Determining Sustainability Premium in Real Estate Valuation: A Preliminary Survey of perspectives from Estate Surveyors and Valuers in Lagos, Nigeria

[1]Adeyemo, Adebola O. / [2]Ajayi, Cyril A.

Abstract

There is a growing global focus on sustainability and understanding how it impacts property value is important. This will promote informed investment decisions and foster more accurate property valuation. This study examines valuers' assessment of suitable premium to be earmarked for sustainability features in residential and commercial properties in Lagos, Nigeria. It also identifies possible variations in premium between property types. The target population consists of 198 randomly selected real estate practitioners in Lagos, Nigeria. Data collection was conducted using both online and physical surveys, with 114 valid responses. The valuers (ESVs) were asked to assess percentage increments in property valuations due to the presence of sustainability features, categorized into six key components: energy efficiency (EE), water efficiency (WE), innovation and site planning (IS), economy and conservation of materials (E), waste management (W), and indoor air quality (IAQ). Features were rated on a scale of 0-10%, 11-20%, 21-30%, 31-40%, and 41-50%. The analysis employed descriptive statistics using percentages and results graphically presented. The findings indicate that water efficiency consistently commanded the highest premium (41-50%) for both residential (33%) and commercial properties (27.8%). Variations in premium between residential and commercial properties are attributed to utility preferences both in building design requirements, and user operations

Keywords: sustainability premium, sustainability features, valuation, Lagos

[1] Dept. of Estate Management, University of Ibadan, Nigeria. funmilawoye@gmail.com, adebola.adeyemo@ui.edu.ng. (Corresponding Author)

[2] Dept. of Estate Management, Obafemi Awolowo University, Ile-Ife, Nigeria.

Introduction

Environmental and social factors have become important considerations in real estate valuation. Investors and developers, users and practitioners in real estate are increasingly focusing on the concept of "sustainability premium," which refers to the additional value commanded by sustainable properties. However, lack of a standardized approach and method for the valuation of sustainability features in properties remain a matter of great concern even to the international community as affirmed in a recent IVSC ESG report (IVSC 2024). As a result, real estate practitioners all over the world seem not to be demonstrating enough confidence in this aspect of valuation.

A persistent challenge lies in the underdevelopment of sustainability measurement frameworks and the lack of well-defined outcomes and impact metrics. (Rawhouser et. al., 2019). It consequently affects engagement and alignment with the broader sustainability goals. (Findlay & Moran, 2019; Höchstädter & Scheck, 2015). One major reason for lack of standardization seems to be the diversity of stakeholders involved in real estate investment, each with distinct priorities making it challenging to create a universal framework for measuring sustainability. (Holloway et al., 2023). As a result, sustainability metrics are often customized to suit specific market conditions and stakeholder requirement such that a one size fits all methodology may be difficult to come by (Ning & Salgado, 2022)

In developed countries, valuing sustainability in real estate development involves a variety of methods, including Discounted Cash Flow (DCF), which assesses the impact of sustainability features on future income and costs (D'Amato & Kauko, 2012); Capitalization rate (Cap Rate) models which reflect the potential for sustainable buildings to reduce operating costs and attract higher rents (Warren- Myers, 2013). Advanced techniques like hedonic pricing models and artificial neural networks (ANNs) are used to quantify the value of sustainability features by analyzing market data (Abidoye & Chan,

2017). Also, Life Cycle Cost Analysis (LCCA) is employed to assess the long-term financial impacts of sustainable features (Latief, Y., Berawi, M. A., Basten, V., Budiman, R. & Riswanto, R, 2017.). These methods are complemented by sustainability certifications, which increases the values of properties that possess them (Holterman & Kok, 2019). Non-availability of data and market opacity are challenges to the adoption of these methodologies in developing economies (Oladokun & Mooya, 2024).

There is a dearth of studies on adaptable methodologies for measuring sustainability premium in real estate valuation for developing economies. Some studies have found user perception and preferences also to be major determinants of worth (Tru & Ngoc, 2024). As such, there is a developing localized perspective of the varied influence of sustainability features in property valuation in Nigeria (Adeyemo, 2024). In this study, experts in property valuation, who have had years of experience of relating with end users and property owners offered their perception on the relative influence of sustainability features on properties.

This study seeks to look further at real estate valuers' perception as to what premium the sustainability features in properties should command. It will also investigate any variations in value across residential and commercial property types while bringing to focus the underlying factors driving such variations. The findings will assist Nigerian real estate valuers and practitioners in similar contexts by providing an adaptable framework to incorporate a premium for sustainability features in their valuation calculations. Their reports can then provide more accurate guidance to policymakers, and investors in making informed decisions and strategize effectively in a market increasingly oriented towards sustainability

Background

The World Commission on Environment and Development (WCED, 1987)

categorized sustainability into social, economic and ecological dimensions. For real estate investors, what this will mean is that if these dimensions are measurable, it should increase the demand for sustainable buildings and could boost sustainability in real estate in general.

According to Ogunbiyi & Adeyemo (2024), one of the greatest barriers to sustainable property investments in Lagos, Nigeria is low perceived benefits of sustainable property investments among professionals in the built environment. With 80% of study respondents being real estate consultants, the findings revealed a lack of technical know -how to measure and incorporate the sustainability premium in property valuation. Ogunbiyi and Adeleke (2024), investigated if respondents would proceed in investments where the proposed project's profitability is projected to be lower due to sustainable (green) building practices being implemented. Up to 43% responded that they would not proceed with such a project. This shows the respondents' concern for the economic feasibility of projects even in adopting sustainable practices.

The Discounted cash flow (DCF) models have been instrumental in demonstrating the impact of sustainability features on property value (d'Amato & Kauko, 2012). As research has advanced, methodologies such as hedonic analysis of extensive sales and rental datasets, alongside meta-analyses, have become prominent for assessing the influence of sustainability on various valuation variables (Fuerst and McAllister, 2011; Mesthrige et al, 2013; Holtermans and Kok, 2019). In recent years, the introduction of Energy Performance Certificates (EPCs) in the UK and Europe (Fuerst & Van de Wetering (2015) and the National Australian Built Environment Rating System (NABERS) in Australia (Newell, G., MacFarlane, J. & Walker, R, 2014) has brought sustainability to the forefront of property valuation.

Studies by Darlton & Fuerst (2018); Ghosn, C., Warren-Myers, G. & Candido, C. (2024); Leskinen, N., Vimpari, J. & Junnila, S. (2020), and Pang (2020)

have further highlighted the effects of green certifications on valuation metrics such as rents, occupancy rates, operating costs, and yields. Leskinen et al. (2020), for instance, analyzed 71 academic articles, showing growing evidence of green certifications' positive impact on cash flow and sales prices of commercial properties. Similarly, Dalton and Fuerst (2018) explored premiums associated with sustainable certifications like LEED and Energy Star for both residential and commercial properties. These certifications cover most, if not all, dimensions of sustainability. Studies on the effect of such certificates, however, also measure something else than merely the sustainability of real estate. They measure the psychological effect of a certificate on the real estate value. For example, if two buildings have exactly the same sustainability performance, but only one is certified, this one may be valued higher, because there is an actual proof of sustainability. Benefield et al. (2019) proved this effect for green certified homes. However, should certification status, be a main determinant in valuing sustainability?

The use of empirical studies in valuation practice has been said to have limitations. This fact was highlighted by Warren-Myers (2012) and later supported by he European Valuation Standards (TEGoVA, 2016). They emphasize that value cannot simply be determined by interpreting available data but is instead influenced by market factors such as information transparency, location differences, environmental conditions, and consumer awareness (EVIP 1, EVS, 2016, p. 260). Similarly, Eichholtz et al. (2023) note that variations in sustainability premiums across markets arise from factors including economic conditions, regulatory frameworks, market demand, and technological progress. Regional disparities in environmental awareness and the enforcement of regulations also play a significant role in shaping how sustainability premiums should be valued and realized in different markets.

From the foregoing, valuers have a pivotal role in property markets, as key analysts of the market and not promoters of government agenda even

though there are pressures to so do (Adeyemo et al, 2024). The valuer should assess the market value of an asset, not lead the market as this negates the theoretical underpinning of market value which states there must be a willing buyer and seller. (Warren-Myers, 2013). It seems safe to say that determining premium commanded by sustainability features in property investments lies heavily on the expertise of the real estate valuer and his understanding and interpretation of the particular market he operates in.

Sustainability features have been found to display varied influence across property types. Hyland, Lyons & Lyons (2013), established the fact that home-buyers and tenants may prioritize features such as improved indoor air quality, energy-efficient appliances, and sustainable landscaping. The study revealed perceived greater benefits to occupants' health, comfort, and lifestyle in residential real estate valuation. Energy-efficient homes are also observed to command higher sales prices and exhibit faster absorption rates in the market. In commercial spaces, efforts are geared towards operational efficiencies, cost reduction, and enhancing tenant satisfaction and retention in commercial properties. Features such as energy-efficient systems, green building certifications (e.g., LEED), and sustainable construction materials are particularly valued for their ability to lower operating expenses and support corporate social responsibility goals. (Fuerst & McAllister, 2011).

The work of Kucharska-Stasiak and Olbinska (2018), revealed preference of commercial tenants for space efficiency. In Australia, the work of Kim, S., Lim, B. T. & Kim, J. (2017), revealed green certification and accessibility to transportation as the important drivers for rental premium. In South Africa though, features that bear on economic sustainability such as number of bathroom or floor area have more effect on rental values than environmental features. Here, green or environmental features are not the most common words mentioned in rental adverts for residential properties. Green features added limited value (Odubiyi, T. B., Abidoye, R. B., Aigbavboa, C. O., Thwala, W.

D., Ademiloye, A. S. & Oshodi, O. S. (2024)

In Lagos, Nigeria, there are greater considerations for space efficiency, reduction of doors and walls and presence of fire extinguishers in commercial spaces. (Adeyemo,2024). The study revealed that while commercial space users face increasing pressure to demonstrate environmental stewardship, cost reduction is still a consideration to ensure profitability. However, natural lighting, sustainable landscaping, subsistence food gardening, pollution control, reduced use of generators and indoor air quality have perceived higher worth in residential property valuation. Across the 26 sustainability features considered, there was a notable perceived higher influence of these features in residential property valuation.

In a similar study on the adoption of green practices in Lagos, the result of the findings revealed that ESVs in Lagos, have a low-level awareness of green buildings in general. (Ola & Adjekophori, 2018). The study further revealed that careful orientation that maximum use of natural day lighting and the use of energy efficient and eco-friendly equipment are major considerations in commercial property investment. The reason is that Lagos commercial districts are characterized by high rise and midrise buildings and energy efficiency will work more if proper attention is given to maximizing the use of daylighting and natural ventilation systems

Table 1:Sustainability features

Sustainable practice	Features
Water efficiency	Rain water harvesting, water saving facilities in toilet and bathrooms, channelization of water to gardens through drains.
Economy/materials conservation	Use of durable materials, food gardening, storey house, reduction of walls and doors through open plans
Waste management	Control of noise, fumes and waste, treatment of waste water, waste recycle/ recycle bins, non-burning for waste disposal methods, reduced use of generators
Innovation/ site	Easy access to pubic transportation, space efficiency, green areas,

Sustainable practice	Features
planning	adaptability of building for mixed uses, green certification
Energy efficiency	Solar panel, motion sensitive switches, led light bulbs and other low energy lighting, energy star appliances, natural lighting
Indoor air quality	Low fence, cross ventilation, effective exhaust and air vent, availability of fire extinguishers.

Source: Adapted from (IMMOVALUE, 2010; Ismail & Majid,2014; Oyewole & Kolawole, 2018)

Many case studies, observational data and property market information speaks of the existence of the relationship between Sustainability and market value. However not many give the numerical evidence that sustainability features increase the value of real estate. (Falkenbach et al.,2010). Also, none of the identified methodologies are entirely reliable and able to measure the impact of Sustainability on market value accurately (Hindagoda & Gunawardhana, 2020; Warren-Myers, 2022). Consequently, valuers in their practice still grapple with the challenges of understanding and incorporating environmental, social, governance and climate risks in valuations. (Adeyemo, 2024; Ogunbiyi & Adeyemo, 2024; Warren-Myers, 2022).

In Nigeria, the paucity of data makes some of the aforementioned methodologies practically impossible. However, it is needful to look for a way to ensure sustainability is still incorporated into valuation in developing countries like Nigeria so that investors can be encouraged to invest in sustainable building eventually increasing the stock of sustainable buildings and possibly increasing available data. (Ogunbiyi & Adeyemo; 2024).

This study aims to explore the opinions of valuers regarding the premium that sustainability features in residential and commercial properties should command. It also examines any differences in premium values for the two property types, and highlight the possible underlying factors that drive these variations. Understanding these dynamics is crucial for developing accurate

valuation models and promoting sustainable real estate practices.

Methodology

Real Estate Valuers in Lagos are the study's target population. These professionals are members of the Estate Surveyors and Valuers Registration Board of Nigeria (ESVARBON), a professional body recognized by the Federal Government of Nigeria for granting valuation licenses to professionals who have been trained to interpret market value of properties. Lagos property market – a major hub of property development and investment activities in Nigeria was investigated. The sampling frame consists of the real estate valuation firms in Lagos State as listed in the current directory of the Nigerian Institution of Estate Surveyors and Valuers (NIESV). Fifty percent (198) study population were randomly selected. This sampling method ensures equal opportunity for selection and guards against bias towards any respondent category in a profession that comprises the young and old generation of professionals. Both online and physical surveys were used to elicit information. The real estate valuers were asked to give their assessment of a suitable percentage increase on their valuation calculations as a result of the presence of the sustainability features in residential and commercial properties. These were presented using a scale of 0-10%, 11-20%, 21-30%, 31-40%, 41-50% and allowance made for no response. The sustainability features are rated under the major six categories namely Energy Efficiency (EE), Water efficiency (WE), Innovation and Site planning (IS), Economy and Materials Conservation(E), Waste management(W) and Indoor air quality (IAQ) and a hundred and fourteen (114) responses were received. This methodology was adopted having been used in similar studies (Babawale and Oyalowo, 2011 and Fachrudin et al., 2018). Descriptive statistics were adopted to analyse the collated data to realize the study's objectives. Frequency counts were converted to percentages, with the results presented in graphs.

Results and Discussions

Measurement of sustainability premium in residential properties

Figure 1 presents the results from the real estate valuers 'assessment of a suitable percentage increase on their valuation calculations due to the presence of sustainability features in residential properties. The highest incremental value (41-50%) was noticed for sustainability feature of water efficiency (33%), followed by energy efficiency (26%), and Innovation and site planning (24%). A 31-40% increment in rental value was agreed on for economy of materials used and innovation and site-planning by 27% and 24.3% of ESVs respectively. Average premium of about 21-30% was agreed on by 27% of ESVs for waste management and energy efficiency while 11-20% incremental value was determined for sustainability features of innovation and site planning by 23.5% of ESVs. Waste Management and Indoor air quality attracted the least premium according to 15% and 14% of ESVs respectively. The analysis of aggregates indicates an average premium of 31-40% for sustainability features on rental values for residential properties in Lagos.

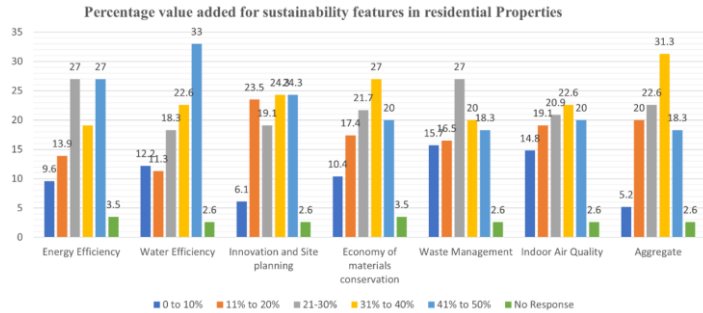

Fig. 1: Percentage value added for sustainability features in residential properties

The assessment by estate valuers on the impact of sustainability features on rental values in residential properties reveals insightful drifts in the market. Water efficiency presenting as the most highly valued feature, by the highest

percentage of ESVs, suggests a strong tenant preference for water conservation, possibly due to challenges with water availability in Lagos. Energy efficiency, followed closely, emphasizing its importance in mitigating high energy costs and power supply issues in the city. Innovation and site planning, rated similarly suggesting the market's appreciation for access to public transport, presence of green areas for subsistence gardening and beautification, green certification plus adaptability of building for mixed uses.

These results corroborate the findings of Hyland, Lyons & Lyons (2013), Benefield et al. (2019) and Adeyemo (2024) about the varied influence of sustainability features on residential and commercial property valuation. Features like the economy of materials used and waste management received moderate premiums. Use of durable materials, food gardening, plus reduction of walls and doors through open are features considered under economy and their moderate attraction for sustainability premium indicates some level of importance. However, one could insinuate that tenants who occupy these rental apartments may not be overly concerned about durability in light of rent affordability. Also the high population and working conditions of Lagos residents do not seem to give room for much green areas or time for gardening. Security issues may not also accord much fancy for low walls in residential areas. This result supports the finding of Adeyemo (2024).

For waste management in Lagos, moderate valuation shows relative importance especially knowing government efforts, however, there may be less perceived immediate benefit among tenants which has impacted value determination by estate values. The least premium attracted by indoor air quality seem to signal a gap in understanding or demand for this critical health-related feature.

The aggregate average rental premium of 31-40% for sustainability features signifies a growing acknowledgment of sustainable practices as a value

driver in Lagos's residential property market, even though variations in perception of influence suggest the need for more targeted education and awareness on less-valued features like indoor air quality. These findings affirm sustainability role as a competitive advantage for residential properties, encouraging developers and investors to prioritize features that tenants find valuable.

Measurement of sustainability premium in commercial properties

Figure 2 presents the results from the real estate valuers 'assessment of a suitable percentage increase on their valuation calculations due to the presence of sustainability features in commercial properties. The highest incremental value (41-50%) was also noticed for sustainability feature of water efficiency (27.8%), followed by innovation and site planning (25.2%), and economy and conservation of materials (24.3%).

A 31-40% increment in rental value was agreed on for innovation and site-planning, water efficiency and indoor air-quality by 25.2%, 24.3% and 23.5% of ESVs respectively. Average premium of about 21-30% was agreed on by 27% of ESVs for waste management and energy efficiency with 26.1 of them agreeing on the same premium for innovation and site plannng. Furthermore, 11-20% incremental value was determined for sustainability features of Indoor air quality by 27.7% of ESVs. Waste Management, Indoor air quality and energy efficiency attracted the least premium according to 13% of ESVs. The analysis of aggregates also indicates an average premium of 31-40% for sustainability features on rental values for commercial properties in Lagos, Nigeria.

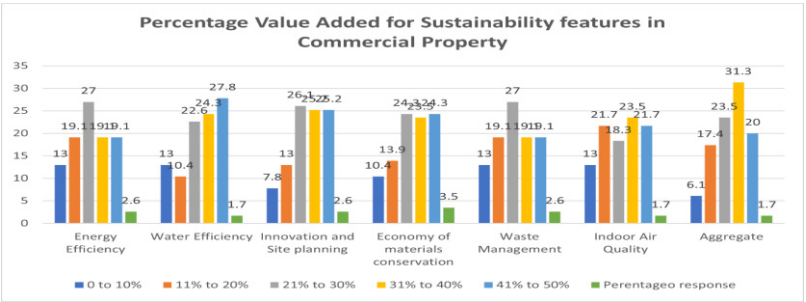

Fig. 2: Percentage value added for sustainability features in commercial properties

The analysis of sustainability features and their impact on commercial property valuations in Lagos, Nigeria, reveals several key trends. Water efficiency emerges as the top value driver, with 27.8% of real estate valuers agreeing on a 41-50% incremental value. This underscores the critical importance of water conservation also in commercial properties, likely due to challenges surrounding water availability and the costs of maintaining reliable water supply among other important requirements essential for the smooth running of a work environment.

Innovation and site planning follow closely, with 25.2% of ESVs also assigning a 41-50% premium. This suggests that access to public transportation, space efficiency, green areas, adaptability of building for mixed uses, green certification are perceived as highly valuable in Lagos commercial properties. This supports the work of Kucharska-Stasiak and Olbinska (2018), revealing preference of commercial tenants for space efficiency. Similarly, the economy and conservation of materials attracted a significant valuation increase of 24.3%, highlighting the growing importance of sustainable building materials in commercial property investment in the study area. This corroborates the work of Fuerst & McAllister, (2011) which states that sustainable construction materials are particularly valued for their ability to lower operating expenses and support corporate social responsibility goals.

A premium of 31-40% was widely agreed upon for features such as innovation and site planning, water efficiency, and indoor air quality, showing a consistent market preference for properties that incorporate strategic innovations, water conservation measures and a growing appreciation for cross effective air circulation and safety measures.

On the lower end, waste management and indoor air quality received relatively modest premium valuations, with 13% of ESVs assigning them minimal incremental values. Notably, 27.7% of ESVs linked indoor air quality to only an 11-20% increment, suggesting that awareness of its benefits may still be limited but likely to grow.

The aggregate finding of a 31-40% average premium for sustainability features also underscores their growing recognition as critical factors in commercial property valuation, reflecting a gradual but positive shift toward sustainable real estate investment in Lagos.

Sustainability premiums for residential and commercial properties

Figure 3A-G shows differences in the focus of sustainability premiums between residential and commercial properties across the six major categories of sustainability features.

Figure 3 A shows residential buildings have more uneven distribution of energy efficiency, with higher energy efficiency in the 41% to 50% range while Commercial buildings show more consistency, with values remaining stable across the 21% to 50% categories. Both building types have their highest energy efficiency concentration in the 21% to 30% range (27%), suggesting that this is the commonly acknowledged efficiency level. Residential buildings show a second peak in the 41% to 50% category (27%), whereas commercial buildings do not reach this level.

Figure 3B reveals that the premium placed on water efficiency is similar in both residential and commercial building types though residential places

more premium on the range of 41%-50%. This shows that water is almost of equal magnitude of importance for both residential and commercial properties. However residential properties place a higher emphasis on water efficiency in the 41–50% range (33%) than commercial properties (27.8%), indicating greater prioritization of water conservation in homes.

In Figure 3C, commercial properties lead in innovation, with the highest per-

centage in the 31–40% range (25.2%) compared to 24.3% for residential properties. Residential properties peak in the 31–40% range (27%), while commercial properties show a more balanced distribution, peaking at 24.3% in the same range. Both property types exhibit similar trends, with a 27% focus in the 21–30% range for both residential and commercial properties.

Figure 3D reveals that commercial properties lead with values remaining stable from 21-50% premium range (23.5%, 24.3%) on economy and materials conservation while residential properties follow a similar but less even trend, though peaking at 31-40% premium (27%)

Figure 3E shows that the premium placed on water Waste Management is similar in both residential and commercial building types on the range of 21%-30% by 27% ESVs. This reveals a commonly acknowledged moderate premium for waste management practices.

In Figure 3F, Commercial properties lead in indoor air quality, with the highest percentage in the 31–40% range (23.5%) compared to 22.0% for residential properties. However, residential properties show a more balanced distribution within higher ranges. Finally, Figure 3G reveals that both property types exhibit similar trends, with a 27% respondents agreeing to 31–40% premium.

Conclusion

The results from real estate valuers' assessment of the impact of sustainability features on property valuation in Lagos, Nigeria, show notable patterns for both residential and commercial properties. For residential properties, the highest incremental value (41-50%) was associated with water efficiency (33%), followed by energy efficiency (26%) and innovation and site planning (24%). Similarly, in commercial properties, the same top percentage increase (41-50%) was recorded for water efficiency (27.8%), followed by innovation and site planning (25.2%) and the economy of materials (24.3%). An average

premium increase of 31-40% was identified for sustainability features in both residential and commercial properties, with the economy of materials and innovation/site planning being particularly significant. Waste management and indoor air quality consistently attracted lower premium valuations in both categories, indicating these features are not perceived by valuers as contributing as significantly to property value compared to other sustainability attributes in the study area. Lastly, indoor air quality consistently attracted a lower valuation increment (11-20%) across both property types.

In conclusion, this study establishes a high valuation premium for water efficiency in both sectors, reflecting its perceived importance in Lagos. Innovation and site planning command have high value in commercial property valuation, highlighting developers' interest in strategic designs that enhance operational efficiency. However, features such as waste management and indoor air quality may require greater stakeholder awareness to command higher valuation premiums. The consistent 31-40% aggregate premium for sustainability features underscores the increasing market acknowledgment of green practices' economic value.

REFERENCES

Abidoye & Chan (2017). Critical review of hedonic pricing model application in property price appraisal: A case of Nigeria. International Journal of Sustainable Built Environment, 6(1), 250-259.

Adeyemo, A. (2024). Valuers' perception of the Relative Influence of Sustainability Features in Nigerian Property Valuation. Lagos Journal of Environmental Studies, 13(1), 43-54.

Adeyemo, A. O., Jogunola, A. & Akinwale, B. E. (2024). The Role Of Estate Surveyors And Valuers In Lifestyle Audit In Nigeria: Challenges And Solution. African Journal For The Psychological Studies Of Social Issues, 27(2).

Babawale, G. and Oyalowo, B. (2011). Incorporating Sustainability into Real Estate Valuation: The Perception of Nigerian Valuers. Journal of Sustainable Development Vol. 4, No. 4.

D'Amato, M. & Kauko, T. (2012). Sustainability and risk premium estimation in property valuation and assessment of worth. Building Research & Information, 40(2), 174-185.

Eichholtz, P., Kok, N. & Yonder, E. (2023). The economics of green building. Review of Environmental Economics and Policy, 17(1), 13-34.

Fachrudin, K. A. &Fachrudin, H. T. (2017, March). 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.

Falkenbach, H., Lindholm, A. L. & Schleich, H. (2010). Review articles: environmental sustainability: drivers for the real estate investor. Journal of Real Estate Literature, 18(2), 201-223.

Findlay, S. & Moran, M. (2019). Purpose-washing of impact investing funds: motivations, occurrence and prevention. Social Responsibility Journal, 15(7), 853-873.

Fuerst, F. & McAllister, P. (2011). Green noise or green value? Measuring the effects of environmental certification on office values. Real Estate Economics, 39(1), 45-69.

Fuerst & Van de Wetering (2015). How does environmental efficiency impact on the rents of commercial offices in the UK?. Journal of Property Research, 32(3), 193-216.

Ghosn, C., Warren-Myers, G. & Candido, C. (2024). Mapping the International Valuation Standards ESG criteria and sustainability rating tools adopted at scale by the Australian commercial real estate market. Journal of Property Investment & Finance, 42(5), 494-523.

Höchstädter, A. K. & Scheck, B. (2015). What's in a name: An analysis of impact investing understandings by academics and practitioners. Journal of Business Ethics, 132, 449-475

Holtermans, R. & Kok, N. (2019). On the value of environmental certification in the commercial real estate market. Real Estate Economics, 47(3), 685-722.

Hindagoda, W. T. D. & Gunawardhana, T. (2020). Incorporating sustainable building features into property valuation: a review. In Proceedings of International Conference on Real Estate Management and Valuation.

Holloway, S., Aiginger, K. & Vanegas, C. (2023). A comprehensive review of sustainability assessment frameworks in real estate. Journal of Sustainable Development, 29(2), 110-123.

Hyland, M., Lyons, R. C. & Lyons, S. (2013). The value of domestic building energy efficiency—evidence from Ireland. Energy Economics, 40, 943-952.

IMMOVALUE summary report, 2010. http://www.immovalue.org/pdf/immvalue result oriented report. Pdf.

Ismail, W. & Majid, R. (2014, April). The impact of green features on property valuation procedure. In Proceeding of the International Real Estate Research Symposium (IRES) (Vol. 29, p. 30).

IVSC 2024 https://www.ivsc.org/esg2024/

Kim, S., Lim, B. T. & Kim, J. (2017). Green features, symbolic values and rental premium: Systematic review and meta-analysis. Procedia Engineering, 180, 41-48

Komolafe, M. O. & Oyewole, M. O. (2018). Awareness and perception of office property users on green building in Lagos, Nigeria. International Journal of Built Environment and Sustainability, 5(3).

Kucharska-Stasiak, E. & Olbińska, K. (2018). Reflecting sustainability in property valuation-defining the problem. Real Estate Management and Valuation, 26(2), 60-70.

Latief, Y., Berawi, M. A., Basten, V., Budiman, R. & Riswanto, R. (2017). Premium cost optimization of operational and maintenance of green building in Indonesia using life cycle assessment method. In AIP conference proceedings (Vol. 1855, No. 1). AIP Publishing.

Leskinen, N., Vimpari, J. & Junnila, S. (2020). A review of the impact of green building certification on the cash flows and values of commercial properties. Sustainability, 12(7), 2729.

Mesthrige Jayantha, W. & Sze Man, W. (2013). Effect of green labelling on residential property price: a case study in Hong Kong. Journal of Facilities Management, 11(1), 31-51.

Newell, G., MacFarlane, J. & Walker, R. (2014). Assessing energy rating premiums in the performance of green office buildings in Australia. Journal of Property Investment & Finance, 32(4), 352-370.

Ning, Y. & Salgado, P. (2022). Challenges in standardizing sustainability metrics in real estate: A global perspective. Real Estate Sustainability Review, 18(4), 203-218.

Odubiyi, T. B., Abidoye, R. B., Aigbavboa, C. O., Thwala, W. D., Ademiloye, A. S. & Oshodi, O. S. (2024). Impact of green features on rental value of residential properties: evidence from South Africa. Real Estate, 1(1), 65-79.

Ogunbiyi, J. O. & Adeleke, F. G. (2024, June). Beyond the Mirage: A Review of Nigerian Sustainable Methods, Materials and Policy Propositions for Low-Cost and Affordable Housing. In Innovative Solutions for Affordable Housing Symposium, University of Cape Town, Cape Town, South Africa.

Ogunbiyi, J. O. & Adeyemo, A. O. (2024). School of Environmental Technology. School of Environmental Technology, 47.

Ola, O. S. & Adjekophori, B. (2018). Adoption of green building practice in commercial properties in Lagos, Nigeria

Oladokun, S. O. & Mooya, M. M. (2024). Another look at data challenges in property valuation practice: a case of Lagos property market. Journal of Property Investment & Finance, 42(4), 325-347.

Pang, W. (2024). Incorporate environmental, social and governance initiatives in commercial property valuation: a case study of Klang Valley, Malaysia (Doctoral dissertation, UTAR).

Rawhouser, H., Cummings, M. & Newbert, S. L. (2019). Social impact measurement: Current approaches and future directions for social entrepreneurship research. Entrepreneurship theory and practice, 43(1), 82-115.

Tru, V. N. & Ngoc, A. M. (2024). Exploring Tourists' Preferences for Bike-Sharing Services in the Context of Tourism. Sustainability, 16(8), 3375.

Warren-Myers, G. (2012). The value of sustainability in real estate: a review from a valuation perspective. Journal of Property Investment & Finance, 30(2), 115-144.

Warren-Myers, G. (2013). Is the valuer the barrier to identifying the value of sustainability? Journal of Property Investment & Finance, 31(4), 345-359.

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.

WCED, S. W. S. (1987). World commission on environment and development. Our common future, 17(1), 1-91.