



Sustainable Environment and the built Space: Integrating Ecology, Planning and Human Well-being

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**ASSESSING THE ROLE OF IRON AND STEEL RECYCLING PLANTS IN PROMOTING
SUSTAINABLE BUILT ENVIRONMENTS IN NIGERIA: A LITERATURE REVIEW
APPROACH**

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Abstract

This study examines the role of iron and steel recycling plants in promoting sustainable built environments in Nigeria through a literature review approach. The increasing rate of urbanization, industrialization, and construction activities in Nigeria has contributed significantly to the generation of metal waste and the depletion of natural resources, thereby creating an urgent need for sustainable material recovery systems. Iron and steel recycling plants have emerged as important industrial facilities that support environmental sustainability through waste reduction, resource conservation, energy efficiency, and the promotion of circular economy practices within the built environment. The study explores existing scholarly literature on sustainable built environments, industrial ecology, recycling systems, and sustainable industrial development in order to assess the environmental, economic, and social contributions of iron and steel recycling plants in Nigeria. The paper adopts a qualitative research methodology based on a critical thematic literature review of relevant academic journals, conference papers, textbooks, government reports, policy documents, and environmental publications. The study is anchored on Industrial Ecology Theory and Circular Economy Theory, which emphasize resource efficiency, waste-to-resource systems, and sustainable industrial integration. The review identifies major themes including waste management, pollution reduction, sustainable construction material supply, energy conservation, green industrial development, and environmental resilience. Findings from the reviewed literature indicate that iron and steel recycling plants contribute significantly to sustainable built environment development by reducing dependence on virgin raw materials, minimizing landfill waste, lowering greenhouse gas emissions, and supporting sustainable infrastructure development. Despite these contributions, the study identifies several challenges affecting the effectiveness of recycling plants in Nigeria, including inadequate infrastructure, poor environmental regulation enforcement, technological limitations, inconsistent power supply, and weak integration of sustainability principles into industrial planning and design. The paper concludes that iron and steel recycling plants represent strategic components of sustainable industrial and built environment development in Nigeria. It recommends stronger policy implementation, investment in green technologies, improved environmental management systems, and the adoption of sustainable industrial planning strategies to enhance the performance and environmental contributions of recycling facilities in the country.

Keywords: Circular Economy, Environmental Sustainability, Industrial Ecology, Iron and Steel Recycling, Nigeria, Recycling Plants, Sustainable Built Environment