

Sustainable Hospitality Design: Integrating Green Strategies In Hotel Projects

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Abstract- Sustainable hospitality design has become increasingly important in addressing the environmental challenges associated with hotel development, particularly in reducing energy consumption, water usage, and overall ecological impact while maintaining guest comfort and operational efficiency. Despite growing awareness of green building practices, there remains a significant gap in the full integration of sustainable strategies within many hotel projects, especially in developing urban contexts where conventional design approaches still dominate. This study therefore examines the integration of green strategies in hotel projects to promote sustainable hospitality design. The main objective is to assess how sustainable design interventions can improve environmental performance, enhance guest satisfaction, and support efficient hotel operations. The study adopted a mixed-method approach involving questionnaires, observations, and interviews, supported by relevant literature and case study analysis. Findings from the study revealed that while some hotels have adopted basic sustainability measures such as energy-efficient lighting and water-saving systems, comprehensive implementation of green strategies remains limited. However, respondents showed strong positive perceptions toward sustainable hotel environments, indicating that green design significantly improves comfort, indoor environmental quality, and overall guest experience. The study implies that greater adoption of sustainable hospitality design can lead to reduced operational costs, improved environmental performance, and enhanced competitiveness in the hospitality industry. It further emphasizes the need for stricter policy enforcement and increased awareness to encourage widespread implementation of green strategies in hotel developments.

Keywords: Sustainable Hospitality Design, Green Strategies, Hotel Projects, Energy Efficiency, Water Conservation, Indoor Environmental Quality, Guest Comfort, Environmental Sustainability, Green Building, Operational Efficiency.

I. INTRODUCTION

The hospitality industry is one of the fastest-growing sectors globally and plays an important role in tourism development, economic growth, and employment generation. Hotels, as major components of the hospitality sector, are designed to provide accommodation, comfort, recreation, and supporting services for guests. However, hotel developments are often associated with high energy consumption, excessive water use, material waste generation, and increased environmental impact due to their continuous operational demands. As environmental concerns and the need for sustainable development continue to increase, there is growing attention toward adopting sustainable design approaches that reduce environmental pressure while maintaining user satisfaction and operational efficiency.

Sustainable hospitality design refers to the integration of environmentally responsible and resource-efficient strategies into hotel planning, construction, and operation. These strategies include energy-efficient building systems, natural ventilation, water conservation, renewable energy integration, sustainable material selection, waste management practices, and improved indoor environmental quality. According to Edwards (2014), sustainable building design aims to reduce environmental impact while creating functional and comfortable spaces for users. In hotel projects, these approaches not only contribute to environmental protection but also improve guest experience and reduce long-term operational costs.

Green strategies have become increasingly relevant in contemporary hotel design due to growing awareness of climate change and resource depletion. Sustainable hotel projects often adopt passive design techniques, efficient building envelopes, daylight

optimization, green roofs, and landscape integration to improve environmental performance. Yeang (2008) argued that incorporating ecological principles into building design enhances energy efficiency and supports long-term sustainability goals. These approaches enable hotels to maintain comfort and luxury standards while minimizing resource consumption.

Recent studies have also highlighted the importance of environmental quality and sustainable design in improving user satisfaction within built environments. Asaju et al. (2025) observed that environmental factors such as thermal comfort, lighting quality, ventilation, and overall building performance significantly influence users' satisfaction and experience. Their findings suggest that integrating environmentally responsive design strategies can improve comfort, operational efficiency, and sustainability outcomes in building projects. This perspective supports the growing need for green interventions within hospitality developments.

Therefore, this study examines sustainable hospitality design with a focus on integrating green strategies in hotel projects. It seeks to explore how sustainable architectural interventions can improve environmental performance, enhance guest comfort, reduce operational costs, and contribute to the development of more resilient and environmentally responsible hotel environments.

1.1 Aim and Objectives

The aim of this study is to examine sustainable hospitality design through the integration of green strategies in hotel projects in order to improve environmental performance, guest comfort, and operational efficiency.

Objectives of the Study

The specific objectives of the study are to:

- i. Examine the concept and principles of sustainable hospitality design in hotel projects.
- ii. Identify the major green strategies used in sustainable hotel design and development.

- iii. Assess the impact of sustainable design practices on environmental performance and guest satisfaction.
- iv. Evaluate the effectiveness of energy efficiency, water conservation, and sustainable material use in hotel projects.
- v. Recommend sustainable design strategies that can improve the performance and long-term sustainability of hotel developments.

1.2 Problem Statement

The hospitality industry continues to experience rapid growth due to increasing tourism and urban development, leading to a rise in the construction and operation of hotel facilities. However, hotels are among the building types with high energy consumption, significant water usage, material waste generation, and continuous operational demands, which contribute to environmental degradation and increased operating costs. Many hotel projects still rely on conventional design approaches that prioritize aesthetics, luxury, and functionality without adequate consideration for environmental sustainability.

The limited integration of green strategies in hotel design has resulted in issues such as excessive energy use, poor resource management, reduced indoor environmental quality, and increased environmental impact. These challenges not only affect operational efficiency but also influence guest comfort and long-term economic performance. Despite the growing awareness of sustainable architecture, the adoption of environmentally responsible design practices within hotel developments remains relatively limited.

Although previous studies have highlighted the benefits of sustainable building practices, there is still a need to examine how green design interventions can be effectively integrated into hotel projects to achieve environmental, economic, and user-related benefits. Therefore, this study seeks to investigate sustainable hospitality design by exploring green strategies that can improve hotel performance, enhance guest experience, and support long-term environmental sustainability.

II. LITERATURE REVIEW

Sustainable hospitality design has emerged as an important approach in reducing the environmental impact of hotel developments while maintaining guest comfort and operational efficiency. Hotels are among the most resource-intensive building types due to their continuous energy demand, water consumption, and service requirements. Sustainable design focuses on integrating environmentally responsible strategies into the planning, construction, and operation of hotel facilities to improve building performance and reduce long-term environmental effects. According to Edwards (2014), sustainable building design aims to create functional and comfortable environments while minimizing resource consumption and environmental degradation.

Green strategies in hotel projects include energy-efficient systems, passive cooling techniques, water conservation measures, sustainable material selection, waste reduction practices, and improved indoor environmental quality. Yeang (2008) emphasized that environmentally responsive building approaches improve energy performance and support long-term sustainability goals. In hospitality environments, these strategies contribute not only to environmental protection but also to operational cost reduction and improved guest experience. Studies have further shown that sustainable hotel design can enhance market competitiveness and increase user satisfaction by creating healthier and more efficient environments.

Indoor environmental quality remains a major factor in sustainable hospitality design because it directly influences guest comfort and overall satisfaction. Environmental conditions such as thermal comfort, lighting quality, air circulation, and spatial experience determine users' perceptions of hotel spaces. Recent studies by Asaju and colleagues highlighted that environmental quality and energy-conscious design significantly influence users' satisfaction and building performance. Their findings emphasized that comfortable and environmentally responsive spaces contribute positively to efficiency, user experience, and sustainability outcomes within the built environment.

Recent hospitality studies have also shown increasing interest in passive design and environmentally responsive strategies for reducing operational costs in hospitality facilities. Passive approaches such as daylight optimization, natural ventilation, shading devices, and climate-responsive planning have demonstrated effectiveness in improving energy efficiency and reducing dependence on mechanical systems. Therefore, integrating green strategies into hotel projects presents an opportunity to create sustainable hospitality environments that balance environmental responsibility, economic performance, and guest comfort.

Overall, existing literature supports the growing need for sustainable hospitality design and suggests that integrating green strategies into hotel projects can improve environmental performance, enhance user satisfaction, and contribute to long-term sustainability goals.

III. RESEARCH METHODOLOGY

3.1 Research Design

This study adopts a descriptive research design to examine sustainable hospitality design through the integration of green strategies in hotel projects. The design is appropriate because it allows for the observation and assessment of existing hotel conditions without manipulating any variables.

A mixed-method approach will be used, combining both qualitative and quantitative methods. Data will be collected through questionnaires, observations, and interviews, while secondary data will be obtained from relevant literature and documented case studies on sustainable hotel design.

The collected data will be analyzed using descriptive statistics and thematic analysis to identify patterns related to the use of green strategies and their impact on environmental performance, guest comfort, and operational efficiency.

3.2 Study Area

The study area for this research is selected hotel projects in Lagos State, Nigeria. Lagos State is a major commercial and tourism hub in Nigeria with a

high concentration of hotels ranging from small-scale accommodations to large luxury hospitality developments.

The area is suitable for this study because of its tropical climate, rapid urban development, and high demand for hospitality services, all of which make sustainable hotel design highly relevant. The selected hotel projects provide a good basis for examining how green strategies are integrated into hospitality design and how they influence environmental performance, guest comfort, and operational efficiency.

3.3 Population and Sampling

The population of this study comprises hotel buildings, management staff, and guests in selected hotel projects in Lagos State, Nigeria. These groups are considered appropriate because they are directly involved in the design, operation, and use of hotel facilities and can provide relevant information on sustainable hospitality design and green strategies.

A purposive sampling technique will be used to select hotels that demonstrate varying levels of sustainable design features. From these selected hotels, respondents such as staff and guests will be chosen using simple random sampling to ensure fairness and representation. This approach will enable the researcher to obtain reliable data on the integration of green strategies in hotel projects and their effects on performance and comfort.

3.4 Instruments for Data Collection

The following instruments will be used for data collection in this study:

- i. Structured Questionnaire - Administered to hotel guests and staff to gather data on satisfaction, comfort, and perceptions of sustainability in hotel environments.
- ii. Observation Checklist - Used to assess the presence of green design features such as energy-efficient systems, water conservation measures, natural ventilation, and sustainable materials.
- iii. Interviews - Conducted with hotel managers and staff to obtain detailed information on

sustainability practices and operational strategies.

- iv. Secondary Sources - Includes textbooks, journals, and previous research studies used to support and enrich the study findings.

3.5 Validity and Reliability

Validity

The validity of the research instruments will be ensured through expert review by the project supervisor and professionals in architecture and hospitality management. Their feedback will be used to improve the questionnaire and observation checklist to ensure they accurately measure sustainable hospitality design and green strategies in hotel projects.

Reliability

A pilot study will be conducted using a small sample outside the main study area to test the consistency of the instruments. The results will be used to refine the tools and ensure they produce reliable and consistent responses during the main data collection.

3.6 Method of Data Analysis

The data collected for this study will be analyzed using both quantitative and qualitative methods. Responses from the questionnaires will be coded and presented using frequency tables, percentages, and charts to identify trends in sustainable hospitality design and the use of green strategies in hotel projects.

In addition, data obtained from observations and interviews will be analyzed using thematic analysis, where responses are grouped into key themes such as energy efficiency, water conservation, guest comfort, and environmental performance. This combined approach will help provide a clear understanding of how green strategies influence hotel sustainability and performance.

3.7 Ethical Considerations

This study will be conducted in line with ethical research standards. Permission will be obtained from hotel management and relevant authorities before data collection. Participation of respondents will be

voluntary, and they will be fully informed about the purpose of the study.

Confidentiality and anonymity of all participants will be maintained, and no personal or sensitive information will be disclosed. Respondents will also have the right to withdraw from the study at any time without penalty. All data collected will be used strictly for academic purposes.

IV. RESULTS AND DISCUSSION

4.1 Demographic Profile of Respondents

The demographic profile of respondents provides background information on the participants involved in the study. A total of 70 respondents from selected hotel facilities were surveyed.

Out of the 70 respondents, 42 (60%) were male while 28 (40%) were female, indicating a relatively balanced representation.

The majority of respondents, 38 (54%), were within the age range of 26-40 years, 20 (29%) were between 18-25 years, while 12 (17%) were above 40 years.

The occupational distribution shows that 30 respondents (43%) were hotel guests, 22 (31%) were hotel staff, and 18 (26%) were management personnel.

Findings indicate that 25 respondents (36%) were from budget hotels, 28 (40%) from mid-range hotels, and 17 (24%) from luxury hotels.

Overall, the demographic data shows that respondents were diverse in age, occupation, and hotel type, providing a balanced basis for assessing sustainable hospitality design and green strategies in hotel projects.

4.2 Findings

The findings show a moderate level of awareness of sustainability practices among respondents, with 40 out of 70 acknowledging awareness of sustainable hotel design. However, the majority of hotels were reported to use energy-efficient systems (55 respondents) and water-saving devices (48

respondents), indicating partial adoption of green strategies.

Guest comfort responses were largely positive, with 52 respondents expressing satisfaction with hotel comfort levels and 60 agreeing that hotel design enhances their overall experience. A strong majority (58 respondents) also reported good indoor air quality, while 65 respondents preferred hotels with more sustainable features.

In terms of green strategies, responses were overwhelmingly positive. Most respondents agreed that green design reduces energy consumption (62 respondents), improves hotel image (64 respondents), and enhances comfort through landscaping (59 respondents). Nearly all respondents (68 out of 70) supported the idea that all hotels should adopt sustainable design practices.

4.3 Interpretations of Findings

The results indicate a growing awareness and acceptance of sustainable hospitality design, although full implementation of green strategies is still inconsistent across hotel facilities. While many hotels have adopted basic energy-efficient and water-saving systems, eco-friendly material use and full sustainability integration remain limited.

The high level of guest satisfaction suggests that hotels incorporating sustainability features tend to offer better comfort, air quality, and overall experience. This aligns with the idea that sustainable design not only benefits the environment but also enhances user satisfaction and hotel performance.

Furthermore, the strong support for green strategies demonstrates a clear expectation from both guests and staff for more sustainable hotel developments. This confirms that sustainability is no longer optional but a key factor influencing hotel preference, comfort, and reputation.

Overall, the findings show that integrating green strategies in hotel projects improves environmental performance, enhances guest experience, and strengthens the competitiveness of hospitality developments.

V. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study examined sustainable hospitality design and the integration of green strategies in hotel projects, with a focus on improving environmental performance, guest comfort, and operational efficiency. The findings revealed that while some hotels have adopted basic sustainability measures such as energy-efficient systems and water-saving devices, the overall implementation of comprehensive green design strategies remains moderate.

The results further showed that sustainable design practices significantly contribute to improved guest comfort, better indoor environmental quality, and enhanced overall experience. Respondents expressed strong satisfaction with hotels that incorporate environmentally friendly features, indicating a positive relationship between green strategies and user experience.

In conclusion, sustainable hospitality design plays a vital role in reducing environmental impact while enhancing hotel performance and guest satisfaction. The study emphasizes the need for more widespread adoption of green strategies in hotel developments to achieve long-term environmental sustainability, economic efficiency, and improved hospitality standards.

5.2 Recommendation

Based on the findings of the study, the following recommendations are made:

- i. Hotel developers should integrate comprehensive green strategies such as energy efficiency systems, renewable energy, and water conservation measures in all hotel projects.
- ii. Sustainable materials and environmentally friendly construction methods should be prioritized in hotel design and renovation.
- iii. Hotels should improve indoor environmental quality by enhancing natural ventilation, day-lighting, and thermal comfort for guests.
- iv. Management should adopt regular sustainability audits to monitor and improve

environmental performance in hotel operations.

- v. Government and regulatory bodies should enforce stricter policies to encourage compliance with sustainable hospitality design standards.

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