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SUSTAINABLE TOURISM IN SRI LANKA: GREEN HOTEL PRACTICES AND IMPLEMENTATION BARRIERS OF LUXURY HOTELS IN COLOMBO

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Abstract: *In the framework of sustainable tourism development, the study focused on green hotel practices and barriers faced in implementing those practices in luxury hotels in Colombo, Sri Lanka. Also, a comparison of practices across the hotel categories. Semi-structured interviews were used to gather information from managers and sustainability officers from three-, four-, and five-star hotels using a qualitative research approach. According to the findings, the majority of luxury hotels have included waste management programs, water-saving devices, energy efficiency measures, and guest and employee engagement tactics into their daily operations. The degree of implementation, however, differs greatly by hotel category, with mid-scale hotels adopting limited practices due to budgetary limitations and a lack of technical competence, while five-star hotels lead the way due to their higher resources and global competitiveness. These findings contribute to understanding sustainable tourism practices in Sri Lanka and provide recommendations for improving implementation across the hotel sector.*

Keywords: *Green Hotel Practices, Sustainable Tourism, Implementation Barriers, Luxury Hotels*

1. Introduction

1.1 Background of the Research

Sustainable tourism is a long-term aim for Sri Lanka, and the importance of sustainable tourism cannot be understated for Sri Lanka to work towards a favourable overall balance in environmental, socio-cultural, economic, and experiential consequences for tourists and residents (Samarasekara et al., 2022). Even though the 30-year civil war caused numerous issues for the industry, the post-war sector recovered, putting Sri Lanka on a stable growth trend, and the tourism industry expanded quickly. There, the importance of both domestic and foreign businesses engaging in the hotel sector has increased.

The tourist business includes the hotel industry as a subsector. Businesses in the hotel and accommodation industries are closely linked to the expansion of employment and have the potential to generate income for the nation (Leonidou et al., 2013). The ongoing growth of hotels has broader effects on the environment and society. Due to their increasing use of natural resources, many hotels are causing environmental harm. Understanding how a hotel enhances its green image and reputation, outperforms the competition, and reacts swiftly to the rising need for environmental concern is crucial to understanding the need for change in the market environment.

In tourism, the hotel plays a significant role in protecting the environment. Therefore, hotels must adapt to green practices. Sri Lanka's economy is mostly driven by tourism, which also makes a substantial contribution to infrastructure development, employment, and foreign

exchange revenues. But its quick growth, especially after the war, has resulted in more unsustainable practices, particularly in the luxury hotel industry in cities like Colombo. Through increasing carbon emissions, excessive use of energy and water consumption, and inappropriate waste disposal, unsustainable tourism significantly contributes to environmental degradation. Due to their high resource consumption, luxury hotels contribute significantly to the 8% of greenhouse gas emissions caused by tourism worldwide (Lenzen et al., 2018). Concerns have been expressed about the burden that major hotels in Colombo are placing on the city's electricity and water resources (SLTDA, 2021). Waste from tourism has also contaminated city beaches and endangered coastal ecosystems. The lack of sustainable operational methods in major destinations has resulted in increasing environmental pressure, which the Sri Lanka Tourism Development Authority has recognised (SLTDA, 2022). The social benefits of tourism are not equally dispersed; they frequently enrich international hotel corporations while providing local communities with little long-term benefit.

Overall development is still uneven, despite the fact that several hotels have started green initiatives, ranging from energy-efficient lighting and guest involvement programs to more sophisticated techniques like solar water heating and rainwater harvesting. Although many five-star hotels show a strategic commitment to sustainability, lower-tier hotels find it difficult to follow because of their limited financial resources, lack of technical know-how, and unclear implementation incentives or roadmap.

Furthermore, Sri Lanka's tourism infrastructure and natural resources, including coastal areas and biodiversity hotspots, are becoming more vulnerable due to climate change. The actual application of green hotel techniques in Colombo's luxury market is still uneven and poorly studied, despite national and international legislative promises to support sustainable tourism. As a result, the confluence of urban environmental stressors, unequal green practice adoption, and low participation in national certification programs leads to a lasting environmental impact as well as lost chances for increased productivity, brand distinction, and transformation backed by policy.

Given Sri Lanka's desire to market its tourism industry as competitive, environmentally friendly, and in line with the country's recovery and sustainability objectives, this disparity is especially noticeable. Finding out how many luxury hotels now use sustainable practices and realising the barriers preventing their full integration are critical needs. By concentrating on the Colombo District, this study fills that knowledge gap and seeks to offer practical advice for more environmentally friendly hotel management in Sri Lanka. Accordingly main research questions include this study are as follows.

1. What are the green hotel practices which currently implemented by the selected luxury hotels in Colombo in terms of water, energy, waste, and guest engagement?
2. What are the main barriers to implementing sustainable practices across different hotel categories?
3. How can the hotels of different star classifications (3-star, 4-star, 5-star) compare in their sustainability efforts?
4. What kind of strategies can be developed to improve the adoption of green practices and certification, which support Sri Lanka’s goal of positioning a sustainable tourism hub?

1.2 Definition of Concepts

1.2.1 Sustainable Tourism

In 2005, UNWTO and UNEP jointly defined sustainable tourism as “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities.” United Nations Environment Programme and World Tourism Organisation, 2005.

The Brundtland Report (1987) defines sustainable tourism as development that satisfies current demands without jeopardising the capacity of future generations to satisfy their own.

1.2.2 Green Hotel Practices

The most important component of a tourist destination is a hotel. In addition to room service and food and beverage services, hotels serve as temporary lodging for travellers. The most valuable aspect of a hotel's offerings is its human capital in the form of services (Perera & Pushpanathan, 2015). The Green Hotel Association (2018) defines a green hotel as one whose management places a high priority on energy and clean water consumption, waste reduction, and other cost-cutting measures to preserve environmental sustainability. In the hotel sector, there are three primary green practices (Baris, Erdogan, N. 2007)

1.2.3 Energy-saving techniques

Energy conservation is one of the most crucial aspects of the hotel industry's environmental management. Hotels typically use enormous amounts of electricity and fossil fuel energy for several operating areas. These steps include installing energy-efficient appliances and other related equipment, implementing renewable energy programs like solar and wind power, installing digital thermostats, using energy-star qualified products, installing motion sensors that turn off lights in low-traffic areas, installing reflective glass or triple-glazed windows, using energy-efficient light bulbs, and cleaning unoccupied, dirty rooms with natural light instead of artificial light.

1.2.4 Water Conservation measures

The hotel sector has made extensive use of this as a key green management tactic. In general, hotels use a lot of water in their daily operations. Therefore, the size and capacity of the hotel, the occupancy rate, and the kind and calibre of services and amenities offered all affect how much water is used in the hotel sector. Installing water-efficient fixtures and appliances, such as low-flow showerheads and toilets, and installing infrared-activated faucets are examples of water-saving techniques used by the hotel sector.

1.2.5 Waste Management measures

Due to the massive amounts of wet waste, such as food scraps, cooking oil, and garden waste, and dry waste such as plastics, cans, paper, and linen that are dumped in landfills, the hotel business is typically regarded as a significant source of greenhouse gas emissions. In order to reduce hotel waste, hotel operators started implementing various strategies, such as using coloured bins and clearly marked containers to collect recyclables, buying products with recycled materials, collecting organic kitchen waste separately for soil composting, purchasing food items and cleaning supplies in bulk, and implementing a donation program.

1.4 Barriers to green hotel practices

The barriers to green practices in hotels are among the topics of some studies. For example, Chan (2008) summed up that hotel managers' motivation to adopt green practices is weakened by a lack of professional advice, resources, certifiers/verifiers, and expertise, as well as by unknown results and the cost of implementation and maintenance.

Kamalulariffin et al. (2013) performed the second relevant study into the barriers. Five barriers were identified by this study: government and regulatory requirements, demand from customers, competitiveness, organisational greenness, and a change-oriented mindset. Vikneswaran et al. (2012) conducted the third research project and their associates identified nine obstacles. These include the high costs associated with implementation and ongoing maintenance, which often discourage hotels from investing in environmentally sustainable

initiatives. Additionally, a lack of sufficient knowledge and awareness regarding green practices limits effective adoption. Hotels frequently face resource constraints, including shortages of time, manpower, equipment, and financial resources. The absence of strong commitment and momentum from hotel owners further impedes progress. Moreover, the lack of urgency and the ambiguity surrounding environmental guidelines create uncertainty in implementation efforts. Other challenges include the shortage of qualified verifiers and consultants, conflicting guidance from different stakeholders, and inadequate government regulations and enforcement mechanisms, all of which hinder the successful adoption of sustainable practices within the hotel industry.

1.5 Global context of green hotel practices

According to previous studies, there are three main components of sustainable tourism practices, which are as follows: 1) energy management; 2) waste management; and 3) water conservation. According to Mensah (2006) also, above are the most often used environmental management techniques that support environmental quality, image building, and cost savings in hotels.

The main obstacles to implementing green operating practices at Victoria Falls' hotels and lodges include a lack of funding, scarce resources, and technical advancements. According to Fazzari et al. (1988), Victoria Falls hotels and lodges' capacity to adopt sustainable practices is impacted by the cash flow sensitivity brought on by financial constraints.

The sector's lack of awareness and education has been cited as another significant obstacle. The implementation of sustainable practices is hampered by management and employee ignorance and complacency, which is indicative of a larger problem with environmental awareness. Fukey & Isaac, (2014) stress the importance of raising knowledge of how hotel operations affect the environment.

1.6 Sri Lankan Context of Green Hotel Practices

According to a case study (Wilson et al., 2019) on how hotels in Sri Lanka can improve their efficiency through environmentally sustainable practices, hotels that practise environmental responsibility are more efficient. It has been said that waste management and energy efficiency need to be improved. Additionally, they show that medium- and large-scale hotels play a significant role, with five-star hotels accounting for 14.2% of the total room capacity, four-star hotels for 10.8%, and three-star hotels for 7.6% (Herath, 2023)

Additionally, they highlight the significance of the evolving tourist demographic, which demands environmentally friendly procedures. They argue that hotels employ these eco-friendly practices as part of their corporate social responsibility to cut expenses, enhance their reputation, and stand out in the market. Recognising the harmful impact of products, governments also stress the significance of green business practices in the hotel and tourism sector in order to safeguard the environment. Addressing environmental challenges is also commonly viewed as a way to satisfy customer demands, social responsibility, or company ethics.

2. Methodology

This study uses a qualitative case study strategy to explore the green hotel practices and implementation barriers in Sri Lanka’s hotel industry. The research was conducted between June 2025 and September 2025 period and data was collected through semi-structured interviews. The study focuses specifically on a number of selected luxury hotels (3-star, 4-star, 5-star) in the Colombo District, making it possible to examine green practices and the barriers to their adoption in a contextualised manner. A total number of 30 participants, including hotel managers and sustainability officers, were purposively selected for the study. Also, the data

was analysed using thematic analysis to identify the key themes related to the implementation of green hotel practices.

The study is carried out in Sri Lanka's commercial and urban centre, Colombo District, which has more than 25% of the nation's hotel room capacity (SLTDA, 2022). Colombo is a perfect place to research sustainable tourism initiatives because it combines upscale tourism infrastructure and environmental stress. To find the relevant data, the participants below were included in the research as presented in Table 1.

Table 1. Hotel participants

Se. No	3-Star	4-Star	5-Star
1	Viveka hotel	Radisson Hotel Colombo	Waters Edge
2	Cinnamon Red Colombo	Rockwell Colombo	Cinnamon Lakeside Colombo
3	Grand Oriental Colombo	Mirage Colombo	Sheraton Colombo
4	Metro Port City hotel	Grand Bell Hotel Colombo	The Kingsbury Colombo
5	Hotel Nippon Colombo	Fairway Hotel Colombo	Taj Samudra Colombo
6	Pearl City hotel	Zest Metropole Colombo	Amari hotel Colombo
7	Port View City Hotel	Sofia Colombo City Hotel	Galadari hotel Colombo
8	The Ocean Colombo	MA Radha Colombo	Marino Beach Colombo
9	Hotel Janaki Colombo	Nyne hotels lake lodge	Cinnamon Grand
10	Hotel Sapphire	Aathma Colombo House	Galle Face hotel Colombo

Source: Constructed by authors

Within each selected hotel, key informants will be purposively chosen based on their involvement in operational, strategic, and sustainability-related decision-making processes. These informants will include General Managers, who oversee overall hotel operations and policy implementation; Engineering or Maintenance Managers, who are responsible for infrastructure management, energy efficiency, and environmental initiatives; and Sustainability or Environmental Officers, who lead and coordinate the hotel's sustainability practices and green programs. Their diverse perspectives will provide comprehensive insights into the adoption of sustainable practices, the challenges encountered, and the strategies employed to enhance environmental performance within the hotel sector.

2.1 Data Collection Methods

Semi-structured interviews and open-ended questions with chosen hotel employees will be the main method used to gather data. This approach enables participants the freedom to go into further detail about their experiences, opinions, and difficulties with green practices while also allowing for rich, detailed responses.

A set of the questionnaire was prepared based on the barriers identified from the literature. The questionnaire was divided into 5 parts. In part one, questions were based on the background of the respondent, details of the hotels, such as hotel type, designation so on. In part two, questions were regarding the existing sustainable practices in hotels. In part three, questions were asked regarding the barriers to implementation. In part four, questions were asked regarding the reflections and recommendations of hotels in implementing sustainable practices, and finally the questions in part five were regarding the final thoughts.

3. Results

3.1 Green Hotel Practices

Each of the responses received from the members was carefully transcribed and reviewed several times in order to provide the material and to record significant concepts and recurring themes. Using an open coding process, meaningful statements were identified and

categorised based on how well they applied to operational barriers, policy implications, green hotel practices, and stakeholder engagement.

Early on, the respondents noted several recurring sustainable tourism practices, such as the installation of motion sensors, the use of solar water heating systems, the adoption of ISO 14001 environmental management standards, and the introduction of LED lighting. Initiatives for employee knowledge to raise environmental awareness, food redistribution, and garbage segregation were also mentioned by them.

For example, one sustainability officer from a five-star hotel stated:

"We have switched almost entirely to LED lighting and have installed motion sensors in all guest corridors. This has reduced our monthly electricity bills by nearly 30%."

Such early insights revealed that energy efficiency measures are widely highlighted across the sector. However, financial constraints and policy gaps were evident from the outset. As one of the managers of a four-star hotel has explained:

"*The government does not offer any meaningful subsidies or tax incentives. Every sustainability upgrade, from solar water heating to waste treatment systems, comes entirely out of our operational budget."*

This interaction between structural constraints and attempts to adopt sustainable practices emerged as an ongoing theme in the study and influenced the direction of future questions. Follow-up questions were designed to dive deeper into new thoughts when they surfaced. While gradually focusing on the themes, this iterative process ensured that the analysis stayed rooted in participant viewpoints.

3.1.1 Refining the Analysis through Iteration

This study completely incorporated the iterative nature of thematic analysis. Recurring patterns that emerged during the initial code development helped guide the future data collection. For instance, subsequent interviews looked deeper into finance models, payback periods, and alternative energy after participants often emphasised the high costs of installing green technologies. In the same manner, when the topic of guest involvement came up, follow-up enquiries looked into the ways in which tourists were informed and how they were seen to affect their behaviour.

The code structure changed and advanced as a result of this process. Smart heating and cooling systems, motion sensors, and LED lights were all coded under the more general heading of energy efficiency measures. The category of sustainable waste management was created by combining several relevant codes, such as food recycling, composting, waste segregation, and plastic reduction. Similarly, comments about policy uncertainty, a lack of incentives, and the lack of certified checkers were categorised under policy and regulatory issues, whereas responses about staff training, awareness campaigns, and guest education fell under the stakeholder involvement category.

Through iterative refining, the research was able to go beyond superficial descriptions and reveal the underlying mechanisms impacting the adoption of sustainable practices in hotels in Colombo.

3.1.2 Resource and Energy Efficiency Motivated by Sustainability

Among all participating luxury hotels in Colombo, energy saving was one of the most noticeable themes. Nearly all of the respondents talked about continuous attempts to lower energy use, whether through simple initiatives or significant financial investments. Common actions include installing motion sensors in conference rooms and hallways, converting to LED lighting completely, and implementing climate control systems to maximise the use of air conditioners.

A manager from a five-star hotel has explained that:

"We invested in a building management system that automates temperature control and adjusts lighting depending on occupancy levels. Within the first year, our overall energy costs dropped by nearly a third."

In the same spirit, some hotels have integrated solar water heating systems to reduce their dependency on electricity from the grid. However, because lower-ranked hotels found it difficult to justify the initial costs, these expenditures were nearly exclusively limited to four- and five-star hotels.

The results shown here are consistent with sustainability reports from major hotel groups in Sri Lanka. For instance, Jetwing Hotels' 2023 Sustainability Report highlights that about 42% of its energy comes from renewable sources, mostly plants and solar power. This demonstrates that the luxury hotels in Colombo are leading the way in energy efficiency technology.

Many participants failed to stress that cost was still a major challenge. 3-star hotels had to utilise low-cost measures like LED retrofits and behavioural cues for guests and employees, whereas 5-star hotels frequently had the funds to seek innovative solutions. The disparity stresses how funding capacity has a significant impact on the extent of environmentally friendly efforts related to energy efficiency.

3.1.3 Thorough Reduction and Waste Handling

Waste management was another frequently discussed topic in the context of sustainability. Hotels have recognised the operational and reputational benefits of effectively managing waste, even though techniques vary widely depending on the resources available.

All hotel types practiced basic waste stream segregation, which included food waste, glass, and plastics. However, more advanced practices like biogas production, on-site composting, and relationships with local recycling companies were reported by luxury hotels.

One sustainability officer from a four-star hotel shared:

"We have established a partnership with a local recycling firm to handle glass and plastic waste, while organic matter is composted on-site. This has helped us achieve almost zero landfill contribution."

Many hotels, particularly five-star hotels, where buffet-style operations can generate a lot of trash, also mentioned food waste tracking systems. By monitoring and measuring daily food waste, these hotels were able to reduce waste and costs by altering menu design and procurement levels.

The results are in line with the protocols recommended by leading hospitality brands in Sri Lanka. For instance, Cinnamon Hotels' 2024 Sustainability Report states that all of their kitchen trash is diverted from landfills and that a significant portion is converted into biogas to power their operations. Middle-range hotels are less likely to employ these innovative technologies but there is evidence that as sustainability standards rise, their adoption is occurring gradually.

3.1.4 Guest and Staff Engagement in Hotel Sustainability

In order to maintain green approaches, stakeholder engagement is mandatory. According to the report, hotels are getting more and more staff and visitors involved in their sustainability initiatives.

Eco-cards, which encourage guests to reuse towels and linens in order to save water and energy, are commonly used as guest education materials in rooms. In order to increase transparency and encourage guest participation, several hotels reported putting digital dashboards in their lobby areas that showcase their monthly progress in waste reduction and energy savings.

As one of the hotel managers explained:

"We have realised that involving guests directly makes a difference. When they see our achievements displayed publicly, they tend to participate more willingly in our sustainability programs."

Employee participation was just as essential. The majority of hotels held frequent training sessions to acquaint employees with best practices and sustainability regulations. In several instances, staff members were urged to offer their own suggestions for enhancing waste management and energy efficiency procedures. In addition to promoting compliance, this kind of empowerment encouraged creativity among employees.

Due to resource limitations, three-star hotels had to rely on unofficial awareness seminars, whereas five-star hotels had more formal engagement frameworks, including specialised sustainability training modules. However, throughout the collection, the dedication to incorporating stakeholders at all levels was clear.

3.2 Barriers in Implementing Green Practices

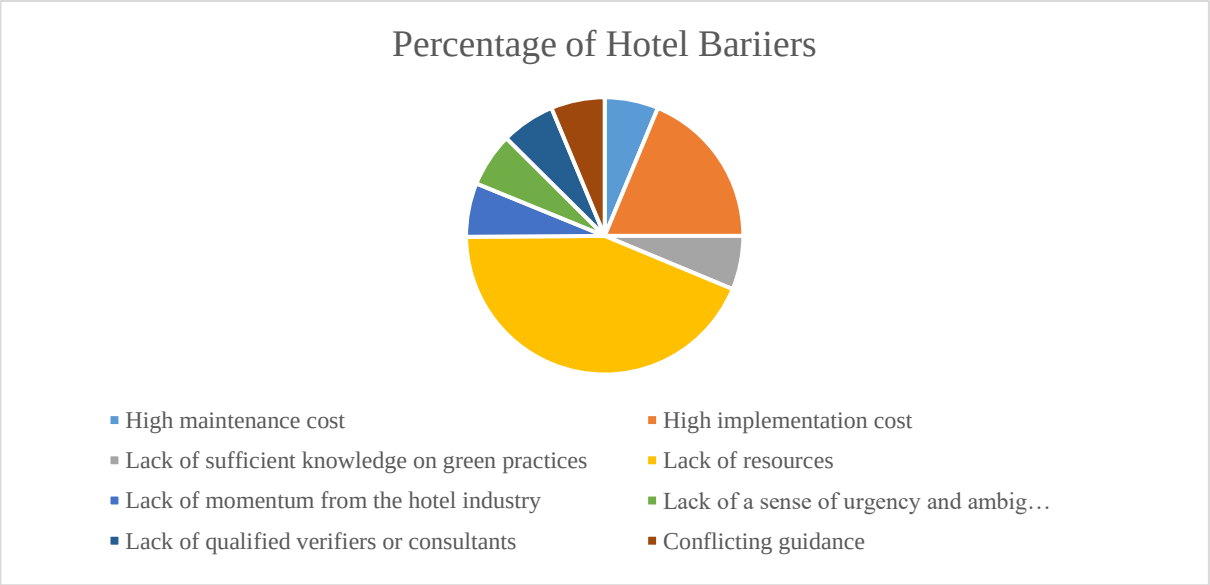
Considering increased awareness of environmental issues and operational advantages, the study identified a number of major barriers that prevent Colombo's hotels from widely implementing sustainable methods.

Financial limitations were one of the most frequently mentioned difficulties. Securing the substantial upfront investment needed for energy-efficient technology, renewable energy systems, and water recycling facilities proved to be a challenge for many hotels, especially three-star and smaller four-star properties. Even though these interventions can save money in the long run, most mid-tier hotels cannot afford the initial capital outlay.

A sustainability manager from a four-star hotel has explained: *"We understand the benefits of solar power and rainwater harvesting, but these systems cost millions of rupees to install. Without financial support or subsidies, it is nearly impossible for us to proceed."*

As shown in Figure 1, Several hotels also emphasised technical and operational constraints. It can be difficult and expensive to transform outdated infrastructure to support automated waste management systems, greywater recycling, or smart energy controls. Additionally, smaller hotels lack internal knowledge of technology, which makes it challenging to successfully implement new technologies.

Figure 1. *Barriers faced by hotels*



Source: Constructed by authors

3.3 Star Classifications of Hotels Employ Different Approaches.

There were significant differences in the level of sustainability adoption across hotels rated three, four, and five stars.

When it came to putting thorough green initiatives into effect, five-star hotels were always at the top of the heap. They made investments in solar heating infrastructure, building automation systems, and international certifications such as ISO 14001. The necessity to remain globally competitive and the expectations of foreign visitors frequently motivated these actions. Three-star hotels, on the other hand, used more straightforward, affordable procedures including linen reuse initiatives, LED lighting, and simple trash segregation. Despite their admirable efforts, they are nonetheless constrained by their lack of funding, technological proficiency, and policy guidance. Four-star hotels found a medium ground, implementing certain cutting-edge procedures while giving preference to those that offered quick financial gains. This distinction highlights the necessity of context-specific regulation interventions and customised support systems in order to assure that sustainability objectives may be met by the hotel industry as a whole, irrespective of scale or classification.

3.4 Strategies to Improve the Adoption of Green Practices and Sustainability Certification

Participants proposed several strategies to enhance the adoption of green practices and sustainability certification across the hotel sector in Sri Lanka. The most frequently mentioned recommendation was the provision of financial incentives by the government. Hotel managers, particularly from three-star and four-star hotels, highlighted the need for tax concessions, low-interest green loans, and subsidies for renewable energy investments and environmentally friendly technologies. Many respondents believed that financial support would encourage hotels with limited resources to invest in sustainable infrastructure and environmental management systems.

Another important recommendation was the strengthening of technical support and capacity-building initiatives. Participants emphasized the need for training programs, workshops, and knowledge-sharing platforms to improve awareness and technical expertise among hotel employees and managers. Several respondents noted that access to qualified sustainability consultants and clearer implementation guidelines would facilitate the successful adoption of green technologies and environmental certifications.

Respondents also highlighted the importance of strengthening regulatory and certification frameworks. Many participants suggested simplifying certification procedures and increasing awareness of internationally recognized standards such as ISO 14001 and Green Globe certification. Furthermore, respondents indicated that clearer environmental regulations and stronger monitoring mechanisms could encourage greater commitment to sustainability within the hotel industry.

Finally, participants emphasized the importance of collaboration among government agencies, tourism authorities, hotel associations, local communities, and private-sector stakeholders. Such partnerships were viewed as essential for promoting sustainable tourism development, sharing best practices, and creating a supportive environment for green innovation. According to the respondents, a coordinated approach would help Sri Lanka strengthen its position as a sustainable tourism destination while improving the environmental performance of hotels across all categories.

Table 2. *Suggested Strategies to Improve Green Practice Adoption*

Strategy	**Description**
Financial Incentives	Tax concessions, subsidies, green financing schemes, low-interest loans
Capacity Building	Training programs, workshops, sustainability awareness campaigns

Technical Support	Access to consultants, implementation guidelines, knowledge-sharing platforms
Certification Support	Simplified certification procedures, awareness of ISO 14001 and Green Globe
Policy and Regulatory Support	Stronger environmental regulations and monitoring mechanisms
Stakeholder Collaboration	Partnerships among government, hotels, tourism authorities, and communities

Source: Constructed by authors

4. Discussion/ Conclusion

The findings revealed that luxury hotels in Colombo have increasingly adopted green hotel practices, particularly in the areas of energy conservation, waste management, water conservation, and stakeholder engagement. Common initiatives identified in the study included LED lighting, motion sensors, solar water heating systems, waste segregation, composting, and linen reuse programs. These findings are consistent with Erdogan and Baris (2007), who identified energy-saving technologies, water conservation measures, and waste reduction strategies as the most widely implemented environmental practices in hotels. Similarly, Mensah (2006) emphasized that these practices contribute significantly to environmental sustainability and operational efficiency within the hospitality sector. The findings also support Kularatne et al. (2019), who found that environmentally sustainable practices improve hotel efficiency by reducing resource consumption and operating costs.

The study identified several barriers that hinder the implementation of sustainable practices, including financial constraints, limited technical expertise, inadequate government support, and a lack of awareness. High initial investment costs associated with renewable energy systems and environmentally friendly technologies were reported as major challenges, particularly among three-star and four-star hotels. These findings are consistent with Chan (2008), who found that implementation and maintenance costs are significant barriers to environmental management in hotels. Likewise, Vikneswaran et al. (2012) highlighted that insufficient resources, limited knowledge, and weak regulatory support often prevent hotels from fully adopting green practices. Therefore, the challenges identified in this study reflect barriers commonly experienced across the hospitality industry.

The comparison among hotel categories revealed that five-star hotels demonstrate a higher level of sustainability adoption than three-star and four-star hotels. Five-star hotels have invested in advanced technologies, renewable energy systems, and internationally recognized environmental certifications, while lower-category hotels mainly rely on basic and low-cost environmental initiatives. These findings support Kularatne et al. (2019), who reported that larger hotels possess greater financial and technological capabilities to implement sustainability initiatives. Furthermore, Herath (2023) noted that large-scale hotels in Sri Lanka play a leading role in environmental management due to their greater resource availability and international market exposure. This suggests that organizational capacity and financial strength significantly influence the adoption of sustainable practices.

The findings further suggest that stronger policy support and institutional mechanisms are necessary to improve the adoption of green practices and sustainability certification across the hotel sector. Participants emphasized the importance of government incentives, financial assistance, technical training, awareness programs, and simplified certification procedures to encourage sustainability implementation. These findings are consistent with Kamalulariffin et al. (2013), who highlighted that supportive regulations, stakeholder collaboration, and organizational readiness are essential for promoting environmental practices in hotels. Similarly, Fukey and Isaac (2014) emphasized the role of education and awareness in strengthening sustainability performance and fostering environmentally responsible behavior among hotel stakeholders. The findings also align with Lee et al. (2019), who found that green awards and certifications positively influence consumers' perceptions of hotels, strengthen

green behavioral intentions, and generate economic benefits for the hospitality industry in Sri Lanka. This suggests that sustainability certification not only enhances environmental performance but also serves as a competitive marketing tool that can improve customer trust and business performance. Therefore, greater collaboration among government agencies, tourism authorities, hotel operators, and certification bodies is necessary to create a supportive environment for sustainability adoption and to support Sri Lanka's objective of positioning itself as a leading sustainable tourism destination.

4.1 Recommendations

Based on the findings of the study, several recommendations can be proposed to enhance the adoption of green practices and sustainability certification in Sri Lanka's hotel sector. The recommendations are prioritized according to their importance and feasibility. As a high-priority recommendation, the government should introduce financial incentives such as tax concessions, subsidies, and low-interest green loans to encourage hotels to invest in renewable energy systems, water conservation technologies, and modern waste management infrastructure. Financial support would be particularly beneficial for three-star and four-star hotels that face significant budgetary constraints when implementing sustainability initiatives. Additionally, the National Sustainable Tourism Certification (NSTC) framework should be strengthened by simplifying certification procedures, establishing clearer compliance guidelines, increasing the availability of certified auditors, and conducting capacity-building workshops for hotel managers. These improvements would encourage greater participation in sustainability certification programs while ensuring alignment with Global Sustainable Tourism Council (GSTC) standards.

At a moderate priority level, industry-wide sustainability training programs should be developed through collaborations among universities, hotel associations, and the Sri Lanka Tourism Development Authority (SLTDA). Such programs could enhance knowledge and skills related to waste management, energy efficiency, and stakeholder engagement, thereby improving the effective implementation of sustainable practices. Furthermore, hotels should invest in guest-centric awareness initiatives through digital dashboards, mobile applications, and social media campaigns that communicate sustainability achievements and encourage guests to participate in environmental programs. Increased guest engagement can strengthen the overall impact of hotel sustainability efforts and promote environmentally responsible behaviour among tourists.

As lower-priority but long-term strategic initiatives, hotels should be encouraged to improve transparency by preparing Environmental, Social, and Governance (ESG) reports aligned with Global Reporting Initiative (GRI) standards. Such reporting practices would enhance stakeholder confidence, strengthen corporate accountability, and improve competitiveness in international tourism markets. In addition, industry-wide collaboration platforms should be established to facilitate the sharing of best practices, innovations, challenges, and lessons learned among hotels. These collaborative networks would support continuous improvement and help the hospitality sector collectively advance Sri Lanka's goal of becoming a leading sustainable tourism destination.

4.2 Practical Implications

From the point of view of management, hotel operators looking to integrate sustainability into operations while establishing a balance between cost effectiveness and guest happiness can find practical insights in this research. Important implications include:

Energy and Resource Management: The results show that long-term cost reductions and increased operational efficiency can be achieved by investing in smart energy controls, LED

lighting, solar heating systems, and water recycling technology. Hotels may lower costs and improve their environmental brand image at the same time by giving priority to these measures.

Waste Management: In order to limit environmental effects and improve community connections, hotels should implement thorough plans for garbage segregation, composting, and food donation partnerships.

Engagement of Visitors and Staff: The study demonstrates that successful sustainability is driven by active stakeholder engagement. To raise awareness and promote habit change, hotels should give priority to staff training modules, digital dashboards, and guest education initiatives.

4.3 Policy Implications

The study identifies a number of systemic limitations that necessitate concerted policy actions, including high upfront investment costs, a lack of financial incentives, and unreliable certification systems. The following implications at the policy level emerge:

Government Incentives: To promote investment in waste management infrastructure and renewable energy systems, the Sri Lankan government should create tax breaks, green finance programs, and low-interest loans.

Strengthening the NSTC Framework: To guarantee that hotels have access to trained auditors and clear instructions, the National Sustainable Tourism Certification procedure should be streamlined and brought into line with international GSTC standards.

Platforms for Knowledge Sharing: To disseminate best practices and close implementation gaps, industry groups and the Sri Lanka Tourism Development Authority (SLTDA) could organise webinars, workshops, and cross-hotel partnerships.

4.4 Limitations of the Study

Although this study offers valuable insights, it has several limitations. Since the research was confined to the Colombo District, the findings may not accurately reflect the sustainable practices in resort or rural areas of Sri Lanka. Additionally, the study relied on self-reported statistics, which may be subject to bias or the overestimation of sustainability efforts. Furthermore, the exclusion of guest perspectives made it difficult to assess how customer demand influences the adoption of sustainable practices.

4.5 Future Suggestions

Future studies could address these limitations by expanding the scope to include rural and coastal regions to capture broader sustainability dynamics, incorporating guest perspectives to understand how consumer demand influences hotel strategies, and conducting longitudinal studies to track how sustainability adoption evolves and exploring the financial modelling of sustainability investments to assess cost-benefit outcomes for different hotel categories.

This research came into the conclusion that although the hotel industry in Colombo shows an increasing dedication to sustainable practices, the rate and extent of adoption differ greatly throughout classes.

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