

Integration of Green Operational Practices and Their Impact on Guest Perception in the Hotels of Madhya Pradesh, India

Gourav Namdeo*, Lokeshver Singh Jodhana, Pratap Singh Sisodia

Institute of Hotel Management - IPS Academy, Indore, 453331, India

*Corresponding Author's Email: gouravnamdeo786@gmail.com

Abstract

Introduction: This research analyzes the impact of sustainable operational practices on guest perceptions and satisfaction at hotels in Madhya Pradesh. With the growing importance of sustainability in hospitality management, hotels are beginning to implement energy-saving, water-saving, waste-reduction, and eco-friendly amenity practices. **Methods:** A mixed-method approach was utilized. Quantitative data were collected using structured questionnaires from 200 hotel guests, while qualitative data were gathered through follow-up interviews. Reliability and validity checks were conducted, and the quantitative data were analyzed using descriptive statistics and Partial Least Squares Structural Equation Modeling (PLS-SEM). **Results:** This finding is especially true for water-saving and energy-saving initiatives, which guests reported observing most frequently. Awareness of sustainability initiatives improves satisfaction, and the communication of these initiatives enhances perceptions and loyalty intentions. **Conclusion:** The research demonstrates that in Madhya Pradesh's hotel industry, adopting eco-friendly practices can enhance both the perceived value of services and customer satisfaction levels. To maximize the benefits of sustainability in hotel operations, effective communication, guest involvement, and the implementation of sustainability practices are crucial.

Keywords: Green Hotel Operations; Guest Perception; Hospitality Management; Madhya Pradesh; Sustainable Tourism

Introduction

Due to the significant consumption of water and electricity and the use of disposable supplies and food, sustainability has been strategically integrated into hospitality management (Kasim, 2007). The operation of hotels in an environmentally friendly manner is no longer perceived as compliance with legislative requirements. It is becoming increasingly linked to service, corporate social responsibility, brand and reputation, and customer relationships (Bohdanowicz, 2006). Previous literature established the relationship between operational sustainability and environmental responsibility in the hospitality industry (Manaktola & Jauhari, 2007). In contrast, the recent literature suggests that the green initiatives of hotels improve customer satisfaction and enhance behavioral intentions if customers believe the initiatives are authentic and well-implemented (Han *et al.*, 2019).

Green Operational Practices in Hotels

Hotels implement green operational practices by incorporating innovative techniques that help reduce the hotel's environmental footprint while maintaining the same quality of service to guests (Abdou *et al.*, 2022). Some of these practices are the use of energy-efficient bulbs, smart thermostats, the reuse of linens and towels, low-flow plumbing fixtures, segregation and recycling of waste, the use of biodegradable amenities, and eco-friendly purchasing (González-Viralta *et al.*, 2023). Recent research in the hotel industry highlights the positive impact of these practices on perceived value, trust, satisfaction, loyalty, and other positive customer-related outcomes, provided the practices are presented honestly and clearly, and guests are informed about the initiatives (Singh *et al.*, 2025).

Tourism Sustainability in Madhya Pradesh

The diverse offerings of Madhya Pradesh, including heritage tourism, wildlife reserves, pilgrimage circuits, and the burgeoning urban hospitality sector, provide an appropriate backdrop to study the sustainable hotel operation (Patil & Kanitkar, 2022). As tourism develops in the regions of Indore, Bhopal, Gwalior, Jabalpur, and others, hospitality providers are expected to strike a balance between the operational and eco-friendly aspects of service (Sahu & Nema, 2025). The recent studies of tourism and green hospitality in the Indian state of Madhya Pradesh justify the need to study the sustainability initiatives and implementation in the region and how they are perceived by the visitors (Wanie *et al.*, 2025).

Research Gap

Research on green hospitality has grown significantly, but as far as evidence goes for the Madhya Pradesh region, it is non-existent (Thai & Nguyen, 2022). Most of the literature on the subject has looked at green hotels from a pan-national/international perspective and has been content with looking at the general relationships of green practices and some mix of satisfaction, trust, and behavioral intention (Talakder & Faruk, 2025). Few studies examine how guests perceive sustainability initiatives, both visible and less visible, in a developing regional tourism market during their hotel stay (Zareh *et al.*, 2023). This is a critical gap in knowledge, as studies have shown that in the context of green hospitality, the lack of awareness, poor communication, and poor cue interpretation can lead to substantial negative outcomes in satisfaction, loyalty, and intentions to revisit (Çetinkaya *et al.*, 2026).

Research Objectives

This study will measure the extent to which guests are informed of eco-friendly operational methods used at hotels in Madhya Pradesh, determine the correlation between awareness and guest satisfaction, and investigate how the conveyance of sustainability practices impacts overall perception and loyalty intention.

Methodology

Research Design

A mixed-method design was implemented because the research problem demanded both an element of measurement and an element of interpretation (Creswell & Clark, 2017). From the quantitative part, structured evidence about the level of awareness and satisfaction was generated (Saunders *et al.*, 2019). On the other hand, qualitative interviews illustrated how guests noticed, interpreted, and assessed sustainability initiatives during their stay. This design type is appropriate for the hospitality field because it aims to merge statistical findings with the actual experience of guests (Hair *et al.*, 2021).

Study Area

The main hotel and tourism centers in Madhya Pradesh, involving Indore, Bhopal, Gwalior, and Jabalpur, were the focus of the study. The cities were chosen since they provide a variety of hotels and represent a considerable portion of the tourism and hospitality industry in the state.

Sampling Strategy

The chosen hotels meet the criteria for being star-rated, independent, and chain-affiliated properties. The chosen hotels employed convenience sampling for the selection of respondents. Given this combination, it was deemed appropriate to reach out to guests with recent and direct encounters with hotel operations.

Inclusion and Exclusion Criteria

The study participants were limited to hotel visitors aged 18 and older who had spent at least one night at the hotel and gave informed consent. To keep the study focused on guest perception, hotel staff and managers were excluded.

Data Collection Instruments

The data collection methods involved a structured survey and a semi-structured interview guide. The survey focused on respondents' socio-demographic data, their knowledge of green practices, and their level of satisfaction with the sustainability efforts of hotels. The interview guide helped the researcher gain more profound data concerning guests' recognition and appreciation, or, conversely, their indifference towards green operational practices. The semi-structured guide enabled uniformity across interviews while allowing additional flexibility to explore experiential responses in more depth (Kallio *et al.*, 2016).

Data Collection Procedure

With the consent of the hotels involved, guests were given a briefing about the study and invited to take part voluntarily. Initially, guests were given questionnaires, followed by interviews with some respondents to enrich the understanding of the questionnaires.

Data Analysis Techniques

The SmartPLS and SPSS software packages were used to perform descriptive statistics and inferential analysis, respectively. This study employs PLS-SEM primarily because it investigates the relationship of latent constructs regarding awareness, perception, satisfaction, and loyalty dimensions. Regarding the qualitative data, thematic analysis was used to capture guests' interpretations of their sustainability initiatives (Braun and Clarke, 2006). These methods are consistent with the descriptive recommendations for management and social science mixed methods with PLS-SEM (Hair *et al.*, 2021).

Conceptual Theoretical Framework

The framework proposes that a hotel's implementation of operational practices that are considerate of the environment raises guest consciousness, influencing their perception, satisfaction, and intent to remain loyal. Implementing energy-efficient systems, eco-friendly products, and other environmentally responsible initiatives should signal to guests that the hotel is responsible and environmentally considerate. The more guests notice these efforts, the more likely they will have a positive assessment and intent to return to the hotel.

The framework shows a positive correlation where hotels' green practices lead to increased guest awareness, which in turn impacts their environmental perception, and subsequently, positive perception enhances satisfaction and loyalty.

This study is grounded in the Theory of Planned Behavior (TPB) and Cue Utilization Theory, which clarify how individuals form perceptions and behavioral intentions based on observed cues and prior awareness. In the context of green hospitality, operational practices act as observable cues that shape guests' environmental perception and satisfaction.

The study conceptualizes the following constructs:

- Green Operational Practices (GOP) (independent variable)
- Guest Awareness (GA) (mediating variable)
- Guest Perception (GP)
- Guest Satisfaction (GS)
- Loyalty Intention (LI) (dependent variable)

Integration of Quantitative and Qualitative Data

Although the study primarily implements a quantitative approach using structured questionnaires, qualitative interviews were conducted to complement and validate the statistical findings. The qualitative insights were used to better understand how guests perceive and respond to green operational practices, thereby enhancing the robustness of the results through methodological triangulation.

Results

The findings suggested that hotel guests in Madhya Pradesh had the highest awareness regarding operational practices that were visible to them, especially those concerning water and energy conservation. Conversely, practices that were less visible to the guests, such as eco-certifications and local food sourcing, were associated with lower awareness.

Table 1: Guest Awareness of Green Operational Practices

Practice category	Percentage of Guests Aware (%)
Energy conservation	85
Water conservation	90
Waste management	70
Use of eco-certifications	60
Local sourcing of food	50

Table 1 illustrates that the greatest level of awareness is related to water conservation (90%) and energy conservation/waste management (85%), while waste management awareness was 70%. Eco-certification (60%) and local sourcing of food (50%) were the least acknowledged categories.

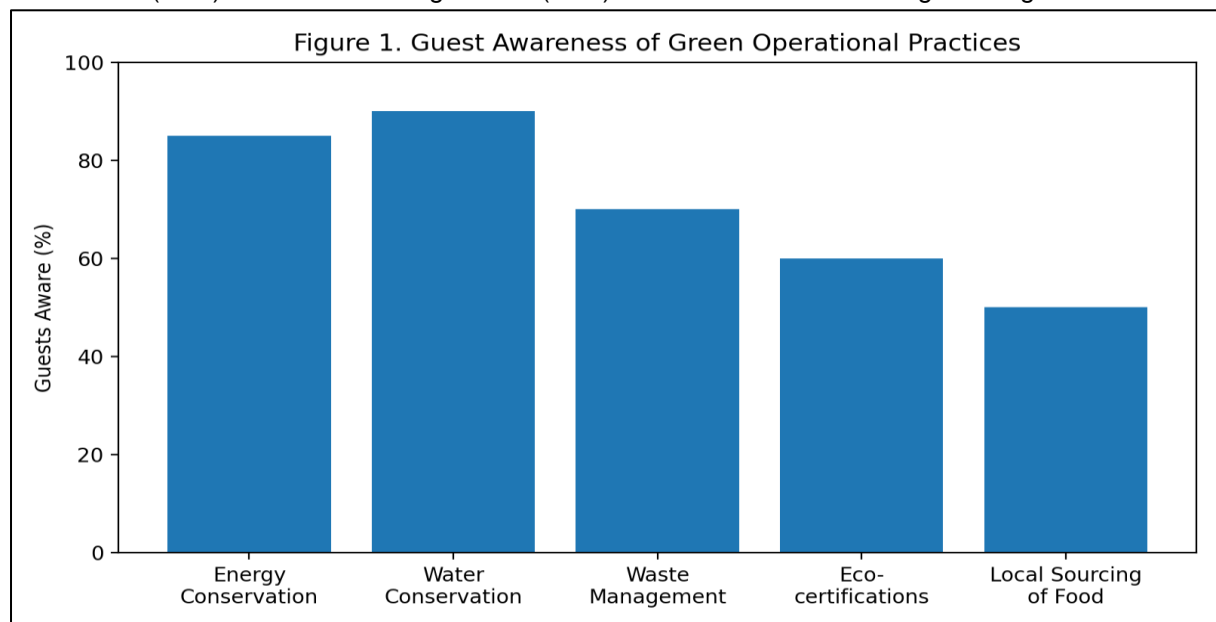


Figure 1: Guest Awareness of Green Operational Practices

Figure 1 visually captures this same trend and demonstrates that guests were generally more aware of operational measures that have a direct and immediate impact on their stay, such as water-saving devices and energy-saving light bulbs.

Data on guest satisfaction indicates significant discrepancies based on the level of awareness regarding the hotel’s green initiatives. Guests with a high level of awareness provided a mean satisfaction score of 4.2; in contrast, the score provided by guests with low awareness was 3.5.

Table 2: Impact of Green Operational Practices on Guest Satisfaction

Guest segment	Mean satisfaction score (1–5 Likert)
High green-aware guests	4.2 (SD 0.6)
Low green-aware guests	3.5 (SD 0.8)

Table 2 shows that respondents who were more aware of green operational practices reported more satisfaction.

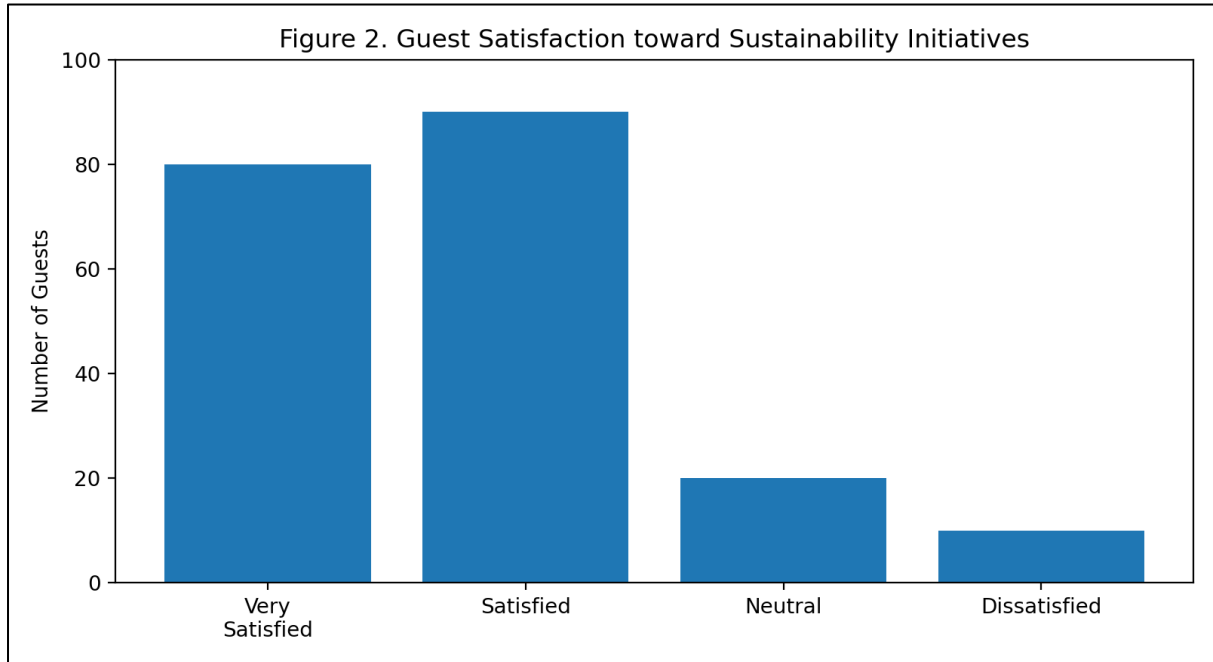


Figure 2: Guest Satisfaction toward Sustainability Initiatives

Figure 2 shows how respondents' satisfaction levels are distributed with respect to sustainability initiatives. The majority of respondents fell in the satisfied and very satisfied ranges. A minimal number reported being dissatisfied.

Findings from the Guest Interview

Qualitative Findings: Thematic Analysis

The qualitative data obtained from semi-structured interviews were analyzed using thematic analysis. Three major themes emerged:

Theme 1: Visibility Drives Awareness

Guests reported that visible initiatives such as towel reuse and energy-saving lighting were easily recognized.

“I noticed the towel reuse policy and LED lighting, which made me feel the hotel is environmentally responsible.” (Reply from one of the guests)

Theme 2: Lack of Communication Limits Perception

Several respondents indicated that some green practices were not clearly communicated.

“I am sure the hotel is doing more, but they don't inform guests properly about it.” (Reply from one of the guests)

Theme 3: Sustainability Enhances Satisfaction

Guests expressed that awareness of eco-friendly practices improved their overall experience.

“Knowing that the hotel follows eco-friendly practices made my stay more satisfying.”

(Reply from one of the guests)

These themes support the quantitative findings, highlighting the importance of awareness and communication.

Discussion

Guests recognize sustainability features they can see or easily understand, which helps improve their overall evaluation of the hotel stay (Robinot & Giannelloni, 2010). Prior research also documented this effect, noting that visible sustainability features and credibly positioned environmental marketing positively impact customer satisfaction and loyalty (Chang *et al.*, 2024).

The apparent lack of awareness of eco-certifications and local sourcing further emphasizes the necessity of clear communication (Po & Jiang, 2023). Sustainability initiatives may be visible to the hotel, but without communication, guests may perceive the hotel as lacking sustainability initiatives (Dedat & Rodrigues, 2025). Recent studies have found that when hotel activities, such as sustainability initiatives, are communicated clearly and in a customer-focused way, guests are able to form a 'green' image and 'green' trust. Ultimately, they perceive the hotel as sustainable and are more likely to return and show loyalty (Baser & Mutlu, 2025).

The current findings also align with the intention-based models applied to green hotel research (Chen & Tung, 2014). Books based on the theory of planned behavior and associated behavioral frameworks demonstrate that attitude, perceived control, trust, and environmental knowledge affect the intention to select or revisit green hotels (Yarimoglu & Gunay, 2020; Kim & Ha, 2022). The intention to visit a green hotel is significantly higher for guests who have had a past experience in these hotels when compared to those who have never previously stayed in green hotels (Ferreira *et al.*, 2025).

Furthermore, the most recent research demonstrates that green initiatives may influence satisfaction, engagement, behavioral intention, and consumer response through trust, service quality, and cue-based interpretation, including research published between 2025 and 2026 (Genç & Zengin, 2025; Singh *et al.*, 2025). Environmentally conscious guests feel more positive and confident in choosing green hospitality services, recognizing their contribution to both consumer well-being and environmental sustainability (Ru-Zhue *et al.*, 2025). Information-seeking behavior of the guest directly influences purchase decisions, highlighting the importance of ensuring that sustainability-related information is accurate, detailed, and easily accessible (Adepoju & Yeşilada, 2026).

Limitations

The study's cross-sectional design meant that responses from guests were collected at a single point, and the results indicate an association rather than a longitudinal causal effect. The sample was taken from specific hotels in large metropolitan areas of Madhya Pradesh, meaning the findings may not apply to smaller towns, rural areas, or different hotel categories within the state. The study relied on self-reported perception data, and respondents' assessments of sustainability initiatives may have been influenced by social desirability bias and recall issues. The focus was on guest awareness and satisfaction, rather than on environmental performance measures, such as actual savings in energy, water, waste, or emissions.

Conclusion

The study has determined that guest perceptions at hotels in Madhya Pradesh are shaped positively through the green operational practices that people notice during their stay. Several guests who were more aware of the sustainability practices at the hotel said that they were more satisfied with their stay. This indicates that there is a relationship between the communication of green practices and the perceived service value.

The results of this study indicate that sustainability is still an important environmental issue but is also a management issue and a competitive issue in the hospitality industry, as hotels that effectively

communicate their green practices can enhance guest satisfaction and loyalty. In Madhya Pradesh, hotels that gradually and strategically adopt green operational practices will enhance the guest experience, improve the hotel's image, and promote more sustainable destination development. The differences in the levels of perception of sustainable cues in the luxury, mid-scale, and budget categories of hotels will also become evident when conducting comparison studies across categories and levels of certification. The value of longitudinal studies is particularly notable regarding the evolution of awareness, trust, satisfaction, and loyalty over time, as the duration of the initiatives becomes more visible to guests.

Recommendations

Hotels in Madhya Pradesh must enhance how they communicate their sustainability initiatives through various channels, such as in-room materials, digital displays, reception communication, and operational signage. Additionally, programs to train hotel staff about sustainability initiatives should be improved to ensure they are well-equipped to promote these efforts. It's important not to trivialize the need to raise guest participation in reuse, recycling, and conservation initiatives. Sustainability messaging should also be integrated into the brand communication of hotels to build trust with environmentally conscious travelers. Pursuing eco-certification would further benefit hotels by demonstrating their commitment to sustainability. Furthermore, state-level recognition, incentives, or support mechanisms could encourage a wider adoption of green operational practices across various hotel categories.

CRedit Authorship Contribution Statement

G.N: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing - original draft. L.S.J: Supervision, Validation, Writing - review and editing. P.S: Supervision, Resources, Writing - review and editing.

AI Assistance Declaration

The authors applied generative AI tools exclusively for linguistic and grammatical refinements in the drafting of this manuscript. After these revisions, the authors elaborated on the changes made, justified the content, and accepted responsibility for the manuscript's final version.

Conflict of Interest

The authors declare that they have no conflicts of interest.

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