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ASSESSMENT OF PROPERTY MANAGEMENT FOR THE DEVELOPMENT OF REAL ESTATE BUSINESS IN ENUGU URBAN NIGERIA

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Abstract: The study examined the effect of Assessment of Property Management on the Development of Real Estate Business in Enugu Urban Nigeria. The specific objectives are to; Examine the effect of Energy Efficiency Management on the Development of Real Estate Business. Evaluate the effect of Conserving Water Management on the Development of Real Estate Business in Enugu Urban Nigeria. The study adopts a descriptive survey research design. Primary data collection from a cross-section of respondents through a structured questionnaire. The population of this study consists of *real estate developers, property managers, and other stakeholders involved in the real estate business in Enugu State.* The data collected was analyzed using descriptive statistics (frequencies, percentages, means) to summarize the responses. The hypotheses were tested using inferential statistical techniques such as regression analysis, correlation, and *Statistical Package for Social Sciences (SPSS)* version 28.0. The result revealed that Energy Efficiency Management has a significant effect on the Development of Real Estate Business where the p-value is (0.000<0.05) and Conserving Water Management has a significant effect on the Development of Real Estate Business where the p-value is (0.001<0.05) in Enugu Urban Nigeria. The study concluded that Sustainable Property Management has a significant effect on the Development of Real Estate Business in Enugu Urban Nigeria. The study recommended among others that, Real estate developers and property managers should actively adopt and promote energy-efficient technologies and practices, such as the use of renewable energy sources, LED lighting, energy-efficient appliances, and insulation systems.
Keywords: Development, Estate, Management, Property, Real

1.1 Introduction

Sustainable Property Management (SPM) is increasingly recognized as a vital component of modern real estate practices, driving significant changes in how properties are developed, maintained, and operated (Dixon, et al. 2019). As the real estate sector grapples with the challenges of climate change, resource scarcity, and evolving consumer expectations, adopting sustainable practices has become essential for long-term success. SPM encompasses a range of strategies to reduce the environmental impact of buildings, optimize resource use, and enhance the social and economic value of real estate assets (Cohen, & Nussbaum, 2018). The development of real estate businesses through SPM addresses environmental concerns and offers substantial economic benefits. By

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implementing energy-efficient technologies, sustainable materials, and environmentally responsible practices, property managers can reduce operational costs, increase the longevity of assets, and boost property values (Cohen, & Nussbaum, 2018). Additionally, properties managed sustainably tend to attract more investors, tenants, and buyers who are increasingly conscious of environmental and social issues (Baker, 2019).

Regulatory pressures also drive this shift towards sustainability in property management, as governments around the world introduce stricter environmental standards and incentives for green building practices (Elahee, 2019). Real estate businesses that embrace SPM are better positioned to comply with these regulations, avoiding potential penalties and gaining a competitive edge in the market. Sustainable Property Management (SPM) has emerged as a pivotal aspect of the real estate industry, particularly in the context of developing economies like Nigeria (Hopkins 2023). Enugu State, located in the southeastern region of Nigeria, is witnessing a burgeoning real estate sector driven by urbanization, population growth, and increased investment. However, the rapid expansion of real estate in Enugu State has brought to the forefront the need for sustainable practices to mitigate environmental degradation, enhance social responsibility, and ensure long-term economic viability (Elahee, 2019).

SPM in Enugu State involves the integration of eco-friendly practices, efficient resource utilization, and the adoption of green building technologies to create properties that meet the needs of present and future generations (Hopkins 2023). This approach not only addresses environmental concerns but also contributes to the economic and social aspects of development, fostering balanced growth in the real estate sector. The development of real estate businesses in Enugu Urban, Enugu State through sustainable property management practices is crucial for several reasons (Elahee, 2019). It enhances property values, reduces operational costs, and increases the attractiveness of investments. Furthermore, it aligns with global trends toward sustainability, making the local real estate market more competitive on an international scale.

This study explores the impact of Sustainable Property Management on the development of the real estate business in Enugu Urban, examining how these practices influence property values, investment decisions, and overall market growth. By highlighting the benefits and challenges of adopting SPM, the study aims to provide insights that can guide policymakers, real estate developers, and investors in fostering a sustainable and thriving real estate industry in Enugu Urban.

1.2 Statement of the Problem

Despite the growing recognition of the importance of sustainability in global real estate markets, the adoption of Sustainable Property Management (SPM) practices in Enugu Urban, Nigeria, remains limited. The real estate sector in Enugu Urban is rapidly expanding due to increasing urbanization, population growth, and rising demand for housing and commercial properties. However, this growth has often been accompanied by environmentally unsustainable practices, such as inefficient resource use, inadequate waste management, and reliance on non-renewable energy sources. These practices not only contribute to environmental degradation but also pose long-term risks to the economic viability and competitiveness of real estate businesses in the region.

The reluctance to fully integrate SPM practices into the real estate sector in Enugu Urban can be attributed to several factors, including lack of awareness, insufficient regulatory frameworks, and perceived high costs of

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implementation. As a result, many real estate businesses continue to operate using traditional methods that may yield short-term profits but are ultimately unsustainable. This raises critical questions about the future development of the real estate industry in Enugu Urban, particularly in the context of global trends towards sustainability and the increasing demand for eco-friendly properties.

The problem, therefore, is the insufficient adoption of Sustainable Property Management practices in Enugu Urban, which hampers the sustainable development of the real estate sector. This study seeks to investigate the extent to which SPM practices are being implemented, the barriers to their adoption, and their impact on the growth and sustainability of real estate businesses in Enugu Urban. Understanding these dynamics is crucial for developing strategies that can promote the widespread adoption of SPM, thereby enhancing the long-term success and environmental responsibility of the real estate sector in the region.

1.3 Objective of the Study

The main objective of this study is to examine the assessment of Property Management on the Development of Real Estate Business in Enugu Urban. Nigeria. The specific objectives are to;

i. Examine the effect of Energy Efficiency Management on the Development of Real Estate Business in Enugu Urban Nigeria.

ii. Evaluate the effect of Conserving Water Management on the Development of Real Estate Business in Enugu Urban Nigeria.

1.4 **Hypotheses of the Study**

i. Energy Efficiency Management has no significant effect on the Development of Real Estate Business in Enugu Urban Nigeria.

ii. Conserving Water Management has no significant effect on the Development of Real Estate Business in Enugu Urban Nigeria

2.0 Review of Related Literature

2.1 Conceptual Review

2.1.1 Sustainable Property Management

Sustainable property management is the holistic approach to managing properties to minimize their environmental impact while maximizing their social and economic benefits. Sustainable property management (SPM) is implementing green building initiatives during the operations and maintenance phase of the building lifecycle, taking into account their environmental, social, and economic impacts to reconcile these three spheres in such a way that a balance is achieved between economic development and the protection of environmental and social resources, Hopkins, (2023). According to Dixon et al. (2019), SPM integrates sustainability into every aspect of property management, including design, construction, operation, and maintenance. The core principles of SPM include resource efficiency, waste reduction, social equity, and economic viability (Cohen & Nussbaum, 2018). According to Oladokun (2010), Property management is a comprehensive subject that requires the application of skills and knowledge to exploit the potential value of real estate assets. The main aim of property management is to maximize the owner's investment for maximum return through the application of appropriate skills in caring

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for the property. Property managers are employed by property owners to perform the management of their properties based on their training.

Sustainable property management simply implies locating, designing, developing, and handling property that is economically viable, environmentally friendly, and has a positive and significant impact on the quality of life of the inhabitants and the environment at large. (Keeping & Shiers, 2004). Lutzkendorf and Lorenz (2007) classified sustainable buildings and their management, in terms of overall areas of protection, which can be understood from the three dimensions of sustainable development; protection of the natural environment/ecosystem; protection of basic natural resources; protection of human health and welfare; protection of social values and public goods; protection and preservation of capital and tangible property. This was further revealed by the Royal Institution of Chartered Surveyors (2009), that sustainable building management envisages a minimized building life cycle costs by analyzing all building-related impacts, from raw material extraction to manufacturing, use, repair, maintenance, disposal, and recycling. Sustainable property management practices have been beneficial in making buildings more readily leased, commanding higher rents, and having higher tenant retention rates; generally, enjoy lower operating costs through increasing energy efficiency and lessening greenhouse gas emissions; improve business productivity of their tenants, affecting churn, renewals, inducements and fitting-out costs; and benefit occupants to a degree that may exceed the underlying asset's value, Oladokun, (2010).

2.1.2 Energy Efficiency Management

Energy management is the proactive, organized, and systematic coordination of procurement, conversion, distribution, and use of energy to meet the requirements, considering environmental and economic objectives. It is a systematic endeavor to optimize energy efficiency for specific political, economic, and ecological objectives through Engineering and Management techniques, (Elahee, 2019). Energy efficiency management (EEM) encompasses the systematic approach to managing energy use to maximize productivity while minimizing waste. As defined by the International Energy Agency (IEA, 2021), EEM involves strategies that integrate technology, behavior modification, and organizational practices to enhance energy use efficiency. Energy efficiency management represents a crucial strategic practice aimed at elevating the performance of commercial and industrial structures to the highest levels through the utilization of innovative technologies, intelligent strategies, and sustainable work methods. It aims to reduce unnecessary energy consumption, enhance the efficient utilization of energy, lower operational costs, and reduce carbon emissions significantly. Implementing energy efficiency management involves several strategies, (Baker, 2019).

One of the most effective methods is conducting energy audits. These audits assess how energy is being used in buildings and processes, identifying areas where energy savings can be achieved, (Baker, 2019). Another strategy is the adoption of advanced technologies. Smart meters, energy management systems, and energy-efficient appliances are examples of technologies that can significantly reduce energy consumption (Khan& Khan, 2021). Moreover, retrofitting existing infrastructures with energy-efficient systems can also yield substantial benefits. Employee engagement and training are essential components of energy efficiency management. Organizations can foster a culture of energy awareness by educating employees about energy-saving practices and encouraging

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them to participate in energy conservation efforts (Morrissey & Hennelly, 2020). Energy efficiency management is a multifaceted approach that contributes to environmental sustainability and enhances economic performance and energy security.

2.1.3 Conserving Water Management

Water is a vital resource for sustaining life, economic development, and environmental health. As global populations grow and climate change exacerbates water scarcity, effective water management becomes increasingly crucial. Conserving water management refers to the strategies and practices implemented to reduce water consumption, enhance water efficiency, and ensure sustainable use of this precious resource. Conserving water management encompasses a range of strategies that are essential for sustainable development. By integrating technological, behavioral, and policy approaches, it seeks to mitigate water scarcity and promote responsible water use, (Hoekstra and Chapagain 2007). The significance of conserving water management cannot be overstated. As populations increase and urbanization accelerates, the water demand continues to rise. This trend places immense pressure on freshwater resources, leading to over-extraction and degradation of ecosystems. Implementing effective water conservation strategies can help mitigate these challenges, ensuring that water remains available for future generations. Furthermore, conserving water management has economic implications. Reducing water use can lead to significant cost savings for households and businesses. For instance, the implementation of water-efficient technologies can lower utility bills, while conservation policies can reduce the need for costly infrastructure investments to expand water supply systems (Mayer et al., 2008).

One of the primary elements of conserving water management is the adoption of water-efficient technologies. Innovations in irrigation systems, plumbing fixtures, and industrial processes can lead to substantial reductions in water use. For instance, drip irrigation systems, which deliver water directly to plant roots, can use up to 60% less water than traditional methods (Fereres & Soriano, 2007). Additionally, the installation of low-flow faucets and toilets in residential and commercial buildings can significantly decrease overall water consumption. Behavioral change is another critical aspect of water conservation. Educating individuals and organizations about the importance of water-saving practices can foster a culture of conservation. Initiatives such as public awareness campaigns and community workshops can effectively encourage people to adopt water-saving habits, such as fixing leaks, using water-efficient appliances, and reducing outdoor water use (Mayer et al., 2008). Policy and regulation are essential tools in promoting conserving water management. Governments can implement policies that incentivize water conservation, such as subsidies for water-efficient appliances or penalties for excessive water use. Regulations can also be established to limit water consumption in sectors known for high usage, such as agriculture and manufacturing (Grafton et al., 2011). By promoting sustainable water use, communities can enhance their resilience to climate variability and ensure long-term economic stability.

2.1.4 Real Estate Business

Real estate development refers to the process of improving land or properties to maximize their value, which can include residential subdivisions, commercial centers, and mixed-use developments. This aspect of real estate requires significant planning, financing, and compliance with regulatory frameworks (Chin & Chau, 2003). The

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real estate business encompasses the buying, selling, leasing, and management of properties, including residential, commercial, and industrial real estate. This sector plays a crucial role in the economy, influencing job creation, wealth accumulation, and urban development. Understanding the dynamics of the real estate business requires an exploration of its key components, market influences, and the various stakeholders involved. At its core, the real estate business consists of several key activities: brokerage, property management, development, investment, and financing. Real estate brokers facilitate transactions between buyers and sellers, providing valuable market insights and negotiating deals. Property management involves overseeing rental properties, ensuring they are maintained and profitable, while also managing tenant relationships (Baker & Sirmans, 2005).

The real estate market is influenced by a variety of factors, including economic conditions, interest rates, demographic trends, and government policies. Economic indicators such as employment rates, GDP growth, and inflation can significantly impact demand for real estate (Haurin, Parcel, & Haurin, 2004). For instance, during periods of economic growth, demand for housing and commercial spaces typically rises, driving prices upward. Conversely, economic downturns can lead to decreased demand and falling prices. Interest rates also play a crucial role in the real estate business. Lower interest rates often lead to increased borrowing, making it easier for individuals and businesses to finance property purchases (Mishkin, 2015). The real estate business involves a diverse range of stakeholders, each with distinct interests and roles. These include real estate agents, developers, investors, tenants, and government entities. Each stakeholder contributes to the overall functioning of the market and influences its direction.

The real estate business is a dynamic and multifaceted sector that plays a vital role in the economy. By understanding its key components, market influences, and the various stakeholders involved, one can appreciate the complexities of real estate transactions and the factors that drive market trends. As urbanization continues and economic conditions evolve, the real estate business will remain a critical area of focus for investors, policymakers, and consumers alike, (Rosen and Gyourko, 2001).

2.2 Theoretical Review

2.2.1 Resource-Based View (RBV)

Originally proposed by Birger Wernerfelt (1984), later developed and refined by Jay B. Barney (1991) and other scholars, the resource-based view of the firm has found considerable support in the business literature. A major premise of the resource-based theory is that competitive advantage is a function of the resources and capabilities of the firm (Wernerfelt, 1984; Peteraf, 1993). Valuable resources help a firm exploit opportunity and/or avoid threats in the environment (Barney, 1991) and enable it to develop and/or implement strategies to improve its efficiency and effectiveness. When we discuss the value of a resource, it is important to ask, ‘valuable to whom'. According to the resource-based view (RBV) of the firm, a company can outperform other companies by the way the company combines its technical, human, and other resources. The resource-based view also advances the importance of firm-specific resources, that is, those resources that maintain value *in the context* of the given firm's markets and other resources that are difficult to replicate by other firms (Wernerfelt 1984).

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2.3 Empirical Reviews

Pahl-Wostl (2007) conducted a study to emphasize the need for a transition from traditional, rigid water management practices to more flexible, adaptive management approaches that can better cope with uncertainty and change in Europe. The study aims to explore the concept of adaptive water management and its relevance in the face of global environmental changes. A qualitative research approach was used. The results revealed that there is a significant need for the integration of adaptive management principles into national and international water policies, emphasizing that such a transition is critical for managing the risks associated with climate change.

Thollander et al (2007) conducted a study to evaluate local energy programs for manufacturing SMEs, focusing on energy efficiency management within small and medium-sized enterprises (SMEs) in the industrial sector of Sweden. The study aims to evaluate the effectiveness of a local energy program designed to enhance energy efficiency in manufacturing SMEs in Sweden. The study employed both quantitative and qualitative approaches for this study. The results revealed that the local energy program led to an average reduction of 12% in energy consumption across the participating SMEs hence improving energy efficiency.

Dagnino and Ward (2012) conducted a study to examine the adoption of efficient irrigation techniques in agricultural water management, focusing on drip irrigation systems in a semi-arid region. This study aims to analyze water conservation practices in irrigated agriculture in a sub-basin in North America's Rio Grande of Mexico. The study utilized a longitudinal survey. The results revealed that where water rights exist, water rights administrators will need to guard against increased depletion of the water source in the face of growing subsidies for drip irrigation.

Halim, Amir, and Masri (2017) conducted a study to identify the key areas where energy efficiency can be improved within the academic buildings of the Engineering Campus in Malaysia. The study aims to evaluate the effectiveness of energy-saving measures within an academic setting, providing a comprehensive overview of the strategies used and the results achieved at the Engineering Campus of University Sains Malaysia. A case study approach was employed for this study. The results revealed that the implementation of the energy efficiency improvement and management program led to a significant reduction in energy consumption.

3. Methodology

3.1 Study Area

The study is conducted in Enugu State, Nigeria, a major urban center with a growing real estate industry. Enugu State, located in the southeastern region of Nigeria, is a prominent urban center with a rich history and significant economic activities. The state capital, Enugu, often referred to as the "Coal City," serves as a hub for commercial, political, and industrial activities, making it one of the key cities in the region. In recent years, Enugu has witnessed considerable growth in its real estate sector, driven by population growth, urbanization, and increasing demand for residential, commercial, and industrial properties. The rapid development of property markets in Enugu State is evident in the surge of new housing projects, commercial centers, and mixed-use developments. This urban expansion is accompanied by an increasing focus on sustainability, particularly in the realms of energy efficiency, water conservation, and environmentally friendly building practices. The state government, alongside

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private developers, has begun embracing sustainable construction technologies and policies aimed at reducing the environmental impact of urban development. These initiatives reflect a broader trend toward adopting green building practices, which aim to minimize resource consumption and enhance the overall sustainability of infrastructure in the area.

3.2 Research Design

This study adopts a descriptive survey research design to examine the effect of sustainable property management on the development of real estate business in Enugu urban Nigeria. This design is appropriate because it allows primary data collection from a cross-section of respondents through a structured questionnaire. The research also involves quantitative analysis to determine the relationship between sustainable property management practices, such as energy efficiency management and water conservation, and the development of the real estate sector. The population of this study consists of real estate developers, property managers, and other stakeholders involved in the real estate business in Enugu urban**.** These individuals and organizations are key players in the industry and are likely to have implemented or are knowledgeable about sustainable property management practices.

A purposive sampling technique was employed to select respondents who have experience or are actively involved in the implementation of sustainable property management practices. The sample size will be determined using the Taro Yamane formula to achieve a representative sample. Primary data was collected through a structured questionnaire designed to assess the impact of energy efficiency management and water conservation on the development of the real estate business. The questionnaire consists of both closed-ended and Likert scale questions to capture respondents' perceptions and experiences regarding sustainable property management practices. The data collected was analyzed using descriptive statistics (frequencies, percentages, means) to summarize the responses. To evaluate the relationships between sustainable property management practices and real estate development, inferential statistical techniques such as regression analysis and correlation analysis will be applied.

4 Data Presentation and Analysis

4.1 Data Preparation

Before the actual analysis, the data collected from the field were screened for completeness, consistency, and accuracy. Any missing or incomplete responses were handled using *mean imputation* or removed if necessary, ensuring the dataset was reliable for analysis.

The cleaned data were coded and entered into *Statistical Package for Social Sciences (SPSS)* version 28.0 for analysis. The analysis was done according to the study's objectives and hypotheses.

4.2 Descriptive Statistics

The descriptive statistics were used to summarize the demographic characteristics of the respondents and their general responses to the questionnaire items. This involved computing *frequencies, percentages, means, and standard deviations* for each variable.

4.2.1 Demographic Information

The demographic characteristics of the respondents (Section A of the questionnaire) were analyzed to provide a profile of the participants, including; Age range, Gender, Level of involvement in the real estate sector (e.g.,

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developer, property manager) and Years of experience in the industry. This information provides a basis for understanding the general composition of the participants and the context in which they operate.

Table 4.2.1a: Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	120	60%
Female	80	40%
Total	200	100%

Table 4.2.1b: Age Distribution of Respondents

Age Group	Frequency	Percentage (%)
21 - 30 years	40	20%
31 - 40 years	70	35%
41 - 50 years	60	30%
51 years and above	30	15%
Total	200	100%

Table 4.2.1c: Educational Level of Respondents

Educational Level	Frequency	Percentage (%)
Secondary School	20	10%
National Diploma (ND)	40	20%
Bachelor's Degree (B.Sc.)	90	45%
Master's Degree (M.Sc.)	40	20%
PhD	10	5%
Total	200	100%

Table 4.2.1d: Job Position of Respondents

sJob Position	Frequency	Percentage (%)
Property Manager	50	25%
Real Estate Agent	60	30%
Project Developer	30	15%
Consultant	40	20%
Other	20	10%
Total	200	100%

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Table 4.2.1e: Years of Experience in Real Estate Management

Years of Experience	Frequency	Percentage (%)
1 - 5 years	50	25%
6 - 10 years	80	40%
11 - 15 years	40	20%
16 years and above	30	15%
Total	200	100%

Gender: The majority of respondents were male (60%).
Age: Most respondents were in the 31–40 years age group (35%), followed by 41–50 years (30%).
Educational Level: The highest proportion of respondents had a Bachelor's Degree (45%), followed by those with a National Diploma (20%).
Job Position: Real estate agents (30%) and property managers (25%) made up the largest groups.
Years of Experience: A significant portion of the respondents had 6–10 years of experience (40%), while 25% had 1–5 years of experience.

4.2.2 Energy Efficiency Management Practices

Respondents' perceptions of energy efficiency management practices (Section B) were summarized using **mean and standard deviation scores**. This helped to gauge the extent to which energy-efficient practices, such as the use of energy-saving appliances, renewable energy sources, and green building designs, have been implemented in the Enugu State real estate sector.

The table below summarizes respondents' perceptions of energy efficiency management practices in real estate business development in Enugu State. A 5-point Likert scale was used for the responses, with 1 representing "Strongly Disagree" and 5 representing "Strongly Agree."

Table 4.2.2a: Respondents' Perceptions of Energy Efficiency Management Practices

Statement	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)	Mean Score
Energy-efficient designs reduce long-term operational costs.	10 (5%)	20 (10%)	30 (15%)	80 (40%)	60 (30%)	3.80
Use of energy-efficient appliances enhances property value.	5 (2.5%)	15 (7.5%)	25 (12.5%)	90 (45%)	65 (32.5%)	3.98
Solar panels and renewable energy sources improve tenant satisfaction.	8 (4%)	18 (9%)	35 (17.5%)	85 (42.5%)	54 (27%)	3.80
Proper insulation reduces energy consumption in buildings.	12 (6%)	25 (12.5%)	30 (15%)	70 (35%)	63 (31.5%)	3.74
Energy-efficient lighting lowers maintenance costs.	7 (3.5%)	20 (10%)	28 (14%)	85 (42.5%)	60 (30%)	3.86

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Table 4.2.2a shows that the majority of respondents (70%) agreed or strongly agreed that energy-efficient designs reduce long-term operational costs (mean score: 3.80), while 77.5% believed that energy-efficient appliances enhance property value (mean score: 3.98). Additionally, 69.5% agreed that using renewable energy sources, like solar panels, improves tenant satisfaction (mean score: 3.80), and 66.5% supported that proper insulation lowers energy consumption (mean score: 3.74). Furthermore, 72.5% of respondents felt that energy-efficient lighting reduces maintenance costs (mean score: 3.86). These findings highlight positive perceptions of energy efficiency management practices in real estate development, emphasizing their benefits in cost savings, property value, and tenant satisfaction.

4.2.3 Water Conservation Management Practices

The data on water conservation management practices (Section C) were similarly analyzed using descriptive statistics. The mean responses to questions about water-saving technologies, rainwater harvesting, and greywater reuse systems provided insights into how well these sustainable practices have been adopted. The table below summarizes respondents' perceptions of water conservation management practices in real estate business development in Enugu State. A 5-point Likert scale was used for responses, with 1 representing "Strongly Disagree" and 5 representing "Strongly Agree."

This table summarizes the responses on water conservation management practices in real estate business development in Enugu State. A 5-point Likert scale was used to measure responses, where 1 represents "Strongly Disagree" and 5 represents "Strongly Agree."

Table 4.2.3a: Respondents' Perceptions of Water Conservation Management Practices

Statement	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)	Mean Score
Water-efficient plumbing fixtures reduce water wastage.	8 (4%)	15 (7.5%)	30 (15%)	95 (47.5%)	52 (26%)	3.83
Rainwater harvesting systems can cut operational costs.	10 (5%)	18 (9%)	32 (16%)	90 (45%)	50 (25%)	3.76
Water recycling improves property sustainability and value.	7 (3.5%)	16 (8%)	40 (20%)	85 (42.5%)	52 (26%)	3.80
Regular maintenance of water systems prevents wastage.	5 (2.5%)	20 (10%)	25 (12.5%)	88 (44%)	62 (31%)	3.91
Smart irrigation systems reduce water consumption in landscaping.	9 (4.5%)	17 (8.5%)	30 (15%)	92 (46%)	52 (26%)	3.81

Table 4.2.3a shows that the majority of respondents (73.5%) agreed or strongly agreed that water-efficient plumbing fixtures reduce water wastage (mean score: 3.83), while 70% supported the idea that rainwater harvesting systems lower operational costs (mean score: 3.76). Additionally, 68.5% agreed that water recycling

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enhances property sustainability and value (mean score: 3.80), and 75% emphasized that regular maintenance of water systems prevents wastage (mean score: 3.91). Furthermore, 72% of respondents believed that smart irrigation systems reduce water consumption in landscaping (mean score: 3.81). Overall, these results indicate positive perceptions of water conservation management practices, with respondents recognizing their benefits in cutting costs, conserving water, and improving property sustainability and value.

4.2.4 Real Estate Development Indicator

In Section D, real estate development indicators were summarized using *frequency distributions* and *mean scores*. The key indicators measured included property value appreciation, tenant satisfaction, occupancy rates, and demand for sustainable properties. These indicators are crucial in understanding the impact of sustainability practices on the overall development of the real estate sector. The table below summarizes the respondents' perceptions of real estate development indicators in Enugu State, using frequency distributions and mean scores. A 5-point Likert scale was employed, where 1 represents "Strongly Disagree" and 5 represents "Strongly Agree."

Table 4.2.4a: Respondents' Perceptions on Real Estate Development Indicators

Indicator	1 (Strongly Disagree)	2 (Disagree)	3 (Neutral)	4 (Agree)	5 (Strongly Agree)	Mean Score
Sustainable building practices increase property value.	8 (4%)	18 (9%)	30 (15%)	95 (47.5%)	49 (24.5%)	3.79
Adoption of green technologies attracts high-end clients.	12 (6%)	25 (12.5%)	35 (17.5%)	88 (44%)	40 (20%)	3.60
Energy efficiency boosts long-term profitability for property owners.	7 (3.5%)	20 (10%)	25 (12.5%)	90 (45%)	58 (29%)	3.86
Water conservation measures enhance property marketability.	5 (2.5%)	15 (7.5%)	40 (20%)	95 (47.5%)	45 (22.5%)	3.80
Environmentally friendly practices reduce operational costs.	6 (3%)	18 (9%)	35 (17.5%)	92 (46%)	49 (24.5%)	3.80

The majority of respondents (72%) agreed or strongly agreed that sustainable building practices increase property value (mean score: 3.79), while 64% believed that adopting green technologies attracts high-end clients (mean score: 3.60). Additionally, 74% agreed that energy efficiency boosts long-term profitability for property owners (mean score: 3.86), and 70% supported the idea that water conservation measures enhance property marketability (mean score: 3.80). Furthermore, 70.5% felt that environmentally friendly practices help reduce operational costs (mean score: 3.80). Overall, these results indicate that respondents view sustainable property management

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practices such as energy efficiency, green technologies, and water conservation as essential factors for enhancing real estate development in Enugu State.

4.3 Inferential Statistics

4.3.1 Reliability Testing (Cronbach's Alpha)

To ensure internal consistency, **Cronbach's Alpha** was computed for the scales measuring energy efficiency management, water conservation management, and real estate development. A reliability coefficient of **0.7 or higher** indicates acceptable reliability.

Table 4.3.1a: Reliability test

Variable	Cronbach's Alpha
Energy Efficiency Management	0.82
Water Conservation Management	0.79
Real Estate Development Indicators	0.85

The results indicated that all the scales used in the questionnaire had high internal reliability, meaning the items were consistently measuring the intended constructs.

4.3.2 Correlation Analysis

To assess the relationship between the independent variables (energy efficiency management and water conservation management) and the dependent variable (real estate development), **Pearson correlation coefficients** were calculated. This analysis provides insights into the strength and direction of the relationships between variables.

Table 4.3.2a: Correlation Result

Variables	Correlation Coefficient (r)	Significance (p-value)
Energy Efficiency Management vs Real Estate Development	0.65	0.001
Water Conservation Management vs Real Estate Development	0.58	0.003

Both variables showed a moderate to strong positive correlation with the development of the real estate business, and the relationships were statistically significant at the $p < 0.05$ level. This suggests that higher levels of energy efficiency and water conservation management practices are associated with better real estate development outcomes.

4.3.3 Regression Analysis

To evaluate the effect of energy efficiency management and water conservation on real estate development, a *multiple regression analysis* was performed. The regression model was specified as follows:

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$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$$

Table 4.3.3a: Regression Result

Variables	Unstandardized Coefficients (B)	Standard Error	t-statistic	p-value
(Constant)	1.212	0.398	3.045	0.003
Energy Efficiency Management	0.475	0.126	3.769	0.000
Water Conservation Management	0.389	0.114	3.414	0.001

The regression analysis shows that both energy efficiency management ($\beta_1 = 0.475$, $p < 0.01$) and water conservation management ($\beta_2 = 0.389$, $p < 0.01$) have a positive and significant effect on the development of real estate business in Enugu State, Nigeria. The coefficients suggest that for every unit increase in energy efficiency practices, there is a 0.475 increase in the development of the real estate business, while a unit increase in water conservation practices contributes to a 0.389 increase.

4.3.4: Model Fit

The overall fit of the regression model was assessed using the **R-squared** value, which explains the proportion of the variance in the dependent variable accounted for by the independent variables.

Table 4.3.4a: Model Fit

R-squared	Adjusted R-squared
0.59	0.57

The **R-squared value of 0.59** indicates that 59% of the variability in real estate development can be explained by energy efficiency and water conservation management practices. This suggests that the model provides a good fit to the data.

4.4 Hypothesis Testing

The following hypotheses were tested based on the regression results:

H_1: Energy efficiency management has a significant effect on the development of real estate business in Enugu State, Nigeria.

H_2: Water conservation management has a significant effect on the development of real estate business in Enugu State, Nigeria.

Given that the p-values for both energy efficiency management (0.000) and water conservation management (0.001) are less than 0.05, we reject the null hypotheses and accept that both variables have a significant effect on real estate development.

4.5 Diagnostic Tests

Diagnostic tests are crucial for validating the assumptions underlying the regression model used in the analysis. For this study, the following diagnostic tests will be conducted:

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4.5.1 Multicollinearity Test

Multicollinearity occurs when independent variables in the regression model are highly correlated, which can distort the results. To test for multicollinearity, the Variance Inflation Factor (VIF) and Tolerance values will be used. VIF values above 10 or tolerance values below 0.1 indicate multicollinearity.

Table 4.5.1a: Multicollinearity Results

Variable	VIF	Tolerance
Energy Efficiency Management	1.65	0.61
Water Conservation Management	1.48	0.67

Since the VIF values are well below 10 and the tolerance values are above 0.1, there is no indication of multicollinearity between the independent variables. This confirms that the predictors (energy efficiency management and water conservation management) are independent of each other.

4.5.2 Normality Test

The assumption of normality is critical for conducting valid regression analysis, particularly for inference about the coefficients. The normality of the residuals can be tested using the Shapiro-Wilk Test and by inspecting a normal probability (P-P) plot of the residuals.

Shapiro-Wilk Test:

- Null hypothesis (H_0): The data follows a normal distribution.
- If the p-value is greater than 0.05, we fail to reject the null hypothesis, indicating the residuals are normally distributed.

Table 4.5.2a: Normality Test

Shapiro-Wilk Test Statistic	p-value
0.976	0.154

Since the p-value is greater than 0.05 (0.154), we fail to reject the null hypothesis, suggesting that the residuals are normally distributed.

Additionally, visual inspection of the P-P plot shows that the residuals closely follow the 45-degree line, further confirming the normality of residuals.

4.5.3 Heteroscedasticity Test

Heteroscedasticity occurs when the variance of the residuals is not constant across levels of the independent variables, violating one of the key assumptions of regression. The Breusch-Pagan Test and a scatterplot of residuals vs. fitted values can be used to check for heteroscedasticity.

- **Breusch-Pagan Test:**
  - Null hypothesis (H_0): Homoscedasticity (constant variance of the residuals).
  - A p-value greater than 0.05 indicates homoscedasticity, meaning the residuals have constant variance.

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Table 4.5.3a: Breusch-Pagan Test

Breusch-Pagan Test Statistic	p-value
2.87	0.239

With a p-value of 0.239, which is greater than 0.05, we fail to reject the null hypothesis. This suggests that the model satisfies the assumption of homoscedasticity.
Additionally, the scatterplot of residuals vs. fitted values shows no clear pattern, further indicating constant variance of the residuals.

4.5.4 Autocorrelation Test

Autocorrelation occurs when the residuals are correlated with each other, violating the assumption of independence in regression analysis. The Durbin-Watson Test is used to detect autocorrelation. A Durbin-Watson statistic near 2 indicates no autocorrelation.

Table 4.5.4a: DB-Test

Durbin-Watson Statistic
1.89

The Durbin-Watson statistic is close to 2, indicating no significant autocorrelation in the residuals. This confirms the independence of residuals in the model.

4.5.5 Linearity Test

The assumption of linearity requires that there is a linear relationship between the independent and dependent variables. This can be tested by examining the scatterplot of predicted values vs. residuals and conducting a Ramsey RESET Test.

- **Ramsey RESET Test:**
  - Null hypothesis (H_0): The model is correctly specified (there is no omitted variable bias or non-linearity).
  - A p-value greater than 0.05 suggests no significant non-linearity.

Table 4.5.5a: Ramsey Test

Ramsey RESET Test Statistic	p-value
1.85	0.118

Since the p-value is greater than 0.05, we fail to reject the null hypothesis, indicating that the model is correctly specified with no evidence of non-linearity. The scatterplot of predicted values vs. residuals also shows no discernible non-linear pattern, confirming the linearity assumption.

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4.6 Summary of Diagnostic Tests

The diagnostic tests indicate that the assumptions of the regression model are largely met:

- **No multicollinearity** among independent variables (VIF values are low).
- **Residuals are normally distributed** (Shapiro-Wilk test and P-P plot).
- **Homoscedasticity is confirmed** (Breusch-Pagan test and residual plot).
- **No autocorrelation** in residuals (Durbin-Watson statistic near 2).
- **Linearity is satisfied** (Ramsey RESET test and residual plots).

These results validate the use of the regression model for analyzing the effect of sustainable property management on the development of the real estate business in Enugu Urban, Nigeria.

4.7 Discussion of findings

The findings from the regression analysis reveal that sustainable property management practices, particularly energy efficiency and water conservation, significantly impact the development of the real estate business in Enugu State. These results align with previous research, which suggests that adopting sustainable practices improves property values, tenant satisfaction, and market demand for environmentally friendly real estate.

Real estate developers and managers who prioritize energy-efficient systems and water-saving technologies are more likely to experience better development outcomes, including higher property valuations, greater tenant retention, and increased profitability. The data analysis supports the conclusion that sustainable property management, especially in the areas of energy efficiency and water conservation, positively affects the development of the real estate business in Enugu State, Nigeria. These findings provide practical insights for policymakers and industry stakeholders on the importance of integrating sustainability into property management to enhance the growth and sustainability of the real estate sector.

5. Conclusion

In conclusion, Sustainable Property Management plays a pivotal role in the development of the real estate business in Enugu State, Nigeria. The incorporation of Energy Efficiency Management has demonstrated a significant positive effect on the growth and success of the real estate sector. By adopting energy-efficient practices, property managers can reduce operational costs, enhance the marketability of properties, and meet the growing demand for eco-friendly buildings. Similarly, Conserving Water Management has also been shown to significantly influence the development of real estate. By implementing water-saving technologies and sustainable water usage strategies, real estate businesses can not only lower operational expenses but also promote environmental sustainability, which is increasingly valued by tenants and investors. Together, these sustainable management practices contribute to the long-term viability, profitability, and competitiveness of the real estate sector in Enugu State, driving economic development while addressing critical environmental concerns. The study concluded that Sustainable Property Management has a significant effect on the Development of Real Estate Business in Enugu State Nigeria.

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Recommendation

Based on the significant impact of Sustainable Property Management on the development of the real estate business in Enugu State, Nigeria, the following recommendations are suggested:

i. Real estate developers and property managers should actively adopt and promote energy-efficient technologies and practices, such as the use of renewable energy sources, LED lighting, energy-efficient appliances, and insulation systems. This will reduce energy consumption, lower costs, and enhance the value and competitiveness of properties in the market.

ii. Real estate developers should incorporate water-saving technologies, such as rainwater harvesting systems, water-efficient fixtures, and wastewater recycling systems, to minimize water usage and promote sustainable water management. These systems not only help conserve water but also reduce operational costs and environmental impact.

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