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Awareness and Perception of The Impact of Sustainability Features on Commercial Property Valuations in Lagos, Nigeria

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Abstract

Sustainable development is that which satisfies current needs without jeopardizing the capacity of unborn generations to satisfy their own. it is pertinent to emphasise the need for more awareness of sustainability in property valuation, as poor knowledge can lead to issues such as possible undervaluation of property. Also, valuers should understand the need to incorporate the relevant sustainability features into valuation exercise as accurate property valuation is essential for encouraging investment decision. It is on this note that this study examined the Awareness and Perception of The Impact of Sustainability Features on Commercial Property Valuations in Lagos, Nigeria with a view to identify sustainability features relevant to property valuation in the study area. Primary data was collected with the aid of a structured questionnaire administered on One Hundred and Ninety-Three (193) Estate Surveying and Valuation Firms in Lagos Island with a total of 152 questionnaires retrieved, yielding a 79% response rate. The data collected were analysed using descriptive research designs, specifically weighted mean score and factor analysis. The analysis of the weighted mean score ranked wind turbines highest in awareness followed by greywater recycling, this could be linked to the presence of alternative energy solution and the need for water conservation in Nigeria. The study further grouped the sustainable features into seven (7) components for easy understanding which are - energy efficiency & renewable energy systems; water efficiency & sustainable water management; indoor environmental quality & comfort; green & sustainable building materials; smart & automated building systems; safety & accessibility; and sustainable urban & site planning. The study therefore recommends increase in awareness of sustainable features in the construction industry. Finally, incorporating sustainability concerns into property valuation theory and practice will play a major role in the accomplishment of more sustainable development in the real estate and building industries.

Keywords: Sustainability Features, Property valuation, Perception, Commercial property

1.0 INTRODUCTION

Sustainability is defined as meeting current needs without compromising the ability of future generations to meet their own (Adeyemo 2024). Recently, sustainability has become a global phenomenon because unprecedented challenges like resource scarcity, social inequality, and climate change facing the societies have led to the emergence of sustainability as a key topic of discussion worldwide (Mensah and Ricart 2019). The rising demands for environmental preservation have gained the interest of government, professionals and scholars worldwide (Chouaibi & Rossi, 2022; Velenturf & Purnell, 2021). The campaign for sustainable practices is borne out of the need to reduce the effect of global warming, which is an increase in temperature that occurs gradually on earth due to man's action and this is becoming a thing of concern to both man and its environment (Abubakar et al., 2022). Alohan and Oyetunji (2021) observed that the release of greenhouse gases has been recognized as a contributing element to climate change, and this has become a major global concern. The urgent need to correct this anomaly has led to the campaign for sustainable practices all over the world. Warren-Myers (2022) noted that within the last three decades, the notion of sustainability has grown over time to become a megatrend of paramount significance. Scholars, policymakers, and the general public have been using it as a foundation to derive ideas like "sustainable or green architecture" and "green buildings," which are widely used in today's urban vernacular..

Sustainability features are designs, practices that are introduced into construction that can benefit the environment, enhance occupants' wellbeing and increase building lifecycle (Adeyemo 2024). According to Oladokun and Shiyanbola (2022) users of real estate are gradually beginning to prioritize sustainable features in buildings and this is due to their potential to lessen the detrimental effects of buildings on human health and the environment, as well as its acknowledged benefit in lowering running costs. Cuc et al. (2023) opined that urban development with sustainable features is becoming a crucial part in the construction parlance and expanding next-generation smart cities, also known as sustainable cities, towns with an optimum environmental impact, with low carbon footprint, and are motivated to improve energy efficiency

The integration of sustainable features into commercial property valuation is an evolving field, which requires a multidisciplinary approach combining real estate principles with environmental science and economics as documented in Oladokun and Shiyanbola (2022). Nwosu (2019) emphasised the need for a proper study and understanding of market conditions by considering adequately the

market indices that influence the property market before the values of the properties are ascribed. Shehu, Ayuba, and Daya (2023) observed that in order to promote investment in buildings with sustainability features, there is a need to create awareness that the cost in use of commercial properties with sustainability features are advantageous when compared to the conventional commercial properties and this can be established through valuation process (Adeyemo, 2024). Also, the study of Otegbulu et al. (2015) concluded that sustainable buildings can be cost neutral and provide enormous savings over their operational life cycles.

Sustainability is constantly developing, necessitating in-depth analysis, objective, fact-based studies in both specific and general markets to offer direction, as well as understanding the relevance and implications of sustainability for the valuation profession as a whole (Ibiyemi et al., 2015). There is little knowledge about how Nigerian valuers view and incorporate sustainability aspects into their valuation practice, despite the growing emphasis on sustainability as an input during investment decision-making worldwide.

■2.0 LITERATURE REVIEW

2.1 Overview of commercial property valuation

Commercial property valuation is a methodical process that establishes the market value of properties that are income generating, such as office buildings, retail stores, industrial facilities, and multi-family housing units. In the course of a real estate asset's life cycle, most prudent investors will typically need the asset valued in order to assess the performance of their holdings, for mergers and acquisitions, takeovers, financial reporting, rental value determination, property taxation, capital value determination, and mortgage transactions, among other purposes (Scarrett & Osborn 2014). Accurate property valuation is essential for encouraging investment, obtaining funding, and guaranteeing fair taxation, Bello and Thomas (2015) noted that valuations are central to all performance indices and the investment market in property cannot operate unless reliable valuations are produced. Adebisi (2023) viewed Commercial property investment to include shops or stores, malls, show rooms, purpose-built office, detached house or block of flats converted to office, film houses, hotels, motels and some other social centers used for commercial purposes. Office property generally relates to premises which are used for professional or trade purposes, where, clerical work is done; no selling or displaying of merchandise is involved. It can be anything from a remodelled room inside a building that is mostly residential to a specially developed structure with intricate amenities (Olusegun, 2008).

According to Savills (2016) Businesses that operate within commercial real estate are essential to local economies and communities, and commercial real estate transactions play a significant role in national investment portfolios. Over the past few decades, Nigeria's real estate sector has experienced tremendous expansion due to factors such as urbanization, population growth, and economic diversification. As the nation grows economically and urbanizes, there is a growing need for accurate property valuation techniques. Hidayat (2016) noted that It is well known that commercial buildings require significantly more energy to maintain their operational efficiency, almost every part of the structure is focused on achieving these objectives. Sandt et al. (2016) emphasized that the commercial green building movement includes non-certified structures that use GBFIs in addition to certified ones. According to Dobrovolskiene et al. (2021), in real estate transactions, sustainability features are crucial instruments for decision-making that reduce the possibility of an investor buying a stranded asset. Real estate assets might be considered stranded as soon as they are unable to meet future market expectations regarding carbon performance and regulatory requirements. In summary, the process of valuing commercial real estate is complex and necessitates a deep comprehension of both market dynamics and different valuation techniques. Promoting a healthy and open real estate market requires addressing the issues in this sector, especially in emerging nations like Nigeria.

Many techniques have been developed for property valuation and are commonly applied in both theory and practice (Grover, 2016). These approaches have been categorised into “traditional” and “advanced” valuation methods (Pagourtzi, et al., 2003). Property valuation techniques can be divided into two: the traditional and the modern. Within the conventional methodologies, there are three primary approaches recognized by the International Valuation Standards Council (2011), these three approaches are cost, income, and market. Modern techniques such as fuzzy logic, auto-regressive integrated moving average, hedonic pricing, artificial neural networks, spatial analysis, real options, and rough set methods were covered by the study of Lorenz (2006).

2.2 Awareness of sustainability features amongst valuers

Since the year 2000, there has been a growing awareness of sustainability in the real estate sector among key players, including investors, developers, and users, who are attempting to adopt sustainable practices (Royal Institute of Chartered Surveyors, 2010), While the concern may have its roots in the advocacy for sustainable investment and global focus, the additional benefits and costs associated with investing in or occupying sustainable or green buildings have come together to create a powerful force that is pushing the sustainability agenda in the real estate sector. World Green Building Council (2013) and McGraw Hill Construction (2014) explained that the benefits of incorporating green features in building construction outweigh the additional costs and these benefits include reduced or eliminated negative environmental impacts, energy and water efficiency, improved occupant health and wellbeing, higher rental rates, and lower vacancy rates. Oyewole and Komolafe (2018) opined that Developed economies like the United State of America, the United Kingdom, and Australia have up until now dominated the sustainability of real estate investments, especially with regard to features. Literature evidence indicates that most studies were conducted in developed economies with robust support for sustainable development. Although there have been a few studies (e.g. Komolafe et al. (2016); Oladokun et al. (2010); Oyalowo & Babawale (2011; 2017); Oyewole & Komolafe (2018), on green or sustainable building in developing and emerging nations like Nigeria, it is crucial that these nations, along with all other emerging economies worldwide, adopt sustainable real estate investment practices because they are dealing with issues like unprecedently high population growth, environmental degradation, and subpar living and working environments.

Dahiru et al. (2014) launched an investigation into the Prospects of Green Building Practice in Nigeria. The survey's results demonstrated that the idea of sustainable building is not currently followed in Nigeria and established the necessity of developing sustainable buildings. The most substantial barrier to the development of sustainable building is lack of awareness, which is followed

by the nation's economic status and a lack of supportive policies or laws that would encourage potential customers to utilize sustainable building. The greatest advantage of sustainable building is said to be increased productivity and health, followed by protecting natural resources while ensuring their health and attracting and retaining talent. It was suggested that non-governmental organizations, the government, and professional associations should educate the public by creating constant awareness program to sensitize the people on the need to tap into sustainable building initiatives, and that the government should support the practice.

According to Oladokun and Shiyanbola (2022) in the study of Sustainable features in commercial real estate in Nigeria, which adopted a quantitative research approach, and primary data were collected via questionnaires administered. The study found out that the most sought-after sustainable features in Nigeria were those that lowered energy costs due to the necessity of lowering corporate operating expenses, the pursuit of meeting the worldwide demand for environmental sustainability to lessen the damaging effects of climate change on the environment was also determined to be the driving force behind the need for sustainable features. The study went on to state that Nigeria can learn from more developed nations like the United States of America, Hong Kong, and Malaysia, where the implementation of sustainability has had a significant influence on the environment. Valuers are beginning to recognize the significance of sustainability features more and more as they gain prominence in the real estate sector and as a result of this increased awareness, their effect on property value is perceived more favourably.

Around the world, sustainable buildings and the usage of sustainable features are changing the way construction is done. Many developing nations are about to adopt these practices because they see the potential benefits to their economies and environments (Aliagha et al., 2013). It is imperative that the society realize this, and take proactive measures to support the livelihood of those in the real estate profession in order for humanity to flourish and advance. Public administrators and policy makers must also adopt measures geared at preserving the environment. People are starting to learn about the ideas of sustainability, which are starting to upend and further transform our daily lives, because policies that define and direct governments, businesses, and humanity's general course of action are so important to sustainable development, the valuation discipline is essential to better groom this idea (Lorenz 2006).

2.3 Sustainability features relevant to commercial Property

The influence of climate change and the issues and difficulties it brings with it have fuelled the need and demand for a sustainable environment, which has gotten a lot of attention recently internationally, especially in industrialized countries (Alohan & Oyetunji 2021). According to Adeyemo 2024, “Sustainability is the practice of addressing current demands without compromising the capacity of future generations to address their own needs”. This definition formed the basis for other definition of anything that has to do with sustainability, thus ‘Development that is sustainable is one which satisfies current needs without jeopardizing the capacity of future generations to satisfy their own as established in Lorenz (2006). The study went further to state that because so much progress is being made on a regular basis, the idea of sustainable development has developed throughout time and continues to. Also, the impact of real estate on greenhouse gas emissions throughout the course of its life cycle has led to an increase in the need for sustainable real estate in terms of regulations and laws. Additionally, tenants and investors are becoming more interested in sustainable real estate due to social responsibility and environmental concerns (Oktabec & Wills 2024).

According to Gunawardhanab and Hindagoda (2020), a significant portion of the worldwide environmental degradation and decline in human well-being can be attributed to property and development. Several authors such as Lorenz (2006). Babawale and Oyalowo (2011), Sarkis et al. (2014) amongst others have simplified and categorized sustainability to three primary components often referred to as the "triple-bottom-line”: economic (in some cases referred to as governance), social, and environmental components. Sustainability encompasses more than just the ecological conservation potential of properties, often called the environmental facet. It also encompasses economic viability, the economic dimension and the social responsibilities of the respective real estate entities (Kropp, 2019). Property owners, also referred to as investors, are becoming more interested in sustainable real estate as a result of worries about achieving future energy efficiency criteria. Sustainability also requires careful consideration of the real estate industry's social and economic responsibilities (Oktabec & Wills, 2024). Ciora et al. (2016) viewed Sustainability to have grown to become progressively significant in the real estate world both in the theoretical and commercial activity, as businesses have focused more on creating institutions that will sustain this as well as sustainable products. Thus, words like “green buildings”, “blue/sustainable buildings” and “energy efficient buildings” became part of the recent jargon in the real estate parlance.

The research of Lützendorf and Lorenz (2005) offers a more detailed categorization of buildings that promote the growth of sustainability based on a categorization of protected areas “protection of the natural environment, protection of basic natural resources, protection of human health and well-being, protection of social values and public goods, protection and preservation of capital and material goods” (Lützkendorf and Lorenz, 2005), the research came up with a more thorough set of standards for categorizing sustainable buildings. The report of World Green Building Council (2017) clearly defined a "sustainable building" as one that can have a beneficial influence on the environment and climate while reducing or eliminating negative effects during design, construction, or operation. Green building enhances standard of living while protecting priceless natural resources.

The perception of valuers on the incorporation of sustainability into real estate valuation in Nigeria was examined by Babawale and Oyalowo (2011). The study employed descriptive statistics and Principal Component Analysis as the research methodology, the study surveyed One hundred and sixty estate surveyors and valuers were questioned about sustainability, taking into account social, economic, and environmental factors as part of the triple bottom line, to assign a value to certain sustainability features in relation to the market worth of a hypothetical property. Although respondents tended toward describing sustainability of real estate from a social perspective, the study indicates that the necessity to incorporate sustainability into real estate valuation practices instead of only economic or environmental factors is becoming more widely recognized, particularly in developing countries like Nigeria. the study highlights the sustainability features that valuers find most important in the valuation of a hypothetical sustainable property to include Environmental-influenced Designs Features, cost-saving factors, social factors and Locational Factors

According to Hindagoda et al. (2021) in the study of the importance of green features in determining property values. assessed how green features affect and impact value and the study found out that this can only be achieved when the sustainable features are documented and isolated, The study went on to identify four categories of sustainable features, which were selected because the GBCSA

assigned to them the greatest weight when determining a Green Star grade, and this assertion is supported by the research of (Boyd, 2005; Ellison et al., 2007; Heerwagen, 2000), and (Muldavin, 2010) to include Energy Efficiency, Indoor Environmental Quality (IEQ), Water and Waste Management and Materials. However, Runde and Thoyre (2010) agree with the first three categories' selections, but include site efficiency as their fourth criterion rather than materials. Ahmad et al. (2016) categorized sustainability features into seven major groups and referred to them as "green technologies": Innovations related to natural light, surveillance, power and water recovery, energy from renewable sources, air quality, temperature regulation, and conservation of energy and water. Fachrudin and Fachrudin (2018) emphasized these features that add value in six key areas: construction environmental management, interior health and comfort, resources sourcing process, efficiency in energy use, preservation of water, and proper land use.

Tapsuwan et al. (2018) viewed these characteristics as consisting of products, practices, technologies, goods, and systems that support energy-efficient designs, clean air, water-saving programs, wastewater treatment and recycling systems, long-lasting building materials, cost reduction and space efficiency, occupants' health, lower carbon emissions, green open spaces, mechanical detection devices, and the right design orientation to maximize natural illumination and the quality of indoor air.

The research of Lützendorf and Lorenz (2005) offers a more detailed categorization of buildings that promote the growth of sustainability based on a categorization of protected areas “protection of the natural environment, protection of basic natural resources, protection of human health and well-being, protection of social values and public goods, protection and preservation of capital and material goods” (Lützkendorf & Lorenz, 2005), the research came up with a more thorough set of standards for categorizing sustainable buildings. The report of World Green Building Council (2017) clearly defined a "sustainable building" as one that can have a beneficial influence on the environment and climate while reducing or eliminating negative effects during design, construction, or operation. Green building enhances standard of living while protecting priceless natural resources. The paper continued by outlining a number of characteristics that can turn a building "green," such as: Green Roofs, High performance HVAC systems, Solar Panels, Wind Turbines, Geothermal Systems, Low-Flow Fixtures, Rainwater Harvesting Systems, Enhanced Ventilation, Natural Lighting, Low-Polluting Substances, Green Roofs, Permeable Pavements and Landscaping (World Green Building Council, 2017).

Environmental, economic, and social aspects are only a few of the sustainability factors that apply to commercial real estate. These characteristics help properties have a smaller negative environmental impact, increase operational effectiveness, and increase occupant joy. Commercial real estate with sustainable elements takes into account many environmental, social, and economic aspects. Commercial properties can gain lower operating costs, higher marketability, and increased tenant satisfaction by implementing various sustainable practices such as energy efficiency, water conservation, renewable energy, and improved indoor environmental quality, among others. Including these elements can have a major positive impact on sustainability and improve the overall performance and value of commercial properties as it continues to develop.

■3.0 METHODOLOGY

3.1 Data Collection and Source

This research targets registered Estate Surveying and Valuation Firms located in Lagos Island, Lagos Nigeria. The firms were sourced from the 2023 NIESV directory, which offers a comprehensive list of all registered Estate Firms in Nigeria. Data for the study were collected via a structured questionnaire administered to One Hundred and Ninety-Three (193) Estate Surveying and Valuation Firms in the area. A total of 152 questionnaires were retrieved, yielding an 79% response rate. The data were analysed using descriptive research designs, specifically weighted mean score and factor analysis.

A weighted mean is a sort of mean that is determined by averaging all of the results after adding the probability (or weight) associated with a particular event or outcome to the corresponding quantitative result. The analysis of this study was based on the five (5) point likert scale which was determined with 5, 4, 3, 2 and 1 denoting very high, high, average, low, and very low. Factor analysis reduces a substantial number of possible variables or scale-up elements to a smaller number of more manageable characteristics or parts. Tabachnick and Fidell (2007) opined that when factor analysis is used where many variables are merged into factors that influence the variables, and the irrelevant elements are subsequently removed based on preset standards.

Mathematically factor analysis is represented thus:

$F_K = W1_K X_1 + W2_K X_2 + W3_K X_3 \ldots\ldots\ldots + W1_K X_1 \ldots\ldots\ldots\ldots + WnKXn$ ……. (i)

Where $W1k$ is the weight of the original variable $X1$ is linear composite of the factor K. FK is factor K. The factor was measured on a 4-point scale from 1 to 4, denoting Not Relevant, Slightly relevant, Relevant and Very Relevant. However, Field (2005) suggested that under the Kaiser – Meyer – Olkin (KMO) measure of sampling adequacy, values less than 0.5 are weak, values between 0.5 and 0.7 are average, values between 0.71 and 0.8 are good, values between 0.81 and 0.9 are great and values above 0.9 are superb. The research answers two research questions.

i. What are the sustainability features relevant to commercial property valuation in Lagos State?
ii. What is the level of awareness of these sustainability features among Valuers in the study area?

■4.0 RESULTS

For the purpose of this study, a total of one hundred and ninety-three (193) questionnaires were administered to the sampling frame of one hundred and ninety-three (193) Estate Surveying and Valuation Firms situated within Lagos Island to elicit the required data for the study. One hundred and fifty-two (152) questionnaires representing 79% were retrieved successfully. The conclusions and inferences of this study are therefore based on the responses obtained, indicating that a substantial portion of the administered questionnaires were effectively retrieved and deemed suitable for further analysis. The high retrieval rate of questionnaires distributed during the

administration phase thus conveys the reliability and robustness of the data collected for the study's objectives as a return rate over 50% can be reported, a rate of response over 60% is termed good, and a response of over 70% is excellent (Babbie, 2007).

4.1 Level of Awareness of sustainability features amongst valuers

Table 1 below revealed the weighted mean score of the level of awareness of sustainability features amongst Nigerian real estate surveyors and valuers. Respondents rated their awareness on a five-point Likert scale ranging from "Very High" to "Very Low." The mean scores were computed to determine the relative ranking of each feature, with higher scores indicating greater awareness. Standard deviation (S.D.) values were also calculated to assess variability in responses.

Table 1 Level of awareness of sustainability features amongst valuers

Sustainability Features	VH	H	A	L	VL	Mean	S.D	Rank
Wind Turbines	104	38	9	1	0	4.609	0.632	1st
Greywater Recycling	103	37	7	4	1	4.559	0.761	2nd
Energy-Efficient Designs	95	47	9	1	0	4.553	0.639	3rd
Low- Waterflow Fixtures	95	44	11	2	0	4.526	0.690	4th
Long-Lasting Building Materials	80	63	6	2	1	4.441	0.698	5th
Interior Health and Comfort	86	48	11	7	0	4.401	0.816	6th
LED or other Low-Energy Lighting Technologies	82	50	16	4	0	4.382	0.780	7th
Water Saving Facilities in Toilet and Bathroom	84	48	10	7	3	4.336	0.935	8th
Construction Waste Management	66	70	13	3	0	4.313	0.715	9th
Solar Panel	57	78	7	8	2	4.184	0.849	10th
Mechanical Detection Devices	45	89	12	3	3	4.118	0.789	11th
Geothermal Systems	45	76	20	10	1	4.013	0.869	12th
Rain Water Harvesting	41	79	21	11	0	4.000	0.835	13th
Accessibility to Healthcare Facilities	30	99	16	6	1	3.993	0.723	14th
Insulation and Building Envelope	37	86	18	9	2	3.987	0.816	15th
Wheelchair Accessibility	32	87	30	3	0	3.974	0.700	16th
Building Automation Systems	32	89	18	13	0	3.921	0.818	17th
Less Harmful Materials. i.e. Low-VOC (Volatile Organic Compound)	44	66	21	17	4	3.849	1.047	18th
Low-Polluting Substances	31	83	20	15	3	3.832	0.933	19th
Green Roofs	26	91	18	13	4	3.801	0.917	20th
Permeable Pavements	20	86	28	17	1	3.704	0.860	21st
Enhanced Ventilation	27	72	24	18	11	3.566	1.132	22nd
Natural Lighting	24	57	40	21	10	3.430	1.117	23rd
Green Open Spaces	14	71	41	18	8	3.424	0.996	24th
Wastewater Treatment and Recycling Systems	22	65	24	33	8	3.394	1.134	25th
High Performance HVAC Systems	24	46	34	35	13	3.212	1.214	26th
Adaptability of building for easy conversion	19	29	44	37	23	2.894	1.244	27th
Space Efficiency	19	33	28	36	36	2.757	1.361	28th
Availability of smoke detector	20	22	34	52	24	2.750	1.262	29th
Air Quality	13	26	37	51	25	2.678	1.188	30th

(Source: Author's Field Survey, 2025)

The study examined the level of awareness of sustainability features amongst Nigerian Estate Surveyor and Valuers. Table 1 revealed that of all the outlined features, Wind turbines ranked highest in awareness with a mean score of 4.609, indicating a strong recognition of renewable energy sources as a critical element of sustainable buildings. This may be attributed to increasing discourse on alternative energy solutions in Nigeria, where power supply issues necessitate the adoption of renewable sources. The feature of Greywater Recycling ranks second and closely follows with a mean of 4.559, awareness of greywater recycling is significantly high, suggesting that valuers recognize the importance of water conservation systems in sustainable developments. Notably, the two sustainability features with the lowest awareness levels suggest areas where further advocacy are required: Air quality with a mean score of 2.678 and Availability of Smoke Detectors with a mean score of 2.750 are ranked 30th and 29th respectively. Although comparatively less pronounced in recognition as sustainable features, both features nonetheless remain vital components of sustainability needing further awareness amongst Nigerian Valuers. The findings of this study in lieu of the top ranked sustainable features in terms of awareness is therefore in concordance with the study of Oladokun and Shiyanbola (2022) whose study of sustainable features in commercial real estate in Nigeria, found that the most sought-after sustainable features in Nigeria were those that lowered energy costs due to the necessity of lowering corporate operating expenses, with the pursuit of meeting the worldwide demand for environmental sustainability to lessen the damaging effects of climate change on the environment also determined to be the driving force behind the need for sustainable features such as awareness of renewable energy solutions, water conservation technologies, and energy-efficient designs.

4.2 Factor Analysis of Features Relevant to Commercial Property Valuation in Lagos State

Table 2 KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity

KMO and Bartlett's Test	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.797
Approx. Chi-Square	
Bartlett's Test of Sphericity	2209.494 435
Df	
Sig.	.000

(Source: Author's field survey 2025)

The result of the Kaiser-Meyer-Olkin (KMO) adequacy test revealed a KMO value of 0.797 which implies an "excellent" degree of common variance (Field 2009). The study also employed Bartlett's test of sphericity (BTS) to examine the suitability of the Principal Component Analysis (PCA) for factor extraction (Field, 2009). The BTS test revealed a Chi-square value of 2209.494 and a minimal significance value (p = .000, df = 435) which indicates as revealed by Chan (2015) that the correlation matrix is not an identity matrix. Given the above, the research data has met the prerequisites hence factor analysis can be carried out with reliability.

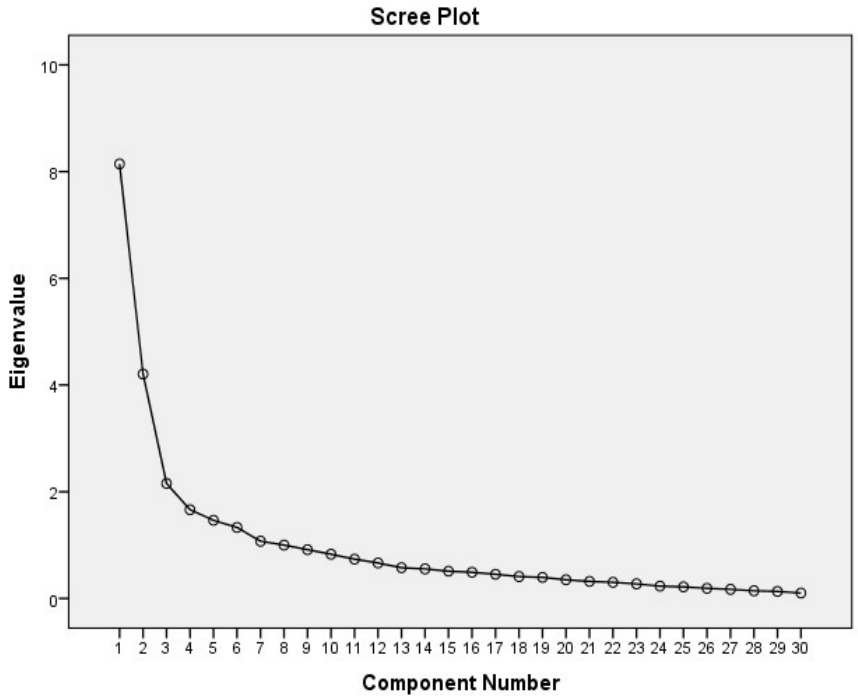

Figure 1 Trend of Contribution of the Component Features Relevant to Commercial Property Valuation
(Source: Author's Field Survey, 2025)

Table 3 shows the communalities of the sustainable features relevant to commercial property valuation (with a value range between 0 and 1) which portray the proportion of the variance explained by the common factors. The communalities of the sustainable features relevant to commercial property valuation were assessed in order to confirm the adequacy of the sample size for factor analysis. Table 3 further reveals that the vast majority of the communalities are greater than 0.60 thus suggesting that the sample is adequate for factor analysis (Field, 2013).

Table 3 Communalities of sustainable features relevant to commercial property valuation in Lagos, Nigeria

Sustainable Features	Initial	Extraction
Space Efficiency	1.000	.781
Green Roofs	1.000	.747
Green Open Spaces	1.000	.803
Permeable Pavements	1.000	.824
Wastewater Treatment and Recycling Systems	1.000	.699
Natural Lighting	1.000	.822
Solar Panel	1.000	.706
Air Quality	1.000	.707
Interior Health and Comfort	1.000	.666
Rainwater Harvesting	1.000	.792
Energy-Efficient Designs	1.000	.569
Long-Lasting Building Materials	1.000	.629
LED or other Low-Energy Lighting Technologies	1.000	.669
Water Saving Facilities in Toilet and Bathroom	1.000	.592
High Performance HVAC Systems	1.000	.558
Building Automation Systems	1.000	.506
Low- Waterflow Fixtures	1.000	.630
Greywater Recycling	1.000	.808
Wind Turbines	1.000	.746
Construction Waste Management	1.000	.624
Enhanced Ventilation	1.000	.646
Low-Polluting Substances	1.000	.648
Less Harmful Materials such as Low-VOC (Volatile Organic Compound)	1.000	.365
Insulation and Building Envelope	1.000	.646
Accessibility to Healthcare Facilities	1.000	.602
Wheelchair Accessibility	1.000	.651
Geothermal Systems	1.000	.659
Mechanical Detection Devices	1.000	.747
Adaptability of building for easy conversion	1.000	.619
Availability of smoke detector	1.000	.674

Extraction Method: Principal Component Analysis
(Source: Author's Field Survey, 2025)

Table 4 Total variance explained of sustainable features relevant to commercial property valuation in the study area

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.144	27.147	27.147	8.144	27.147	27.147	4.615	15.382	15.382
2	4.206	14.020	41.167	4.206	14.020	41.167	3.746	12.486	27.868
3	2.154	7.180	48.347	2.154	7.180	48.347	3.439	11.462	39.330
4	1.664	5.547	53.893	1.664	5.547	53.893	2.799	9.330	48.660
5	1.464	4.880	58.774	1.464	4.880	58.774	2.225	7.416	56.077
6	1.330	4.435	63.208	1.330	4.435	63.208	1.983	6.609	62.686
7	1.073	3.577	66.785	1.073	3.577	66.785	1.230	4.099	66.785
8	1.000	3.332	70.117						
9	.914	3.045	73.163						
10	.829	2.764	75.926						
11	.736	2.452	78.379						
12	.664	2.215	80.593						
13	.576	1.921	82.514						
14	.554	1.847	84.361						
15	.510	1.700	86.061						
16	.491	1.637	87.698						
17	.454	1.512	89.210						
18	.411	1.369	90.579						
19	.395	1.315	91.894						
20	.350	1.168	93.062						
21	.320	1.067	94.129						
22	.302	1.005	95.134						
23	.273	.910	96.045						
24	.231	.769	96.814						
25	.218	.727	97.541						
26	.190	.634	98.174						
27	.171	.569	98.744						
28	.143	.477	99.221						
29	.132	.441	99.661						
30	.102	.339	100.000						

Extraction Method: Principal Component Analysis
(Source: Author's Field Survey, 2025)

Table 4 portrays the eigen values associated with each factor component prior to and subsequently after extraction as well as after rotation. Before extraction, thirty (30) linear components (factors) were identified within the data set. The eigen values associated with each factor represents the variance explained by the linear arrangement represented as the percentage of variance explained. The table further shows that seven (7) components were extracted with a minimum variance of 3.577. The clustering of the factors which represent the sustainable features relevant to commercial property valuation in Lagos State within the seven (7) components generated a cumulative sum of square loading of 66.78%. This signifies that the seven (7) components depict 66.785%. of the characteristics of the thirty (30) highlighted determinants; therefore, 66.785% of the total variation of sustainable features relevant to commercial property valuation in the study area are explained by the cumulative effect of the seven (7) components that have been extracted.

4.3 Factor Analysis Reporting the Seven (7) Clusters of Sustainable Features Relevant to Commercial Property Valuation in Lagos, Nigeria

In Table 5, the thirty (30) sustainable features represented in the seven groups all have factor loadings above 0.50. A study by Olawumi and Chan (2018) indicated that factors within a cluster with factor loading close to 1.0 have higher significance in the underlying cluster. This implies their level of significance and contribution to the components with the factor loading of each variable divulging evidence of its contribution to its underlying factor group (Chan and Hung, 2015).

Factor 1- Energy Efficiency & Renewable Energy Systems

This cluster has the highest eigenvalue (8.144) and explains 27.147% of the total variance, indicating that it is the most significant factor. The highest factor loadings are for the features of 'solar panels' (0.796) and 'wind turbines' (0.784), highlighting their strong contribution to energy efficiency. Other technologies such as 'LED lighting' (0.706), 'energy-efficient designs' (0.660), and 'geothermal systems' (0.580) also contribute to this cluster with the high communalities found in this cluster (above 0.5) suggestive of the fact that these variables strongly correlate with this sustainability factor group. The findings and results outlined in this group give a supporting dialogue to the research of Ciora, Maier and Anghel (2016) who described features of Sustainability to have grown to become progressively significant in the real estate world both in the theoretical and commercial activity, as there is a growing focus on systems of energy systems in properties now termed "energy efficient buildings" and their place in real estate parlance.

Factor 2 - Water Efficiency & Sustainable Water Management

This cluster has an eigenvalue of 4.206 and explains 14.020% of the total variance, making it the second most important factor. Sustainable features of "grey water recycling' and 'permeable pavements' possess the highest factor loadings of 0.862 and 0.718 respectively, thus implying that they represent key components of this cluster. Other important variables include rainwater harvesting (0.504), low-water-flow fixtures (0.594), and wastewater treatment systems (0.655). Subsequently, the strong communalities present (0.592–0.824) indicate a robust relationship among these variables. The findings and results outlined in this group give a supporting dialogue to the research of Ciora, Maier and Anghel (2016) who described features of Sustainability to have grown to become progressively significant in the real estate world both in the theoretical and commercial activity, as there is a growing focus on systems of energy systems in properties now termed "energy efficient buildings" and their place in real estate parlance.

Factor 3 - Indoor Environmental Quality & Comfort

With an eigenvalue of 2.154, this cluster explains 7.180% of the variance. 'Natural lighting' (0.801) and 'air quality' (0.720) as sustainable features found within this group have the highest factor loadings, emphasizing their importance for indoor environmental quality. Other contributing elements include sustainable features of 'enhanced ventilation' (0.704), 'interior health and comfort' (0.635), and 'high-performance HVAC systems' (0.524). The communalities of the features found within this cluster further suggest that these factors though contributing to this cluster significantly, are moderately interrelated. The findings presented by this cluster provide a sync with the study of Boyd (2005) and Muldavin (2010) whose research proffer a category of sustainable features collectively identified as Indoor Environmental Quality (IEQ), as green features which affect and in the long run impact the overall statement of property value

Factor 4 - Green & Sustainable Building Materials

This cluster has an eigenvalue of 1.664 and explains 5.547% of the total variance. 'Insulation and building envelope' (0.777) has the highest factor loading, indicating its significance in this factor group. Other components include 'long-lasting materials' (0.605), 'low-polluting substances' (0.592), and 'less harmful materials of low-volatile organic compounds' (0.589). The concept of green and sustainable building materials is one which examines the need for the inclusion of sustainable construction materials in the valuation process. This is in line with the work of Tapsuwan, Cook, & Moglia (2018) who identified these set of characteristics as possessing prime importance in determining property values in their research detailing the assessment of green features and their effect in determining value.

Factor 5- Smart & Automated Building Systems

Factor 5 possesses an eigenvalue of 1.464 and explains 4.880% of the total variance. Features present within this cluster include 'mechanical detection devices' (0.711), 'building automation systems (0.617)' and 'the adaptability of buildings for easy conversion' (0.587). The communalities of the features within this group indicate moderate interrelations among these smart systems positioned within this cluster of relevance. This cluster corroborates the findings of Tapsuwan, Cook, & Moglia (2018) who further viewed

mechanical detection devices and other automating devices as characteristics capable of influencing the long-term value of properties where they are found.

Factor 6 - Safety & Accessibility

This cluster has an eigenvalue of 1.330 and explains 4.435% of the variance. The most important factors are smoke detectors (0.782) and wheelchair accessibility (0.592), emphasizing safety and inclusivity. 'Access to healthcare facilities' (0.560) also contributes but has a slightly lower factor loading. The communalities indicate that these features, while significant, are slightly less interrelated in comparison to other clusters. Lützendorf and Lorenz (2005) in their study posited that inclusions which enhance the protection of human health and well-being, as representing a key but often overlooked subject in determining property value. The elements found in this cluster have been collectively termed safety and accessibility as their existence plays a significant role in ensuring the welfare and comfort of occupants in properties thus ultimately corroborating the findings of Lützendorf and Lorenz (2005) in determining values of buildings.

Factor 7 - Sustainable Urban & Site Planning

This cluster identifies as one with the lowest eigenvalue (1.073) and a 3.577% variance. The highest factor loadings are for green open spaces (0.851) and space efficiency (0.853), indicating their importance in sustainable urban planning. Other elements such as construction waste management (0.553) and green roofs (0.505) also make up this cluster. Despite its lower contribution to total variance, this cluster remains crucial as a factor group of relevance in commercial property valuation. The findings of this cluster are in tandem with the studies conducted by Runde and Thoyre, (2010), Fachrudin and Fachrudin (2018) and Tapsuwan, Cook, & Moglia (2018) who proposed elements of site/space efficiency, waste management and green sustainable inclusions of urban planning as prerequisite features of sustainability determining the value of land and landed properties in the long run.

Table 5 Cluster groupings of sustainable features relevant to commercial property valuation in Lagos, Nigeria

Cluster Groupings	Communalities	Factor Loadings	Eigen values	Variance (%)
ENERGY EFFICIENCY & RENEWABLE ENERGY SYSTEMS				
Solar Panel	.706	**.796**	8.144	27.147
Wind Turbines	.746	**.784**		
LED or other Low-Energy Lighting Technologies	.669	**.706**		
Energy-Efficient Designs	.569	**.660**		
Geothermal Systems	.659	**.580**		
WATER EFFICIENCY & SUSTAINABLE WATER MANAGEMENT				
Greywater Recycling	.808	**.862**	4.206	14.020
Permeable Pavements	.824	**.718**		
Wastewater Treatment and Recycling Systems	.699	**.655**		
Low-Waterflow Fixtures	.630	**.594**		
Water-Saving Facilities in Toilet and Bathroom	.592	**.588**		
Rainwater Harvesting	.792	**.504**		
INDOOR ENVIRONMENTAL QUALITY & COMFORT				
Natural Lighting	.822	**.801**	2.154	7.180
Air Quality	.707	**.720**		
Enhanced Ventilation	.646	**.704**		
Interior Health and Comfort	.666	**.635**		
High-Performance HVAC Systems	.558	**.524**		
GREEN & SUSTAINABLE BUILDING MATERIALS				
Insulation and Building Envelope	.646	**.777**	1.664	5.547
Long-Lasting Building Materials	.629	**.605**		
Low-Polluting Substances	.648	**.592**		
Less Harmful Materials such as Low-VOC (Volatile Organic Compound)	.565	**.589**		
SMART & AUTOMATED BUILDING SYSTEMS				
Mechanical Detection Devices	.747	**.711**	1.464	4.880
Building Automation Systems	.506	**.617**		
Adaptability of Building for Easy Conversion	.619	**.587**		
SAFETY & ACCESSIBILITY				
Availability of Smoke Detector	.674	**.782**	1.330	4.435
Wheelchair Accessibility	.651	**.592**		
Accessibility to Healthcare Facilities	.602	**.560**		
SUSTAINABLE URBAN & SITE PLANNING				
Space Efficiency	.781	**.853**	1.073	3.577
Green Open Spaces	.803	**.851**		
Construction Waste Management	.624	**.553**		
Green Roofs	.747	**.505**		
Total Variance				**66.785**

(Source: Author's Field Survey, 2025)

■5.0 SUMMARY OF FINDINGS

The findings of this study align with existing literature while highlighting new dimensions in housing preference research. The results suggest that while demographic factors such as gender, age, education, income, and marital status exhibit statistically significant correlations with material preferences, the practical significance of these correlations remains weak ($|R| < 0.2$). This implies that other factors, such as market availability, cultural influences, and policy incentives, may exert a stronger influence on material choices. Prior studies have emphasised that housing preferences are shaped by demographic factors, economic conditions, and cultural The study examined sustainability features relevant to commercial property valuation in Lagos State and the analysis of the frequency and distribution analysis reveal clear trends: features related to energy efficiency, indoor air quality, and safety receive the highest approval, while advanced sustainability solutions like greywater recycling and wind turbines face more skepticism. These findings provide sufficient valuable insights regarding the relevance placed on these sustainable features by addressing their level of importance to commercial property valuation by real estate firms in the study area. These results indicate that respondents highly prioritize fire safety, renewable energy, indoor environmental quality, and lighting efficiency as key sustainable features, an observation which corroborates the findings of Ahmad, Thaheem and Anwar (2016) who categorized sustainability features into seven major groups recognizing innovations including natural light, surveillance, power and water recovery, energy from renewable sources, air quality, temperature regulation, and conservation of energy. Findings from this study are also in line with the research of Fachrudin and Fachrudin (2018) who emphasized the priority and level of relevance placed on sustainable features which add value in key areas of environmental management, interior health and comfort, efficiency in energy use amongst others.

■6.0 CONCLUSION

The assessment of awareness and perception of the impact of sustainability features on commercial property valuations in Lagos State was carried out in this study. The study assessed the extent of awareness regarding sustainability features relevant to property valuation among Valuers in Lagos State and also identified sustainability features relevant to commercial property valuation in the study area. The research grouped the identified sustainable features into seven (7) components which are energy efficiency and renewable energy systems; water efficiency and sustainable water management; indoor environmental quality and comfort; green and sustainable building materials; smart and automated building systems; safety and accessibility; and sustainable urban and site planning. The study ponders so much on the need for the Nigerian Institution of Estate Surveyors and Valuers to create awareness on the need to inculcate sustainability features into valuation process. The results of this study will align the practices of Nigerian Estate Surveyors and Valuers with international standard in the real estate world.

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Conflicts of Interest

The author(s) declare(s) that there is no conflict of interest regarding the publication of this paper.

References

Abubakar, I. R., Maniruzzaman, K. M., Dano, U. L., AlShihri, F. S., AlShammari, M. S., Ahmed, S. M. S., Al-Gehlani, W. A. G., & Alrawaf, T. I. (2022). Environmental Sustainability Impacts of Solid Waste Management Practices in the Global South. *International Journal of Environmental Research and Public Health* 19, 12717. Available online at https://doi.org/10.3390/ijerph191912717

Adebisi, O. S. (2023). Influence of Estate Surveying and Valuation Firms' Services on Commercial Property Lease Performance in Ibadan, Nigeria. *Tropical Journal of the Built Environment* (TJOBE) 4(1) 162 – 173.

Adeyemo A. O. (2024). Valuers' perception of the Relative Influence of Sustainability Features in Nigerian Property Valuation. *Lagos Journal of Environmental Studies* 13(1) 42 – 56.

Ahmad, T., Thaheem, M. J. and Anwar, A. (2016). Developing a green-building design approach by selective use of systems and techniques. *Architectural Engineering and Design Management*, 12(1), 29-50.

Aliagha, G. U., Hashim, M., Sanni, A. O. and Ali, K. N. (2013). Review of green building demand factors for Malaysia, *Journal of Energy Technologies and Policy*, 3(11), 471–478.

Alohan, E. O. & Oyetunji, A. K. (2021) Hindrance and benefits to green building implementation: evidence from Benin city, Nigeria. Real Estate Management and Valuation, 29(3), 65-76. https://doi.org/10.2478/remav-2021-0022

Babawale, G.K. & Oyalowo, B.A., (2011). Incorporating sustainability into real estate valuation: the perception of Nigerian valuers. *Journal of Sustainable Development* 4 (4), 236–248.

Bello, V. A. & Thomas, O. J. (2015). Variance in the Commercial Property Market in Lagos, Nigeria. *International Journal of Investment Management and Financial Innovations*. 1(4), 105 – 110.

Boyd, T. (2005). Can we assess the worth of environmental and social characteristics in investment property? paper presented at the 11th PRRES Conference, 23–27 January, Melbourne, Australia.

Chouaibi, S., Chouaibi, J., & Rossi, M. (2022). ESG and corporate financial performance: the mediating role of green innovation: UK common law versus Germany civil law. *EuroMed Journal of Business*, 17(1), 46-71.

Ciora, C., Maier, G. & Anghela, I. (2016). Is the higher value of green buildings reflected in current valuation practices? Accounting and Management Information Systems 15(1), 58-71.

Cuc, L.D., Rad, D., Manat, D., Szentesi, S. G., Dicu, A., Pantea, M. F., Trifan, V. A., Joldes, C. S. R. & Bâtcˇa-Dumitru, G. C. (2023). Representations of the Smart Green Concept and the Intention to Implement IoT in Romanian Real Estate Development. Sustainability, 15, 7777. https://doi.org/10.3390/su15107777

Dahiru, D., Dania, A. A., & Adejoh, A. (2014). An investigation into the prospects of green building practice in Nigeria. *Journal of Sustainable Development*, 7(6), 158–167. https://doi.org/10.5539/jsd.v7n6p158

Ellison, L., Sayce, S., & Smith, J. (2007). Socially responsible property investment: quantifying the relationship between sustainability and investment property worth *Journal of Property Research*, 24(3), 191-219.

Fachrudin, K. A. & Fachrudin, H. T. (2018). The Effect of Green Home, Green Behavior, and Livability on the Financial Incentive in Medan City, Indonesia. In IOP Conference Series: Materials Science and Engineering, 180(1). IOP Publishing

Field, A. P. (2005). Discovering Statistics Using SPSS (2nd edition). Sage: London

Heerwagen, J. (2000). Green Buildings, Organizational Success and Occupant Productivity. Building Research & Information, 28, 353 –367. https://doi.org/10.1080/096132100418500

Hidayat, M. S. (2016). Implementation of Green Building Concept in Commercial Buildings: Malls and Trade Center in Jakarta. *International Journal of Architecture and Urban Development* 6(.4), Autumn. Available online via: https://www.researchgate.net/publication/361331814

Hindagoda, W. M. T. D., Edirisinghe, J., & Gunawardhana, T. (2021). The importance of green features in determining property values. International Conference on Real Estate Management and Valuation (ICREMV) Available at: https://www.researchgate.net/publication/361207769

Ibiyemi, A., Adnan, Y. M. & Daud, M. N. (2015). Framework for integrating sustainability issues into valuation of non-market industrial real estates. *International Journal of the Environment and Sustainable Development*, 14(2), 170–190.

Ibiyemi, A., Adnan, Y. M., Daud, N. M., & Piaw, Y. (2018). The relationships between valuers' support systems for capturing property sustainability in Nigeria and their knowledge perceptions. Property Management, 37(2). doi:10.1108/PM-01-2018-0006

International Valuation Standards Committee (2011). International valuation standards. London: *International Valuation Standards Committee*

Komolafe, M. O., Oyewole, M. O., & Kolawole, J. T. (2016). Perception of estate surveyors and valuers on users' preference for green building in Lagos, Nigeria In: Laryea, S. and Leiringer R. (Eds) Procs 6th West Africa Built Environment Research (WABER) Conference, 10-12 August 2015, Accra, Ghana, 863-886

Komolafe, M. & Oyewole, M. (2018). Awareness and Perception of Office Property Users on Green Building in Lagos, Nigeria. *International Journal of Built Environment and Sustainability*, vol 5.

Lorenz, D. (2006). The Application of Sustainable Development Principles to the Theory and Practice of Property Valuation, Doctoral, Universität Karlsruhe, Karlsruhe, Germany.

Lützkendorf, T. & Lorenz, D. (2005). Sustainable property investment: valuing sustainable buildings through property performance assessment Building Research and Information 33(3), 212 - 234.

McGraw-Hill Construction (2014). Business Case for Energy Efficiency: Building Retrofit and Renovation. Bedford: The McGraw-Hill Companies.

Mensah, J. & Ricart Casadevall (2019). Sustainable development: Meaning, history, principles, pillars and implications for human action: Literature review. *Cogent social sciences*, 5(1). Available via https://doi,org/10.1080/23311886.2019.1653531

Muldavin, S. (2010). Value Beyond Cost Savings: How to Underwrite Sustainable Properties, Green Building Finance Consortium, San Rafael, CA. Nigerian Institution of Estate Surveyors and Valuers (2023). Directory of estate surveyors and valuers, Eighth edition. Lagos.

Nwosu, A. E. (2019). Valuation Inaccuracy: Implication on Commercial Property Investment Performance in Akure, Nigeria. *Journal of African Real Estate Research*, 4(1), 92-107. DOI: 10.15641/jarer.v0i0.712

Oladokun, T. T. & Shiyanbola, R. E. (2022). Sustainable Features in Commercial Real Estate in Nigeria Sustainable Real Estate in the Developing World, 39–52. Online at doi:10.1108/978-1-83867-837-120211003

Olawumi, T.O. & Chan, D. W. (2018). Identifying and prioritizing the benefits of integrating BIM and Sustainability practices in construction projects: A Delphi survey of international experts. Sustainable Cities an Society, 40, 16-27. https://doi.org/10.1016/j.scs.2018.03.033

Olusegun, K. (2008). Introduction to Property Valuation. Lagos: Climax Communications Ltd.

Otegbulu A. C., Aujuru, V.C., Oladejo, E., & Oyewunmi, G. (2015) Client Driven Demand for Sustainable Features in Office Buildings in Lagos, Nigeria. Journal of Sustainable Development in Africa, 17 (7) 29 – 49.

Oyalowo, B. A. & Babawale, G. K. (2017). Issues in the Definition and Valuation of Sustainable Buildings in Lagos, Nigeria. *Journal of Sustainable Development*

Royal Institution of Chartered Surveyors (2007a). RICS Red Book, RICS Valuation Standards, 6th edition, London.

Runde, T. P. & Thoyre, S. (2010). Integrating sustainability and green building into the appraisal process, *Journal of Sustainable Real Estate*, 2, 221–248.

Sandt, N. V., Allen, C., & Dent, S. (2016). Commercial Green Building Features and Initiatives: Perceptions of the South African Valuer.

Sarkis, J. Meade, L., & Presley, A. (2009). Sustainability in the built environment: Factors and a decision framework. Available online at: https://www.researchgate.net/publication/228364314

Shehu B., Ayuba B., & Daya M.A. (2023) Evaluation of Strategies for Sustainable Property Management in Maiduguri, Borno State, Nigeria. *International Academic Journal of Business School Research*, 8(8) 122 – 130. Available online at https://accexgate.com

Tapsuwan, S., Cook, S., & Moglia, M. (2018). Willingness to pay for rainwater tank features: A postdrought analysis of Sydney water users. Water, 10(9), 1199.

Velenturf, A. P. & Purnell, P. (2021). Principles for a sustainable circular economy. Sustainable Production and Consumption, 27, 1437-1457.

Warren-Myers, G. (2022). Valuing sustainability part 1: a review of sustainability consideration in valuation practice. *Journal of Property Investment & Finance*, 40(4), 398-410, doi: 10. 1108/jpif-02-2022-0013.