

THE GREEN BUILDING OPTION IN LAGOS: PROSPECTS, PRACTICE AND CHALLENGES

Okesoto, J.O., Olawale S.O. & J.S. Seriki-Mosadolorun
Email: banji.okesoto@yabatech.edu.ng

ABSTRACT

The paper examines the prospects, practice and challenges of embracing green building option as alternative to conventional building practice. The research adopted qualitative research method involving the use of Focus Group Discussion (FGD) and the review of existing literatures relating to the subject of discussions. A total of 21 professionals in the built industry were drawn from four tertiary institutions and the private sector in the state. The members of the FGD were guided on subject areas of discussion which include, awareness among the professionals and member of public, feasibility and viability of green building project, examples of green building in Lagos, challenges and acceptability of the concept as an alternative to conventional building in Lagos. Reviewed literatures captured conceptual meaning of green building, drawing examples of the existence of such across the globe. Responses from the FGD were analyzed contextually and presented thematically. Results obtained indicate that, green building concept is popular among the professionals, acceptable among them but lack adequate capacity for design and construction; feasible but relatively not viable for now. The FGD members also agreed that the option is acceptable to the public as an alternative to conventional building and has the ability to stimulate economy since it has the ability to minimize cost of energy use and reduction in carbon emissions. Challenges highlighted include, absence of political will, certification standards legal framework and building capacity. The paper recommends for executive leadership in the state to embrace green building option as alternative to conventional building processes development, provision of improved incentives for builders, strengthening of building codes and planning requirements among others.

Keywords: Building, Green, Lagos, Prospects

INTRODUCTION

The desire to preserve the natural environment in the midst of human progress and environmental exploitation has fueled concerns about a better approach to optimize the use of environmental resources. Green construction is one possibility that has piqued the interest of researchers. The concept is widely accepted among professionals in the built environment, and many who are concerned about environmental sustainability see the Green Building model as an alternative to conventional building development, which is generally associated with carbon emissions that contribute to the depletion of greenhouse gases. Ajatar (2000), for example, identifies land exploitation, existing site deterioration, habitat damage and misuse of natural

resources as negative impacts connected with conventional or orthodox construction development. According to Ajatar (2000) and Dairu (2005), traditional buildings consume more resources, which may jeopardize their availability for future generations. Aside from this over-reliance on brown energy and depletion of environmental resources, users of such buildings and the buildings themselves generate wastes that are likely to exceed the sinking capacity of the atmosphere's basin.

Green building, in general, is the result of a design that focuses on increasing resource efficiency - energy, water, and materials - while reducing building impacts on human health and the environment throughout the building's lifecycle, including better siting, design, construction, operation, maintenance

and removal. Green building attempts to reduce the overall impact of the built environment on human health and the natural environment by making better use of resources such as energy, water and waste absorption capacity while reducing waste production, pollution, and environmental damage. Green buildings are planned, constructed and utilized in environmentally friendly and sustainable ways. Green building proponents agree that investments in new or repaired infrastructure may have a negative impact on the environment now and in the future. Green building, according to Sailor (2008), benefits both the environment and the economy. According to the author, a 2% initial investment in green building design may result in life cycle savings of 20% of total construction expenses - more than ten times the initial investment. When compared to standard commercial buildings, green buildings provide significant economic benefits, including 8-9% lower operating expenses, a 7.5% gain in building value, a 6.6% increase in return on investment, a 3.5% increase in occupancy ratio, and a 3% increase in rent ratio. Regardless of the economic benefits, new data suggests that green building occupants are more productive as a result of improvements in interior settings which are expected to improve users' overall health.

According to Heerwagen (2000), zero net energy buildings are theoretically viable with good design, energy efficient features, and integrated renewable energy applications and buildings may also be energy producers with modest water use. Since the Kyoto Declaration, sustainable structures and buildings have been the norm. One such new order is the encouragement of green construction practices. In Nigeria, particularly in Lagos, there has been a shaky effort to embrace the notion of green construction with the goal of ensuring environmental sustainability and the effective use of natural resources. According to Klufallah et al. (2014), the rationale for embracement is based on the fact that the building industry accounts for 24% of total

carbon dioxide (CO₂) emissions in Lagos. The paper is therefore conceived to assess the level of acceptance and practice of green building concept among the professionals in the built environment in Lagos metropolis.

Conceptual issues

Green building, according to Dahiru et al. (2014), is an integrated approach for designing and delivering healthy, attractive, cost-effective and environmentally responsible living and working environments. Green construction strategies aim to create more sustainable sites, boost water and energy efficiency, reduce waste and emissions, use environmentally friendly building materials and improve interior environmental quality more effectively than traditional building designs. Green building practice in this sense refers to both a structure and the use of environmentally responsible and resource-efficient techniques throughout a building's life cycle from idea through planning, design, and construction.

Green building became popular in response to criticism of conventional constructions for being inefficient and resource-intensive, leading in increasing environmental concerns that have a negative impact on settlement and environmental sustainability. According to a 2019 Energy Information Administration (EIA) estimate, conventional buildings account for one-third of greenhouse gas emissions, one-third of energy, and two-thirds of electricity in the United States. Green building is an essential component of long-term development.

Elements of Green Building

Green building approaches that have been devised have mostly focused on the life cycle performance of buildings. According to Howe (2010), an integrated and comprehensive strategy that includes construction, operation, maintenance, decommissioning and incorporates various qualities.

Elements of Green Building

Sustainable location or sitting

- Energy and water efficiency
- The use of sustainable building materials
- Healthy indoor environmental quality
- Efficient use of energy, water and other resources
- Use of renewable energy, such as solar energy
- Pollution and waste reduction measures, and the enabling of re-use and recycling
- Good indoor environmental air quality
- Use of materials that are non-toxic, ethical and sustainable
- Consideration of the environment in design, construction and operation
- Consideration of the quality of life of occupants in design, construction and operation
- Dynamic design that enables adaptation to a changing environment

Source: Authors' compilation

Justification for Green Building Concept

According to available research, the typical construction paradigm has negative environmental effects with severe repercussions for the economy, physical environment and public health. According to Glasston (2001), conventional structures account for 39% of overall energy consumption, 13% of total water consumption, 68% of total electricity consumption and 38% of total CO₂ emissions in the United States of America (a figure above emissions generated by automobile). The practice is anti-sustainability according to evidence. As a result, it is necessary to take a more sustainable approach to safeguarding public health, cutting CO₂ emissions, and conserving natural resources. The benefits of green construction over traditional practices include economic, social and environmental benefits, some of which are:

Economic Benefits of Green Building

Sustainable sitting reduces the expenses of site preparation, construction materials and operating expenditures. Green buildings must be developed and built in accordance with environmental terrain and other factors. Other economic benefits include:

- Aesthetic benefits that may have greater commercial worth;
- Increased local economic development potential via the adoption of the local content idea; and
- Improved water efficiency measures that result in decreased annual water expenditures and municipal wastewater treatment costs.
- Encourages energy efficiency measures, which result in lower peak power demand, lower need for new energy infrastructure, lower energy prices for customers, and up to 70% cheaper annual fuel and electricity expenses.
- Increased building and equipment life span
- A reduction in the degree of infrastructure that the government will give.

Social Benefits of Green Building

- Inclusive access to infrastructure services such as transportation
- Reduction in wastewater suggesting less issues to be concerned about
- Provision of rare new power plants and transmission lines in the neighborhood
- Expanded market for environmentally preferred goods

Environmental Benefits of Green Building

Some of the environmental advantages of green building identified by Zuo and Zhen (2014), include:

- Promotes environmental resource conservation by lowering pollution levels, greenhouse gas emissions and waste.

- More land preservation, less resource and energy use and environmental resource protection
- Conservation of water resources for wildlife and agriculture.
- Reduces power and fossil fuel use, as well as the environmental impact of fossil fuel production.
- Improved indoor air quality leading to decreased levels of pollutants.

Green Building: Case Study

Rhône -Alpes Green Building : It is one of Valence, France's Best Practice green buildings and is often referred to as eco-building. The structure is a model of economic innovation and sustainability, with a high level of work-life balance. The building's green features include energy-

efficient heating, ventilation and air conditioning technology, as well as environmentally friendly materials that reduce energy consumption and enhance interior air quality. Advanced natural building materials made from recycled building components were used in the construction. This conserves energy while maintaining a pleasant atmosphere in terms of temperature, humidity, lighting and sound effects. A planted rooftop on the building's roof filters the air, controls temperature, promotes cooling during hot weather, and provides for quick drainage during rainstorms.

Madrid Bamboo Green Building: An 18-meter-high bamboo-built tower in Madrid with excellent energy efficiency and a strong feeling of using renewable materials, energies and green building materials.

Figure 1: Bamboo built building



Source: Modified from Zuo & Zhen- Yu 2014.

One of its distinguishing characteristics is its energy-saving glass, which can absorb light and is positioned in places of the structure that may modify the ambience regardless of location. External emissions, water, wind

power, and solar energy are all converted into electricity within the structure, enabling it to be energy self-sufficient while producing zero CO₂. Bamboo is a low-cost and environmentally beneficial construction

material. The 88-resident building is a rent-control project built and operated by the Madrid community authority. Bamboo louvers were inserted on the structure's folding frames to cover the façades. These installed louvers provide temperature control, noise reduction, aesthetic value and shade. Other ecologically friendly features of the building include:

- The use of solar water heating panels mounted on the roof
- Wind chimneys meant to ventilate bathrooms and kitchens in the building

- The bamboos are treated to last for a long time, fire-protected and could be replaced over time.

Study Area

Lagos state is the subject area of study for this paper. The state lies in the south west of Nigeria with 2006 National population Census of 9,013 534 and a projected population of over 20 million as at 2022. The majority of the state population lives in the most urbanized part of the state, subjected to varying environmental challenges resulting from urbanization and unsustainable use of environmental resources.

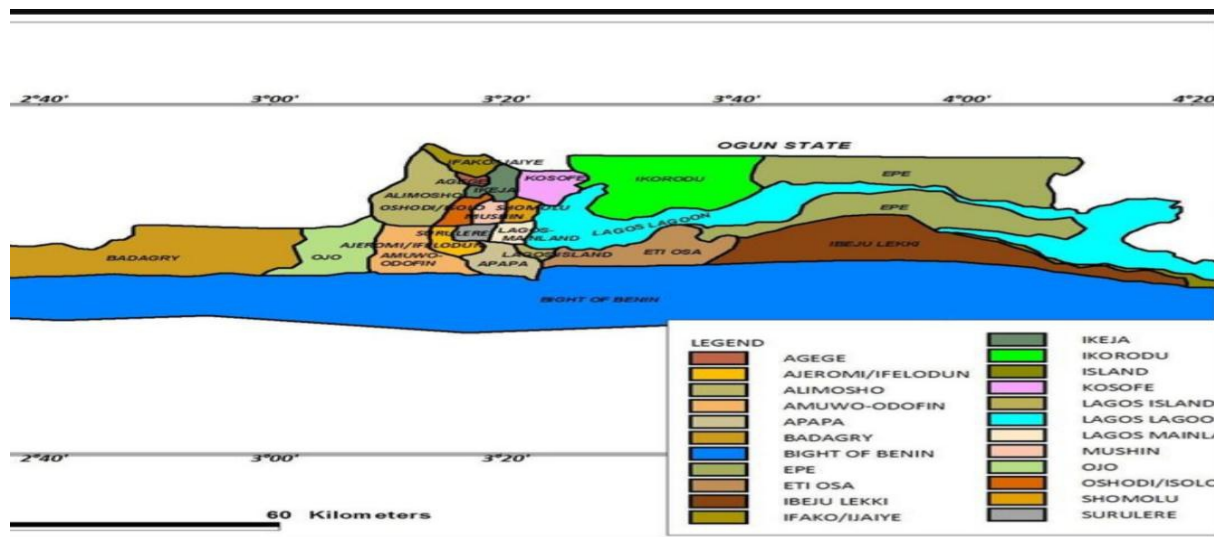


Figure 1 : Lagos State and its Local Government Areas. Source: Oladokun, 2010.

Methods

The research method is majorly qualitative. The study was carried out via focus group discussions and a survey of relevant literatures. The Focus Group Discussion approach was used to seek opinions from thirteen professionals recruited from higher education institutions and eight drawn from the commercial sector functioning within the state. Opinions on a broad variety of topics were asked. The opinions sought were acquired using an interview guide. The Table 1 : Focus Group Discussants

discussants' responses were contextually examined and thematically presented. The research also drew on a body of existing knowledge, particularly published literature and reports from international organizations and governments.

The discussants

The members of the Focus Group Discussions are all professionals in the built environment industry spread across the four higher institutions in Lagos state, the spread is as shown in table 1.

S/N	Name of institutions/sector	Number of participants
1	University of Lagos	3
2	Lagos State University	4
3	Yaba College of Technology	3
4	Lagos State Polytechnic	3
5	Private sector	8
	Total	21

Source: Authors' compilation

The discussants for the study are all professionals in the built environment and are distributed as shown in table 2.

Table 2: Discussants professional background

S/N	Discussant profession	Frequency
1	Architects	7
2	Builders/ Civil engineer	7
3	Urban planners	3
4	Estate surveyors	1
5	Climatologist	2
6	Quantity surveyors	1
	Total	21

Source: Authors' compilation

Discussions

Major areas of discussions among the members of the Focus Group Discussion include:

Awareness

All of the participants indicated that they had a good understanding of the green building idea and that the majority of their professional peers do as well. The general submission of the discussants is that members of the public are unaware of the green building concept and those who are aware lack a clear understanding of how the concept works, making it difficult to embrace the concept despite the fact that the

discussants agree that the green building concept is more sustainable economically and environmentally. The result is that although experts may find it simpler to adopt and integrate green building houses with traditional housing construction, however, market drive may be insufficient. Among the participants, builders reported the presence of a green building organization inside their professional body, the Nigeria Institute of Builders.

Technical capacity

The experts, including architects, who have all assumed the role of technical team leader in the design and construction of green buildings, lack the technical competence to

properly design and develop green structures. They were unanimous in their belief that with little training and increased knowledge, they could supply the necessary building capacity for the design and construction of green buildings.

Acceptability

The discussion participants agreed that the green construction alternative has yet to be adopted by the Nigerian public in lieu of conventional structures, which they ascribed to the fact that the notion only became known to the nation right before or soon after the economic slump. They all agreed that despite the fact that the alternative is cost effective, neither the government nor professional organizations have done much to publicize it since its inception. Green construction, in general, is not well accepted by the public. As a result, in order for the notion to be viable, the government and specialists in the built environment will need to raise public awareness.

Feasibility and viability

All of the panelists agreed that green construction is technically, commercially and ecologically possible if the right political tools are in place. According to the panelists, the environment is favorable for green building design since Lagos has a tropical climate with plentiful sunlight throughout the year, considerable rainfall that is evenly distributed throughout the year, and moderate wind velocity all year. According to them, all of this provides for sustainable and clean energy, rainwater harvesting and ample free passage of air. The panel also recognized that the state's present housing shortage is an incentive for demand as is the potential of green construction to save money on energy and power usage, drinkable water use and raw material consumption. According to the panelists, this will provide encouragement for green building development, perhaps encouraging economic feasibility for green building development.

The panelists also agreed that as green construction becomes more mainstream, it has the potential to be economically, socially and environmentally viable. Nature building, according to them, promotes physical and spiritual benefits, the utilization of renewable natural resources and lower construction costs.

Existing Green Building projects in Lagos

Panelists were asked to mention the practical examples of green building projects in Lagos. The panelists listed four of such in Lagos which include, Heritage building, Nestoil building, the alliance building and the Wings building all situated in Lagos.

Challenges

Members of the Focus Group Discussion were asked to consider the problems that have faced or are anticipated to face the development and sustainability of the green building idea as an alternative to conventional buildings. Some of the challenges mentioned include a lack of a legal framework to promote the option, a lack of adequate building capacity, a lack of motivation for investors, a lack of clear cut policies on green buildings, a lack of certification standards and a temporary transfer of the economic burden to existing tenants of existing green buildings due to their scarcity.

Conclusion and Recommendations

The study contends that the green building idea has the potential to provide an alternative to conventional construction due to its economic, social and environmental benefits. As a result, the study suggests that the important factors for the success of the green building idea, such as relevant experts, customers and the government should work together to promote the concept in order to make it a reality in the state. The government should offer the necessary administrative leadership, as well as incentives for green building developers such as advantageous

tax policies capable of driving investment towards green building construction, installation licensing and certification. There is need to offer direct incentives such as upfront financial incentives for green building users. The government should establish and reinforce construction rules and planning criteria that promote low-impact development.

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