

## EXPLORING GREEN BUILDING IMPLEMENTATION IN SOUTH-WESTERN NIGERIA: TECHNIQUES AND CHALLENGES

ADEOYE OLUGBENGA ADEWOLU, PhD, MNIA, ISTQB/CTFL Senior Lecturer,  
Department of Architecture, Bells University of Technology, Ota, Ogun State

[aoadewolu@bellsuniversity.edu.ng](mailto:aoadewolu@bellsuniversity.edu.ng)

[adeadewolu@yahoo.com](mailto:adeadewolu@yahoo.com)

### Abstract

The paper explores the tactics and obstacles associated with the implementation of green buildings in South Western Nigeria, a region experiencing rapid urbanization and increased demand for infrastructure. The background reveals a construction industry characterized by traditional practices that have significant environmental and social impacts, highlighting the need for sustainable construction solutions. The research objective is to explore the strategies and challenges involved in unlocking green building adoption in the region, with the rationale emphasizing the potential environmental, economic, and social impacts of this transition. The literature review delves into existing knowledge on green building adoption, factors influencing its adoption, and its benefits. Additionally, it looks at how green building practices are doing in Nigeria, especially in the country's southwest, as well as the difficulties in advancing green construction in emerging areas. A mixed-methods research technique is described in the methodology section, integrating both quantitative and qualitative approaches for an in-depth comprehension. Data is sourced from interviews, surveys, and site visits, with data analysis techniques including thematic analysis and statistical analysis. The discussion explores the interplay between strategies and challenges, highlighting how each strategy addresses specific challenges. Solutions and recommendations include financial incentives, infrastructure development, community engagement, regulatory reforms, and industry collaboration. In summary, the study offers a summary of key findings, implications for policy development and industry stakeholders, and suggestions for future research. The results emphasize the opportunity for an increasingly environmentally friendly and responsible built environment in the region and offer perspectives on the approaches and obstacles of green building uptake in South-Western Nigeria.

**Keywords:** Adoption, Green Building, Rating System, Green Construction, Sustainability

## 1. INTRODUCTION

### a. Background:

The construction industry in South-Western Nigeria has witnessed significant growth and development in recent years. With its booming urbanization and increasing demand for infrastructure and housing, the area is essential when it comes to the nation's manufacturing sector(Nigeria - Construction Sector, 2023). Still, the construction practices in South-Western Nigeria have been characterized by traditional methods that often have adverse environmental and social impacts. These conventional construction practices often neglect sustainable principles, resulting in increased energy consumption, resource depletion, and environmental degradation.

Green building practices, encompassing energy efficiency, resource conservation, and sustainable design, are recognized worldwide as a means to address these challenges. In South-Western Nigeria, green building practises are still being adopted in their infancy, with limited awareness and implementation of sustainable construction methods. To reduce the building sector's ecological footprint and maintain its sustainability, the entire area urgently needs to switch to greener construction methods(Oladoja & Ogunmakinde, 2021).

### b. Research Objective:

This study's main goal is to investigate the methods and obstacles to South Western Nigeria's implementation of green buildings. The study's objectives are to assess the region's present level of green construction practises and pinpoint obstacles preventing their further implementation, and propose strategies to promote and facilitate the transition towards sustainable construction practices. By conducting this research, we seek to shed light on the critical issues affecting the

green building adoption process in South-Western Nigeria and provide actionable insights for industry stakeholders, policymakers, and practitioners.

c. Rationale for the Study:

This research is of paramount importance due to its potential environmental, economic, and social impacts. Green building adoption can significantly reduce the construction industry's carbon footprint, contribute to energy efficiency, and promote resource conservation. Furthermore, it could result in a more durable and ecological architecture, which would enhance overall well-being as well as health (Amuda-Yusuf, et al., 2020). Furthermore, by generating new employment possibilities, encouraging creativity, and drawing in capital expenditure, environmentally friendly building techniques can stimulate economic growth in the area.

All things considered, the research is critical to opening the door for ecological architecture implementation in South-Western Nigeria, tackling the urgent ecological challenges facing the area and making a significant contribution to the larger planetary endeavor to mitigate global warming and advance equitable growth.

## **2. LITERATURE REVIEW**

a. Green Building Adoption:

The goal to lessen the negative effects of building industries and increase knowledge of ecological responsibility have made the implementation of green building practices an international priority. The academic work currently in the publication has emphasized a number of elements that impact the uptake of green building practises, such as regulatory requirements, monetary rewards, ecological consciousness, and technological developments (Saka, Olanipekun, & Omotayo, 2021). Studies have also demonstrated the many advantages that green buildings provide, such as reduced energy consumption, lower operational costs, improved indoor air

quality, and a decreased environmental footprint. The aforementioned benefits improve building inhabitants' general standard of existence in addition to helping the natural world.

b. Nigerian Green Building Practises:

Nigeria is implementing green building practices with great success, despite being an emerging economy, although progress varies across different regions. In South-Western Nigeria, In comparison to major centers such as Lagos, the implementation of green building practices is rather delayed. The notion of high upfront expenses, insufficient regulations, and a lack of knowledge have all contributed to the restricted implementation of green building practices (Isang, 2023). However, a few noteworthy programs, including the Green Building Council of Nigeria (GBCN), are advocating for green building practices and certification programs in the country, offering a glimmer of hope for the region's sustainable construction development (GBCN - Green Building Council of Nigeria, 2023).

c. Challenges in Green Building Adoption:

There are particular difficulties regarding encouraging green building practices in emerging economies like Southwest Nigeria. These difficulties involve weak regulation and law from the government, a dearth of knowledge and comprehension of green building principles, restricted opportunities for green building materials and innovations, and limited resources (Koko & Bello, 2020). Moreover, antiquated methods that obstruct development frequently define the area's construction sector. Traditional elements, like a predilection towards specific architectural designs and resources, are also important in impeding the adoption of green building techniques (Baxi, 2023). Overcoming these challenges necessitates a holistic approach that involves education and awareness campaigns, policy reforms, financial incentives, and capacity-building programs to train local professionals and laborers in green construction techniques (Atalla, Mills, & McQueen, 2022).

The above summary of research offers a thorough overview of how green building uptake is currently progressing both internationally as well as in Nigeria, particularly in South-Western Nigeria, additionally highlighting the ongoing issues that must be resolved in order to help the area make the shift from conventional to environmentally friendly building methods.

### **3. METHODOLOGY**

#### **a. Research Design:**

A multidisciplinary methodology was used to look into the widespread implementation of green buildings in South-Western Nigeria along with its approaches and obstacles associated with it. This methodology integrates both qualitative and quantitative techniques to guarantee a thorough comprehension of the topic. Although statistical information was gathered to spot patterns and developments in the implementation of green building practices, qualitative techniques were employed to provide a comprehensive understanding of the points of view and experiences of those involved in the building construction sector.

#### **b. Data Sources:**

Data for this study was sourced from a variety of channels, including:

**Interviews:** In-depth interviews were conducted with key stakeholders in the South-Western Nigerian construction industry, including architects, builders, developers, and government officials. These interviews provided qualitative insights into their views, experiences, and challenges related to green building adoption.

**Surveys:** Surveys were mailed to a wider group of experienced players, such as ecological specialists, independent contractors, and specialists, in order to get quantifiable information regarding knowledge stages, identified obstacles, and the acceptance status of green buildings.

Site Visits: Field visits to construction sites were conducted to observe and document the actual implementation of green building practices. These visits provided first-hand information on the practical challenges faced during the construction process.

c. Data Collection and Analysis:

Qualitative and quantitative data were collected and analyzed as follows:

The Qualitative Method Data: A theme-based approach was used to arrange, interpret, and examine the qualitative information that came through inspections and questionnaires. To get a better grasp of the tactics and difficulties involved in the adoption of green buildings, general trends were found.

Numerical Data: Survey responses were input into mathematical programs for examination. Although inferential data, such as regression modeling, were used to find significant links and associations, descriptive stats were typically used to summarise the results.. The quantitative data helped quantify the extent of green building adoption and the factors influencing it.

The integration of quantitative and qualitative techniques facilitated an all-encompassing and multifaceted investigation of the tactics and obstacles associated with the implementation of green buildings in South-Western Nigeria. The results of this study will aid in the formulation of sensible policies and suggestions for encouraging environmentally friendly building methods in the area.

#### **4. STRATEGIES FOR ADOPTING GREEN BUILDINGS**

a. Knowledge and Training:

The key to promoting implementation in South-Western Nigeria of green construction practises is raising consciousness and providing educational opportunities about them(Akindele, et al., 2023). To achieve this, comprehensive strategies should be implemented. To inform

entrepreneurs, architects, engineers, and construction experts about the advantages of green building, conferences, seminars, and other educational events ought to be held. Moreover, public awareness campaigns through media, social platforms, and integrated civic engagement can educate the general population on the value of environmentally friendly building practices(Soderholm, 2020). Convincing others by showcasing the observable advantages of green buildings, like reduced energy consumption and improved air quality inside, may prove quite effective.

#### b. Strategy and Regulation:

Promoting the implementation of green buildings is greatly aided by state guidelines and laws. South-Western Nigeria should develop and enforce building codes and standards that incorporate green building principles. This can include mandatory energy efficiency requirements, waste reduction measures, and guidelines for sustainable materials. Additionally, governments can offer incentives such as tax breaks, reduced permit fees, and expedited approvals for green building projects. Establishing a clear path for compliance and offering tangible rewards can motivate developers to embrace green construction practices(Hafez, et al., 2023).

#### c. Capacity Building:

Capacity building is crucial for professionals in the construction industry to design and construct green buildings effectively. Training programs and workshops should be established to equip architects, engineers, and construction workers with the necessary knowledge and skills(Ayarkwa, Opoku, Antwi-Afari, & Li, 2022). Collaboration with local universities and vocational institutions can help develop specialized green building curricula. Additionally, certification programs from recognized bodies like the (GBCN) - Green Building Council of Nigeria can enhance the credentials of professionals and encourage them to prioritize green practices in their projects(Ade-Ojo & Omotade, 2022).

#### d. Financial Support:

Implementation of green building initiatives is sometimes stated as being hampered by their astronomical initial prices. To overcome this challenge, financial mechanisms must be introduced. Government-backed green financing programs, low-interest loans, and grants can help bridge the affordability gap(Li, Zheng, & Zeng, 2023). Additionally, partnerships with financial institutions can lead to specialized green building loan products that offer favorable terms to developers pursuing sustainable construction projects(Oguntuase & Windapo, 2021). Encouraging green building certifications can also unlock access to financial incentives, as Residents as well as developers find buildings with certification more appealing.

#### e. Technology as well as Innovation:

Incorporating technology and innovation is essential for advancing green building practices. Power-efficient gadgets, alternative power sources, and innovative construction methods can all be promoted in South-Western Nigeria. Green building material concepts, like made in-house, green building supplies, may help cut expenses and minimise negative effects on the ecosystem(Bushnaq, 2023). Moreover, embracing digital tools like Building Information Modeling (BIM) can improve project efficiency and sustainability. Research and development initiatives should be promoted to drive innovation in green building practices and adapt them to local conditions(Li, Yi, Jiong, Zhang, & Zhou, 2023).

In conclusion, In order to crack the door to South Western Nigeria's acceptance of green buildings, an extensive plan is needed. By raising awareness, enacting supportive policies, building capacity, providing financial incentives, and embracing technology and innovation, the region can transition toward sustainable construction practices that benefit the environment, economy, and society. Together combined, each of these strategies have the power to completely



transform the local construction sector and create an architecture that is more robust and ecological in the long run.

## **5. CHALLENGES IN GREEN BUILDING ADOPTION**

### **a. Economic Challenges:**

Financial difficulty represents one of the major barriers to the widespread implementation of green construction practises in South-Western Nigeria. When comparing environmentally friendly building initiatives to traditional construction methods, the initial expenditure required is sometimes larger. One potential impediment is the expense of renewable resources, technology, and skills, particularly in a region with budget constraints and a focus on minimizing upfront expenses(Nasereddin & Price, 2021). Developers and investors may hesitate to commit to green building practices due to concerns about return on investment and the perception of increased costs. Moreover, the lack of local manufacturing and supply chains for green building materials can lead to higher procurement costs. To address this challenge, financial incentives, subsidies, and accessible green financing options need to be established to bridge the affordability gap and make green building more economically viable(Munaro & Tavares, 2023).

### **b. Lack of Infrastructure:**

The limited infrastructure in South-Western Nigeria can pose a considerable challenge for the feasibility of green building projects. Inadequate access to essential services like reliable electricity, the effective deployment of green building elements, such as water conservation and solar power, might be impeded by disposal and water supply infrastructure(Agboola, Alotaibi, Dodo, Abuhussain, & Abuhussain, 2023). Additionally, the absence of recycling facilities and sustainable waste disposal practices can limit the potential for recycling and waste reduction in

construction projects. To overcome this challenge, concurrent investments in infrastructure development should accompany green building initiatives. Improved infrastructure will not only support green building practices but also enhance the overall living conditions in the region.

c. Cultural and Behavioral Factors:

Cultural and behavioral factors have a substantial influence on the resistance to green building practices in South-Western Nigeria. Traditional building methods and designs hold cultural significance and are deeply ingrained in local construction practices. The utilisation of particular construction supplies and architectural designs are examples that demonstrate these social norms can act as barriers to embracing sustainable construction practices (Henry & Idakwoji, 2023). Moreover, there may be a resistance to change in established construction practices, as people tend to favor what they are familiar with. The adoption of educational initiatives, highlighting the advantages of green buildings, and encouraging the integration of ecologically sound components into architectural designs that are socially acceptable are all necessary to address these issues and bring about an overhaul in social norms. Building trust and collaboration between local communities, architects, and developers is also vital for overcoming cultural resistance.

d. Regulatory Barriers:

Existing regulations, building codes, and it's possible that norms in South-Western Nigeria don't sufficiently promote or facilitate green building techniques. Sometimes the regulations are out of date and don't take into consideration the most recent developments in environmentally friendly building practises (Gbonegun, 2020). Moreover, ambiguous or inconsistent regulations can create uncertainty for developers and architects, making it challenging to navigate the permitting and approval processes for green building projects. Regulatory reforms are necessary to align the legal framework with green building principles. This includes updating building codes to include

provisions for energy efficiency, water conservation, and sustainable materials. Regulatory bodies should actively engage with industry stakeholders to develop a clear and supportive framework that encourages green building adoption.

In conclusion, addressing the economic, infrastructure, cultural, and regulatory challenges is essential to unlock the path to green building adoption in South-Western Nigeria. Overcoming these barriers requires a coordinated effort involving government, industry professionals, local communities, and financial institutions. South-Western Nigeria is capable of developing a stronger and more environmentally friendly architecture that is beneficial to current and future generations by tackling these issues head-on.

## **6. CASE STUDIES**

### **a. Examples of Successful Projects:**





**Figure 1: Heritage Place, Lagos, NIGERIA**

## HERITAGE PLACE, LAGOS

The Heritage Place, Lagos is the first commercial building to be LEED-Certified in design and construction. The building applies cutting-edge technology to meet the requirements



GSJ© 2023 **Figure 2: The Heritage Place, Lagos, NIGERIA**  
www.globalscientificjournal.com

and environmental expectations for today's and tomorrow's needs.

It features recycled water - with rainwater harvesting to water reuse in the irrigation of the gardens, condensate recovery from the building's cooling units and accurate control systems in the bathroom facilities to minimise wastage.

Automatic presence detectors as well as high-efficiency lighting to reduce and resupply energy when and where needed.

Heritage Place orientation optimises natural lighting and ventilation,. It minimises exposure to solar radiation, reducing the energy requirements for cooling, heating and indoor air quality.

The building optimises high-efficiency glazing with an external thermal envelope to minimise demand on cooling requirements This project incorporated innovative energy-efficient technologies, such as solar panels and natural ventilation systems, resulting in a substantial reduction in energy consumption(Fernando, Navaratnam, Rajeev, & Sanjayan, 2023). The building's design also maximized the use of natural light and rainwater harvesting, further lowering operational costs and environmental impact. The



Figure 3: Green Oasis Residence, Ibadan

Lotus Tower becomes a regional leader in environmentally friendly building after receiving accreditation courtesy of the Green Building Council of Nigeria (GBCN).

The Green Oasis Residence: Situated in Ibadan, this residential complex showcases sustainable construction in South-Western Nigeria. Green Oasis Residence utilized locally sourced eco-friendly materials and implemented energy-efficient appliances and wastewater treatment systems(Adejumo & Adeosun, 2022). In addition to lowering greenhouse gases, the initiative

gave its occupants a cosier as well as cleaner home. The successful green building serves as a model for future sustainable housing developments.

### NESTOIL TOWER, LAGOS

Designed as a Mixed-Use building, Nestoil Tower is located at Victoria Island, Lagos and is owned by Nestoil Limited. It was constructed in 2015. The site is between Saka Tinubu Street and Akin Adesola on the Victoria Island.

The building has a Helipad and 12,200 square metres of commercial space. There are fifteen floors of flexible space of approximately 3,900 square metres. Each floor is about 9,900 square metres of leasable commercial spaces. There are residential accommodations to meet the housing needs of occupants. There are multi-storey parking lots and recreational facilities within the building.

The building attained the Leadership in Energy and Environmental Design (LEED) Standard Certification (Silver) rating.

#### b. Challenges Faced in Real Projects:

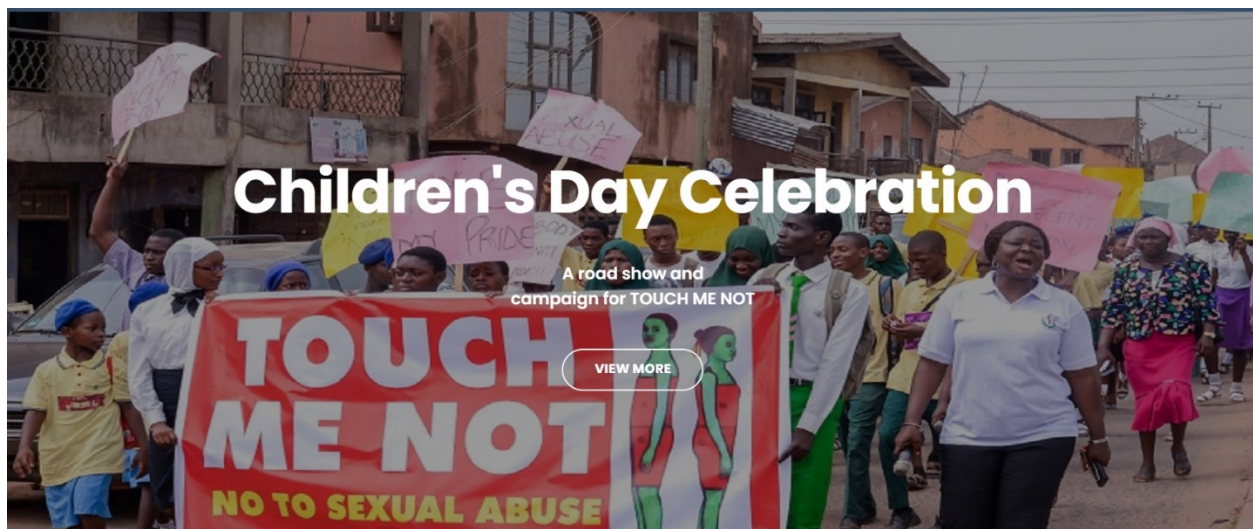
The EcoVille Project: While intended to be a ground-breaking green housing development in Abeokuta, the EcoVille Project faced several challenges(Yinusa, 2023). One of the main challenges remained initially the prohibitive price of installation brought on by the



**Figure 4: NESTOIL TOWER, Lagos, NIGERIA**

adoption of green building techniques and resources. Although these features promised long-term sustainability, potential buyers were deterred by the upfront expenses. The project had to work on providing more affordable financing options to overcome this challenge.

The Green Schools Initiative: A set of green school projects in Ijebu-Ode aimed to create environmentally friendly educational institutions. However, these projects encountered resistance due to cultural factors. Local communities were hesitant to embrace the modern architectural



*Figure 5: The Green School Project During Children's Day Celebration*

designs and eco-friendly features, preferring traditional construction. The green school projects had to engage with the communities, educate them on the benefits of sustainable schools, and adjust the designs to incorporate cultural elements to gain acceptance and overcome this challenge (Abolaji & Atobatele, 2021).

## 7. DISCUSSION

### a. Strategies vs. Challenges:

The strategies presented for promoting green building adoption in South-Western Nigeria are intricately connected to the challenges faced in the region. Economic challenges, for instance,

can be mitigated through financial incentives and accessible green financing options, as discussed in the strategies section. Similarly, awareness and education initiatives are vital to addressing cultural and behavioral factors that resist green building practices (Park & Kim, 2020). It is feasible to progressively change cultural preconceptions by interacting with neighbourhoods and highlighting the advantages of green construction.

Eliminating compliance obstacles can be greatly aided by governments laws and regulations that apply. By enacting clear and supportive frameworks, regulations can align with green building principles and reduce ambiguity. Capacity-building strategies also directly address the challenge of a lack of expertise in sustainable construction by equipping professionals with the necessary skills and knowledge.

#### b. Overcoming Barriers:

To effectively promote green building adoption in South-Western Nigeria, a holistic approach is essential:

**Financial Support:** Encourage the establishment of green financing programs and partnerships with financial institutions to provide accessible loans and incentives for green building projects.

**Infrastructure Development:** Simultaneously invest in improving infrastructure, ensuring that the region has the capacity to support sustainable building technologies and practices.

**Community Engagement:** Work closely with local communities, architects, and developers to incorporate culturally relevant elements into green building designs and to foster acceptance of new construction methods.

**Regulatory Reforms:** Collaborate with regulatory bodies to update building codes, making them more aligned with green building principles and streamlining the approval process.



Industry Collaboration: Promote collaboration between government, industry professionals, and educational institutions to ensure that capacity-building initiatives are well-implemented, and local expertise in green building practices is developed(United Nations Framework Convention on Climate Change, 2023).

By combining these efforts, South-Western Nigeria can overcome the challenges it faces in green building adoption, clearing the path towards enabling the region's building sector to become ecologically informed and responsible.

## **8. CONCLUSION**

### **a. Summary of Findings:**

The widespread implementation of green buildings in South-Western Nigeria has been thoroughly examined, and some important discoveries have been revealed. Growing interest and providing knowledge are two tactics for encouraging the use of green buildings, implementing supportive policies and regulations, building capacity among professionals, providing financial support, and embracing technology and innovation. These strategies are vital in addressing the challenges, which include economic constraints, limited infrastructure, cultural resistance, and regulatory barriers. Successful green building projects like the Lotus Tower and the Green Oasis Residence serve as inspiring examples, demonstrating the feasibility and benefits of sustainable construction practices. On the other hand, real projects like the EcoVille Project and the Green Schools Initiative highlight the challenges faced during development, such as high initial costs and cultural resistance.

### **b. Implications:**

The findings have significant implications for South-Western Nigeria. They call for the development of supportive policies and regulations, the establishment of green financing programs, and the initiation of infrastructure development alongside green building projects. Community engagement and cultural adaptation should be integral parts of future construction efforts. For industry stakeholders, the shift toward green building practices represents an opportunity for innovation, growth, and long-term cost savings. Policymakers must play a central role in facilitating this transition, as their decisions will shape the regulatory framework and financial incentives that will determine the success of green building adoption.

#### c. Future Research:

Future research should focus on assessing the effectiveness of the strategies proposed in this study. Evaluation of implemented strategies will provide valuable insights into their impact on green building adoption rates in South-Western Nigeria. Studies can also examine regional permanent socioeconomic and ecological advantages of green building initiatives, providing quantifiable data to support further policy development. Investigations into the evolving cultural perceptions of green construction and the potential for cultural adaptation in architectural design should also be pursued. All things considered, further study will be essential for both the advancement of ecological building methods and their introduction within the building sector in South-Western Nigeria.

## References

- Abolaji, J., & Atobatele, A. J. (2021). *Effect of School Feeding Programme on Primary Education in Ijebu-Ode Local Government Area of Ogun State, Nigeria (2010-2020)*. Ijebu-Ode: ResearchGate.
- Adejumo, A., & Adeosun, J. O. (2022). Residents' Awareness of Green Building Features in Ibadan Municipality, Nigeria. *UNIOSUN - Journal of Engineering and Environmental Sciences*, DOI: 10.36108/ujees/2202.40.0280 - Accessed Online on Thursday 09 November 2023.
- Ade-Ojo, O., & Omotade, D. T. (2022). ASSESSMENT OF EDUCATION AND TRAINING FOR GREEN BUILDING DEVELOPMENT IN QUANTITY SURVEYING CURRICULUM - CASE STUDY OF FUT, AKURE, NIGERIA. *NIQS RECON6*. AKURE: FUT, AKURE.

- Agboola, O. P., Alotaibi, B. S., Dodo, Y. A., Abuhussain, M. A., & Abuhussain, M. (2023). Built Environment Transformation in Nigeria: The Effects of a Regenerative Framework. *Journal of Asian Architecture and Building Engineering*, <https://doi.org/10.1080/13467581.2023.2238045> - Accessed Online on Saturday 11 November 2023.
- Akindele, O. E., Ajayi, S. O., Toriola-Coker, O. L., Oyegoke, A. S., Alaka, H. A., & Lyson, S. (2023). Sustainable Construction Practice in Nigeria: Barriers and Strategies for Improvement. *Built Environment Project and Asset Management*, DOI: 10.1108/BEPAM-06-2022-0085 - Accessed on Saturday 11 November 2023.
- Amuda-Yusuf, G., Mayowa, R., Adebisi, R. T., Abdulraheem, M. O., Soliu, I., & Eluwa, S. E. (2020). Barrier Factors Affecting Adoption of Green Building Technologies in Nigeria. *Built Environment Journal*, DOI: 10.24191/bej.v17i2.8860 - Accessed Online on Friday 10 November 2023.
- Atalla, G., Mills, M., & McQueen, J. (2022, May 13). Six Ways That Governments Can Drive the Green Transition. *EY - Building a Better Working World*.
- Ayarkwa, J., Opoku, D.-G. J., Antwi-Afari, P., & Li, R. Y. (2022). Sustainable Building Processes' Challenges and Strategies: The Relative Important Index Approach. *ELSEVIER: Cleaner Engineering and Technology*, <https://doi.org/10.1016/j.clet.2022.100455> - Accessed Online on Sunday 12 November 2023.
- Baxi, S. (2023, September 25). Green Building: An Innovative Approach to Reducing Carbon Footprint. *LinkedIn*.
- Bushnaq, O. (2023, August 10). Advancements in Green Building Materials and Technologies. *Energy Management Services-EMS-Emirates LLC LinkedIn.com*.
- Fernando, D., Navaratnam, S., Rajeev, P., & Sanjayan, J. (2023). Study of Technological Advancement and Challenges of Facade System for Sustainable Building: Current Design Practice. *MDPI - Sustainability 2023*, <https://doi.org/10.3390/su151914319> - Accessed Online on Thursday 09 November 2023.
- GBCN - Green Building Council of Nigeria. (2023). *Leading the Transformation of the Built Environment to Create Buildings and Communities that are Environmentally Responsible, Profitable and Healthy to Live, Work and Play*. Lagos: GBCN - Green Building Council of Nigeria.
- Gbonegun, V. (2020, September 07). Experts List Hinderances to Green Building Developments in Nigeria. *The Guardian*.
- Hafez, F. S., Sa'di, B., Safa-Gamal, M., Taufiq-Yap, Y. H., Alrifaey, M., Seyedmahmoudian, M., . . . Mekhilef, S. (2023). Energy Efficiency in Sustainable Buildings: A Systematic Review with Taxonomy, Challenges, Motivations, Methodological Aspects, Recommendations, and Pathways for Future Research. *ELSEVIER - ScienceDirect - Energy Strategy Reviews*.
- Henry, E., & Idakwoji, W. A. (2023). Sustainability of Traditional Building Practices in Nigeria: The Case of Igala Traditional Architecture. *ResearchGate*, DOI: 10.30574/ijrsra.2023.10.2.0886 - Accessed Online on Saturday 11 November 2023 .
- Isang, I. (2023). A Historical Review of Sustainable Construction in Nigeria: A Decade of Development and Progression. *Frontiers in Engineering and Built Environment*, DOI: 10.1108/FEBE-02-2023-0010 - Accessed Online on Saturday 11 November 2023.

- Koko, A. F., & Bello, M. (2020). Exploring the Factors Hindering the Use of Green Architecture in Nigeria. In J. A. Arcas - Ed., C. Rubio-Bellido, A. Perez-Fargallo, & I. Oropeza-Perez, *Zero-Energy Buildings*. London: IntechOpen.
- Li, L., Yi, Z., Jiong, F., Zhang, S., & Zhou, J. (2023). Exploring the Mechanism of Digital Transformation Empowering Green Innovation in Construction Enterprises. *ELSEVIER - Developments in the Built Environment*, <https://doi.org/10.1016/j.dibe.2023.100199> - Accessed Online on Saturday 11 November 2023.
- Li, S., Zheng, X., & Zeng, Q. (2023). Can Green Finance Drive the Development of the Green Building Industry? - Based on the Evolutionary Game Theory. *MDPI - Sustainability 2023*, <https://doi.org/10.3390/su151713134> - Accessed Online on Saturday 11 November 2023.
- Munaro, M. R., & Tavares, S. F. (2023). A Review on Barriers, Drivers, and Stakeholders Towards the Circular Economy: The Construction Sector Perspective. *ELSEVIER - Cleaner and Responsible Consumption*, <https://doi.org/10.1016/j.clrc.2023.100107> - Accessed on Saturday 11 November 2023.
- Nasereddin, M., & Price, A. (2021). Addressing the Capital Cost Barrier to Sustainable Construction. *ELSEVIER - Developments in the Built Environment*, <https://doi.org/10.1016/j.dibe.2021.100049> - Accessed Online on Saturday 11 November 2023.
- Nigeria - Construction Sector. (2023). *Nigeria - Country Commercial Guide*. Washington, DC: International Trade Administration.
- Oguntuase, O., & Windapo, A. O. (2021). Green Bonds and Green Buildings: New Options for Achieving Sustainable Development in Nigeria. In O. Oguntuase, & A. O. Windapo, *Housing and SDGs in Urban Africa* (pp. DOI: 10.1007/978-981-33-4424-2\_11). ResearchGate.
- Oladoja, O., & Ogunmakinde, O. E. (2021). Challenges of Green Building in Nigeria: Stakeholders' Perspectives. *Australasian Universities Building Education Association (AUBEA) Conference*. Geelong: ResearchGate.
- Park, H., & Kim, J. D. (2020). Transition Towards Green banking: Role of Financial Regulators and Financial Institutions. *Asian Journal of Sustainability and Social Responsibility*.
- Saka, N., Olanipekun, A. O., & Omotayo, T. (2021). Reward and Compensation Incentives for Enhancing Green Building Construction. *Science Direct - Environmental and Sustainability Indicators*, <https://doi.org/10.1016/j.indic.2021.100138> - Accessed Online on Saturday 11 November 2023.
- Soderholm, P. (2020). The Green Economy Transition: The Challenges of Technological Change for Sustainability. *Sustainable Earth Reviews*.
- United Nations Framework Convention on Climate Change. (2023). *Implementation of the Framework for Capacity-Building in Developing Countries*. Bonn: United Nations.
- Yinusa, O. (2023). *Challenges in Off-Planned Real Estate Projects in Nigeria: A Comprehensive Guide for Developers and Investors*. Lagos: LinkedIn.com.