

**Research Article****LEED-CERTIFIED BUILDING: ADVANCING SUSTAINABLE DEVELOPMENT GOALS THROUGH GREEN DESIGN****\*Adeoye Olugbenga ADEWOLU**

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**Abstract**

The paper examines how green construction techniques affect the Sustainable Development Goals (SDGs) by analyzing an in-depth investigation of a LEED-certified structure. The goal of the study is to make valuable contributions and insights to the ongoing discourse on sustainable urban development. Aspects of green construction in attaining sustainability in the economy, society, and environment are discussed in the opening section of the study. The scholarly study offers a comprehensive analysis of the SDGs, the environmental benefits of green buildings, and the applicability of LEED certification and a synthesis of prior research on the subject. The methodology section details the selection process of the case study, along with the employed data collection methods, including surveys, interviews, and documentation analysis. The subsequent section delves into the specifics of the LEED-certified building under investigation, elucidating its green design features, the certification process, and stakeholder involvement. The impact assessment section evaluates the building's contributions to the preservation of the environment, positive impact on the welfare of the people, and a vibrant economy, contextualizing these findings within the framework of the SDGs. Challenges and limitations encountered during the study are discussed, accompanied by reflections on lessons learned and areas for improvement. A comparative analysis of non-green buildings and an exploration of industry trends form the basis of the subsequent section. The paper concludes with recommendations for policy interventions and practical suggestions for future green building projects, emphasizing the role of such initiatives in advancing SDGs. This study advances knowledge of the real-world difficulties and advantages associated with using green construction concepts, offering valuable guidance for policymakers, industry professionals, and advocates of sustainable urban development.

**Keywords:** LEED-Certified Building, Green Building, Sustainability, Green Design, SDGs.

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**INTRODUCTION****Background**

The escalating challenges of climate change and the increasing strain on natural resources have propelled sustainability to the forefront of global discourse. Within this context, the built environment emerges as a critical focal point for addressing environmental concerns, social equity, and economic viability (He, Prof. Dr., Sharifi, Dr., Feng, Prof. Dr., & Yang, Prof. Dr., 2022). Traditional construction practices contribute significantly to environmental degradation and resource depletion. Green building techniques have become more popular as a sustainable solution to these problems, trying to address ecological issues, promote occupants' wellness, and enhance economic efficiency (Omopariola, Olanrewaju, Albert, Oke, & Ibiyemi, 2022). Towards this end, the paper looks into how adopting green building techniques might help achieve the Sustainable Development Goals (SDGs).

**Significance of Green Building**

Green building techniques are defined as preserving natural resources, energy efficiency, as well as ecological sensitivity. They have evolved as a viable solution to balance the demands of urbanization with environmental responsibility. Such practices not only reduce the carbon footprint of structures but also foster a healthier living environment, promoting social equity. The significance of green buildings extends beyond individual structures to have greater consequences for the

achievement of global ecological objectives and the growth of sustainable cities (Bungau, Bungau, Prada, & Prada, 2022).

**Purpose of the Study**

Through a thorough case study of a LEED-rated building, The current research aims to explore in detail the relationship between green building and the SDGs. By analyzing the tangible results of the concepts of sustainable design, this study seeks to add concrete proof to the body of knowledge and shed light on how green construction might be used to tackle the intricate interactions across all three pillars of ecological sustainability.

**Research Questions**

To guide this inquiry, the following research questions will be addressed:

- How does the LEED-certified building under study embody green design principles?
- What environmental benefits are attributed to the green building practices employed in the case study?
- In what ways does the LEED-certified building contribute to social well-being and community development?
- What, if any efficiency gains and financial consequences come with implementing green construction techniques?
- In what ways does the LEED-certified building's influence correspond with and support particular Sustainable Development Goals?

By delving into these issues, policymakers, researchers, and practitioners involved in sustainable urban development projects will get a more nuanced knowledge of the complex contributions made by green building methods.

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## LITERATURE REVIEW

### SDGs - Sustainable Development Goals

The Sustainable Development Goals (SDGs) are a worldwide paradigm designed to tackle pressing issues in the environment, society, and economy. The Sustainable Development Goals (SDGs) are a set of 17 interconnected goals conceived by the United Nations an equitable and environmentally friendly future for all (United Nations, 2023). This section provides an in-depth exploration of the SDGs, elucidating their targets and the interconnected nature that underpins the global pursuit of sustainability. Contextualizing the relevance of green construction techniques in supporting these aspirational targets requires a comprehension of the SDGs' larger context.

### Environmental Impact of Green Buildings

The built environment has undergone an evolutionary change with the introduction of green building principles, which prioritize ecological responsibility, energy conservation, and resource efficiency (Liu, *et al.*, 2022). The following section explores the core ideas of green building, looking at how energy-efficient designs, environmentally friendly building supplies, and waste disposal reduction strategies may lessen the adverse ecological effects of the built environment. This discussion also encompasses the examination of green buildings' life cycles, dealing with their stamina and sustainable development in the face of changing environmental threats.

### LEED Certification and its Relevance

The accreditation for LEED, or Leadership in Energy and Environmental Design, has grown into an internationally recognized mark of excellence for assessing and certifying green buildings. This section explores the criteria and benchmarks set by LEED, describing the accreditation procedure and its importance in encouraging extremely efficient, green buildings (U.S. Green Building Council, 2021). The conversation also assesses the value of the LEED rating system in the larger framework of urban sustainability, considering its effects on overall ecological impact, indoor environmental quality, water conservation, and energy efficiency.

### Previous Studies on Green Building Impact

A thorough analysis of earlier studies on the effects of green building techniques offers a basis for comprehending the current state of knowledge. This subsection synthesizes findings from empirical studies, case analyses, and meta-analyses, highlighting key insights into the environmental, social, and economic outcomes associated with green building initiatives (Wang, Wang, Yu, & Mao, 2023). By examining the successes, challenges, and trends identified in previous research, this review aims to inform the current study and identify gaps in the literature that warrant further investigation. In summary, this literature review lays the groundwork for the subsequent chapters, creating a theoretical framework to guide research into how green building affects the SDGs. The synthesis of knowledge from diverse sources enhances the understanding of the interconnected facets of sustainable

development and sets the stage for the empirical investigation undertaken in this research.

## METHODOLOGY

### Case Study Selection

The selection of a suitable case study is paramount to the credibility and relevance of this research. A purposeful sampling approach was employed to identify a LEED-rated building that exemplifies the integration of sustainable building practices. Criteria for selection included the building's certification level, the diversity of sustainable features, and its alignment with the research focus on adding value to SDGs – Sustainable Development Goals. This chosen case study represents a contemporary and exemplary model of sustainable construction, providing a comprehensive understanding of how many aspects of sustainability are affected by green building.

### Data Collection

A mixed-methods approach was deployed to gather information to fully understand the selected LEED-certified structure and how it affects the Sustainable Development Goals.

### Surveys

Structured surveys were distributed to the occupants, facility managers, and other relevant stakeholders associated with the LEED-certified building. The aforementioned surveys' objective was to gather quantitative data on patterns in energy use, tenant fulfillment, as well as perceived ecological and social advantages. The survey instrument was crafted to align with the research questions, ensuring that collected data would facilitate a detailed analysis of the building's impact (Immonen, Kiljander, & Aro, 2020).

### Conversations and Interviews

The key players in the creation and erection of the LEED-certified building, such as developers, builders, architects, and environmental specialists, were interviewed in-depth. The purpose of these qualitative interviews was to offer an in-depth understanding of the processes for making choices, challenges with implementation, as well as perceived success elements that affect the building's sustainability results. Open-ended questions were employed to encourage detailed responses and uncover unanticipated aspects of the case study.

### Documentation Analysis

A comprehensive review of project documentation, including architectural plans, sustainability reports, and certification records, supplemented the empirical data gathered through surveys and interviews. This analysis served to validate and triangulate the information obtained through primary data sources, offering a holistic perspective on the LEED-certified building's design, construction, and performance (Taherdoost, 2021).

### Variables and Measurements

To systematically assess the impact of the LEED-certified building on SDGs, key variables and measurements were identified:

**Environmental Impact:**

- a. Energy efficiency (measured through energy consumption data)
- b. Water conservation (quantified by water usage patterns)
- c. Materials and resource efficiency (evaluated through construction and operational practices)

**Social Impact:**

- a. Occupant satisfaction and well-being (assessed through survey responses)
- b. Community engagement and development initiatives facilitated by the building

**Economic Impact:**

- a. Cost-effectiveness of sustainable practices (analyzed through construction and maintenance expenses)
- b. Economic benefits derived from the building's operational efficiency

The systematic collection and analysis of data through the aforementioned methods and factors are meant to offer a solid basis for assessing how green construction methods affect the Sustainable Development Goals. The findings of the research are more credible and reliable when the results are triangulated from many sources.

**LEED-CERTIFIED BUILDING CASE STUDY**

**Building Overview**

The selected LEED-certified building serves as a paradigm of sustainable construction, embodying innovative design principles and environmentally conscious practices. Situated in Lagos, Nigeria, Heritage Place, Figure 1, located in Ikoyi, Lagos, is evidence of the dedication to sustainable urban development. The following part offers a thorough rundown of the structure, including its architectural design, purpose, size, and occupancy characteristics. Understanding the contextual details of the LEED-certified structure lays the groundwork for a deeper exploration of its green design features and the ensuing impact on Sustainable Development Goals.



**Figure 1. Heritage Place, Ikoyi, Lagos: Epitome of Successful Corporate Green Building**

**Green Design Features**

The core of the case study – Heritage Place, Ikoyi, as shown in Figure 1 lies in the examination of the building's green design

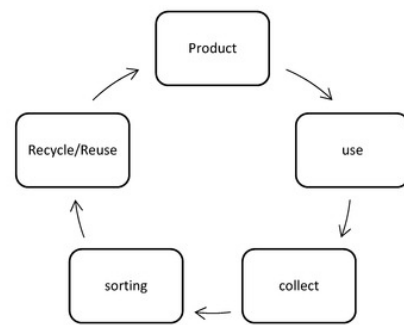
features, which collectively contribute to its LEED certification. Numerous ecologically friendly characteristics are included in the building, from cutting-edge water conservation techniques and alternative energy sources to systems that are energy-saving and eco-friendly materials. This subsection delves into the specifics of these green design features, elucidating how they function symbiotically to minimize the building's environmental footprint. Notable aspects include:

1. Utilization of recycled and locally sourced materials
2. Using energy from renewable sources, such as windmills, CHP, and photovoltaic cells
3. Energy-saving HVAC as well as lighting systems.
4. Implementation of water-efficient fixtures and greywater recycling systems

	Heritage Place
○ Optimized building orientation	●
○ Integrated landscape	○
○ High performance building envelope	●
○ Utilizing Day-lighting	●
○ Window Shading devices	●
○ Photovoltaic	○
○ Wind	○
○ Biomass	○
○ Geothermal	○
○ Install LED bulbs	●
○ Use of Low energy HVAC equipment	●

**Figure 2. Alternatives for environmentally friendly HVAC and lighting systems at Heritage Place**

The illustration in Figure 3 below demonstrates the comparative advantage of utilization of the Circular Economy Model of recycling and locally sourced materials.



(a) The circular economy (CE) Model



(b) Linear economy model

**Figure 3. Utilization of the Circular Economy (CE) Model for recycling and local materials**

**LEED Certification Process**

The journey towards LEED certification involves a rigorous assessment of a building's adherence to sustainability standards. This subsection provides an in-depth exploration of the LEED certification process undertaken by the building under study. From the initial planning stages to the final evaluation, each step is scrutinized to understand how the

project aligned with the prerequisites and credits outlined by the LEED rating system. Details include:

- Pre-construction planning and goal-setting
- Integration of sustainable design principles into architectural plans
- Monitoring and verification processes during construction
- Post-construction evaluation and certification achievement



**Figure 4. Heritage Place, Ikoyi Lagos: Elegant and Functional as Environment-Friendly Building**

### Stakeholder Involvement

The success of a LEED-certified building extends beyond the technical aspects of design and construction; it hinges on the collaboration and engagement of diverse stakeholders (UGREEN, 2023). This subsection explores the roles and contributions of various stakeholders involved in the planning, execution, and ongoing management of the building. As shown in Figure 4, the elegance and poise of Heritage Building demonstrates the successful synergy of efforts of key stakeholders which include architects, engineers, builders, occupants, and sustainability consultants. By understanding the perspectives and contributions of each group, this section aims to uncover the multifaceted dynamics that shape the sustainability outcomes of the LEED-certified building. The examination of the LEED-certified building in this case study provides a holistic understanding of its design, certification process, and stakeholder dynamics. The subsequent chapters will delve into the tangible outcomes and impact of these elements on Sustainable Development Goals, providing insightful information on responsible development of cities to researchers and practitioners alike.

## IMPACT ASSESSMENT

### Environmental Benefits

The environmental benefits derived from the green design features of the LEED-certified building are a pivotal aspect of this impact assessment. This section systematically evaluates the building's contribution to environmental sustainability by examining key factors:

#### Energy Efficiency

- a. Calculating the amount of power saved by using energy from renewable sources, heating and cooling systems, and energy-efficient lighting.

- b. Analyzing the reduction in carbon emissions and the building's overall energy footprint.

#### Water Conservation:

- a. Assessing the effectiveness of water-efficient fixtures and greywater recycling systems in reducing overall water consumption.
- b. Examining the impact on local water resources and the building's resilience in the face of water scarcity.

#### Materials and Resource Efficiency:

- a. Examining the application of locally produced and repurposed materials in building.
- b. Evaluating waste reduction practices and the building's contribution to minimizing construction-related environmental impact.

#### Social and Economic Implications

Beyond the environmental realm, the social and economic implications of the LEED-certified building play a crucial role in its overall impact. This section scrutinizes the tangible outcomes related to occupant well-being, community engagement, and economic efficiency:

#### Occupant Satisfaction and Well-Being:

- a. Assessing occupant feedback through surveys to gauge satisfaction with indoor environmental quality and overall well-being.
- b. Exploring the impact of green design features on occupant health, productivity, and overall satisfaction with the built environment.

#### Community Engagement:

- a. Examining initiatives and programs facilitated by the building to engage with the local community.
- b. Evaluating the building's role as a community resource and its contribution to social cohesion.

#### Economic Benefits:

- a. Analyzing the cost-effectiveness of sustainable practices in construction and ongoing building operations.
- b. Assessing the economic benefits derived from energy and resource efficiency, such as reduced operational costs and increased property value.

#### Support for the Goals of the Sustainable Development Agenda

In order to clarify the LEED-certified building's overall achievement of the Sustainable Development Goals (SDGs), this subsection summarises the results of the economic, social, and environmental evaluations. Each sub-section links the specific outcomes observed in the case study to relevant SDGs, demonstrating the building's alignment with global sustainability targets (Henzler, Maier, Jager, & Horn, 2020). By establishing a clear connection between the building's impact and the broader SDG framework. This section offers a thorough grasp of how green construction techniques may revolutionize the growth of cities and promote sustainability.

Finally, the LEED-certified building's assessment of impacts shows the real advantages it offers to the social, environmental, and economic facets of environmental sustainability. These insights set the stage for the subsequent chapters, which will explore challenges, comparative analyses, and recommendations to inform future green building initiatives.

## CHALLENGES AND LIMITATIONS

### Barriers Faced During Implementation

The successful implementation of green building practices is not without its challenges. This section explores the barriers encountered during the planning, design, and execution phases of the LEED-certified building, shedding light on the complexities associated with sustainable construction:

#### Financial Constraints:

- a. Examining the financial challenges faced in incorporating green design features and obtaining LEED certification.
- b. Assessing the trade-offs made between upfront costs and long-term savings.

#### Regulatory Hurdles:

- a. Analyzing compliance issues and navigating through regulatory frameworks that may pose challenges to sustainable construction practices.
- b. Identifying areas where local regulations may conflict with green building objectives.

#### Stakeholder Resistance:

- a. Investigating resistance or skepticism from various stakeholders, including builders, occupants, or local communities.
- b. Strategies employed to address and overcome stakeholder resistance.

#### Lessons Learned

Reflecting on the challenges faced during the implementation of the LEED-certified building provides valuable insights into the lessons learned from the experience.. The following section highlights important lessons that should guide subsequent green construction projects:

#### The Integrated Design Method:

- a. Highlighting the significance of a comprehensive design approach that includes all project participants from the outset.
- b. Recognizing the benefits of collaboration between architects, builders, sustainability consultants, and occupants.

#### Early Stakeholder Engagement:

- a. Highlighting the significance of early and transparent communication with stakeholders to garner support and address concerns.

- b. Showcasing instances where stakeholder involvement positively influenced project outcomes.

#### Education and Awareness:

- a. Highlighting the necessity of continual education and awareness campaigns to promote a sustainable culture among tenants and those who surround them.
- b. Detailing strategies employed to communicate the benefits of green building practices effectively.

#### Areas for Improvement

Acknowledging the challenges and lessons learned, this portion highlights specific areas where the application and effects of green building principles need to be improved:

#### Enhancing Affordability as well as Accessibility:

- a. Suggesting methods to increase the affordability and accessibility of green construction techniques for a wider variety of projects.
- b. Exploring potential incentives or subsidies to encourage widespread adoption.

#### Policy Advocacy:

- a. Advocating for policy changes that support and incentivize sustainable construction practices.
- b. Recommending specific policy adjustments at the local, regional, or national levels.

#### Continued Research and Innovation:

- a. Emphasizing the need for ongoing research and innovation in green building technologies and materials.
- b. Identifying gaps in current knowledge that warrant further investigation and exploration.

This chapter provides a candid examination of the challenges faced, lessons learned, and aspects that need upgrades in light of this study's accomplishments in putting green building principles into effect. In their quest, professionals, legislators, and academics may all benefit greatly from the results of this study.

## COMPARATIVE ANALYSIS

### Comparison with Non-Green Buildings

This section undertakes a comparative analysis between LEED-certified buildings and non-green buildings to discern the distinctive impacts and advantages of sustainable construction. The comparison encompasses various dimensions, including environmental performance, occupant well-being, and economic considerations:

#### Environmental Footprint:

- a. Quantifying the differences in energy consumption, carbon emissions, and resource utilization between the LEED-certified building and conventional structures(Kim, Moon, & Jang, 2023).

- b. Comparing the green building's future ecological sustainability to that of its non-green equivalent.

#### Occupant Experience:

- a. Comparing the LEED-certified building's tenant happiness, well-being, and earnings against with the outcomes of non-green structures (Almeida, Bambad, & Razavi, 2023).
- b. Identifying the potential benefits or drawbacks of green design features on the quality of life for occupants.

#### Economic Efficiency:

- a. Examining the LEED-certified building's economic performance in terms of return on investment overall, upkeep expenses, and operating expenses (Durable Building Solutions, 2023).
- b. Comparing the financial implications of sustainable practices against conventional construction methods.

#### Industry Trends and Best Practices

To provide a forward-looking perspective, this section delves into current industry trends and emerging best practices in green building construction. Drawing from recent developments and innovations, the analysis explores advancements that can further enhance the impact of sustainable construction on urban development (Shanker & Bhushan, 2020):

#### Technological Innovations:

- a. Looking at how to incorporate the latest innovations into green building, such as enhanced control of energy and smart systems for construction (Selvaraj, Kuthadi, & Baskar, 2023).
- b. Assessing the potential of technological advancements to optimize resource use and enhance building performance.

#### Material Science and Innovation:

- a. Examining recent developments in eco-friendly construction materials and their applications in sustainable building projects (Ekhaese & Ndimako, 2023).
- b. Showcasing how the science of materials might help to lessen the negative effects of building on the natural world.

#### Resilience as well as Adaptability:

- a. Recognizing the rising significance of flexibility and resilience in the face of changing ecological issues and global warming (Carmen, *et al.*, 2022).
- b. Exploring strategies for designing green buildings that can withstand and adapt to changing conditions.

#### Community-Centric Approaches:

- a. Analyzing the shift toward community-centric green building projects that prioritize social engagement, inclusivity, and community development (Maddaloni & Sabini, 2022).
- b. Demonstrating the best methods for incorporating neighbourhood groups in the development and implementation of sustainable building projects.

By contrasting the effects of green and non-green building methods, this chapter seeks to offer a comprehensive knowledge of the larger context around sustainable construction techniques and explore current industry trends and best practices. The insights derived from this comparative analysis contribute to the ongoing dialogue on sustainable urban development, offering valuable guidance for stakeholders involved in shaping the built environment of the future (Mazutis & Sweet, 2022).

## RECOMMENDATIONS

### Policy Implications

The following section highlights the major policy consequences of trying to promote a more environmentally friendly built environment in light of the conclusions and insights drawn from the LEED-certified building case study and the more comprehensive investigation of green building techniques:

### Incentive Programs:

- a. Promote the adoption of green construction methods by the construction industry and by advocating for incentives from the government, including tax credits, grants, or expedited permitting processes.
- b. Establish clear guidelines for incentivizing sustainable features in new construction and renovation projects.

### Regulatory Frameworks:

- a. Strengthen building codes and regulations to mandate or incentivize adherence to sustainable design and construction practices.
- b. Collaborate with industry stakeholders to ensure that regulations are practical, achievable, and aligned with global sustainability goals.

### Public-Private Collaborations/Partnerships:

- a. Encourage cooperation amongst the general population and industry to advance projects for ecologically sound development.
- b. Create frameworks for public-private partnerships that facilitate the use of green construction techniques for initiatives involving public infrastructure.

### Education and Training:

- a. Invest in educational programs to raise awareness among architects, builders, and policymakers about the benefits and best practices of green building.
- b. Create educational programs to give experts the abilities and know-how to apply sustainable building techniques.

### Practical Suggestions for Future Projects

Building on the lessons learned and identified areas for improvement from the LEED-certified building case study, the following piece provides useful advice on how to improve the effect and accomplishments of upcoming green building initiatives:

**Affordability Initiatives:**

- a. Explore innovative financing mechanisms to make green building practices more affordable for a broader range of projects.
- b. Develop partnerships with financial institutions to create tailored loan programs for sustainable construction.

**Community Engagement Strategies:**

- a. Prioritize early and transparent communication with local communities to address concerns and garner support for green building projects.
- b. Implement community engagement programs that involve residents in the decision-making process, fostering a sense of ownership and pride.

**Continuous Monitoring and Evaluation:**

- a. Establish robust monitoring and evaluation mechanisms for green building projects to track performance over time.
- b. Implement feedback loops to continuously improve and adapt sustainable features based on real-world outcomes.

**Benchmarking and Certification Programs:**

- a. Encourage the adoption of industry-recognized benchmarking and certification programs to set standards for sustainable construction.
- b. Promote the use of labels or certifications that communicate a building's green features to occupants and the broader community.

The purpose of this section is to offer practical suggestions to parties in the project, professionals in the industry, and regulators to advance sustainable urban development through the incorporation of green building practices. By combining policy initiatives with practical suggestions, With these suggestions, we want to bring about good change and make a stronger and more environmentally friendly architecture a reality.

**CONCLUSION****Summary of Findings**

The present investigation set out to thoroughly investigate how green construction techniques relate to the Sustainable Development Goals (SDGs), using a LEED-certified building as a case study. Going over the multiple sections revealed a plethora of information about the many results of ecologically conscious buildings. In summary:

**Environmental Impact:**

- a. The structure that achieved LEED certification demonstrated notable decreases in power usage and greenhouse gas emissions, highlighting the effectiveness of green design elements.
- b. Water conservation measures and resource-efficient practices contributed to a diminished environmental footprint.

**Social Well-being:**

- a. The favorable influence of environmentally friendly architecture upon the building dwellers' psychological well-being was confirmed by the LEED-certified building's overall contentment with interior environmental standards.
- b. Community engagement initiatives demonstrated the potential for sustainable construction to foster social cohesion and community development.

**Economic Efficiency:**

- a. The economic benefits derived from energy and resource efficiency in the LEED-certified building highlighted the potential for sustainable practices to yield long-term financial gains.
- b. Cost-effectiveness and return on investment were identified as key factors contributing to the economic viability of green building.

**Implications for Green Building Advocacy**

The implications drawn from the findings of this research extend beyond the specific case study, shaping the discourse surrounding green building advocacy and sustainable urban development:

**Holistic Approaches to Sustainability:**

- a. Green building practices emerged as integral components of holistic approaches to sustainability, addressing environmental, social, and economic dimensions simultaneously.
- b. The success of the LEED-certified building underscores the importance of integrated design and the collaboration of diverse stakeholders in achieving comprehensive sustainability outcomes.

**Alignment with Sustainable Development Goals:**

- a. Researchers revealed a strong correlation between the effects of green construction techniques and certain Sustainable Development Goals.
- b. The case study serves as a model for how sustainable construction can contribute to global efforts to address climate change, enhance social equity, and promote economic resilience.

**Advocacy for Policy Interventions:**

- a. The study emphasizes the need for policy interventions that incentivize and regulate sustainable construction practices.
- b. Recommendations for policymakers include the establishment of incentive programs, strengthened regulations, and the promotion of public-private partnerships to drive sustainable urban development.

**Empowering Stakeholders:**

- a. By providing practical suggestions for future projects, the research empowers architects, builders, and policymakers to overcome challenges and enhance the success of green building initiatives.

b. Economical campaigns, involvement from community tactics, and continuous evaluation are among the measures that are considered essential for the successful use of sustainable construction principles.

In conclusion, this research contributes valuable insights to the discourse on green building practices, illustrating their tangible impact on sustainability and their alignment with broader global goals. The findings and recommendations presented herein are intended to inform and inspire further advancements in sustainable urban development, inspiring parties to adopt green construction methods as a fundamental element in constructing a robust and environmentally friendly future.

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