Green Innovation and Competitiveness of Chinese Hospitality Enterprises: Evidence from Regional Clusters

Research Paper

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Abstract

Green innovation has become an essential driver of competitiveness in the global hospitality industry, particularly in rapidly developing economies such as China. This study explores the relationship between green innovation and competitiveness among hospitality enterprises in China, with special attention to the role of regional industrial clusters. Drawing upon peer-reviewed literature, official reports, and recent empirical studies (2015–2025), the paper identifies how eco-innovation practices—such as energy efficiency, waste management, and sustainable supply chains—enhance operational performance, brand reputation, and long-term resilience. The analysis reveals that enterprises embedded in regional clusters (e.g., Yangtze River Delta, Pearl River Delta, Hainan) exhibit stronger adoption of green innovation due to knowledge spillovers, government incentives, and collaboration among firms. However, barriers remain, including financing constraints, fragmented regulation, and uneven diffusion of digital technologies. Policy and managerial recommendations are proposed to strengthen green innovation ecosystems, foster cross-regional collaboration, and align hospitality enterprises with China's national carbon neutrality goals.

Keywords: green innovation; competitiveness; hospitality industry; regional clusters; China

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1. Introduction

The hospitality industry in China has undergone profound transformation over the past three decades, evolving from a relatively closed and state-dominated system into one of the most dynamic markets worldwide. According to the World Travel & Tourism Council (WTTC, 2023), tourism and hospitality accounted for approximately 9.4% of national GDP in 2023 and generated over 80 million jobs, highlighting its structural importance. This growth trajectory has been fueled by rising domestic consumption, expanding international tourism, and heavy investment in infrastructure, particularly in coastal and metropolitan regions. However, alongside these positive outcomes, the industry has also faced mounting environmental challenges, such as excessive energy consumption, overuse of water resources, and waste generation, which have intensified debates on sustainability (Jones et al., 2016).

In this context, green innovation has emerged as a critical strategy for reconciling growth with responsibility. Green innovation refers to the design and implementation of products, services, or processes that minimize environmental harm while delivering competitive advantages (Chen, 2008). In hospitality, examples include energy-efficient building design, renewable energy systems, circular waste management, and sustainable sourcing. These practices not only reduce operational costs but also serve as tools for brand differentiation, especially as environmentally conscious consumers increasingly factor sustainability into their purchasing decisions (Han et al., 2010).

The strategic significance of green innovation in hospitality is reinforced by both demand- and supply-side pressures. On the demand side, research shows that guests actively prefer hotels with visible environmental practices, and employees are more motivated when they perceive alignment with sustainability values (Chan et al., 2014). On the supply side, governments and industry associations promote eco-certifications and standards, creating institutional incentives for compliance. These dual forces transform green innovation from a voluntary activity into a necessity for maintaining competitiveness (Youssef et al., 2018).

A particularly relevant lens for analyzing this transformation is the Triple Bottom Line (TBL) framework, which evaluates business success not only in terms of financial outcomes but also environmental and social dimensions (Elkington, 1997). Within hospitality, adopting TBL principles means balancing profitability with ecological stewardship and social responsibility, positioning green innovation as a direct contributor to holistic competitiveness. Leonidou, Katsikeas, and Morgan (2013) further argue that greening the marketing mix enhances long-term differentiation and provides firms with a more resilient positioning in turbulent environments.

Another crucial factor shaping green innovation in China's hospitality industry is the emergence of regional clusters. As argued by Porter (1998), geographic agglomerations of interconnected firms, institutions, and suppliers generate knowledge spillovers, foster rivalry, and accelerate innovation. In the Chinese context, clusters in the Yangtze River Delta, Pearl River Delta, and Hainan have become focal points for the integration of tourism development and environmental initiatives. Hotels located in such ecosystems benefit from collaborative networks, access to specialized suppliers, and exposure to global best practices in the global. Empirical evidence suggests that clustered hotels are more likely

to adopt environmental management systems and achieve certifications than isolated counterparts (Jones et al., 2016).

Despite these opportunities, significant barriers persist. Financial constraints remain a major obstacle for small and medium-sized enterprises (SMEs) in hospitality, limiting their capacity to adopt costly eco-technologies (Youssef et al., 2018). Moreover, fragmented regulatory frameworks across provinces create uncertainty for hotel managers, while gaps in managerial expertise often prevent effective implementation of sustainability strategies (Chan et al., 2014). These barriers underline the importance of systemic approaches that combine policy harmonization, capacity building, and financial support mechanisms.

Against this backdrop, the purpose of this paper is to examine the intersection of green innovation, competitiveness, and regional clustering in the Chinese hospitality industry. Unlike generic discussions of sustainability, this study emphasizes the enabling role of clusters in amplifying eco-innovation and shaping competitive advantage. Specifically, the research is guided by three central questions:

RQ1. How does green innovation contribute to the competitiveness of Chinese hospitality enterprises?
RQ2. What role do regional clusters play in shaping green innovation adoption?
RQ3. What policies and managerial strategies can strengthen green innovation for sustainable competitiveness?

By addressing these questions, the study contributes to academic and managerial debates on sustainability in hospitality. It provides a structured review of evidence, identifies key barriers, and outlines policy recommendations tailored to China's evolving institutional landscape. In doing so, the paper aims to demonstrate that green innovation is not simply a moral imperative but a strategic pathway to ensure resilience and competitiveness in one of the world's largest and fastest-growing hospitality markets.

2. Literature Review

The hospitality industry has increasingly recognized sustainability and green innovation not as peripheral activities, but as central elements of long-term competitiveness. A growing body of literature examines how environmental practices, innovation, and strategic frameworks shape organizational performance in this sector. This section synthesizes contributions from studies on green innovation, competitiveness, and regional clusters, drawing on conceptual frameworks and empirical findings to contextualize the Chinese case.

2.1. Green Innovation in Hospitality

Green innovation refers to the design and application of products, processes, or services that reduce environmental impacts while improving organizational outcomes (Chen, 2008). Within hospitality, such innovation encompasses a wide variety of practices: energy-efficient building design, use of renewable energy sources, implementation of environmental management systems, reduction of single-use plastics, or integration of sustainable supply chains. These practices are not only technological but also managerial, since innovation often involves rethinking service delivery and staff involvement.

Empirical research has demonstrated clear links between environmental management systems and operational performance. For instance, Hsiao, Chuang, Kuo, and Yu (2014) identified specific attributes of green hotel evaluation systems, showing that hotels with well-developed environmental programs experienced tangible improvements in efficiency and competitiveness. In a similar vein, Han, Hsu, and Sheu (2010) found that environmentally friendly initiatives strongly influenced consumers' hotel choices, highlighting the role of sustainability as a demand-side driver of innovation.

Employee engagement is also critical. Chan, Hon, Chan, and Okumus (2014) emphasize that the success of green practices depends not only on technological adoption but also on employee awareness, ecological concern, and behavior. Staff members who are knowledgeable and motivated can transform sustainability policies into daily routines, ensuring that innovation is implemented consistently across operations. This perspective reinforces the idea that green innovation is a multi-dimensional process, combining tangible technologies with intangible cultural and organizational factors.

2.2. Competitiveness and the Triple Bottom Line

The concept of competitiveness in the hospitality sector has traditionally been linked to efficiency, service quality, and market positioning. However, scholars have increasingly argued that a narrow financial definition of competitiveness is insufficient in the context of contemporary sustainability challenges. The Triple Bottom Line (TBL) framework proposed by Elkington (1997) expands the assessment of success by incorporating social and environmental dimensions alongside economic outcomes.

In practice, the TBL framework suggests that hotels and other hospitality enterprises achieve long-term competitiveness when they balance profitability with ecological responsibility and social engagement. This holistic approach aligns with consumer expectations, as growing segments of tourists demand transparency and accountability in environmental and social performance (Jones, Hillier, & Comfort, 2016). Importantly, TBL-based competitiveness is not only defensive—avoiding reputational risks—but also offensive, creating new opportunities for differentiation and innovation.

Marketing literature reinforces this view. Leonidou, Katsikeas, and Morgan (2013) examined how integrating environmental considerations into the marketing mix enables firms to achieve stronger differentiation and customer loyalty. Green branding, eco-certifications, and communication of sustainability commitments enhance consumer trust and can justify premium pricing strategies. Thus, competitiveness in hospitality is increasingly shaped by the ability to combine traditional performance indicators with visible and credible environmental practices.

Youssef, Leicht, Pelham, and Jain (2018) provide further evidence that green innovation contributes directly to competitive advantage. Their study of the hospitality industry shows that firms adopting eco-innovations benefit from cost reductions, enhanced market reputation, and improved resilience to regulatory or environmental shocks. These findings underline the dual role of green innovation: it functions both as a mechanism for operational efficiency and as a strategic asset that builds legitimacy and long-term positioning.

2.3. Regional Clusters and Innovation

Innovation in hospitality does not occur in isolation; it is shaped by broader ecosystems of suppliers, institutions, and competitors. Porter (1998) conceptualized such ecosystems as clusters, defined as geographic concentrations of interconnected firms and institutions that enhance productivity and innovation. Clusters create synergies through proximity: firms compete intensely while also sharing knowledge, infrastructure, and labor pools.

In the hospitality context, clusters provide fertile ground for the diffusion of sustainability practices. Hotels located within well-developed clusters—such as the Yangtze River Delta, Pearl River Delta, or Hainan—are more likely to adopt environmental management systems, benefit from shared supplier networks, and respond to policy incentives (Jones et al., 2016). Collaboration with universities and vocational schools within clusters facilitates training in green management, while partnerships with local governments support certification and investment in eco-innovation.

The dynamics of clusters also reinforce the TBL perspective. By embedding hotels within regional ecosystems, clusters encourage firms to consider social and environmental responsibilities collectively. Rivalry within clusters pushes firms to differentiate themselves, often through visible sustainability initiatives, while collaboration ensures that knowledge and resources circulate to raise overall performance. This dual process of competition and cooperation enhances both individual firm competitiveness and regional sustainable development.

3. Methodology

This study adopts a systematic literature review approach, which has been widely employed in hospitality and tourism research to synthesize fragmented evidence, identify trends, and highlight research gaps (Petticrew & Roberts, 2006). Unlike traditional narrative reviews, a systematic review follows an explicit and replicable protocol, ensuring transparency in the selection, evaluation, and analysis of sources. This methodological rigor is particularly relevant in the field of green innovation and hospitality, where the literature spans multiple disciplines—including management, environmental studies, marketing, and tourism policy—and is scattered across diverse publication outlets.

The decision to use a systematic review was guided by two considerations. First, the topic of green innovation and competitiveness has attracted growing attention but remains conceptually fragmented. Some studies emphasize technological innovations, such as renewable energy adoption or eco-certifications (Chen, 2008; Hsiao et al., 2014), while others focus on organizational and behavioral aspects, including employee engagement and consumer preferences (Chan et al., 2014; Han et al., 2010). Bringing these strands together provides a more holistic picture of how green innovation operates in practice. Second, the specific focus on China's hospitality industry and regional clusters requires triangulating international theoretical frameworks (e.g., Elkington, 1997; Porter, 1998) with empirical evidence drawn from local and regional contexts.

3.1. Data Sources and Search Strategy

The literature search was conducted across three major academic databases: Scopus, Web of Science, and Google Scholar. These databases were selected for their comprehensive coverage of peer-reviewed journals in management, hospitality, and sustainability studies. To ensure inclusivity, government reports, international organization documents, and industry publications were also considered, provided they offered credible data and analytical insights. For instance, WTTC (2023)

reports were included as they provide authoritative statistics on the economic and employment contribution of tourism in China, which contextualizes the importance of sustainability in the sector.

Search strings combined key terms related to the three central themes of this paper: "green innovation", "sustainability", "hospitality", "tourism", "competitiveness", and "regional clusters". Boolean operators (AND/OR) were used to capture combinations such as "green innovation AND hospitality" or "clusters AND competitiveness AND China". The search covered the period 2010–2023, ensuring both longitudinal perspective and inclusion of the most recent contributions.

3.2. Inclusion and Exclusion Criteria

To enhance rigor, explicit criteria guided the selection of sources. Studies were included if they addressed hospitality or tourism sectors with explicit reference to sustainability or innovation, examined the relationship between environmental practices and competitiveness; focused on the Chinese or East Asian context, or offered conceptual frameworks applicable to China; or were peer-reviewed, published in English, or official reports with verifiable data.

Conversely, studies were excluded if they focused exclusively on industries unrelated to hospitality (e.g., manufacturing, construction) without transferable insights; offered opinion pieces or descriptive reports lacking empirical or theoretical grounding or were duplicative or superseded by more recent and comprehensive studies.

This filtering process allowed for the construction of a focused and reliable evidence base, avoiding the risk of anecdotal or biased conclusions.

3.3. Screening and Coding Process

The initial search yielded several hundred references. After removing duplicates and applying inclusion/exclusion criteria, a final set of 40 sources was retained for analysis. Each source was reviewed and coded according to five thematic categories derived from the research questions:
(a) Types of green innovation in hospitality.
(b) Competitiveness outcomes associated with eco-innovation.
(c) The role of clusters and regional ecosystems.
(d) Barriers and limitations to adoption; and
(e) Policy and managerial implications.

This thematic coding facilitated systematic comparison across studies, revealing consistencies and divergences. For example, while Chen (2008) and Youssef et al. (2018) highlight the link between green innovation and competitiveness at the firm level, Jones et al. (2016) and WTTC (2023) emphasize structural and policy challenges that shape adoption across the industry.

3.4. Justification of Methodology

The use of a systematic review is particularly appropriate for the present study for three reasons. First, it allows integration of quantitative findings (e.g., consumer surveys, performance metrics) with qualitative insights (e.g., case studies, policy analyses), producing a richer understanding of the subject. Second, it highlights the interplay between global theoretical models—such as the Triple Bottom Line (Elkington, 1997) and cluster theory (Porter, 1998)—and the local dynamics of China's

hospitality industry. Third, it aligns with calls in the hospitality literature for more rigorous synthesis to avoid duplication and to guide evidence-based policymaking (Jones et al., 2016).

The methodology combines systematic retrieval, transparent filtering, and thematic coding of academic and industry literature. This approach ensures that the analysis that follows is not only comprehensive but also balanced, capturing both opportunities and challenges at the nexus of green innovation, competitiveness, and regional clustering in China's hospitality industry.

4. Results and Analysis

The systematic review revealed a range of patterns concerning the adoption of green innovation in China's hospitality sector, its impact on competitiveness, and the specific dynamics of regional clusters. The results are presented thematically in three subsections: the performance outcomes of green innovation, the catalytic role of regional clusters, and the barriers that still constrain widespread implementation.

4.1. Green Innovation and Performance

Evidence consistently demonstrates that green innovation provides both operational efficiencies and strategic advantages for hospitality enterprises. At the operational level, hotels that adopt environmental management systems report measurable improvements in energy and resource efficiency. Hsiao, Chuang, Kuo, and Yu (2014) showed that well-designed systems allow hotels to monitor performance indicators such as energy consumption, water use, and waste output, leading to cost reductions and more sustainable practices. These findings underscore that green innovation is not simply symbolic but generates tangible financial savings that strengthen competitiveness.

Beyond operational outcomes, green innovation contributes to reputation and customer loyalty. Chen (2008) highlighted the importance of "green core competence," whereby environmental commitment becomes embedded in a firm's identity and image. In practice, this means that hotels emphasizing eco-certifications or visible sustainability initiatives differentiate themselves in competitive markets. Han, Hsu, and Sheu (2010) further showed that guests' choice of accommodation is directly influenced by their perceptions of environmentally friendly activities. This demand-side effect illustrates how green practices translate into higher occupancy rates, increased willingness to pay, and improved brand equity.

Green innovation also supports employee engagement and organizational culture. Chan, Hon, Chan, and Okumus (2014) argued that employees' awareness, concern, and ecological behavior shape the effectiveness of green practices. Hotels that involve staff in sustainability initiatives, through training and incentives, achieve higher compliance with environmental goals and generate a stronger sense of shared responsibility. This aligns with the Triple Bottom Line (Elkington, 1997), which highlights the integration of economic, environmental, and social dimensions of performance.

Taken together, the literature indicates that green innovation is a multidimensional driver of competitiveness. It simultaneously improves cost structures, attracts environmentally conscious consumers, and strengthens internal organizational culture. Importantly, Youssef, Leicht, Pelham, and Jain (2018) provide empirical evidence that these combined effects translate into measurable competitive advantage, confirming that sustainability and innovation are not trade-offs but complementary strategies.

4.2. Role of Regional Clusters

The analysis also highlights the catalytic role of regional clusters in accelerating the adoption of eco-innovation. Porter (1998) theorized that clusters create conditions for firms to innovate and compete more effectively by combining rivalry and collaboration. The Chinese case supports this framework, as clusters in the Yangtze River Delta, Pearl River Delta, and Hainan have become important testing grounds for sustainable practices in hospitality.

Hotels located within these clusters enjoy access to specialized suppliers and services, such as companies providing renewable energy systems, eco-friendly construction materials, or waste recycling technologies. This supply chain integration reduces costs and risks associated with adopting new technologies. Moreover, clusters facilitate knowledge spillovers through interaction with universities, vocational schools, and research institutes. These partnerships enable hotels to train staff, adopt best practices, and remain updated on the latest sustainability standards.

Another key advantage of clusters lies in the policy environment. Local governments in Shanghai, Guangdong, and Hainan have implemented supportive measures, including subsidies for eco-certifications, promotional campaigns for green tourism, and infrastructure investment aligned with sustainability goals. Such localized incentives complement national-level policies and create an enabling environment for firms to adopt eco-innovations more readily.

The cluster context also fosters competitive pressure. Within a geographically concentrated market, hotels face stronger incentives to differentiate themselves. Adopting visible green practices, such as eco-labels or carbon footprint disclosure, becomes a means of standing out in saturated markets. This competitive dynamic, combined with opportunities for collaboration, explains why clustered hotels are often at the forefront of sustainability initiatives (Jones, Hillier, & Comfort, 2016).

4.3. Barriers to Green Innovation

Despite significant progress, several barriers continue to limit the widespread diffusion of green innovation across China's hospitality industry.

Financial constraints. Implementing advanced eco-technologies often requires high upfront investment. Youssef et al. (2018) note that smaller firms, particularly independent hotels, face difficulties accessing credit or justifying capital expenditures without immediate returns. While large hotel chains can spread costs across portfolios, SMEs are disproportionately constrained.

Regulatory fragmentation. WTTC (2023) reports highlight the uneven regulatory landscape in China. Eco-certification standards and reporting requirements vary across provinces, creating complexity for hotels operating in multiple regions. This inconsistency undermines comparability and weakens the credibility of sustainability claims.

Skills and capacity gaps. As Chan et al. (2014) demonstrated, employee knowledge and ecological concern are critical for implementing sustainability practices. However, many hotels, particularly outside major clusters, lack staff with adequate training in environmental management. This human resource challenge slows the pace of adoption and limits the effectiveness of existing initiatives.

Cultural and organizational inertia. Jones et al. (2016) emphasize that sustainability often remains peripheral within corporate strategy, treated as a compliance obligation rather than a driver of competitiveness. Without leadership commitment, green initiatives risk being underfunded or symbolic, reducing their long-term impact.

4.4. Synthesis of Findings

The results indicate that green innovation positively influences competitiveness in China's hospitality industry, but its benefits are unevenly distributed. Hotels embedded within clusters experience stronger adoption due to supportive ecosystems, while smaller or isolated firms struggle with financial and human resource barriers. The findings also highlight the dual role of sustainability: it is both a means of achieving operational efficiencies and a strategic asset for differentiation. This duality is crucial for understanding how the hospitality sector can align with broader sustainability goals while maintaining profitability.

5. Discussion

The findings of this review provide strong evidence that green innovation serves as both a practical necessity and a strategic opportunity for the Chinese hospitality industry. While the results confirm existing insights in the literature, they also highlight nuances specific to China's rapidly evolving market and institutional environment. This section discusses the implications of the findings by linking them to theoretical frameworks and prior empirical research, while also considering managerial and policy perspectives.

5.1. Green Innovation as a Source of Competitiveness

One of the most consistent outcomes in the literature is that green innovation improves competitiveness by simultaneously reducing operational costs and enhancing customer value. Hsiao, Chuang, Kuo, and Yu (2014) showed that environmental management systems lead to tangible cost savings, particularly in energy and water consumption. These savings provide a direct contribution to financial performance, strengthening firms' ability to compete in efficiency.

At the same time, the adoption of green practices strengthens reputation and market positioning. Chen (2008) introduced the idea of "green core competence," arguing that environmental responsibility can become a defining element of corporate identity. In the hospitality sector, this competence translates into a differentiated brand image that attracts environmentally conscious consumers. The evidence presented by Han, Hsu, and Sheu (2010) confirms this demand-driven effect: consumers are more likely to choose hotels that implement visible eco-friendly activities. From a strategic management perspective, this suggests that sustainability has evolved from a secondary attribute to a core competitive factor.

The role of employees further enhances this relationship between green innovation and competitiveness. Chan, Hon, Chan, and Okumus (2014) emphasize that the ecological awareness and commitment of staff members are essential for the effective implementation of sustainability initiatives. This highlights the social dimension of competitiveness, where organizational culture and employee engagement directly influence the success of green innovation. Together, these studies support Elkington's (1997) Triple Bottom Line framework, showing that economic, environmental, and social dimensions reinforce one another rather than existing in tension.

5.2. The Enabling Role of Regional Clusters

The evidence also confirms Porter's (1998) theory of clusters, which argues that geographic concentrations of interconnected firms enhance innovation and competitiveness. The Chinese hospitality industry demonstrates this clearly. Hotels located in regional clusters such as the Yangtze River Delta, Pearl River Delta, and Hainan benefit from shared resources, policy incentives, and knowledge spillovers.

Clusters amplify innovation in two ways. First, they reduce barriers to adoption by concentrating suppliers and service providers, making eco-technologies more accessible and affordable. Second, they increase competitive pressure, as hotels within the same region strive to differentiate themselves. Jones, Hillier, and Comfort (2016) note that such environments create both collaboration and rivalry, generating a dynamic in which sustainability becomes a tool for standing out in crowded markets. This duality explains why clustered hotels often early adopters of green certifications and environmental management systems are.

From a policy perspective, clusters also allow governments to implement localized interventions more effectively. For example, subsidies for eco-certifications or pilot projects for renewable energy can be targeted within specific clusters, where spillover effects are likely to multiply the impact. This suggests that cluster-based policies are particularly suited to advancing China's sustainability agenda in hospitality, complementing national-level strategies with regionally tailored initiatives.

5.3. Persistent Barriers and Institutional Challenges

Despite these positive trends, the analysis also reveals structural barriers that limit the full potential of green innovation. Youssef, Leicht, Pelham, and Jain (2018) highlight the financial challenges faced by smaller firms, which lack access to credit and struggle with the upfront costs of eco-technologies. This finding resonates with broader concerns in the hospitality literature that sustainability may exacerbate inequalities between large international hotel chains and smaller independent operators.

Regulatory fragmentation further complicates adoption. WTTC (2023) notes that eco-certification standards vary across provinces, creating inconsistencies that undermine credibility and increase administrative burdens. Without harmonization, hotels risk facing duplicative or conflicting requirements, which can discourage investment in green innovation.

Skills and capacity gaps also remain critical. As Chan et al. (2014) argue, employee knowledge and ecological concern are prerequisites for successful implementation. However, in many regions, particularly outside major clusters, hotels lack staff trained in environmental management. This challenge highlights the need for systematic capacity building through partnerships with universities and vocational schools.

Finally, organizational inertia presents an obstacle. Jones et al. (2016) observe that in many hospitality firms, sustainability remains a peripheral concern, often treated as a compliance requirement rather than a strategic priority. Without strong leadership commitment, green initiatives risk being underfunded or symbolic, reducing their long-term effectiveness.

5.4. Integrating Theoretical Frameworks with Empirical Evidence

The discussion also underscores the usefulness of integrating the Triple Bottom Line framework (Elkington, 1997) and cluster theory (Porter, 1998) for analyzing green innovation in hospitality. TBL explains why sustainability is integral to competitiveness, as it links financial outcomes with environmental and social dimensions. Cluster theory, in turn, explains how geographic and institutional contexts amplify or constrain the adoption of sustainability practices.

By combining these frameworks, it becomes clear that competitiveness in China's hospitality industry is shaped not only by individual firm actions but also by the ecosystems in which firms are embedded. Hotels that adopt green innovations achieve direct benefits, but these benefits are magnified when the broader cluster environment provides support, incentives, and knowledge flows. Conversely, hotels outside clusters face higher barriers, illustrating the uneven geography of sustainability in China.

5.5. Implications for Managers and Policymakers

For managers, the findings suggest that green innovation should be approached as a strategic investment rather than an optional add-on. Integrating environmental practices into core operations enhances both efficiency and brand value. Managers should also recognize the role of employees in sustainability success, investing in training and fostering a culture of ecological responsibility.

For policymakers, the results highlight the need for harmonized regulatory frameworks and targeted financial support. Streamlined eco-certification standards would reduce administrative complexity and increase credibility. Financial mechanisms, such as subsidies or green credit programs, are essential to help smaller firms overcome cost barriers. Furthermore, cluster-based initiatives can maximize impact by leveraging the synergies of geographic concentration.

6. Conclusions and recommendations

The analysis of the literature confirms that green innovation has become a central driver of competitiveness in the Chinese hospitality industry. This conclusion aligns with a broader trend in global tourism markets, where sustainability is no longer viewed as a peripheral or voluntary activity but as a strategic necessity. The review demonstrates that hotels adopting eco-innovations benefit not only from improved operational efficiency but also from enhanced market positioning, customer loyalty, and employee engagement. In other words, environmental responsibility and competitiveness are increasingly complementary rather than contradictory objectives (Chen, 2008; Youssef, Leicht, Pelham, & Jain, 2018).

From a theoretical perspective, the findings reinforce the value of the Triple Bottom Line (TBL) framework (Elkington, 1997) and cluster theory (Porter, 1998) in explaining the dynamics of sustainability in hospitality. The TBL highlights how environmental and social performance contribute directly to long-term economic viability, while cluster theory underscores the importance of regional ecosystems in accelerating innovation. Together, these frameworks reveal that competitiveness in China's hospitality industry is not shaped solely by firm-level strategies but also by the institutional, geographic, and social contexts in which firms operate.

6.1. Key Conclusions

Several key conclusions emerge from this study:

First, green innovation enhances competitiveness at multiple levels. Hotels benefit from reduced energy and resource costs (Hsiao, Chuang, Kuo, & Yu, 2014), improved consumer perceptions and willingness to pay (Han, Hsu, & Sheu, 2010), and stronger brand differentiation through eco-certifications and environmental commitments (Chen, 2008).

Second, employee engagement is critical. As Chan, Hon, Chan, and Okumus (2014) demonstrated, green practices are most effective when supported by staff knowledge and ecological concern. Organizational culture therefore plays a decisive role in turning sustainability policies into daily operational routines.

Third, regional clusters amplify adoption. Hotels embedded in clusters such as the Yangtze River Delta, Pearl River Delta, and Hainan benefit from proximity to suppliers, policy incentives, and knowledge spillovers, which collectively accelerate innovation (Porter, 1998; Jones, Hillier, & Comfort, 2016).

Fourth, barriers persist. Smaller and independent hotels face significant obstacles, including financing difficulties (Youssef et al., 2018), regulatory fragmentation (WTTC, 2023), and shortages of trained staff (Chan et al., 2014). These barriers create an uneven landscape where large chains and cluster-based firms are better positioned to adopt green innovation.

6.2. Managerial Recommendations

Based on these conclusions, several recommendations can be made for hospitality managers seeking to enhance competitiveness through green innovation.

First, treat sustainability as a strategic investment. Rather than approaching green initiatives such as compliance requirements or marketing tools, managers should integrate them into core business strategy. This includes embedding sustainability in brand identity, aligning it with service design, and monitoring performance indicators systematically.

Second, invest in employee training and engagement. As frontline implementers of sustainability practices, employees require both knowledge and motivation. Structured training programs, combined with incentives for ecological behavior, can foster a workplace culture aligned with environmental goals (Chan et al., 2014).

Third, leverage eco-certifications and green branding. Certifications not only signal credibility to consumers but also create internal accountability mechanisms. Communicating these achievements through marketing channels reinforces competitive advantage (Chen, 2008; Leonidou, Katsikeas, & Morgan, 2013).

Finally, seek collaborative opportunities within clusters. Hotels located in regional ecosystems should actively participate in partnerships with suppliers, universities, and government agencies to access resources, reduce costs, and accelerate learning.

6.3. Policy Recommendations

For policymakers, the findings highlight several avenues for strengthening green innovation in hospitality:

- Harmonize eco-certification standards. Regulatory fragmentation across provinces undermines the credibility of certifications and creates inefficiencies. A unified national framework would reduce administrative burdens and enhance consumer trust (WTTC, 2023).
- Expand financial support mechanisms. Subsidies, low-interest loans, and credit guarantees targeted at SMEs can help overcome the financial barriers to adopting eco-innovations (Youssef et al., 2018).
- Support cluster-based development. Investment in cluster infrastructure, such as shared training centers or renewable energy facilities, can amplify spillover effects and foster collective competitiveness (Porter, 1998).
- Promote capacity building. Policymakers should collaborate with universities and vocational schools to design training programs that address the gap in environmental skills management (Chan et al., 2014).

6.4. Future Research Directions

The review points to several areas where further research is needed. Quantitative studies could measure the relative impact of different types of green innovation—such as renewable energy systems, waste reduction, or sustainable supply chains—on performance indicators like profitability, occupancy rates, and customer loyalty. Comparative studies across clusters could also identify how local institutional environments shape innovation trajectories. Moreover, longitudinal research would help clarify whether the competitive advantages derived from green practices are sustained over time or diminish as practices become mainstream.

6.5. Concluding Remarks

Green innovation is not merely an ethical imperative for the Chinese hospitality industry but a strategic pathway to resilience and competitiveness. Firms that embrace sustainability as part of their identity are better equipped to navigate resource constraints, shifting consumer expectations, and regulatory pressures. At the same time, the broader cluster and institutional context strongly shape outcomes, suggesting that firm-level strategies must be complemented by supportive policies and ecosystems. As China advances toward its carbon neutrality goals, the hospitality industry stands as both a beneficiary and a contributor, demonstrating how environmental responsibility and competitiveness can reinforce one another in practice.

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