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Challenges in the Implementation of Green Building projects and Sustainable Construction Practices by Quantity Surveyors in Edo State, Nigeria

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Abstract
Green building projects and sustainable construction have gained global attention due to the potential to reduce environmental impact and enhance the efficiency of resources. However, with the increasing demand for sustainable construction and green projects, Quantity Surveyors (QS) in Edo state, face multifaceted obstacles in integrating sustainability into cost management, procurement and project lifecycle assessments. This study identified the challenges involved in implementing green projects and sustainable construction and the mitigating measures to these challenges. Primary data were obtained with the use of structured questionnaires that were administered to quantity surveyors in Edo State. A non-probability sampling procedure was adopted in this study. The sample representative for questionnaire dissemination was chosen using the purposeful sampling method. Fifty-one (51) copies of questionnaires were distributed to the respondents and a total of thirty-five (35) copies of questionnaire administered were completed, retrieved and used for analysis. Data collected were analyzed using descriptive and inferential statistics. The findings revealed that the key challenges include, lack of knowledge on green building and sustainable construction practices, high initial cost of sustainable materials, lack of training on sustainable practices, inadequate government policies and incentives and resistance to change among stakeholders. The study recommended the need for targeted interventions such as comprehensive training programmes for quantity surveyors in Edo state to enhance their knowledge and skills in sustainable construction practices, green building technologies and BIM adoption, enhanced collaboration among stakeholders and the establishment of robust cost databases for sustainable materials. It emphasizes the need for interdisciplinary approaches to address these challenges effectively. By empowering Quantity Surveyors with the necessary tools and knowledge, the construction industry can achieve a balanced approach to economic viability and environmental sustainability, contributing to global climate goals.
Keywords: Green building projects, Sustainable construction, Quantity Surveyors, Edo state.

1.0 Introduction

Sustainable construction has emerged as a critical paradigm in the global construction industry, driven by the urgent need to address environmental challenges and promote responsible resource utilization. Green building projects, a subset of sustainable construction, aim to reduce carbon footprints through energy-efficient designs, eco-friendly materials, and innovative technologies (Ekung, Odesola & Opoku, 2022). These practices aim to reduce environmental impact while enhancing the social and economic benefits of construction projects (Adebiyi & Osazuwa, 2017). This shift has necessitated a redefinition of roles and responsibilities for construction professionals, including quantity surveyors (QS), who now play an essential role in achieving sustainability goals.

Quantity surveyors, as key professionals within the construction industry manage costs, control financial risk, and equally promote financial transparency in construction projects (Isan & Ebiloma, 2024). They are uniquely positioned to influence green building practices and sustainability

initiatives through their expertise in cost management, resource optimisation and lifecycle costing (Adebiyi & Osazuwa, 2017; Akabudike, 2024). Also, they prepare cost plans, control cost and also prepare bill of quantities for green projects (Ekanayaka & Bandara, 2021). Their involvement spans the entire project lifecycle- from inception to completion which allows them to integrate sustainability principles into procurement decisions, value engineering and risk mitigation strategies (Onososen, 2019; Akabudike, 2024). Supporting this view, Isan & Ebiloma, (2024) argue that the involvement of QS can lead to better cost control, waste management and environmental risk mitigation. Quantity surveyors however, require knowledge and skills in construction technology, computer, ethics, environmental services, leadership and measurement (Chamikara et. al., 2018). In addition to the aforementioned they equally need to be skilled in green costing, carbon cost planning and sustainable property valuation (Omotayo et. al., 2022).

Despite their potential contributions, Quantity surveyors in Nigeria and Edo state in particular, face challenges in fully embracing green building and sustainable construction practices. Studies have highlighted gaps in formal education and training related to sustainability competencies, and these hinder their ability to compete globally in this domain (Onososen, 2019). The author argues that the absence of green building courses in academic curricula further underscores the need for capacity- building initiatives to prepare quantity surveyors for sustainable construction practices.

Again, another significant issue is the lack of comprehensive cost data for sustainable materials and technologies. This data gap complicates accurate cost estimation and life cycle analysis, which are crucial for evaluating the long-term economic implications of green construction. Furthermore, QS professionals often encounter resistance from stakeholders due to the perceived high initial costs of sustainable practices. This resistance underscores the need for innovative strategies to align financial objectives with environmental goals (Ekanayaka & Bandara, 2021).

This study is therefore, aimed at evaluating the challenges faced by quantity surveyors in the implementation of green building projects and sustainable construction in Edo state, with a view to recommend possible strategies to overcome the perceived challenges which will help to enhance the capacity of Quantity Surveying professionals to contribute effectively to green building initiatives. Furthermore, it seeks to provide insights into best practices for integrating sustainability into cost management processes, thereby promoting a more holistic approach to construction project delivery.

2.0 LITERATURE REVIEW

2.1 Challenges faced by Quantity Surveyors in green building projects and sustainable construction

The challenges faced by quantity surveyors in the implementation of green building projects and sustainable construction in Nigeria are multifaceted, encompassing issues related to awareness, training, financial constraints, technological limitations, and policy enforcement. These challenges hinder the widespread adoption of environmentally sustainable practices and require critical examination to develop effective solutions. One of the most significant challenges is the lack of awareness and education among quantity surveyors regarding green building practices. Studies have shown that while professionals in the construction industry may have some knowledge of sustainable techniques, there is often a gap between awareness and implementation. This lack of understanding stems from insufficient integration of green building concepts into academic curricula at Nigerian universities. Onososen (2019) highlighted that green building education is virtually absent in the curricula of higher institutions offering quantity surveying courses, leaving graduates ill-prepared to tackle sustainability issues effectively. The absence of formal training in green competencies limits the ability of quantity surveyors to contribute meaningfully to sustainable construction efforts as a

lot of quantity surveyors lack the capability of integrating green solutions into their work due to their lack of knowledge and specialised training in sustainability.

Financial constraints also pose a significant barrier to sustainable construction practices. Shuaib, (2024) and Ashen, Rimtip & Davou, (2024) noted that many professionals are discouraged from adopting green practices because of the financial burden involved. Green building projects often require higher initial investments due to the cost of eco-friendly materials and technologies and clients are unwilling to invest in these solutions as they prefer short term savings over long term benefits (Bolade-Oladepo, Oladepo & Fasuyi, 2020). Also, clients' choice of reducing immediate cost in favour of benefits derived from long term sustainability makes it challenging for quantity surveyors to promote sustainable alternative solutions (Che Haron, Ibrahim & Mat Rawi, 2017). Furthermore, limited government support in terms of subsidies or incentives exacerbates this challenge, making it difficult for stakeholders to justify the adoption of sustainability measures.

Resistance to change within the construction industry further complicates efforts to implement sustainable construction and green building practices (Oke & Aliu, 2024). Many stakeholders, including clients and contractors, are hesitant to embrace new methods and technologies due to perceived risks or unfamiliarity with sustainable approaches. Akabudike (2024) emphasized that resistance to change is a major obstacle that prevents quantity surveyors from promoting sustainability effectively. Again, a lot of professional quantity surveyors, clients and other stakeholders lack the awareness and knowledge of sustainability principles thereby leading to resistance or reluctance in adopting green building technologies (Che Haron, Ibrahim &Rawi, 2017; Bolade-Oladepo, Oladepo & Fasuyi, 2020; Alohan & Oyetunji, 2021).The lack of technical expertise among quantity surveyors is another critical challenge as sustainable construction requires specialized knowledge in areas such as energy efficiency, waste management, and renewable energy systems. Since, many professionals lack the necessary skills due to inadequate training and limited access to continuous professional development programs, Onososen (2019) pointed out that regulatory bodies need to reassess formal training systems and organize more informal training options such as workshops and seminars to bridge this competency gap. In addition, Policy enforcement remains weak in Nigeria's construction industry, further hindering the adoption of green building practices. Shuaib (2024) observed that while there are policies aimed at promoting sustainability, their enforcement is often inconsistent or ineffective. This lack of regulatory oversight allows stakeholders to bypass environmental standards without facing significant consequences.

Technological limitations also affect the implementation of sustainable practices (Agboola, et. al., 2023). The use of advanced tools such as Building Information Modeling (BIM) can significantly enhance project planning and resource optimization. However, many quantity surveyors lack access to these technologies or the skills required to utilize them effectively. Akabudike (2024) noted that insufficient ICT knowledge among professionals limits their ability to leverage technology for sustainability purposes.

Finally, the inability to have easy access to adequate database for assessing the cost of sustainable materials and technologies presents a critical challenge for quantity surveyors as it hinders their ability to prepare and recommend accurate lifecycle cost analyses and value engineering (Che Haron et. al., 2017). Overall, addressing these challenges will enable quantity surveyors play significant role in driving the needed sustainable outcomes in Nigeria.

2.2 Strategies for addressing challenges faced by Quantity Surveyors in green building projects and sustainable construction

The implementation of green building projects and sustainable construction in Nigeria presents numerous challenges for quantity surveyors and one of such challenges is the criticism of the insufficient inclusion of green building concepts in curricula of formal education systems in

Nigeria. Green building education should be integrated into undergraduate and postgraduate programs to equip future professionals with the necessary skills (Onososen, 2019). Additionally, continuous professional development through workshops, seminars, and conferences can help practicing quantity surveyors stay updated on global trends in sustainable construction. Onososen, (2019) and Oluwatosin et. al., (2016), emphasized the need for academic institutions to reassess their curricula to include sustainability-focused courses. Supporting this view, Bejide Oso & Opeyemi (2021) recommended the introduction of sustainable construction in educational institution. Education and training are crucial for enhancing knowledge transfer and improving awareness among construction professionals. Akindele et al. (2023) emphasize the importance of integrating sustainability into academic curricula and organizing professional training programs to equip quantity surveyors and other stakeholders with the necessary skills to implement sustainable practices. This can be addressed by continuous professional development where QS can benefit from training programmes on green cost estimation, life cycle costing and sustainability assessment. Another vital strategy involves fostering collaboration among stakeholders. Quantity surveyors must work closely with architects, engineers, policymakers, and clients to promote the adoption of green building practices and sustainable construction (Aje et. al., 2015; Akabudike, 2024). Collaborative efforts can bridge the gap between awareness and implementation by ensuring that all parties understand the benefits of sustainable construction. Shuaib (2024) and Ashen et. al., (2024) highlighted the importance of stakeholder engagement in overcoming resistance to change and increasing demand for environmentally sound practices while encouraging effective collaboration and teamwork between professionals working together on green and sustainable construction projects, while Akindele et al. (2023) highlight the importance of stakeholder regulation and partnerships in bridging gaps between policy and practice, ensuring that all parties work together to achieve sustainability goals.

Furthermore, financial constraints often hinder the adoption of green building techniques due to higher initial costs. Mitigating this challenge requires government intervention through subsidies, tax incentives, and grants for green and sustainable projects (Adebiyi & Osazuwa, 2017; Akabudike, 2024). Incentive programs can mitigate financial constraints, which are a major barrier to sustainable construction. Offering subsidies or low-interest loans to developers who adopt eco-friendly materials and technologies can reduce the cost burden associated with green building projects. Akindele et al. (2023) emphasize that incentive support is crucial for encouraging stakeholders to invest in sustainability. Supporting this view, Abisuga & Okuntade (2020) and Oke & Aliu, (2024) suggest that governments should provide incentives such as tax breaks or grants for green building projects while penalizing non-compliance with environmental regulations. This support is crucial for encouraging stakeholders to invest in sustainability. These policies that reduce financial barriers can encourage developers and clients to invest in eco-friendly materials and technologies. Awareness campaigns are essential for addressing misconceptions about green building practices (Ashen et. al., 2024). Publicizing the long-term benefits of sustainable construction through media platforms can increase demand for eco-friendly projects and encourage stakeholders to prioritize environmental considerations. Alohan & Oyetunji (2021) and Abdulsalam, Masrom & Nawawi (2024), highlight the importance of awareness in addressing misconceptions about green building practices. Shuaib (2024) noted that while awareness exists, implementation remains limited due to misconceptions about costs and complexities. Additionally, technological advancements also play a significant role in mitigating challenges. The adoption of Building Information Modeling (BIM) can streamline project planning and execution by integrating sustainability considerations into design processes. Ojo et al. (2020) emphasized that technology enables accurate cost estimation and resource optimization, which are crucial for implementing green building projects effectively. Technological advancements,

such as Building Information Modeling (BIM), can streamline project planning and resource optimization and equally integrate sustainability considerations into design processes, enabling more efficient and environmentally friendly construction practices.

Promoting local production of eco-friendly materials can reduce reliance on expensive imports while supporting local economies. Policies that encourage local manufacturing industries to produce sustainable construction materials are vital for making green building more accessible. Akindele et al. (2023) recommend international partnerships to address sustainability challenges. In conclusion, mitigating challenges faced by quantity surveyors in implementing green building projects requires a comprehensive approach that combines education, collaboration, financial incentives, technological advancements, ethical practices, regulatory reforms, capacity building and stakeholder engagement.

3.0 Materials and Methods

The study explored challenges in the implementation of green building projects and sustainable construction practices by Quantity Surveyors in Edo State, Nigeria. This study adopted a survey research design and both primary and secondary sources of data were used in this study. The primary data involved the use of a questionnaire administered to the respondents. The study population were registered and practicing Quantity Surveyors in Edo State who are knowledgeable on the subject matter. Due to the difficulty in getting the total number of registered professionals from the registration body, a snowball and purposeful sampling approach was adopted. The Snowball approach, based solely on referrals was adopted to help locate registered QS. The sample representative for questionnaire dissemination was chosen using the purposeful sampling method. A total of 35 responses were retrieved from respondents and usable for analysis. The questionnaire designed for the study consisted of close-ended questions comprising of two sections: the first section contained demographic questions where respondents had to choose and answer from the alternatives provided while the second section was designed to assess the challenges in the implementation of green building projects and sustainable construction practices by Quantity Surveyors. The background information of respondents was analysed by means of frequency distribution and percentage. Mean item score was used to rank the challenges facing quantity surveyors in green building and sustainable construction in Edo state and the mitigating measures. In order to achieve the objectives of the study, 5-point Likert scale was used to inquire information from respondents where 1= strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= strongly agree. The Likert scale was transformed to Mean Item Score (MIS) for each of the identified variables.

4.0 Results and Discussion

4.1. Background Information of Respondents

Table 1 presents a summary of background information of respondents. Analysis in Table 1 revealed the academic qualification of the respondents, where 22.86% of the respondents had obtained MSc/M.Tech, 31.43% of the respondents had B.Sc/B.Tech, 25.71% were HND holders, 11.43% had PGD and 8.57% had PhD. The vast majority of respondents (88.57%) had more than ten years of experience which is adduced sufficient and they are knowledgeable on the subject matter.

Table 1: Summary of background information of respondents

Category	Classification	Frequency	Percent (%)
Years of experience	21 and above	9	25.71
	16-20	12	34.29
	11-15	10	28.57

	5-10	4	11.43
	Total	35	100.00
Academic qualification	Ph.D.	3	8.57
	M.Sc./M.Tech	8	22.86
	P.G.D.	4	11.43
	B.Sc. /B.Tech	11	31.43
	HND	9	25.71
	Total	35	100.00
Professional membership grade	Fellow	3	8.57
	Corporate	26	74.29
	Probationer	6	17.14
	Total	35	100.00

Source: Analysis of Field Data (2025)

Table 2: Challenges Faced by Quantity Surveyors in the Implementation of Green Projects and Sustainable Construction

Identified challenges	Mean	Rank
Limited knowledge of green building practices	4.75	1
High initial cost of sustainable materials	4.50	2
Lack of training on sustainable practices	4.48	3
Inadequate government policies and incentives	4.45	4
Resistance to change among stakeholders	4.38	5
Absence of local standards for green construction	4.27	6
Difficulty in lifecycle cost analysis for green projects	4.16	7
Limited availability of sustainable materials	4.12	8
Poor awareness of sustainability benefits	4.05	9
Challenges in integrating Building Information Modelling (BIM)	3.95	10
Insufficient collaboration among stakeholders	3.86	11
Lack of client demand for green projects	3.75	12
Unreliable supply chain for eco-friendly materials	3.71	13
Limited financial incentives for green projects	3.57	14
Complexity in assessing environmental impacts	3.43	15

Source: Analysis of Field Data (2025)

4.2 Challenges Faced by Quantity Surveyors in the Implementation of Green Projects and Sustainable Construction

Table 2 shows the identified challenges faced by quantity surveyors in the implementation of green building projects and sustainable construction. The results indicate that lack of knowledge on green building practices and sustainable construction practices is the most significant challenge faced by quantity surveyors with a mean score of 4.75. This finding aligns with previous research by Onososen (2019), who emphasized the need for improved green building education in Nigeria institutions. Other major challenges are: high initial cost of sustainable materials lack of training on sustainable practices, inadequate government policies and incentives and resistance to change among stakeholders. The findings align with global trends indicating that knowledge gaps, cost concerns and policy inadequacies are significant barriers to sustainable construction practices (Che Haron, et. al., 2017; Bolade- Oladepo, et. al, 2022). For example, inadequate training on green

technologies mirrors challenges identified in other countries (Che Haron, et. al., 2017). Similarly, resistance to change among stakeholders has been reported as a universal issue (Shayan, et. al., 2019).

Table 3: Identified Mitigating Strategies to the Challenges Faced by Quantity Surveyors in the Implementation of Green Projects and Sustainable Construction

Identified mitigating measures	Mean	Rank
Enhance sustainability education in quantity surveying curriculum	4.65	1
Promote continuous professional development in green building practices	4.54	2
Advocate for government incentives for sustainable construction	4.29	3
Advocate for policies promoting green projects and sustainability	4.24	4
Improve collaboration with other built environment professionals	4.15	5
Conduct research on cost effective green materials and technologies	3.96	6
Implement lifecycle costing techniques for green projects	3.81	7
Create awareness programmes for clients on the benefits of sustainable construction	3.75	8
Establish partnerships with international green building organisations	3.63	9
Develop standardised sustainable construction guidelines	3.59	10
Integrate digital technologies for sustainable project management	3.44	11
Promote green building certification for quantity surveyors	3.25	12
Encourage specialisation in sustainable construction practices	2.86	13

Source: Analysis of Field Data (2025)

4.3 Mitigating strategies to the Challenges Faced by Quantity Surveyors in Green Projects and Sustainable Construction

Table 3 shows the most highly ranked mitigating strategy is enhancing sustainability education in quantity surveying curriculum with a mean item score of 4.56. This aligns with the recommendation of Onososen (2019), who emphasized the need for reassessing the system of education in terms of sustainable development. Promoting continuous professional development in green building practices ranks second with mean sore of 4.54, followed by advocating for government incentives for sustainable construction with mean score of 4.29. These align with Bolade- Oladepo, et. al., 2022, who emphasized education, policy reforms and collaborative approaches as critical solutions. The findings of this study highlight the critical role of quantity surveyors in promoting sustainable practices in the Nigerian construction industry. By implementing these mitigating strategies, quantity surveyors can overcome the challenges they face and contribute more effectively to the development of a sustainable construction industry in Nigeria.

5.0 Conclusion and Recommendations

Quantity surveyors play vital roles in sustainable construction by assessing and managing sustainable materials, implementing green building practices and ensuring cost effective sustainable solutions. However, they often struggle with adopting new technologies and integrating sustainability into their traditional practices. Moreover, the construction industry's shift towards sustainability demands that quantity surveyors expand their competencies to include green building knowledge and innovative technical methods.

In Edo state, as in other regions, the challenges faced by quantity surveyors in green projects and sustainable construction are multifaceted, ranging from inadequate training and awareness to limited client demand, resistance to change, the perception of increased cost associated with

sustainable materials and practices and the need for regulatory compliance with green building standards. Addressing these challenges requires a multifaceted approach that includes training in sustainable practices, collaboration with stakeholders and the adoption of advanced technologies like BIM to enhance project efficiency and sustainability. The findings of this study, underscore the necessity for a paradigm shift in how quantity surveying professionals are trained, supported and integrated into sustainable practices. By addressing these challenges, the profession can contribute significantly to achieving environmental responsibility, economic viability and social equity in Edo state and Nigeria's construction sector.

To mitigate the challenges identified and ensure enhanced contributions from quantity surveyors to green projects and sustainable construction in Nigeria and Edo state in particular, the following recommendations are proposed:

i) Collaborate with Universities and professional bodies to develop and deliver comprehensive training programmes for quantity surveyors in Edo state to enhance their knowledge and skills in sustainable construction practices, green building technologies and BIM adoption.

ii) Establish regular project meetings and workshops to facilitate communication and collaboration among stakeholders such as quantity surveyors, architects, engineers, contractors and clients to ensure a shared understanding of sustainability goals and objectives

iii) Investment in BIM software and provision of training for quantity surveyors and other project stakeholders to enhance project efficiency, cost management and sustainability.

iv) The establishment of robust cost databases for sustainable materials

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