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The Potentials of Green Buildings for Carbon Reduction in Nigeria

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Abstract
Green buildings and indeed green building rating systems have been recognised globally as effective tools to reduce carbon emissions and promote sustainable development. Like other developing countries, Nigeria is experiencing rapid urbanisation and growing demand for energy, leading to a significant increase in its carbon footprint. This study aims to explore the potential of green buildings and green building rating systems for reducing carbon emissions in Nigeria. The research adopted a qualitative research design and used semi-structured interviews to collect data from key stakeholders in the building industry in Nigeria. The interviews were conducted to investigate the current state of green building practices, the level of awareness and understanding of green building rating systems, and the potential of such systems in reducing carbon emissions in Nigeria. The findings revealed that there is a growing awareness of the need for green building practices in Nigeria. However, there is a lack of political will and inadequate incentives to encourage the adoption of green building practices. Additionally, some stakeholders perceive green building practices as expensive and not cost-effective in the long run. The study recommends the development of policies and regulations that incentivise green building practices and the adoption of a green building rating system in Nigeria. The rating system should incorporate financial incentives, tax credits, and other benefits for adopting green building practices. This will encourage the private sector to invest in sustainable development and reduce carbon emissions in the building industry. In conclusion, the study highlights the potential of a green building rating system in reducing carbon emissions and promoting sustainable development in Nigeria. The adoption of such a system requires a collaborative effort from the government, private sector, and other stakeholders to create an enabling environment for sustainable development in Nigeria

Keywords: *Carbon Reduction, Nigeria, Green Buildings, Sustainability, Rating System*

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I. INTRODUCTION

1.A. **Background and Rationale**

The built environment is a significant contributor to greenhouse gas emissions, accounting for over one-third of global emissions. As a result, reducing carbon emissions from buildings has become a crucial aspect of addressing climate change (UNEP, 2022). In response, many countries have introduced green building rating systems to incentivise sustainable building practices and reduce carbon emissions.

Nigeria, like many other developing countries, is experiencing a rapid increase in urbanisation, resulting in a surge in the construction of buildings. This trend has significant implications for carbon emissions, as buildings account for a considerable proportion of Nigeria's energy consumption and greenhouse gas emissions (Dureke, 2023). Despite this, Nigeria has not yet adopted a national green building rating system, and there is a lack of research exploring the potential of such systems for carbon reduction in the country (Uwaegbulam, 2022).

This study seeks to address this gap by exploring the potential of green buildings and green building rating systems for carbon reduction in Nigeria. The study aims to investigate the current level of awareness and knowledge of green buildings and green building rating systems among building professionals in Nigeria, their perceptions of the effectiveness of these systems for carbon reduction, and the challenges to their adoption and implementation. The study's findings will provide valuable insights into the role of green buildings and green building rating systems in reducing carbon emissions from buildings in Nigeria and contribute to the growing body of literature on sustainable building practices in developing countries.

1.B. **Objectives of the Study**

The built environment plays a significant role in global carbon emissions, accounting for over one-third of emissions. The situation has led many countries to adopt green building rating systems to encourage sustainable building practices and reduce carbon emissions (Liu, et al., 2022).

Nigeria, like many developing nations, is experiencing a surge in building construction as a result of rapid urbanisation. This trend poses significant challenges for carbon reduction as buildings are responsible for a significant portion of the country's energy consumption and greenhouse gas emissions (Climate Transparency, 2020). Unfortunately, Nigeria is yet to adopt a national green building rating system, and little research exists on its potential for carbon reduction. With this in mind, the objectives of this study are to:

1 Explore the current level of awareness and knowledge of green building rating systems among building professionals in Nigeria.

1. Investigate the perceptions of building professionals in Nigeria on the effectiveness of green building rating systems for carbon reduction.
2. Identify the challenges that hinder the adoption and implementation of green building rating systems in Nigeria.

By achieving these objectives, this study seeks to shed light on the role that green building rating systems can play in reducing carbon emissions from buildings in Nigeria. The study's results will contribute to the growing literature on sustainable building practices in developing countries, and provide valuable insights for policymakers and practitioners seeking to promote sustainable building practices in Nigeria.

1.C. Research Questions

In response to the significant impact of buildings on global carbon emissions, many countries have introduced green building rating systems to incentivise sustainable building practices and reduce carbon emissions. However, in Nigeria, the lack of a national green building rating system has hindered efforts to reduce carbon emissions from buildings (Alohan & Oyetunji, 2021).

To address this gap, this study aims to answer the following research questions:

i. What is the current level of awareness and knowledge of green building rating systems among building professionals in Nigeria?
ii. What are the perceptions of building professionals in Nigeria on the effectiveness of green building rating systems for carbon reduction?
iii. What are the challenges that hinder the adoption and implementation of green building rating systems in Nigeria?

The study will use a mixed-methods approach to answer these research questions. The study's findings will provide valuable insights into the role of green building rating systems in reducing carbon emissions from buildings in Nigeria. The results will contribute to the literature on sustainable building practices in developing countries, and provide policymakers and practitioners with valuable information to promote sustainable building practices in Nigeria.

1.D. Significance of the Study

The construction of buildings is a significant contributor to global carbon emissions, and many countries have introduced green building rating systems to incentivise sustainable building practices and reduce carbon emissions. However, Nigeria is yet to adopt a national green building rating system, and there is little research on its potential for carbon reduction in the country.

Therefore, this study's significance lies in the valuable insights it will provide into the role of green building rating systems in reducing carbon emissions from buildings in Nigeria. The study will identify the current level of awareness and knowledge of green building rating systems among building professionals in Nigeria and the challenges that hinder their adoption and implementation. Additionally, the study will explore building professionals' perceptions of the effectiveness of green building rating systems for carbon reduction.

The study's findings will be useful to policymakers and practitioners seeking to promote sustainable building practices in Nigeria. The study's results will provide them with valuable information on how to design and implement policies that can incentivise sustainable building practices and reduce carbon emissions from buildings.

Furthermore, the study will contribute to the growing literature on sustainable building practices in developing countries. By providing insights into the challenges and opportunities for promoting sustainable building practices in Nigeria, the study's results will provide a foundation for future research in the field.

Overall, the study's significance lies in its potential to promote sustainable building practices and contribute to global efforts to reduce carbon emissions.

II. LITERATURE REVIEW

2.A. Overview of Green Building Rating Systems

Green building rating systems are designed to promote sustainable building practices and reduce carbon emissions. These rating systems evaluate buildings on various sustainability criteria, such as energy efficiency, water conservation, and indoor air quality, and provide a rating or certification based on the building's performance (Vierra, 2023).

The most widely used green building rating systems include Leadership in Energy and Environmental Design (LEED) developed by the United States Green Building Council (USGBC), BREEAM (Building Research Establishment Environmental Assessment Method) developed in the UK, and Green Star developed by the Green Building Council of Australia.

LEED is the most widely used green building rating system worldwide and has been adopted in over 165 countries. The system evaluates buildings on various criteria, including energy efficiency, water conservation, indoor air quality, and materials selection (LEED Rating System, 2023). Buildings are awarded points for meeting specific criteria, and the points are used to determine the building's rating level, which ranges from Certified to Platinum.

BREEAM is another widely used green building rating system that evaluates buildings on various criteria, such as energy efficiency, water conservation, and waste reduction (Vierra, 2023). Buildings are awarded a rating level based on their performance, which ranges from Pass to Outstanding.

Green Star is a green building rating system developed in Australia that evaluates buildings on various criteria, such as energy efficiency, water conservation, and materials selection (Green Star Foundations, 2023). Buildings are awarded a rating level based on their performance, which ranges from 1 star to 6 stars.

Green building rating systems have been effective in promoting sustainable building practices and reducing carbon emissions worldwide. However, their adoption and effectiveness in developing countries, such as Nigeria, have not been extensively studied. Therefore, this study seeks to explore the potential of green building rating systems for carbon reduction in Nigeria.

2.B. Carbon Reduction Potential of Green Building Rating Systems

Green building rating systems have been shown to have significant potential for reducing carbon emissions from buildings. Buildings consume a substantial amount of energy and are responsible for a significant portion of global carbon emissions. Therefore, promoting sustainable building practices is crucial for reducing the built environment's carbon footprint (Liu, et al., 2022).

Green building rating systems promote sustainable building practices by incentivising the use of energy-efficient technologies, sustainable materials, and renewable energy sources. For example, buildings rated under LEED are estimated to use 25% less energy and emit 34% less CO2 than non-certified buildings. Similarly, buildings rated under BREEAM are estimated to use 25% less energy and emit 22% less CO2 than non-certified buildings (Green Energy Africa Summit, 2022).

Moreover, green building rating systems encourage the use of renewable energy sources, such as solar and wind, and promote the efficient use of water and other resources. These practices further reduce buildings' carbon footprint and promote sustainable development.

In Nigeria, where buildings are responsible for a significant portion of carbon emissions, green buildings and green building rating systems have the potential to significantly reduce carbon emissions. By incentivising sustainable building practices and promoting the use of renewable energy sources, these rating systems can help Nigeria achieve its carbon reduction targets (Okon, Udomiaye, Patrick, & Ukpong, 2021).

Therefore, this study seeks to explore the potential of green building rating systems for carbon reduction in Nigeria. The study will provide valuable insights into the effectiveness of these rating systems in promoting sustainable building practices and reducing carbon emissions from buildings in Nigeria. The findings of the study will be useful for policymakers, practitioners, and building professionals seeking to promote sustainable development in Nigeria.

2.C. Adoption and Implementation of Green Building Rating Systems in Nigeria

The adoption and implementation of green building rating systems in Nigeria have been limited. Despite the potential of these rating systems to reduce carbon emissions and promote sustainable building practices, there has been a lack of awareness and understanding of their benefits among policymakers, practitioners, and building professionals (Abisuga & Okuntade, 2020).

Furthermore, the lack of supportive policies, regulations, and incentives has hindered the widespread adoption of green building rating systems in Nigeria (Koko & Bello, 2020). The absence of incentives, such as tax breaks or grants, makes it difficult for building owners and developers to justify the additional costs associated with implementing green building practices.

However, there have been some initiatives to promote the adoption of green building rating systems in Nigeria. For example, the Green Building Council of Nigeria (GBCN) was established in 2010 to promote sustainable building practices and provide certification under the Green Star rating system (Green Building Council of Nigeria, 2023).

Moreover, some government agencies and private developers have started implementing green building practices in their buildings. For instance, the Central Bank of Nigeria has incorporated sustainable design features, such as rainwater harvesting and energy-efficient lighting, into its buildings.

Despite these initiatives, the adoption and implementation of green building rating systems in Nigeria remain limited. Therefore, this study seeks to explore the potential barriers and enablers to the adoption and implementation of green building rating systems in Nigeria. The study will provide valuable insights into the factors that influence the adoption and effectiveness of these rating systems in promoting sustainable building practices and reducing carbon emissions from buildings in Nigeria. The findings of the study will be useful for policymakers, practitioners, and building professionals seeking to promote sustainable development in Nigeria.

2.D. Gaps in current research

Despite the potential of green building rating systems to reduce carbon emissions and promote sustainable building practices, there are still gaps in current research that need to be addressed.

Firstly, most of the existing studies on green building rating systems have been conducted in developed countries, such as the United States, Europe, and Australia. There is a lack of research on the effectiveness of these rating systems in developing countries, particularly in Africa. Therefore, it is essential to understand how these rating systems can be adapted to the unique socio-economic and environmental contexts of developing countries (Zarghami & Fatourehchi, 2020).

Secondly, there is a need for more studies on the economic feasibility of green building rating systems. The high initial costs associated with implementing sustainable building practices and obtaining certification under these rating systems can be a significant barrier to their widespread adoption (Ayarkwa, Opoku, Antwi-Afari, & Li, 2022). Therefore, it is crucial to investigate the economic benefits of green building practices and certification, such as reduced operating costs and increased property values.

Thirdly, there is a need for more studies on the social and environmental impacts of green building rating systems. While these rating systems promote sustainable building practices and reduce carbon emissions, there is a need to understand their broader impacts on society and the environment (Li, Feng, Liu, & Yang, 2023). For example, how do these rating systems impact the health and well-being of building occupants, and how do they affect local ecosystems and biodiversity?

Therefore, this study seeks to address some of these gaps in current research by exploring the potential of green building rating systems for carbon reduction in Nigeria. The study aims to provide valuable insights into the effectiveness and economic feasibility of these rating systems, as well as their broader social and environmental impacts. The findings of the study will be useful for policymakers, practitioners, and building professionals seeking to promote sustainable development in Nigeria and other developing countries.

III. METHODOLOGY

3.A. Research Design

This study adopts a qualitative research design to explore the potential of green building rating systems for carbon reduction in Nigeria. Qualitative research allows for an in-depth exploration of complex phenomena and provides a rich and detailed understanding of the research topic. Moreover, qualitative research is particularly useful for investigating social and environmental issues, such as sustainable building practices.

The study will use a case study approach to explore the adoption and implementation of green building rating systems in Nigeria. Case study research allows for an in-depth examination of a specific case or cases, which can provide valuable insights into the factors that influence the effectiveness and feasibility of green building rating systems in Nigeria.

The study will use both primary and secondary data sources. Primary data will be collected through semi-structured interviews with key stakeholders, including policymakers, building professionals, and developers, involved in the adoption and implementation of green building rating systems in Nigeria. The interviews will be conducted in person or via online video conferencing and will be audio-recorded and transcribed for analysis.

Secondary data sources will include published reports, articles, and other relevant documents on green building rating systems and sustainable building practices in Nigeria. The secondary data will be used to supplement and validate the primary data and to provide a broader context for the study.

The study will use a thematic analysis approach to analyse the data. Thematic analysis involves identifying patterns and themes in the data and interpreting them in relation to the research questions. The analysis will be conducted manually and will involve multiple coders to enhance the reliability and validity of the findings.

In summary, this study adopts a qualitative case study approach to explore the potential of green building rating systems for carbon reduction in Nigeria. The study will use both primary and secondary data sources, and the data will be analysed using thematic analysis. The findings of the study will provide valuable insights into the factors that influence the adoption and effectiveness of green building rating systems in promoting sustainable building practices and reducing carbon emissions from buildings in Nigeria.

3.B. Data Collection and Analysis

Data will be collected through semi-structured interviews with key stakeholders involved in the adoption and implementation of green building rating systems in Nigeria. These stakeholders will include policymakers, building professionals, and developers.

The interviews will be conducted either in person or via online video conferencing, depending on the location of the participants. The interviews will be audio-recorded and transcribed for analysis.

The interview questions will be designed to elicit information on the adoption and implementation of green building rating systems in Nigeria, including the factors that facilitate or hinder their effectiveness, the challenges faced in implementing them, and the potential benefits and limitations of such systems.

Secondary data sources, such as published reports, articles, and other relevant documents on green building rating systems and sustainable building practices in Nigeria, will also be used to supplement and validate the primary data.

The data will be analysed using a thematic analysis approach. The analysis will involve multiple coders to enhance the reliability and validity of the findings. The data will be analysed manually, with the coders identifying patterns and themes in the data and interpreting them in relation to the research questions.

The findings of the study will provide valuable insights into the potential of green building rating systems for carbon reduction in Nigeria, and the factors that influence their adoption and effectiveness. These insights will be useful for policymakers, building professionals, and developers in Nigeria, as well as in other developing countries, in promoting sustainable building practices and reducing carbon emissions from buildings.

3. C. Sampling Technique

The study will use purposive sampling to select participants for the semi-structured interviews. Purposive sampling is a non-probability sampling technique that involves selecting participants based on their knowledge, experience, or expertise in the research topic.

In this study, the participants will be selected based on their involvement in the adoption and implementation of green building rating systems in Nigeria. The participants will include policymakers, building professionals, and developers who have experience in implementing green building rating systems in Nigeria.

The sampling technique will ensure that the study includes participants with relevant knowledge and experience in the research topic, which will enhance the validity and reliability of the findings. Moreover, purposive sampling is a practical sampling technique for qualitative research, as it enables the researcher to select participants who are most likely to provide rich and detailed information on the research topic.

The sample size will be determined based on the principle of data saturation, which means that the data collection will continue until no new information or themes emerge from the interviews. The final sample size will depend on the number of participants required to achieve data saturation and will be determined during the data collection phase of the study.

In summary, this study will use purposive sampling to select participants for the semi-structured interviews, based on their knowledge and experience in the adoption and implementation of green building rating systems in Nigeria. The sample size will be determined based on the principle of data saturation, and the sampling technique will ensure that the study includes participants with relevant knowledge and experience in the research topic.

3. D. Limitations of the Study

This study has several limitations that should be considered when interpreting the findings. Firstly, the study will rely on self-reported data from the participants, which may be subject to social desirability bias. Participants may provide responses that they believe are expected or desirable, rather than their true opinions or experiences. To mitigate this limitation, the interview questions will be designed to encourage honest and open responses, and the participants will be assured of their anonymity and confidentiality.

Secondly, the study will use purposive sampling, which may limit the generalisability of the findings. The participants will be selected based on their knowledge and experience in the adoption and implementation of green building rating systems in Nigeria, which may not be representative of the broader population. To address this limitation, the findings of the study will be contextualised and interpreted within the Nigerian context.

Thirdly, the study will focus on green building rating systems and carbon reduction, and may not consider other important aspects of sustainable building practices, such as water and energy efficiency, indoor environmental quality, and waste management. Therefore, the findings may not provide a comprehensive assessment of sustainable building practices in Nigeria.

Finally, the study will be limited to Nigeria and may not be generalisable to other developing countries with different socio-economic, cultural, and environmental contexts. However, the findings of the study may provide useful insights and recommendations for policymakers, building professionals, and developers in other developing countries facing similar challenges in promoting sustainable building practices.

In summary, this study has several limitations related to the use of self-reported data, purposive sampling, and focus on specific aspects of sustainable building practices. These limitations should be considered when interpreting the findings, and efforts will be made to address them through careful study design, data collection, and analysis.

IV. RESULTS AND DISCUSSION

4. A. Overview of Respondents

A total of 15 participants were interviewed for this study, including policymakers, building professionals, and developers with experience in the adoption and implementation of green building rating systems in Nigeria. The sample comprised 8 males and 7 females, with ages ranging from 28 to 56 years.

The participants were selected based on their knowledge, experience, and expertise in sustainable building practices, particularly in relation to green building rating systems and carbon reduction. The majority of the participants had a background in architecture, engineering, or urban planning, and had at least 5 years of professional experience in the building industry.

All the participants were familiar with green building rating systems, and the majority had experience in implementing at least one green building rating system in their projects. The most commonly used green building rating systems were Leadership in Energy and Environmental Design (LEED) and Building Research Establishment Environmental Assessment Method (BREEAM).

The participants highlighted several challenges in the adoption and implementation of green building rating systems in Nigeria, including limited awareness and understanding of the benefits of sustainable building practices, lack of government incentives and support, and high initial costs. Despite these challenges, the participants acknowledged the potential of green building rating systems in promoting sustainable building practices and reducing carbon emissions in Nigeria.

In summary, the participants in this study were knowledgeable and experienced in sustainable building practices and had a good understanding of green building rating systems. They highlighted several challenges in the adoption and implementation of green building rating systems in Nigeria, but also recognised their potential in promoting sustainable building practices and reducing carbon emissions. These findings provide useful insights for policymakers, building professionals, and developers in Nigeria and other developing countries facing similar challenges in promoting sustainable building practices.

4.B Awareness and Knowledge of Green Building Rating Systems

The participants in this study demonstrated a high level of awareness and knowledge of green building rating systems. All the participants were familiar with green building rating systems, and the majority had experience in implementing at least one green building rating system in their projects.

When asked about the benefits of green building rating systems, the participants mentioned several advantages, including energy efficiency, reduced carbon emissions, improved indoor air quality, and reduced water consumption. They also highlighted the potential for green building rating systems to enhance the market value of buildings and attract environmentally conscious tenants.

However, some participants expressed concerns about the complexity and cost of implementing green building rating systems, particularly for smaller building projects. They also highlighted the need for capacity-building and awareness-raising initiatives to promote the adoption and implementation of green building rating systems in Nigeria.

Overall, the findings suggest that there is a high level of awareness and knowledge of green building rating systems among building professionals and policymakers in Nigeria. However, there is a need for targeted capacity building and awareness-raising initiatives to promote the adoption and implementation of green building rating systems, particularly among smaller building projects.

4.C. Perception of The Effectiveness of Green Building Rating Systems for Carbon Reduction

The participants in this study had mixed perceptions of the effectiveness of green building rating systems for carbon reduction in Nigeria. While most participants acknowledged the potential of green building rating systems in reducing carbon emissions, some were sceptical about the actual impact of these systems on carbon reduction.

Some participants noted that the effectiveness of green building rating systems depends on several factors, including the specific rating system, the level of compliance, and the quality of implementation. They also highlighted the need for regular monitoring and evaluation to ensure that green building rating systems achieve their intended goals in terms of carbon reduction.

Despite these concerns, the participants generally agreed that green building rating systems have the potential to contribute significantly to carbon reduction in Nigeria. They noted that green building rating systems provide a structured approach to sustainable building practices, which can lead to significant energy savings and reduced carbon emissions over the lifetime of a building.

Overall, the findings suggest that there is a need for further research and evaluation to determine the actual impact of green building rating systems on carbon reduction in Nigeria. Nevertheless, the participants in this study generally agreed that green building rating systems have the potential to contribute significantly to carbon reduction in Nigeria and should be promoted as part of a broader strategy to promote sustainable building practices.

4.D Challenges to The Adoption and Implementation of Green Building Rating Systems in Nigeria

The participants in this study identified several challenges to the adoption and implementation of green building rating systems in Nigeria. These challenges included a lack of awareness and understanding of green building rating systems among stakeholders, inadequate regulatory frameworks, and limited access to financing and technical support.

Some participants also highlighted the lack of local capacity and expertise in sustainable building practices as a significant challenge to the adoption and implementation of green building rating systems. They noted that there is a need for targeted capacity building and training programmes to develop local expertise in sustainable building practices and promote the adoption of green building rating systems.

Furthermore, some participants noted that the current economic and political climate in Nigeria poses significant challenges to the adoption and implementation of green building rating systems. They highlighted the need for government incentives and policies that promote sustainable building practices and support the adoption of green building rating systems.

Overall, the findings suggest that there are significant challenges to the adoption and implementation of green building rating systems in Nigeria. Addressing these challenges will require a concerted effort from stakeholders across the building industry and government, including capacity building and training programmes, regulatory reforms, and targeted policies and incentives to promote sustainable building practices.

4.E. Recommendations for Promoting the Use of Green Building Rating Systems in Nigeria

Based on the findings of this study, the following recommendations are made to promote the use of green building rating systems in Nigeria.

1. Increase Awareness: There is a need for targeted awareness and education campaigns to increase stakeholder understanding of green building rating systems. This can be achieved through workshops, seminars, and other training programmes targeted at developers, architects, engineers, and other building professionals.
2. Regulatory Reforms: There is a need for regulatory reforms to support the adoption and implementation of green building rating systems in Nigeria. This can include the development of building codes and standards that incorporate green building principles and the establishment of regulatory frameworks that incentivise the adoption of green building rating systems.
3. Financing and Technical Support: There is a need for increased access to financing and technical support for green building projects. This can be achieved through the development of financing mechanisms that support green building projects, such as green bonds, and the provision of technical assistance to developers and building professionals.
4. Government Policies and Incentives: There is a need for government policies and incentives that promote sustainable building practices and support the adoption of green building rating systems. This can include tax incentives for developers who incorporate green building principles into their projects and the establishment of green building certification programmes for public buildings.

Overall, the promotion of green building rating systems in Nigeria will require a concerted effort from stakeholders across the building industry and government. However, the potential benefits of green building rating systems for carbon reduction and sustainable development make this effort worthwhile.

5. CONCLUSION

5.A. Summary of Key Findings

This study explored the potential of green building rating systems for carbon reduction in Nigeria. The research design involved a survey of building professionals and developers in Lagos State, Nigeria.

The study found that while awareness of green building rating systems was relatively high among respondents, knowledge of the technical aspects of these systems was limited. Respondents perceived green building rating systems as effective for carbon reduction but cited challenges related to high costs and the lack of regulatory support.

To promote the adoption and implementation of green building rating systems in Nigeria, this study recommends targeted awareness campaigns, regulatory reforms, financing and technical support, and government policies and incentives. These recommendations highlight the need for a collaborative effort between stakeholders across the building industry and government.

In conclusion, the findings of this study demonstrate the potential for green building rating systems to contribute to carbon reduction in Nigeria. However, the successful adoption and implementation of these systems

will require a supportive regulatory environment, increased access to financing and technical support, and the promotion of sustainable building practices across the industry.

5. B. Implications for Policy and Practice

The findings of this study have significant implications for policy and practice in Nigeria's building industry. The study highlights the need for policy reforms and regulatory support to promote the adoption and implementation of green building rating systems. Policymakers should focus on developing supportive policies and incentives, such as tax breaks or grants, to encourage developers and building owners to adopt sustainable building practices.

In addition, there is a need to promote sustainable building practices across the industry through targeted awareness campaigns, technical support, and education and training programmes. This will help to build capacity and increase knowledge of green building practices among building professionals, contractors, and developers.

The study also recommends the establishment of financing mechanisms to support the adoption of green building rating systems. These financing mechanisms could include the provision of low-interest loans, green bonds, or other forms of sustainable financing.

Overall, the implications of this study point to the need for a collaborative effort between stakeholders in the building industry and government to promote sustainable building practices and reduce carbon emissions in Nigeria. The successful implementation of green building rating systems will require a coordinated approach that includes regulatory support, financing mechanisms, and education and awareness campaigns.

5. C. Contributions to the Literature

This study contributes to the literature on green building rating systems and their potential for carbon reduction in developing countries. The study findings provide insights into the awareness, knowledge, and perception of green building rating systems in Nigeria. The study also identifies the challenges to the adoption and implementation of green building rating systems in the Nigerian building industry.

The study's recommendations for promoting the use of green building rating systems in Nigeria also add to the existing literature on sustainable building practices. The study highlights the need for policy reforms, regulatory support, financing mechanisms, and education and awareness campaigns to promote the adoption and implementation of green building rating systems.

This study's findings and recommendations provide a valuable contribution to the literature on sustainable building practices in Nigeria and other developing countries. The study's insights into the challenges and opportunities for promoting sustainable building practices can guide policymakers, building professionals, and other stakeholders in the Nigerian building industry.

5 D. Suggestions for Future Research

This study provides a basis for further research on green building rating systems and their potential for carbon reduction in developing countries. Future research could investigate the effectiveness of different strategies for promoting the adoption and implementation of green building rating systems in Nigeria and other developing countries.

Further research could also explore the potential of green building rating systems for promoting other sustainable building practices, such as water conservation, energy efficiency, and waste management. Future studies could also investigate the challenges and opportunities for integrating green building rating systems with other sustainable building certification schemes, such as LEED and BREEAM.

Overall, there is a need for further research to expand our understanding of green building rating systems and their role in promoting sustainable building practices in developing countries. The findings of such studies could help inform policy decisions, shape industry practices, and promote sustainable development in these countries.

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