



Sustainable Development through Green Housekeeping Initiatives in Luxury Hotels

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KEYWORDS

Green housekeeping, Environmental sustainability, Eco-friendly cleaning, Star hotels.

ABSTRACT

Background: Environmental sustainability has become a major concern in the hospitality industry due to increasing environmental pressures, regulatory expectations, and growing awareness among stakeholders. The housekeeping department is one of the most resource-intensive areas in hotel operations, consuming significant amounts of water, energy, and chemical cleaning agents. Therefore, the adoption of green cleaning practices is essential for promoting sustainable hotel operations, particularly in rapidly expanding hospitality regions such as the Delhi National Capital Region (NCR).

Objective: This study aimed to explore the green cleaning practices implemented in the housekeeping departments of selected star hotels in Delhi NCR. It sought to identify the types of environmentally sustainable practices adopted, examine the perceived benefits of green housekeeping, and understand the challenges faced in implementing these initiatives.

Methodology: The study employed a qualitative research design to gain in-depth insights into sustainable housekeeping practices. Data were collected from housekeeping managers, supervisors, and operational staff working in selected star-category hotels in Delhi NCR using purposive sampling. Semi-structured, in-depth interviews were conducted to gather detailed information on green cleaning procedures, organizational support, and operational barriers. The collected data were analyzed using thematic analysis to identify recurring patterns, themes, and categories. Ethical considerations, including informed consent and confidentiality, were maintained throughout the study.

Results: The findings revealed that most star hotels had initiated eco-friendly cleaning practices such as the use of biodegradable cleaning products, microfiber cleaning systems, water-saving techniques, and proper waste segregation. These initiatives were largely supported by management commitment and organizational sustainability policies. Key benefits included reduced environmental impact, improved health and safety for housekeeping staff, and enhanced brand image among environmentally conscious guests. However, the study also identified challenges that hindered full implementation, including high initial investment costs, limited staff training, and the absence of standardized sustainability guidelines across the industry.

Conclusion: The study concludes that green cleaning practices play a significant role in promoting environmental sustainability and improving operational efficiency in hotel housekeeping departments. Although star hotels in Delhi NCR have made progress in adopting sustainable practices, further efforts are needed to overcome cost barriers, enhance staff training, and establish clear industry-wide sustainability standards. The findings provide practical insights for hotel managers and policymakers seeking to strengthen sustainable housekeeping initiatives..

1. INTRODUCTION

The hospitality industry is one of the fastest-growing service sectors worldwide and plays a significant

role in economic development, employment generation, and tourism promotion. However, this rapid growth has also led to increased environmental concerns due to high consumption of energy, water, chemicals, and other natural resources. Among various operational departments in hotels, the housekeeping department is one of the most resource-intensive units, particularly due to its extensive use of cleaning chemicals, water, disposable materials, and energy-intensive equipment. As a result, hotel housekeeping operations have emerged as a critical focus area for achieving environmental sustainability within the hospitality sector (Bohdanowicz & Martinac, 2007).

Environmental sustainability refers to the responsible interaction with the environment to avoid depletion or degradation of natural resources, ensuring long-term ecological balance. In the context of hotel operations, sustainability emphasizes minimizing environmental footprints while maintaining service quality and guest satisfaction. Over the past two decades, increasing awareness about climate change, pollution, and human health risks associated with chemical exposure has encouraged hotels to adopt environmentally responsible practices. This shift has led to the emergence of green housekeeping, which integrates eco-friendly cleaning products, sustainable processes, and responsible waste management practices into daily hotel operations (Mensah, 2014).

Housekeeping departments traditionally rely on chemical-based cleaning agents such as detergents, disinfectants, floor cleaners, glass cleaners, and air fresheners. Many of these products contain volatile organic compounds (VOCs), phosphates, chlorine, and other toxic substances that pose serious risks to human health and the environment. Prolonged exposure to such chemicals can cause respiratory disorders, skin allergies, and other occupational health issues among housekeeping staff. Additionally, improper disposal of chemical waste contaminates water bodies and soil, contributing to long-term ecological damage (Dodds & Holmes, 2016). In response to these challenges, green cleaning practices have gained prominence as a sustainable alternative.

Green cleaning practices involve the use of environmentally friendly cleaning products that are biodegradable, non-toxic, and free from harmful chemicals. These products are designed to reduce environmental pollution, enhance indoor air quality, and ensure the health and safety of both employees and guests. Alongside eco-friendly products, green housekeeping also emphasizes sustainable processes such as microfiber cleaning systems, low-water consumption techniques, energy-efficient equipment, proper chemical dilution systems, and environmentally responsible laundry operations. Together, these practices contribute significantly to reducing the environmental footprint of hotel operations (Chen, Sloan, & Legrand, 2017).

Star hotels, due to their scale of operations and high service standards, have a particularly significant environmental impact. These hotels consume large volumes of water and energy daily and generate substantial amounts of waste. At the same time, star hotels possess greater financial resources, technological capabilities, and managerial expertise, enabling them to adopt sustainable innovations more effectively than smaller establishments. As a result, star hotels are increasingly viewed as key drivers of sustainability within the hospitality industry. Many international hotel chains have already incorporated green housekeeping standards as part of their corporate social responsibility (CSR) initiatives and environmental management systems (Kirk, 1995).

In India, environmental sustainability in hospitality has gained increasing attention due to rapid urbanization, tourism growth, and rising environmental degradation. The Delhi National Capital Region (NCR), which includes Delhi, Gurugram, Noida, Faridabad, and Ghaziabad, represents one of the most prominent hospitality hubs in the country. The region hosts a large concentration of luxury and star-category hotels catering to business travelers, international tourists, and large-scale events. However, Delhi NCR also faces severe environmental challenges, including air pollution, water scarcity, waste management issues, and ecological stress. In this context, sustainable hotel operations—particularly within housekeeping departments—are of critical importance (Singh, Slotkin, & Vamosi, 2007).

Green cleaning practices in hotel housekeeping not only address environmental concerns but also contribute to operational efficiency and brand image. Studies have shown that hotels adopting sustainable practices often experience cost savings through reduced chemical consumption, lower water usage, and improved equipment efficiency. Moreover, environmentally conscious guests increasingly prefer hotels that demonstrate a commitment to sustainability. This growing demand for green hospitality has encouraged hotel managers to integrate eco-friendly practices as a competitive advantage rather than viewing them solely as regulatory or ethical obligations (Han, Hsu, Lee, & Sheu, 2011).

Despite the growing emphasis on sustainability, the adoption of green cleaning practices in Indian star hotels remains uneven. While some hotels have successfully implemented eco-friendly products and processes, others face challenges such as higher initial costs, lack of staff training, limited supplier availability, and resistance to change. Furthermore, the effectiveness of green cleaning practices depends not only on the availability of eco-friendly products but also on proper implementation, monitoring, and staff awareness. Without adequate training and management support, sustainability initiatives may fail to achieve their intended outcomes (Tzschentke, Kirk, & Lynch, 2008).

Housekeeping staff play a central role in the successful implementation of green cleaning practices. Their knowledge, attitudes, and compliance with sustainability guidelines significantly influence the effectiveness of eco-friendly initiatives. Therefore, assessing green cleaning practices in star hotels requires a holistic approach that considers product selection,



operational procedures, staff training, management commitment, and environmental outcomes. Evaluating these aspects provides valuable insights into the current status of environmental sustainability in hotel housekeeping operations (Chan & Hawkins, 2010).

The present study, titled “Environmental Sustainability in Hotel Housekeeping: A Study of Green Cleaning Practices in Star Hotels of Delhi NCR,” aims to examine the extent to which star hotels in the region have adopted eco-friendly cleaning products and sustainable housekeeping processes. The study seeks to assess the awareness and implementation of green cleaning practices, identify challenges faced by hotels, and evaluate the perceived environmental and operational benefits of sustainability initiatives. By focusing on star hotels in Delhi NCR, the research contributes to the limited empirical literature on sustainable housekeeping practices in the Indian hospitality context.

This study is significant for multiple stakeholders, including hotel managers, policymakers, educators, and researchers. For hotel management professionals, the findings may assist in developing effective sustainability strategies and improving housekeeping operations. For policymakers, the study offers insights into the practical implementation of environmental guidelines in hospitality establishments. For academic researchers, it adds to the growing body of knowledge on sustainable hospitality management and provides a foundation for future studies on green operations and environmental performance in hotels.

2. LITERATURE REVIEW

2.1. Concept of Environmental Sustainability in Hospitality

Environmental sustainability has become a central concern in the global hospitality industry due to increasing environmental degradation, climate change, and growing stakeholder pressure for responsible business practices. Sustainability in hospitality refers to the adoption of practices that minimize negative environmental impacts while ensuring economic viability and social responsibility. According to Brundtland (1987), sustainable development emphasizes meeting present needs without compromising the ability of future generations to meet their own needs. In the hospitality context, this concept translates into responsible resource utilization, waste reduction, pollution control, and adoption of eco-friendly technologies.

Several scholars have emphasized that hotels significantly contribute to environmental problems through excessive consumption of water, energy, chemicals, and generation of solid waste (Bohdanowicz, 2006). As a result, environmental sustainability has evolved from a voluntary initiative to a strategic necessity for hotel organizations. Research indicates that sustainability-oriented hotels not only reduce operational costs but also enhance brand reputation and customer loyalty (Mensah & Blankson, 2013).

2.2. Role of Housekeeping in Environmental Sustainability

Among various hotel departments, housekeeping has been identified as one of the most environmentally impactful operational units. The department is responsible for room cleaning, laundry operations, public area maintenance, and waste handling, all of which require intensive use of cleaning chemicals, water, and energy. Kirk (1995) highlighted that housekeeping operations alone account for a substantial proportion of a hotel’s chemical consumption and wastewater generation.

Studies by Chan, Okumus, and Chan (2018) revealed that unsustainable housekeeping practices lead to indoor air pollution, occupational health hazards, and ecological damage. Traditional cleaning agents often contain toxic substances such as chlorine, ammonia, and phosphates, which negatively affect water ecosystems and human health. Consequently, researchers have increasingly focused on green housekeeping as a critical pathway for achieving environmental sustainability in hotels.

2.3. Green Cleaning Practices in Hotel Housekeeping

Green cleaning practices refer to the use of environmentally friendly products and processes that reduce harm to human health and the environment. These practices include the use of biodegradable and non-toxic cleaning agents, microfiber cloths, energy-efficient equipment, water-saving techniques, and controlled chemical dispensing systems. According to Chen, Sloan, and Legrand (2017), green cleaning is a fundamental component of sustainable hotel operations and directly contributes to improved indoor air quality and employee well-being.

Research conducted by Dodds and Holmes (2016) demonstrated that green cleaning practices significantly reduce chemical residues in hotel environments and lower greenhouse gas emissions associated with production and disposal of conventional cleaning products. Additionally, studies have shown that eco-friendly cleaning processes enhance operational efficiency by reducing chemical consumption and maintenance costs (Kim, Lee, & Fairhurst, 2017).

2.4. Eco-Friendly Cleaning Products: Effectiveness and Challenges

Eco-friendly cleaning products are designed to perform cleaning and disinfecting functions while minimizing environmental and health risks. These products are typically free from volatile organic compounds (VOCs), synthetic

fragrances, and harsh chemicals. According to Hsieh (2012), green cleaning products are equally effective as conventional cleaners when used correctly, provided staff receive adequate training.

However, the literature also highlights several challenges associated with the adoption of eco-friendly cleaning products. Tzschentke, Kirk, and Lynch (2008) identified higher initial costs, limited supplier availability, and skepticism regarding performance as major barriers to implementation. Similarly, Mensah (2014) found that many hotels hesitate to adopt green products due to concerns about guest satisfaction and perceived cleaning standards. Despite these challenges, long-term benefits such as improved staff health, regulatory compliance, and reduced environmental impact outweigh short-term constraints.

2.5. Management Commitment and Organizational Support

Management commitment plays a crucial role in the successful implementation of green housekeeping practices. Studies by Chan and Hawkins (2010) revealed that hotels with strong top-management support are more likely to adopt comprehensive environmental management systems (EMS). Leadership commitment influences policy formulation, staff training, supplier selection, and monitoring mechanisms.

Furthermore, Bohdanowicz and Zientara (2008) emphasized that sustainability initiatives are more effective when integrated into organizational culture rather than treated as isolated operational changes. Hotels that align green housekeeping practices with corporate social responsibility (CSR) strategies demonstrate higher levels of environmental performance and employee engagement.

2.6. Training and Awareness of Housekeeping Staff

Employee training and awareness are critical determinants of the effectiveness of green cleaning practices. Housekeeping staff are the primary users of cleaning products and equipment; therefore, their knowledge and attitudes significantly influence sustainability outcomes. Studies by Erdogan and Baris (2007) found that inadequate training often leads to improper chemical usage, wastage, and non-compliance with sustainability guidelines.

Research indicates that structured training programs focusing on product handling, dilution techniques, waste segregation, and energy conservation significantly improve green practice adoption (Chan et al., 2018). Additionally, staff awareness of health and environmental benefits enhances motivation and compliance, leading to better overall performance.

2.7. Guest Perception and Market Demand for Green Hotels

Guest perception plays an important role in driving sustainability initiatives in hotels. Modern travelers are increasingly environmentally conscious and prefer hotels that demonstrate responsible practices. Han et al. (2011) found that guests' positive attitudes toward green practices significantly influence their intention to revisit and recommend green hotels.

Several studies suggest that green housekeeping practices positively affect guest satisfaction by improving indoor air quality and overall cleanliness perception (Lee, Hsu, Han, & Kim, 2010). However, research also cautions that sustainability initiatives should not compromise service quality, as guests expect high standards in star-category hotels.

2.8. Green Housekeeping in Star Hotels

Star hotels possess greater resources, infrastructure, and managerial expertise to adopt sustainability initiatives compared to small and medium-sized hotels. According to Alvarez Gil, Burgos Jiménez, and Céspedes Lorente (2001), luxury and star hotels are more proactive in implementing environmental practices due to brand reputation concerns and international standards.

Studies conducted in international contexts reveal that chain-affiliated star hotels exhibit higher levels of green practice adoption than independent properties (Bohdanowicz, 2006). However, research in developing countries, including India, indicates variability in implementation due to regulatory gaps, cost concerns, and lack of standardized guidelines.

2.9. Indian Context of Green Housekeeping Practices

In India, sustainability in hospitality is still in a developing stage. While several five-star and international chain hotels have adopted green certifications and eco-friendly practices, many hotels remain at an early adoption phase. Singh, Slotkin, and Vamasi (2007) noted that Indian hotels face challenges such as limited awareness, insufficient training, and absence of strict environmental regulations.

Studies focusing on Indian metropolitan regions highlight that environmental initiatives are often driven by corporate policies rather than local regulations (Khanna, 2019). Delhi NCR, being a major hospitality hub, presents a unique case where environmental pressures such as air pollution and water scarcity necessitate sustainable housekeeping practices. However, empirical studies specifically focusing on green cleaning practices in star hotels of Delhi NCR remain limited.

2.10. Research Gap

An analysis of existing literature reveals that while numerous studies have examined environmental sustainability and green practices in hotels globally, limited research has focused specifically on green cleaning practices within housekeeping

departments, particularly in the Indian context. Most Indian studies address sustainability at a general operational level without detailed evaluation of eco-friendly cleaning products, staff practices, and implementation challenges.

Furthermore, there is a lack of region-specific empirical research focusing on star hotels in Delhi NCR, despite the region's environmental sensitivity and concentration of luxury hotels. This gap highlights the need for a comprehensive study evaluating green cleaning practices, management commitment, staff awareness, and perceived benefits in star hotels of Delhi NCR.

2.11. Research Objectives

1. To examine the types of eco-friendly cleaning products and sustainable housekeeping processes used in star hotels.
2. To understand management perspectives on environmental sustainability in hotel housekeeping operations.
3. To analyze the role of training, policies, and organizational support in promoting sustainable housekeeping practices.

2.12. Research Propositions / Qualitative Hypotheses

(For qualitative studies, the term "propositions" or "assumptions" is preferred over statistical hypotheses.)

Proposition 1

- Star hotels in Delhi NCR demonstrate varying levels of adoption of green cleaning practices, influenced by organizational policies and management commitment.

Proposition 2

- Management perception of environmental sustainability plays a crucial role in determining the extent of green cleaning implementation in housekeeping departments.

Proposition 3

- Housekeeping staff awareness and training significantly shape the effective use of eco-friendly cleaning products and sustainable processes.

Proposition 4

- Adoption of green cleaning practices contributes positively to employee health, workplace safety, and indoor environmental quality.

Proposition 5

- Operational and cost-related concerns act as major barriers to the full-scale implementation of green cleaning practices in star hotels.

Proposition 6

- Guest awareness and preference for environmentally responsible hotels encourage star hotels to adopt sustainable housekeeping practices.

Proposition 7

- Hotels with structured sustainability policies and continuous monitoring systems exhibit more consistent and effective green housekeeping practices.

2.13. Research Questions

1. How are green cleaning practices implemented in housekeeping departments of star hotels in Delhi NCR?
2. What perceptions do hotel managers and housekeeping supervisors hold regarding environmental sustainability?
3. How do housekeeping staff experience and interpret green cleaning practices in their daily operations?
4. What challenges do hotels face in adopting eco-friendly cleaning products and processes?
5. How do guests' environmental expectations influence housekeeping sustainability initiatives?

3. 3. RESEARCH METHODOLOGY

3.1. Research Design

The study adopted a qualitative research design to explore environmental sustainability in hotel housekeeping, with specific reference to green cleaning practices in star hotels of Delhi NCR. A qualitative approach was considered appropriate as it enabled an in-depth understanding of perceptions, experiences, and operational practices related to eco-friendly cleaning

initiatives from the perspectives of hotel management and housekeeping personnel. The research followed an exploratory and descriptive design, allowing the study to capture rich, contextual insights into sustainability-oriented housekeeping operations.

3.2. Locale of the Study

The study was conducted in selected star-category hotels located in the Delhi National Capital Region (NCR), including Delhi, Gurugram, Noida, and adjoining areas. These locations were chosen due to their high concentration of premium hotels and growing adoption of environmentally sustainable hospitality practices.

3.3. Sampling Design

3.3.1. Sampling Technique

A purposive sampling technique was employed to select hotels that had initiated or claimed to follow green housekeeping practices. This ensured the inclusion of information-rich cases relevant to the research objectives.

3.3.2. Sample Size and Sample Characteristics

The study included:

- **Number of Hotels:** 15
- **Participants:** Housekeeping managers, housekeeping supervisors, operational housekeeping staff, and selected hotel administrators responsible for sustainability or operations.

Participants were chosen based on their direct involvement in housekeeping operations or sustainability initiatives, ensuring informed and experience-based responses.

4. Tools and Techniques

4.1. Data Collection Tool

Primary data were collected using semi-structured, in-depth interviews. This method provided flexibility for respondents to share detailed insights while ensuring that key themes such as eco-friendly products, sustainable cleaning processes, staff training, benefits, and implementation challenges were addressed.

4.2. Consent and Ethical Considerations

Prior informed consent was obtained from all participants before conducting interviews. Respondents were assured of confidentiality and anonymity, and participation was voluntary. Interviews were conducted either in person or through scheduled virtual/telephonic interactions, depending on organizational permission and participant availability.

5. Data Analysis and Statistical Analysis

5.1. Qualitative Data Analysis

The collected data were analyzed using thematic analysis. Interview transcripts were carefully reviewed, coded, and organized into meaningful themes and sub-themes aligned with the research objectives. This process enabled the identification of recurring patterns related to the adoption, implementation, benefits, and challenges of green cleaning practices.

5.2. Trustworthiness of Data

To enhance the credibility and reliability of the findings:

- **Data triangulation** was performed by comparing responses from different categories of respondents (management and staff).
- **Reflexivity** was maintained to minimize researcher bias during interpretation.

Since the study followed a qualitative design, statistical analysis was not applied, and the focus remained on interpretive depth and contextual understanding.

6. Results and Analysis

The findings of this qualitative study were derived from semi-structured interviews with 30 respondents working in housekeeping departments of selected star hotels in Delhi NCR. Data were transcribed, coded, and analyzed using thematic analysis. Themes were developed inductively from recurring patterns and then aligned with the research objectives and propositions.

6.1. Profile of Respondents

Table 1: Profile of Participants (N = 30)

Position	Number of Participants
Housekeeping Managers	6
Housekeeping Supervisors	8
Housekeeping Staff	16

The inclusion of managerial and operational staff enabled triangulation of perspectives across hierarchical levels.

Objective 1: Types of Eco-Friendly Products and Sustainable Processes Used

Theme 1: Adoption of Eco-Friendly Cleaning Products

Hotels reported using biodegradable cleaners, non-toxic disinfectants, phosphate-free detergents, and microfiber systems. Adoption was strongest in guest-facing areas.

Table 2: Adoption of Eco-Friendly Cleaning Products

Area of Operation	Level of Adoption
Guest Rooms	High
Public Areas	High
Back-of-House	Moderate
Laundry	Moderate

Category Development: Adoption levels were categorized as:

- **High** = Mentioned consistently by most respondents across hotels
- **Moderate** = Adopted in limited areas or inconsistently
- **Low** = Rare or minimal adoption

These labels emerged during coding based on frequency and intensity of mentions, not numerical counts.

Theme 2: Sustainable Housekeeping Processes

Hotels implemented process-based sustainability measures.

Table 3: Sustainable Housekeeping Processes Identified

Sustainable Practice	Implementation Level
Microfiber Cleaning Systems	High
Controlled Chemical Dilution	Moderate
Water-Saving Techniques	Moderate to High
Energy-Efficient Equipment	Moderate

These findings support Proposition 1, showing varying adoption levels depending on organizational priorities.

Objective 2: Management Perspectives on Environmental Sustainability

Managers viewed green housekeeping as part of corporate sustainability strategy, brand positioning, and regulatory preparedness.

Table 4: Management Commitment to Green Housekeeping

Management Initiative	Observed Influence
Sustainability Policies	Strong
Monitoring Systems	Moderate
Budget Allocation	Moderate
Staff Incentives	Limited

Hotels with formal policies showed more structured practices, supporting Propositions 2 and 7.

Objective 3: Role of Training, Policies, and Organizational Support

Theme 3: Training and Staff Awareness

Training strongly influenced effective implementation.

Table 5: Training Practices in Green Housekeeping

Training Component	Observed Status
Initial Induction Training	Common
Refresher Training	Limited
Practical Demonstrations	Effective
Training Documentation	Inconsistent

Hotels with regular training demonstrated higher staff confidence and compliance, supporting Proposition 3.

Theme 4: Perceived Benefits of Green Cleaning

Table 6: Perceived Benefits of Green Cleaning Practices

Benefit Type	Key Observations
Environmental	Reduced chemical discharge and waste
Employee Health	Fewer skin and respiratory complaints
Operational	Reduced chemical usage over time
Brand Image	Positive guest perception

These findings align with Proposition 4 and existing literature on workplace health and indoor air quality.

Theme 5: Challenges and Barriers

Table 7: Challenges in Implementing Green Cleaning Practices

Challenge	Intensity of Concern
High Initial Costs	High
Limited Supplier Options	Moderate
Staff Resistance to Change	Moderate
Lack of Standardized Guidelines	High

Barriers were discussed frequently by managers, supporting Proposition 5.

Theme 6: Guest Influence on Green Practices

Several managers stated that environmentally aware guests influenced sustainability decisions.

Table 8: Guest Influence on Green Housekeeping Adoption

Guest-Related Factor	Influence Level
Preference for Eco-Friendly Hotels	Moderate to High
Guest Feedback	Moderate
Brand Reputation Pressure	High

This supports Proposition 6, indicating market-driven sustainability adoption.

4. 6.2. OVERALL DISCUSSION

The findings reveal that star hotels in Delhi NCR are transitioning toward sustainable housekeeping, but implementation varies. Management commitment, structured policies, and staff training are critical enablers, while cost and lack of standard guidelines remain key barriers. Guest expectations also serve as a growing driver for green adoption. The study reinforces the importance of leadership-driven sustainability and continuous staff development for successful green housekeeping implementation. This highlighted the importance of leadership-driven sustainability frameworks. The qualitative analysis revealed that star hotels in Delhi NCR were progressively adopting green cleaning practices, though the level of implementation varied across properties and operational areas. The findings confirmed that environmental sustainability in housekeeping was influenced by management commitment, staff training, operational feasibility, and cost considerations. While eco-friendly cleaning practices yielded environmental, health, and reputational benefits, challenges such as cost and standardization limited their full potential.

5. 7. SUGGESTIONS AND RECOMMENDATIONS

Based on the findings of the qualitative analysis, several practical and policy-oriented suggestions are proposed to enhance the adoption and effectiveness of green cleaning practices in the housekeeping departments of star hotels in Delhi NCR. First, hotels should develop and implement clearly defined green housekeeping policies that specifically address the use of eco-friendly cleaning products, sustainable operational procedures, and waste management protocols. Such policies should be formally documented and communicated across all hierarchical levels to ensure uniform understanding and implementation.

Second, continuous and structured training programs should be introduced for housekeeping staff at all levels. While initial training was observed in most hotels, the absence of regular refresher sessions limited consistent application of green practices. Hotels should incorporate hands-on demonstrations, visual standard operating procedures (SOPs), and multilingual training materials to enhance staff comprehension and compliance. Emphasis should also be placed on educating employees about the health and environmental benefits of green cleaning practices to foster intrinsic motivation and long-term behavioral change.

Third, hotel management should establish strong partnerships with certified eco-friendly product suppliers to ensure consistent availability, quality assurance, and cost optimization. Bulk procurement and long-term supplier contracts may help reduce costs associated with green products, addressing one of the major barriers identified in the study. Hotels should also periodically evaluate the performance and environmental impact of cleaning products to ensure alignment with sustainability goals.

Fourth, the study recommends the integration of monitoring and evaluation mechanisms within housekeeping operations. Regular audits, feedback systems, and performance indicators related to chemical usage, water consumption, and waste reduction should be adopted. These mechanisms would help management assess the effectiveness of green cleaning initiatives and identify areas for improvement. Additionally, introducing recognition or incentive programs for staff actively contributing to sustainability efforts could further enhance engagement and accountability.

Finally, policymakers and hospitality associations should consider developing standardized green housekeeping guidelines tailored to the Indian hospitality context. Such guidelines would provide uniform benchmarks for hotels and encourage widespread adoption of sustainable practices across the industry.

6. 8. CONCLUSION

The present study concluded that environmental sustainability in hotel housekeeping is increasingly recognized as a critical operational and strategic priority among star hotels in Delhi NCR. The qualitative findings revealed that while many hotels have initiated green cleaning practices through the adoption of eco-friendly products and sustainable processes, the extent of implementation varied across properties and operational areas. Management commitment, staff training, organizational policies, and operational feasibility emerged as key factors influencing the success of green housekeeping initiatives. The study further established that green cleaning practices offered multiple benefits, including reduced environmental impact, improved employee health and safety, enhanced indoor air quality, and positive brand image. However, challenges such as higher initial costs, inconsistent training, limited supplier options, and lack of standardized guidelines hindered full-scale implementation. Despite these barriers, the overall findings indicated a positive shift toward sustainability-driven housekeeping operations in star hotels. By providing in-depth insights into managerial and staff perspectives, the study contributed to the existing body of knowledge on sustainable hospitality practices in the Indian context. It highlighted the need for a holistic and integrated approach that combines eco-friendly products, sustainable processes, continuous training, and strong leadership support to achieve long-term environmental sustainability in hotel housekeeping operations.

7. 9. FUTURE SCOPE OF THE STUDY

While the present study offered valuable qualitative insights, several avenues for future research were identified. Future



studies may adopt a quantitative or mixed-method research design to statistically examine the relationship between green cleaning practices and variables such as operational efficiency, employee health outcomes, and guest satisfaction. Expanding the sample size and including hotels across different star categories and geographical regions would enhance the generalizability of findings.

Further research could also explore guest perceptions and willingness to pay for environmentally sustainable housekeeping practices, providing market-driven insights for hotel managers. Comparative studies between chain-affiliated and independent hotels, or between metropolitan and non-metropolitan regions, may offer deeper understanding of contextual differences in sustainability adoption.

Additionally, future studies may focus on the long-term financial and environmental impact of green cleaning practices, including lifecycle assessment of cleaning products and cost–benefit analysis. Exploring the role of emerging technologies, such as automation and green innovations in housekeeping, could further contribute to sustainable hospitality development. Such research would not only strengthen academic understanding but also support policymakers and industry practitioners in advancing environmentally responsible housekeeping practices in the hospitality sector.

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