Adoption of Green Building Practice in Commercial Properties in Lagos, Nigeria

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ABSTRACT

Buildings account for a sizeable amount of total energy consumption and total greenhouse gas emissions around the world. Green building has consequently emerged as innovative building concept to lessen the environmental impact of these buildings. This survey-based study therefore, evaluates stakeholder's perception of possible adoption of green building practices and application in commercial properties in Lagos, Nigeria. The survey was conducted in Lagos, using a random and purposive sampling technique with a well-structured questionnaire to gather data from 175 respondent comprising 52 property developers and 123 Registered Estate Surveyors and Valuers. Data collected was analyzed using descriptive and inferential statistics with the aid of SPSS. The result of the findings revealed that respondents have a low level awareness of green building in general. The study further reveal that green features that would be mostly adopted by stakeholders include: careful orientation and low-energy lighting design, the use of renewable energy e.g maximum use of natural day lightening and the use of energy efficient and eco-friendly equipment. The study advocated for increased sensitization of benefits of green building among built environment practitioner. By so doing it will deepen the adoption of green building practice in the study area. The study recommends widespread supply of green features in commercial properties. Also Professional bodies should train and educate their members on the importance of green so as to incorporate the lofty practice in their daily practices. Overall, public enlightenment, awareness, and better enabling green building practice can be improved in Nigeria.

Keywords-- Built Environment, Commercial Properties, Green Building, Stakeholders

I. INTRODUCTION

Buildings are used in a variety of ways. Prominent among these uses are residential, commercial and industrial. Residential use provides accommodation for living; commercial uses can be office, shops and other trading premises; while industrial uses are factories, warehouse accommodation for production and assemblage purposes. Regardless of the building type, size and use as well as statutory regulations, they often have a significant negative impact on the natural environment. [14]. While buildings provide countless benefits to society, they also have significant environmental impacts on the society. [10]. Green building concept has been gaining more popularity in the developed world to serve as a standard to lessen the environmental impact of not only existing building stock but also in the constructions of new ones. [9].Green building design and construction according to [11],describes the practice of using resources more efficiently while creating healthier and more energy-efficient buildings. According [24],"Green or sustainable buildings use key resources like energy, water, materials, and land more efficiently than buildings that are just built to code. With more natural light, and better air quality, green buildings typically contribute to improved productivity, health and comfort of people and environment.

Green building has also been characterized as building with a conscious effort to minimize negative and emphasize positive impacts on both the indoor and outdoor environment. It touches all aspects of the building process from demolition, design, site placement, construction, renovation, operation, and maintenance.) The components of green building are energy efficiency and renewable energy; environmentally preferable building materials and specifications; waste reduction; toxins reduction; indoor air quality; and smart growth (development and conservation strategies that protect the natural environment

and make communities more attractive, economically stronger and more socially diverse [10].

Event such as World commission on Environment and Development (WCED 1987) Rio Earth Summit of 1992, Maastricht Treaty of 1992, Kyoto Conference on Global warming of 1997, Johannesburg Earth summit of 2002, Washington Earth observation summit of 2003,UN-HABITT Conference on promoting and Fostering Green Building Rating System (GBRS) in Africa 2010, Africa Development Forum of 2012, Swiss Asian Environmental forum 2013 and Brussel Green Week Conference of 2014 has been organized globally in the past to increase awareness of environmental impact of buildings and sustainable goals within the built industry in the world.[19] [9]. The ideas and plans instituted by these world events have inspired actions by many countries to implement and incorporate sustainability principles within their built industry. The Brundtland Report, along with other reports and commissions that followed, created an organizational context in which the practices of green building could become not just accepted, but implemented in the developed and developing world.[14], noted that it was not only the wider global awareness of the need to change the way we build our cities that has allowed green building practices to move from a little known concept, but advocated mainly by environmentalists, more towards the mainstream. It was also the greater understanding that built environments have a huge impact on the ecological health of the planet and on the personal health of individuals and communities, and that we have a direct ecological stake and economic interest as well as a social responsibility to protect these endowments well into the future.

However, the critical question that needs to be addressed is whether the increased pace in the adoption and practice of green building practices in the developed world can be inculcated into sustainable real estate development in the developing country like Nigeria. In other words, the consumer's acceptance, patronage and practices of green building in real estate development in Nigeria is fundamental to its success and thus, demands more thorough studies to ensure that resources are well deployed, rather than misused, in sustainable real estate development and management.

Green building practices appears not to have elicited the needed attention in Nigeria when compared with advanced countries like Canada, USA, United Kingdom, Australia, Britain where practices are more pronounced. However, a glimpse of industry based reviews and perhaps a handful of academic researchers[14] [16][17] [13] [2] [9] [15]have conducted studies to substantiate the need for either the practices or establishment of green building rating system. This implies that identifying what constitutes green building practices in commercial properties in Nigeria will remain hinged on myths rather than empirical evidence.

From the foregoing, this study is geared towards stakeholder perception of adoption of green building practice and application in commercial properties in Lagos, Nigeria, thereby empirically situating her among comparable green building practices in the world. The study`s objectives therefore are to:

- ❖ examine the general awareness level of green building practices by stakeholders in the built environments.
- ❖ determine the level of practice of green building concept in the study area.
- ❖ examine the perceived level of adoption of green building features by stakeholder

II. LITERATURE REVIEW

Concept of green building

While the definition of what constitutes a green building is constantly evolving,there are many definitions for a green building that are widely used in the market place.Green building, green architecture, sustainable building, high-performance building, and low-impact development are among the terms used to denote practices that reduce the environmental impact of components of the built environment. [10] defines green building as the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from sitting to design, construction, operation, maintenance, renovation and deconstruction. This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Green building is a sustainable building and an outcome of a design philosophy which focuses on increasing the efficiency of resource use, including energy, water and materials, while reducing building impacts on human health and the environment during the building's life cycle, through better sitting, design, construction, operation, maintenance and removal [25].

Thus, green building is a form of practice(s) in which buildings are designed and built taken into consideration Life Cycle Assessment (LCA) without causing environmental degradations throughout the entire building lifecycle while exhibiting high level of environmental, economic and social performance. It should also be noted that definition of green buildings will be both subjective and specific to taste and dictates of a geographic climate as the definition of green buildings is dominated by European and North American influences where the evidence of green practices is at least visible [16].

Rationale for green building

According to [16], Embracing green or sustainable concept in design and management is aimed at reducing energy, operation and maintenance cost, reduced building related illness, increase the productivity and

comfort of building occupants; reduce waste and pollution and increase building and component durability and flexibility. His study further shown that green building measures taken during construction or renovation can result in significant building operational savings, as well as increases in employee productivity.[15] were of the opinion that the reason for the observed little or lack of interest in green building practices in Nigeria and other developing countries can be linked to the conservative attitude of most Nigerians towards change. The stakeholders in the built industry in the country are used to conventional method of construction. There appears to be low level of awareness and enthusiasm about sustainable building in Nigeria's built environment. This means that building users, occupiers, and other stakeholders are likely to doubt the certainty of its outcomes and benefits.

Authors such as [22] [24] [26]opined that the costs, financial risks, and lack of demand for sustainable buildings far outweigh the benefits. In a report conducted by [6], it was found that among half a dozen Californian developers interviewed in 2001, green buildings cost 10-15% more than conventional buildings. As noted by [23], as cited in [15], uncertainty of outcomes and benefits are common barriers to successful implementation of sustainable practices. In other words, the lack of interest in green building practices must have arisen out of inadequate knowledge of the potential benefits (especially long run) and high level of uncertainty about the actual benefits derivable from green building practices.

The findings from the study of Green construction in Nigeria conducted by [13]revealed that important factors considered for sustainable construction include quality of working conditions, strengthening and enforcement of relevant laws and regulations, and design for flexibility and adaptability. The results of occupiers' preference with respect to existing building components and services to ascertain the level of their appreciation of green elements carried out by [16] revealed that incidences of flooding, loss of property, and poor electricity were traced to unsustainable building design. The author advocated for a holistic adoption of green design in Lagos metropolis. Likewise, in the study of expectations of stakeholders on the potential benefits of green building in Nigeria conducted by [21], they find that reduced capital costs, reduced operating costs, market benefits, health and productivity gains, and reduced liability risk were the perceived benefits from implementing green building practices.

From the above-mentioned, green building is thus embraced to prevent the negative impacts of buildings and structures on the built environment. These impacts according to [10], are felt in four broad areas. First, impacts related to the aspects of built environment include siting, design, construction, operation, maintenance and renovation. Second, the impact is in form of the consumption of energy, water, materials and natural resources. Third, building generates environmental effects such as waste, air pollution, water pollution, indoor pollution, heat islands, storm water runoff and noise. Lastly, the ultimate effects of building activities result in being harmful to human health, environment degradation and loss of resources. With the apparent benefits derivable from sustainable buildings, it is anticipated that if commercial building users and occupants, especially in developing economies, are adequately informed and sensitized, their demand for green building might be better enhanced.

Principles and dimensions of green building practice

The studies of previous researcher on green building have highlighted several dimensions and major principles of green building practices [1][4] [9] [13] [16] [20]. While the study of [4] identified fifteen (15) elements of green building to include: energy conservation measures, land use regulations and urban planning polices, waste reduction measures, resource conservation strategies, indoor environmental quality, friendly energy technologies, re-engineering design process, proactive role of material manufactures, better measure and account for costs, new kinds of partnership and projects, adoption of incentive programmes, education and training and recognition of commercial buildings as productivity assets,[16]highlighted eleven (11) dimensions of green design to include: energy and water efficiency, waste reduction, building operation, construction, maintenance, occupant health and productivity, storm water management, climate and environmental integration. Though there is similarity in the different principles of green building identified by the various researchers, the author noted that a green building will not necessarily have all the above stated principles, since no building can be totally green. In the study of[20]green building principles identified include: energy efficiency, water efficiency, material efficiency, indoor environmental enhancement as well as operations and maintenance optimization. Also, [13] identify nine (9) elements that increase the sustainability of the built environment which include: energy efficiency, integrated design, indoor air quality, thermal comfort, visual comfort, site sustainability, acoustic comfort, spatial comfort and building integrity while [9] identify seven (7) element of green building adoptability in its investigation to include: energy efficiency; water efficiency; environmental and resource conservation; recycling and waste reduction; site sustainability; indoor air environmental quality, maintenance and building optimization.

Therefore, this study adopts cost effectiveness and environmental technology; effective use of existing landscape; efficient use of water; use of recycle and environmental friendly building materials; use of energy efficient and eco-friendly equipment and careful orientation; low energy lightening design; quality indoor air for human safety and comfort as green building

indicator in its investigation to determine general level of awareness of green building practices and to determine level of awareness of these specific features of green building in commercial properties in Lagos. We also examine from stakeholders 'perspective the perceived level of adoption of these green building features in their respective practices. Data obtained represents the perspectives of stakeholders to adoptability of green building practices in commercial properties in Metropolitan Nigeria.

III.   METHODOLOGY

A literature review was first undertaken to determine issues around green building concept, practices and constraints in Lagos. Research instrument used was the questionnaire that was designed to elicit information on respondent's views on issues such as the general level of awareness of green building concept, level awareness of green building practices and adoption of green building features in the course of professional practices by the concerned stakeholders in built industry in Lagos. Questionnaire survey was preferred because it can be used to gather information from large samples and result can be used for further statistical analysis. The study took place in Lagos State, Nigeria being the nation's commercial capital with over 80% of businesses having their head offices or at least a branch office in the city [5]. It is estimated that over 50% of property professionals carry out their professional practices using commercial properties in the city.

Population of the study includes Real Estate Development of Nigeria (REDAN) whose members includes (Architects, Builders, Civil Engineer Town Planners and Quantity Surveyors) and Estate Surveyor and Valuers. The study adopted random sampling techniques where questionnaires were delivered directly to respondents and filled questionnaires were retrieved after the administration. A total of 240 questionnaires were administered to first set of respondent out of which 190 were retrieved. During the process of editing, a total of 15 questionnaires were diagnosed with error of omission and partial completion. This renders affected questionnaires to be invalid for this study. In all, a total of 175 questionnaires were valid for this study, making a response rate of 72.3%.According to [27] the result of a survey could be considered as biased and of little value if the response was lower than 30-40%, the response rate for the research is 72.3% which indicate an unbiased and higher value of survey.

The data was analyzed using the statistical of package for social sciences (SPSS) version 20.0 and the methods applied for data analysis were mean scores and ranking because most of the variables were measured on nominal scale while only few of the variable were measured on the ordinal scale. The averaging statistical analysis was also used to calculate totals, percentages and averages. To measure level of awareness of green building features, responses were evaluated on a perceived level awareness based on a 5- point likert scale where 1 = Very low, 2 = low, 3 = Moderate, 4 high and 5 = very high. Likewise, to measure perceived level of adoption of feature of green building, responses were equally evaluated using 5-point likert scale where 1= hardly adopted 2= fairly adopted, 3= not adopted 4= adopted 5= highly adopted.

Results and discussion

For ease of presentation, the results are analyzed and discussed in line with the three focal areas of the study. The first aspect focused on the examining the general awareness of green building practices by stakeholders in the built environments, the second determine the level of awareness of features of green building concept while level of adoption of green building features by stakeholder is the third level examined.

Table 1: Gender of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	137	78.3	78.3	78.3
	Female	38	21.7	21.7	100.0
	Total	175	100.0	100.0	

From the table above, 78.3% of the respondents are males while the remaining 21.7% are females. Therefore, majority of the respondents are male which reflects the dominance of male workforce in built industry in Nigeria.

Table2: Distribution of the respondent by profession in the study area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Estate Surveyor	123	70.3	70.3	70.3
	(REDAN)	52	29.7	29.7	100.0
	Total	175	100.0	100.0	

Table 2 above shows the distribution of respondent by profession, 70.3% of the respondents are Estate Surveyor and Valuers, 29.7% of the respondents are Member of Real Estate Developer Association of Nigeria (REDAN) whose member comprises Architects, builders, Quantity Surveyors Civil Engineer, etc.

Table 3: Distribution of the respondent by years of experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5	33	18.9	18.9	18.9
	6-10	69	39.4	39.4	58.3
	11-15	42	24.0	24.0	82.3
	16and above	31	17.7	17.7	100.0
	Total	175	100.0	100.0	

Table 3 above indicates the distributions of the respondents by their year of experience 18.9% of the respondents have acquired 1-5 years of experience, while another 39.4% of the respondent have acquired between 6-10 years of experience and 24.0% of the respondents have acquired between 11-15 years of experience and finally about 17.7% of the respondents have acquired more than 16 years of experience. Therefore, majority of the respondent have acquired more than 5 years of experience in their various field which ascertained the credibility of the respondents to adequately answered the questions raised in the questionnaire.

Table4: Distribution of the respondent by professional qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ANIVS	47	26.9	26.9	26.9
	FNIVS	18	10.3	10.3	37.1
	Probationer members	55	31.4	31.4	68.6
	Others	55	31.4	31.4	100.0
	Total	175	100.0	100.0	

Table 4 above presents the distribution of respondent's professional qualification in the study area, while (31.4%) are probationer member of Nigeria Institution of Estate Surveyors and Valuers, another (26.9%) of the respondent are Associate member of Nigeria Institution Valuers and another 10.3% are Fellow of the institution. While the remaining (31.5%) of the respondents are member of REDAN that belong to various professional group such as Nigeria institute of Architect (NIA), Nigeria Institute of Building (NIOB). This ascertain the credibility of the respondents to appropriately answer the research questions.

Table 5: Distribution of the respondent by highest academic qualifications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	HND	66	37.7	37.7	37.7
	B.Sc	85	48.6	48.6	86.3
	M.SC	24	13.7	13.7	100.0
	Total	175	100.0	100.0	

Table 5 above show the respondents highest academic Qualification, (48.6%) of the respondents holds B.Sc, while (37.7%) holds Higher National Diploma and (13.3%) are M.Sc Holder. This implies that majority of the respondents are first degree holder (86.3%) (BSc and HND), this attest to the credibility of the respondents to adequately provide appropriate answers to the various question in the questionnaire.

Summary of qualifications and experiences

Most of the respondents, of which 78.3% and 21.7% are male and female respectively, hold a first degree i.e HND (37.7%) and B.sc (48.6%), and a master's degree (13.7%). Moreover, 70.3% of the respondents are Estate surveyor and valuers with varying professional qualification. i.e (26.9%) ANIVS, FNIVS (10.3%) and 31.4% as Probationer Member, while 29.7% of the respondents are members of REDAN with various qualification and affiliated with other professional members. From the above demographic survey, given the age, years of experience and professional qualifications of the respondents it is believed that suitably qualified to make informed opinion on green building practices within the study area. They are thus informed to give quality opinion on varying variables.

Table 6: Distribution of the respondent by level of awareness of the green building practices.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very aware	27	15.4	15.4	15.4
	Aware	45	25.7	25.7	41.1
	Neutral	50	28.6	28.6	69.7
	Unaware	53	30.3	30.3	100.0
	Total	175	100.0	100.0	

Table 6 shows the level of awareness of green building by the respondents (41.1%) of the respondents are aware of the green building practices while (30.3%) are unaware and another (28.6%)are neutral about the level of awareness of the green building practice. This result among the stakeholders of built industry in the study area suggest that the concept of green building is apparently obscure and new concept of interest in Nigeria, the level of awareness of the concept is still very low even among the stakeholders who are supposed to be championing the course for its adoptability considering it numerous benefits. This result is in agreement with the finding of [9]whose result suggested that lack of awareness of green building practice as the major impediment to the successful adoption and implementation of green practices in Nigeria.

Table 7: Awareness of features of green building in commercial properties

s/n	STATEMENT	RESPONCES (%)					MS	rank
		very low (vl)	Low (l)	Moderate (m)	high (h)	very high (vh)		
1	Use of energy-efficient and eco-friendly equipment (e.g., low energy consumption through use of natural ventilation rather than air-conditioning.	5.1	10.3	16.6	46.9	21.1	3.6857	1st
2	Careful orientation and low-energy lighting design	12.0	18.3	13.1	38.9	17.7	3.3200	2nd
3	Use of recycle & environmentally friendly building materials. E.g careful specification of lower environmental impact building materials.	19.4	26.3	12.0	23.3	20.0	2.9714	8th
4	Quality indoor air for human safety and comfort	9.7	26.3	25.7	21.7	16.6	3.0914	4th
5	Use of renewable energy (e.g., maximum use of natural day-lighting).	7.4	18.3	27.4	28.6	18.3	3.3200	2nd

6	Effective controls and building management system.	9.1	29.7	25.1	24.0	12.0	3.0000	7th
7	Efficient use of water (e.g., use of gray-water recycling for landscape and WCs).	14.9	22.9	29.1	18.9	14.3	2.9486	9th
8	Effective use of existing landscapes (e.g., minimizing site impact through sensitivity to site ecology and careful landscaping).	13.1	23.4	24.0	25.1	14.3	3.0400	6th
9	Adoption of cost-effective and environmentally-friendly technologies	12.6	26.3	20.0	25.1	16.0	3.0571	5th

Table 7 contains the responses of the stakeholders on their level of awareness of the features of green building concept in commercial properties in Lagos. Results of analysis shows that the feature; use of energy-efficient and eco-friendly equipment (e.g., low energy consumption through use of natural ventilation rather than air-conditioning with (MS = 3.6857) was ranked first. This followed by the features Careful orientation and low-energy lighting design and Use of renewable energy (e.g., maximum use of natural day-lighting) with (MS = 3.3200) respectively which was ranked second. This result suggests that though the general awareness level of green building is still very low, the stakeholders believed that these commercial properties consumed a lot of energy in its day to day operation and one of the way to minimize this impact is by the usage of natural light ventilation rather than air conditioning and by careful orientation of the building during the design stage so that the building can maximize usage of natural day light throughout its life. The feature quality indoor air for human safety and comfort with (MS = 3.0914) was ranked 4th in the series of the features. This also suggests green building can guarantee safety and comfort of the occupiers of these buildings who spent majority of their day time carrying out one productive activity or the other on these buildings. While the feature adoption of cost-effective and environmentally-friendly technologies with (MS = 3.0571) was ranked 5th. The feature Effective use of existing landscapes (e.g., minimizing site impact through sensitivity to site ecology and careful landscaping) with MS =3.0400 was ranked 6th while the feature Effective controls and building management system with MS = 3.0000 was ranked 7th. The features use of recycle & environmentally friendly building materials. E.g careful specification of lower environmental impact building materials and Efficient use of water (e.g., use of gray-water recycling for landscape and WCs) with MS = 2.9714 and 2.9486 were ranked 8th and 9th respectively.

The implication of the result is that though there is still little awareness level of the features of green building, the stakeholders perceived that green building if truly in place could at least brings succor to greenhouse effects and high environmental challenges caused by the way and manner in which the current practices of building constructions and management is being done in the country.

Table 8: perceived level of adoption of features of green building practices

s/n	VARIABLES	RESPONCES (%)					MS	RANKING
		hardly adopted	fairly adopted	not adopted	adopted	highly adopted		
1	Adoption of cost-effective and environmentally-friendly technologies	7.4	27.4	24.0	26.3	14.9	3.1371	4TH
2	Effective use of existing landscapes	19.4	22.3	24.0	24.6	9.7	2.8286	6th
3	Efficient use of water (e.g., use of gray-water recycling for landscape and WCs).	13.1	23.4	14.9	33.7	14.9	3.1371	4TH

4	Use of renewable energy (e.g., maximum use of natural day-lighting).	9.1	23.4	17.7	30.9	18.8	3.2682	2nd
5	Quality indoor air for human safety and comfort	21.1	22.3	22.3	21.7	12.6	2.8229	7TH
6	Use of recycle & environmentally friendly building materials	26.3	25.1	12.0	26.9	9.7	2.6857	8TH
7	Use of energy-efficient and eco-friendly equipment	13.7	19.4	14.3	36.6	16.0	3.2171	3RD
8	Careful orientation and low-energy lighting design	7.4	23.4	13.7	38.9	16.6	3.3371	1ST

Table 8 contains the responses of the possible adoption of green building features in commercial properties in Lagos metropolis, Nigeria when fully implemented. Results of analysis from the table shows that careful orientation and low-energy lighting design with the MS = 3.3371 would be mostly adopted and this was followed by the use of renewable energy (e.g Maximum use of natural day lightening with MS = 3.2682 which was ranked 2nd in the series. This was followed by use of energy efficient and eco-friendly equipment with MS = 3.2171 which was ranked 3rd in the order of ranking. The result of this finding is not unexpected considering the huge amount required in servicing these building and equally bearing in mind the epileptic supply of electricity in the study area and Nigeria as a whole. The stakeholders would therefore adopt any measure that would drastically reduce the construction and operating cost of these buildings. This result is in line with one of the reasons/needs for the adoption of green building practices in Nigeria propose by [14]which state that *Cities and towns in Nigeria are characterized with high rise office complexes of different shape and magnitude. Most of the buildings cost more to service in view of the energy inefficiency in the country. Sustainable buildings would however have higher net operating income and consequently a higher value.* The features efficient use of water (e.g., use of gray-water recycling for landscape and WCs) and adoption of cost-effective and environmentally-friendly technologies with MS = 3.1371 were ranked 4th respectively. The implication of this result is that since our conventional buildings requires lot of water to function and perform optimally, if option green building which uses water more efficiently and make use of environmentally friendly technologies are available, then it would be favored by the stakeholders. The features effective use of existing landscapes, quality indoor air for human safety and comfort and use of recycle & environmentally friendly

building materials with MS = 2.8286, 2.8229 and 2.6857 were ranked 6th ,7th and 8th in the order of ranking of adoption.

IV.   SUMMARY AND CONCLUSION

Taking into consideration the huge environmental impact of conventional buildings, the need for adoption of green building practices in the study area was examined. However, if stakeholders in the built environment in Nigeria cannot identify with the need for green features and are not particularly interested in adopting green features in their daily practices, the idea of green building may only remain a myth in Nigeria

It was discovered that most of the stakeholders in the built industry in Nigeria have relatively low level of awareness of the concept of green building in general. Though with this low awareness level, the respondents are of the belief that commercial green building uses energy-efficiently and make use of eco-friendly equipment e.g., low energy consumption through use of natural ventilation rather than air-conditioning and uses renewable energy e.g., maximum use of natural day-lighting as opposed to conventional building.

The study also discovered that most of the respondents would adopt the feature with careful orientation and low-energy lighting design in commercial building and the use of renewable energy e.g., maximum use of natural day-lighting and other features of green building that would reduce the impact of conventional building on the built environment. Therefore, widespread supply of green features accompanied with increased sensitization of benefits of green building would likely deepens the adoption of green building practice in the study area. Also Professional bodies should train and

educate their members on green principles to ensure awareness and knowledge of the practice.

The Nigerian government can equally play a key role in stimulating public and private green building adoption by creating an enabling environment for it development, enacting appropriate laws, and promoting green building policies. And finally, were commend establishment of Green Building Council of Nigeria (GBCN) that will be responsible for rating, creation of awareness, introduction of guidelines, tools and techniques that will drive green building practices in Nigeria.

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