeast region of Nigeria

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Abstract

The South East region of Nigeria faces significant challenges in developing a sustainable built environment. Limited access to resources, weak policy implementation, and cultural factors all contribute to unsustainable construction practices and urban planning. This essay examines the key challenges, existing policies, and emerging opportunities for creating a more sustainable built environment in the southeast. It draws on case studies, data, and expert analysis to provide a comprehensive assessment of the topic. The essay highlights the need for improved resource management, strengthened regulatory frameworks, and increased public awareness and engagement. Civil engineering solutions, such as renewable energy systems, efficient water management infrastructure, and innovative construction techniques, are proposed to complement these efforts. The essay concludes by outlining several promising solutions and recommendations to help the South East region transition towards a more sustainable built environment.

Keywords: Sustainable Development; Green Infrastructure; Renewable Energy; Urban Planning; Resource Management; Policy Implementation

1 Introduction

Across Nigeria, the built environment—encompassing buildings, infrastructure, and urban design—faces significant sustainability challenges. This is particularly acute in the Southeast region, which has experienced rapid urbanization, resource scarcity, and infrastructural deficiencies. Developing a sustainable built environment in the southeast requires addressing complex, interrelated issues around resource use, policy implementation, and community engagement.

This essay examines the key challenges, existing policies, and emerging opportunities for creating a more sustainable built environment in the southeast region of Nigeria. It draws on case studies, data, and expert analysis to provide a comprehensive assessment of the topic, with the goal of informing decision-makers, practitioners, and the public on the critical steps needed to transition towards a more sustainable built environment.

2 Challenges to Sustainable Built Environment in Southeast Nigeria

The South East region of Nigeria faces several key challenges in developing a sustainable built environment. These include:

- **Resource Scarcity and Inefficient Resource Management** The South East region suffers from limited access to key resources needed for sustainable construction, such as clean water, energy, and building materials. For example, the region experiences frequent power outages and unreliable electricity supply, forcing many residents and businesses to rely on diesel generators and other fossil fuel-powered alternatives (Okafor, 2017). This contributes to high greenhouse gas emissions and unsustainable energy use. Similarly, the region faces

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severe water scarcity, with many communities lacking access to clean, reliable water sources. This necessitates the use of borehole wells and other water collection methods that can be environmentally damaging and energy-intensive (Nwankwoala, 2011). The limited availability of sustainable building materials, such as locally sourced timber and recycled materials, also hinders the adoption of green construction practices.

- **Weak Policy Implementation and Enforcement** Nigeria has developed several policies and regulations aimed at promoting sustainable built environment practices, such as the National Building Code and the National Urban Development Policy. However, implementation and enforcement of these policies remain major challenges in the Southeast region. Weak institutional capacity, corruption, and lack of political will all contribute to the gap between policy and practice (Ogbazi, 2013). For example, many new developments in the South East region fail to comply with zoning regulations, building codes, and environmental impact assessments. This leads to the construction of unsafe, energy-inefficient buildings, as well as the destruction of natural habitats and green spaces. The lack of effective monitoring and enforcement mechanisms exacerbates these issues.
- **Cultural Factors and Public Awareness** Cultural norms and public awareness around sustainable practices also present barriers to developing a sustainable built environment in the southeast. Many residents and builders in the region prioritize short-term cost savings over long-term environmental and social benefits, leading to the use of unsustainable materials and construction methods (Olotuah & Bobadoye, 2009). There is also a general lack of awareness and understanding among the public about the importance of sustainable built environment practices, such as water conservation, energy efficiency, and waste management. This, combined with the prevalence of informal settlements and self-built housing, makes it challenging to implement and scale sustainable solutions (UN-Habitat, 2018).

3 Existing Policies and Initiatives for Sustainable Built Environment

The Nigerian government has developed several policies and initiatives aimed at promoting sustainable built environment practices, including:

- **National Building Code (NBC)** The National Building Code, first introduced in 2006 and revised in 2018, sets minimum standards and guidelines for the design, construction, and maintenance of buildings in Nigeria. It includes provisions for energy efficiency, water conservation, and the use of sustainable materials (Federal Ministry of Works and Housing, 2018). However, as mentioned earlier, enforcement and implementation of the code remain significant challenges, especially in the Southeast region.
- **National Urban Development Policy (NUDP)** The National Urban Development Policy, adopted in 2012, provides a framework for sustainable urban development in Nigeria. It emphasizes the importance of integrated land use planning, green infrastructure, and community participation in urban development processes (Federal Ministry of Land, Housing and Urban Development, 2012). While the policy has been praised for its holistic approach, its impact has been limited by weak institutional capacity and political will.
- **Renewable Energy and Energy Efficiency Policy (REEEP)** The Renewable Energy and Energy Efficiency Policy, introduced in 2015, aims to promote the use of renewable energy and energy-efficient technologies in Nigeria. It includes targets for increasing renewable energy generation and improving energy efficiency in buildings (Federal Ministry of Power, 2015). However, the policy's implementation has been hindered by a lack of funding, incentives, and public awareness, particularly in the Southeast region.
- **Waste Management Initiatives** Several state and local governments in the Southeast region have introduced initiatives to improve waste management, such as the establishment of recycling centres and the promotion of composting. For example, the Enugu State Waste Management Authority has implemented a waste segregation program and partnered with private companies to collect and recycle waste (Enugu State Waste Management Authority, 2020). While these initiatives are a step in the right direction, they often lack the scale and coordination needed to effectively address the region's waste management challenges.

4 Opportunities for Sustainable Built Environment in Southeast Nigeria

Despite the significant challenges, the South East region of Nigeria also presents several opportunities for developing a more sustainable built environment:

- **Renewable Energy Potential** The South East region, like much of Nigeria, has significant potential for renewable energy generation, particularly from solar and small-scale hydropower sources. Harnessing this potential could help address the region's energy supply challenges, reduce reliance on fossil fuels, and create new economic opportunities (Adaramola et al., 2014).

- **Sustainable Building Materials** The South East region is home to a variety of locally sourced, sustainable building materials, such as bamboo, rammed earth, and recycled plastic. Promoting the use of these materials and developing innovative construction techniques could help reduce the region's dependence on energy-intensive and environmentally harmful materials like cement and steel (Olusola et al., 2014).
- **Community-Based Initiatives** The Southeast region has a strong tradition of community-based organizations and self-help initiatives. These can be leveraged to promote sustainable built environment practices at the local level, such as community-led waste management, water conservation, and housing improvement programs (Ogbazi, 2013).
- **Civil Engineering Solutions** Specific civil engineering solutions could significantly enhance sustainability in the region. Examples include:
    - **Rainwater Harvesting Systems:** These can mitigate water scarcity by capturing and storing rainwater for domestic and agricultural use. Simple systems involving gutters and storage tanks can be widely adopted in both urban and rural areas.
    - **Green Infrastructure:** Incorporating features like green roofs, permeable pavements, and urban green spaces can reduce flooding, improve air quality, and enhance biodiversity.
    - **Low-Cost Modular Housing:** Utilizing prefabricated components made from locally sourced materials can create affordable and sustainable housing options for low-income communities.
    - **Renewable Energy Microgrids:** Establishing localized solar or wind-powered microgrids can provide reliable electricity to underserved areas.
    - **Efficient Wastewater Treatment Systems:** Designing small-scale, decentralized treatment plants can improve sanitation and reduce water pollution.
- **Sustainable Urban Planning** The rapid urbanization in the Southeast region presents an opportunity to implement sustainable urban planning strategies, such as mixed-use development, transit-oriented design, and green infrastructure. By incorporating these principles into new urban development projects, the region can create more livable, resource-efficient, and environmentally friendly cities (Ogu & Ogbuozobe, 2001).
    - **Capacity Building and Knowledge Sharing** Increased investment in capacity building, education, and knowledge sharing around sustainable built environment practices can help address the skills gap and cultural barriers in the southeast region. This could include training programs for architects, engineers, and construction workers, as well as public awareness campaigns to promote sustainable living (Adewuyi & Otorubio, 2014).

5 Conclusion

The South East region of Nigeria faces significant challenges in developing a sustainable built environment, including resource scarcity, weak policy implementation, and cultural barriers. However, the region also presents a range of opportunities, such as renewable energy potential, locally sourced sustainable materials, and community-based initiatives. To effectively address these challenges and capitalize on the opportunities, a multi-faceted approach is needed.

Key recommendations for creating a more sustainable built environment in the South East region include:

- Enhance implementation and enforcement of existing policies, such as the National Building Code and National Urban Development Policy, through improved institutional capacity and inter-agency coordination.
- Invest in renewable energy infrastructure, particularly solar and small-scale hydropower, to address the region's energy supply challenges and reduce reliance on fossil fuels.
- Encourage the use of locally sourced, sustainable building materials and construction techniques, supported by research, training, and incentive programs.
- Incorporate sustainable urban planning principles, such as mixed-use development and green infrastructure, into new urban development projects.
- Promote civil engineering solutions such as rainwater harvesting systems, modular housing, and decentralized renewable energy systems to address resource and infrastructure deficiencies.
- Initiate public awareness campaigns and community-based programs to promote sustainable living practices, such as water conservation, waste management, and energy efficiency.

By addressing the challenges and seizing the opportunities, the South East region of Nigeria can transition towards a more sustainable built environment, creating a more livable, resource-efficient, and environmentally friendly future for its residents.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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