Adopting sustainable construction in Nigeria: Major constraints

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Abstract. The implementation of sustainable practices within the built environment has taken over the world of construction. In as much as man continues to build, sustainable practices will continue to be a significant necessity. Like every significant change in the world, most countries have been faced with numerous challenges when adopting sustainable construction practices and Nigeria is not an exception. This study, therefore, investigates the factors impeding the adoption of sustainable construction in Nigeria. The aim of this study was achieved by seeking the opinion of various built environment professionals within Ondo State, Nigeria. The survey research design was adopted for this study and the data collected was analyzed using descriptive statistics. Findings from the study revealed that inadequate knowledge and lack of expertise in sustainable construction practices are the greatest constraints faced in the bid to adopt sustainable construction. The study concluded that if attaining full sustainability is the goal of the Nigerian construction industry, professional bodies and relevant government agencies must organize workshops and training to educate construction professionals on their practicable roles in delivering sustainable development. Furthermore, experts in the field of sustainable construction preferably from countries which have fully adopted the concept should be invited to be part of some construction projects so as to provide on-site guidance and mentorship for local professionals.

Keywords. Construction professionals; Green building; Sustainable development; Sustainable construction; Nigerian construction industry.

1. Study Background

In a bid to mitigate the harmful impacts of human activities on the environment, sustainability as a concept was introduced [1]. As confirmed by Kolawole [2], the ideal way to ensure the environment remains conserved is to desist from engaging in any kind of construction activities which is quite impossible. The only sensible thing that can be done is to perform activities that will balance out the adverse effects of construction on the environment [3]. This has given rise to the concept of sustainable construction which is incorporated in the design; construction; operation; management; and maintenance of a building. As Ahn [4] pointed out, every country’s economic, political and developmental affairs, as well as the state and welfare of its communities, are greatly influenced by construction activities. Consequently, construction activities must be carried out in such a way that enhances national development.

Bribian [5] noted that the drive for sustainable construction by various countries has stemmed from the increase in population which has invariably affected the demand for construction. The geometric increase in population has resulted in an increase in demand for buildings and infrastructures. This quest has increased emissions of greenhouse gasses such as super dioxide, nitrous oxide, carbon monoxide to
mention a few which in turn increase the carbon footprint in the atmosphere [6,7]. The increase in demand for construction and its spill-over effect on the environment can only be ameliorated by embarking on sustainable construction.

Sustainability is aimed at reducing the human’s disruption to the natural environment which has mandated the concept of sustainable building. As suggested by Nwokoro [8], sustainable construction can be achieved through five basic practices, these are; energy conservation; land conservation; material conservation; stormwater retention and pollution reduction. The concept of sustainable development has greatly motivated construction professionals to revolutionize the way buildings are been designed, constructed and managed [9,10]. This revolution is necessitated by the increase in demand for environmental and resource efficient buildings. In addition, Bosch [11]; and Pearce [12] further documented that the change was a needed response to the persistent desire to decrease environmental degradation caused by construction; improve users experience and satisfaction; as well as ease cost of operation and maintenance. The application of sustainable principles in buildings must start from the conception stage to the deconstruction stage [13]. To support this, studies carried out by Daniel [14] affirmed that in countries of the world, Nigeria inclusive, where the contract of a building project specifies the nature of execution and delivery of the project, sustainable practices must be inculcated right from the project conception stage.

Du Plessis [15] averred that in the bid to introduce sustainable construction in Africa, construction professionals must ensure that the sustainability tools and techniques are localized and directly channelled to the needs of the immediate community. The study conducted by Aghimien [16] which investigated the barriers of sustainable construction in Zambia submitted that the major barriers include fear of higher investment costs; lack of local green certification, inadequate support from the government, and lack of financial aids. The study, therefore, concluded that educating various construction stakeholders on the benefits of sustainability should be the first priority, closely followed by intense action from the government to support and offer financial incentives for sustainable development.

Dania [17] argued that compared to the rest of the world, Nigeria is still far behind in embracing sustainability in the built environment. A study carried out by Daharu [3] used the perceptions of professionals in the built environment to examine whether the concept of green building has been introduced to any project in Nigeria. The study concluded that green building is not practiced in Nigeria as there is no policy or enabling environment to support its adoption. Numerous studies like that of Al-Saleh [18]; and Aghimien [19] have documented that projects executed within the Nigerian construction industry are generally characterized by poor sustainability standards. However, if a positive change is desired, there is a need to understand the challenges hindering the successful planning and execution of sustainable projects. Hence, the current study seeks to investigate the factors impeding the adoption of sustainable construction in Nigeria. This is with a view of understanding the underlying constraints and proffering practical solutions that will ease the adoption of sustainable construction within the Nigerian construction industry.

2. Design and Method
The study background has established that the Nigerian construction industry is lagging in the adoption of sustainable construction, it further highlighted some challenges and barriers to adopting sustainable construction from previous studies. This study is aimed at understanding the constraints faced by the Nigerian construction industry professionals in delivering sustainable development. This was achieved by measuring the degree at which identified impediments affects the adoption of sustainable construction in Nigeria, through construction professionals’ perspective.

This research is descriptive in nature and adopted the survey research design. Quantitative analysis was used to analyse the data which was sourced from the construction professionals via a close-ended questionnaire. The questionnaire used to collect the data was designed to follow the five-point Likert scale structure which highlighted points pertinent to achieving the aim of this research. This study was carried out in Ondo State, Nigeria with a total of 125 built environment professionals contacted. While 82 questionnaires were received back from the respondents, only 78 were deemed useable after they were checked for completeness and as a result, makes up the basis for this study. The data collected
The result revealed that the major impediment affecting the full adoption of sustainable construction in the study area is inadequate knowledge of sustainable construction principles with a mean score of 4.01. In the same vein, inadequate expertise in sustainable construction and lack of interest among project team members were ranked 2nd and 3rd with mean scores of 3.77 and 3.76 respectively. The
result further revealed that lack of efficiently designed maintenance system for sustainable building occupies the 4th position with a mean score of 3.74. Some other important barriers are cost implications, inefficient management systems, lack of support, and resistance to change.

4. Discussion
The findings of Tunji [20] revealed that the major factor impeding the full adoption of sustainability in the construction industry is the lack of technical knowledge and skills. The findings of the current study and the findings of Tunji [20] however corroborate each other. The adoption of sustainability in construction has been impeded by lack of knowledge regarding sustainable construction which has hampered the level of awareness of construction professionals on the need to adopt such in projects. It, therefore, becomes imperative to educate and sensitize construction professionals in Nigeria in other to keep them aware. This was supported by Oni [13] where it was revealed that in order to hasten the adoption of sustainable construction in Nigeria, Professionals within the built environment must be trained to harmonize individual professional activities as regards sustainability.

Empirical and theoretical findings from the study reveal that numerous factors affect the successful adoption of sustainable construction within the Nigerian construction industry. A critical review of these factors further revealed that they can be classified into two major categories. The first category is the lack of technical knowledge, skills, and capability to implement sustainable construction. This category of challenges is directly attributed to the built environment professionals who are charged with the responsibility of delivering sustainable development. As the fact remains, professionals cannot implement what they do not know. This challenge can be checkmated by organizing rigorous educative training on sustainable construction practices where emphasis can be laid on its principles, tools, and applications. Furthermore, on-site training by experts in sustainable construction will be an added advantage as it will account for a practical experience which is very important within the construction industry.

The second category is the lack of support from relevant stakeholders. In this aspect, the relevant stakeholders include project sponsors who are referred to as the clients; contractors; consultants; project team members; the government; and various professional associations within the built environment field. To checkmate the challenges in this category, the different stakeholders need to play important roles. The government must set up a minimum sustainable standard for all construction projects within the country and ensure that the standard is enforced. Also, financial incentives in the form of building tax breaks should be granted to building with good sustainable development ratings in order to encourage its adoption.

Furthermore, demands for sustainable construction must be made by clients. Adopting sustainable construction and management comes at an extra cost and project sponsors must be ready to cover that cost. Contractors, consultants and project team members must also do their part by acquiring necessary knowledge and skills needed to design, plan, construct and manage sustainable buildings. They must also be willing and committed to delivering sustainable construction. In addition, professional associations must intensify efforts to ensure that its members and the general public are aware of the aim and benefits of sustainable construction. They must as well organize training and set regulations to ensure its adoption. Lastly, efforts must be channelled into ensuring that sustainable materials and resources are available and easily accessible.

5. Conclusion
This study has examined the constraints affecting the full adopting of sustainability in construction projects in Nigeria. Having carried out a survey on the construction professionals via administered questionnaire, it was discovered that the major deterrents include but are not limited to lack of knowledge regarding sustainable construction principles, inadequate expertise in sustainable construction and lack of interest and support from project stakeholders. The study, therefore, concludes that skills deficiency in sustainable construction among construction professionals and inadequate support from relevant stakeholders in the built environment has affected the successful adoption of sustainability in the built environment. Rigorous training and support systems must be organized in order to increase interest and implementation of sustainability in the construction industry. Development
and implementation of sustainability strategies will foster the achievement of the green growth agenda in the Nigerian construction industry.

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