Green Human Resource Management, Green Innovation, and Sustainable Performance in the Hospitality Industry: A Technological Era Perspective

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ARTICLE INFO	ABSTRACT
	With the world moving toward technological enhancement, hospitality industry is embedding environmental policies to achieve sustainable performance. This goal is reinforced by Green Human Resource Management (GHRM), which aligns HR activities and initiatives with ecological efforts to foster environmentally friendly organizational behavior. Drawing on a sample of 245 hotel and resort professionals, this study examines the relationship between Green Human Resource Management (GHRM), Green Innovation (GI), and Sustainable Performance (SP) in the Philippine hospitality industry, specifically in the National Capital Region (NCR). The data were analyzed using Structural Equation Modeling (SEM). The findings indicate a strong, direct, and positive impact of GHRM on sustainable performance. However, the mediating effect of green innovation on this relationship is minimal, suggesting that sustainability gains can be primarily achieved through GHRM practices, while the impact of innovation may be delayed or operate independently. Grounded in the Resource-Based View (RBV), this study offers practical insights for leaders and policymakers seeking to integrate sustainability into HR and technology strategies. It also contributes empirical evidence to the limited body of literature on GHRM adoption in developing countries. **Keywords:** Green Human Resource Management (GHRM), Green Innovation (GI), Sustainable Performance (SP), technological integration, Hospitality Industry

INTRODUCTION

Globally, organizations are increasingly integrating environmental considerations into their strategic frameworks to achieve sustainable performance in the current technological era. This integration is significantly supported by Green Human Resource Management (GHRM), which aligns human resource policies with environmental objectives to promote environmentally responsible behavior among employees.

Research shows that GHRM practices—such as performance management, employee empowerment, and green job descriptions—significantly enhance sustainable performance and green innovation. For instance, a study conducted in the hospitality industry in Vietnam revealed that these GHRM practices positively impact sustainable outcomes and green innovation (Nguyen & Nguyen, 2024).

A key mechanism linking GHRM and sustainable performance is green innovation, which involves breakthroughs in green products and processes. Empirical evidence from Malaysian small and medium-sized enterprises indicates that GHRM fosters green innovation, thereby improving environmental, economic, and social performance. This connection underscores the importance of incorporating environmental considerations into human resource strategies to promote holistic sustainability (Zihan & Makhbul, 2024).

However, there is a notable gap in the literature regarding the reasons for and challenges of GHRM adoption in developing countries. To better understand the obstacles to GHRM implementation—and how these challenges can be effectively addressed to support both economic development and environmental sustainability—this knowledge gap must be filled. Furthermore, in the face of ongoing challenges, this information will provide policymakers and business owners in developing nations with valuable insights into how to leverage GHRM practices for sustainable advancement (Kodua, 2022).

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The importance of Green Human Resource Management (GHRM) is becoming increasingly recognized in the Philippines. A study conducted in Digos City revealed that the adoption of GHRM practices is strongly correlated with increased employee satisfaction. This correlation suggests that eco-friendly HR practices not only promote sustainability but also enhance job satisfaction, which is vital for organizational performance (Alquizar et al., 2023).

Furthermore, the significance of technological innovation in this context cannot be overstated. Technological advancements support GHRM by providing platforms and tools that facilitate green practices. For example, integrating technology into HR processes can help track environmental performance metrics and streamline green training initiatives, thereby reinforcing the company's commitment to sustainability (Shoaib, 2024).

This study aims to examine the relationship between Green HRM, green innovation, and sustainable performance in the hospitality industry in the context of the technological era.

LITERATURE REVIEW

Green Human Resource Management

Green Human Resource Management (GHRM) integrates environmental sustainability into a company's human resource practices, aiming to minimize environmental impact through the implementation of sustainable resource-use policies (HRMI, 2025). This innovative approach embeds ecological responsibility into all HR functions—from recruitment and training to employee retention—thereby fostering a culture of sustainability within the organization and reducing ecological footprints (ARTS, 2022). GHRM adopts a multidisciplinary framework, drawing insights from management, sociology, and economics to effectively address complex environmental concerns (Benevene & Buonomo, 2020).

In the context of the hospitality industry, particularly in hotels and resorts, GHRM practices have become increasingly relevant. Their implementation enhances organizational environmental awareness and improves human capital, which positively contributes to overall business performance (Munawar et al., 2022). Moreover, GHRM helps strengthen brand credibility, improves employee retention, and attracts talent who are environmentally conscious—factors that are crucial in an industry heavily reliant on service quality and brand reputation (Khan & Mutar, 2020).

Recent studies highlight a significant rise in the adoption and academic interest in GHRM within the hotel industry, with a peak in related publications in 2022. This trend underscores GHRM's expanding role in enhancing not only workplace culture but also operational efficiency, financial performance, and stakeholder engagement in hospitality enterprises.

Green Innovation

Green innovation refers to the development of sustainable technologies and processes that aim to reduce environmental impact, including renewable energy applications and advanced recycling systems. In the context of the hospitality industry, these innovations are crucial for reducing ecological footprints while maintaining service quality and operational efficiency. Green innovation also plays a significant role in Environmental, Social, and Governance (ESG) investing, where investors evaluate both environmental responsibility and financial performance (Ike, 2022).

Biomimicry, the use of nature as a model to address human challenges, has contributed to technological advances such as the bullet train, which was designed based on the kingfisher bird's beak to reduce noise pollution and improve energy efficiency (Baker, 2025). The hospitality sector has adopted similar nature-inspired technologies, such as non-toxic adhesives influenced by gecko footpads for use in eco-friendly furnishings, and sustainable architectural designs that replicate natural ventilation and lighting processes to lower energy usage in hotels and resorts.

Additionally, integrating carbon solutions and green technologies—such as hydrogen fuel cells—into large-scale operations, including logistics and building infrastructure, enhances sustainability efforts in hospitality-related industries like tourism, aviation, and food services (Booth, 2024). These practices are essential in addressing climate change, a growing concern in global hospitality operations.

Despite the potential, the widespread adoption of green technologies still faces challenges such as high initial costs, technological barriers, and restrictive legal frameworks. These obstacles limit rapid development, especially in

emerging markets (Lexicon, 2024). Nevertheless, the accelerated evolution and adoption of clean technologies suggest a promising direction for the hospitality sector's sustainability agenda.

In Europe, regulatory efforts are driving the promotion of clean technologies through strategies that focus on electrification, digitalization, and energy conservation. These frameworks aim to reduce industrial costs and boost international competitiveness—principles that are equally applicable to the hospitality industry, which increasingly aligns itself with global sustainability standards (EUREC, 2025).

Sustainable Performance

Sustainable performance in the hospitality industry refers to a company's ability to achieve its operational and financial goals while simultaneously addressing its long-term social, environmental, and economic responsibilities (Al-Abbadi & Abu Rumman, 2023). In the context of hospitality, this includes managing energy and water consumption, reducing food waste, and ensuring guest and employee satisfaction. Achieving sustainable performance also requires balancing effective management practices, raising employee awareness, implementing continuous improvements and innovations, and fulfilling the expectations of guests and other stakeholders over time (Piwowar-Sulej & Iqbal, 2023). In essence, sustainable performance in hospitality means operating profitably while contributing positively to the environment, workforce, and local communities (Abensur, 2024). To manage sustainability effectively, hospitality businesses must regularly set strategic objectives aligned with sustainability goals (Olivero, 2024). Measuring sustainability performance allows hotels and restaurants to monitor progress, evaluate the impact of their initiatives, and engage meaningfully with stakeholders (Toikka, 2024). Moreover, sustainability performance reporting provides a comprehensive overview of how hospitality operations influence both society and the environment, enhancing transparency and accountability (International Finance Corporation, 2024).

Conceptual Framework

Framed from the lens of the Resource-Based View (RBV)—a strategic management theory—this perspective helps explain the association between green human resource management (GHRM), green innovation, and sustainable performance within the hospitality industry. The RBV emphasizes that a firm's internal capabilities and resources are essential in achieving a competitive advantage. In the context of hospitality, integrating environmental management into HR practices fosters the development of renewable organizational resources, such as green-oriented employee skills and eco-conscious operational processes. These internal resources are instrumental in driving green innovation across hotel and restaurant operations. Furthermore, GHRM practices stimulate a wide range of employees' pro-environmental behaviors, which in turn enhance the environmental outcomes and sustainability initiatives of hospitality enterprises (Utami & Alamanons, 2023).
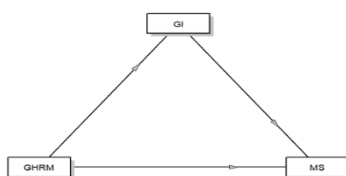

Figure 1. Conceptual Framework of the Study

Figure 1 depicts how green HRM practices lead to green innovation, and how both influence the sustainable performance of hospitality businesses. It also considers that the effectiveness of green innovation on performance may depend on other factors like management support or structure (MS). The focus on the technological era likely addresses how digital transformation facilitates these green initiatives.

METHODS

The study used quantitative research to examine the relationship between Green Human Resource Management (GHRM), green innovation, and sustainable performance in the technological era. It focused on participants who

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were business owners in the hospitality industry within the National Capital Region (NCR) of the Philippines, specifically those implementing business strategies related to sustainability. Purposive sampling was employed to select business owners who were actively involved in GHRM and sustainability practices. Questionnaires were distributed, and the data were analyzed using statistical tools to examine the mediating role of green innovation.

Structural Equation Modeling (SEM) was employed as a statistical technique to demonstrate these relationships. SEM, which evolved from previous statistical methodologies, allowed for the analysis of how GHRM, enhanced by technology, impacted Sustainable Performance both directly and indirectly through Green Innovation. The findings of the study provided substantial evidence of how the application of technology in green HR practices fostered greater green innovation and improved sustainability outcomes.

RESULTS AND DISCUSSION

A total of 245 respondents from hotels and resorts participated in the study. The sample was composed primarily of male participants (55.5%), with the majority falling within the age group of 31–40 years (38.0%). Most respondents held managerial or supervisory positions (46.9%) and were employed in hotels (57.1%) rather than resorts. In terms of business operations, a significant portion of the establishments had been in existence for 11–15 years (31.4%). These findings suggested that the study captured insights primarily from experienced professionals in mid-level leadership roles within well-established hospitality businesses, providing a credible perspective on the implementation of GHRM, green innovation, and sustainability practices.

The frequency distribution of respondents is shown in Table 1.

Table 1. *Demographic Profile of the Respondents*

Category	Subcategory	Frequency	Percentage (%)
Gender	Male	136	55.5%
	Female	109	44.5%
Age Group	21–30 years	69	28.2%
	31–40 years	93	38.0%
	41–50 years	54	22.0%
	Above 50 years	29	11.8%
Position in Organization	Owner/Co-owner	72	29.4%
	Manager/Supervisor	115	46.9%
	Department Head/Officer	38	15.5%
	Others	20	8.2%
Type of Establishment	Hotel	140	57.1%
	Resort	105	42.9%
Years in Operation	Less than 5 years	43	17.6%
	5–10 years	66	26.9%
	11–15 years	77	31.4%
	More than 15 years	59	24.1%

The central variables of the study—Green Human Resource Management, Green Innovation, and Sustainable Performance, were assessed based on the mean and standard deviation of the respondents' Likert scale responses. Table 2 presents the summarized results.

Table 2. *Summary Results of the Level of Green Human Resource Management, Green Innovation, and Sustainable Performance*

	GHRM	GI	MS
N	245	245	245
Mean	4.53	4.80	4.62
Standard deviation	0.618	0.318	0.715

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Respondents strongly agreed that their organizations had these practices in place. The mean score of 4.53 for Green Human Resource Management indicates a high extent of implementation of environmentally sensitive HR practices in NCR-based hotels and resorts, encompassing eco-friendly recruitment, green training, and opportunities for employees to actively engage in sustainability programs. The mean score for Green Innovation was the highest (4.80) and had the lowest standard deviation (0.318), reflecting a strong overall consensus on the presence of Green Innovation practices and a high degree of similarity in how these practices are implemented across organizations. This suggests a well-established culture of eco-innovation at the level of products, services, or production processes. Meanwhile, Sustainable Performance had a high average score of 4.62, which also indicates a very high level of implementation. However, it showed the highest standard deviation (SD = 0.715) among the three, suggesting some variability among organizations. This may be due to differences in organizational size, resource availability, or strategic priorities.

To examine the mediating role of Green Innovation between Green Human Resource Management and Sustainable Performance, Structural Equation Modeling was employed. The results are summarized in Table 3.

Table 3. *Summary Results of the Relationship between Green Human Resource Management, Green Innovation, and Sustainable Performance*

Indirect and Total Effects

Type	Effect	Estimate	SE	95% C.I. (a) Lower	Upper	β	z	p
Indirect	GHRM ⇒ GI ⇒ MS	2.77e−6	1.62e−4	−3.15e−4	3.20e−4	2.39e−6	0.0171	0.986
Component	GHRM ⇒ GI	0.00337	0.0329	−0.0612	0.0679	0.00653	0.1022	0.919
	GI ⇒ MS	8.23e−4	0.0475	−0.0922	0.0939	3.67e−4	0.0173	0.986
Direct	GHRM ⇒ MS	1.09184	0.0245	1.0439	1.1398	0.94358	44.6018	< .001
Total	GHRM ⇒ MS	1.09184	0.0245	1.0438	1.1399	0.94358	44.5117	< .001

Note. Confidence intervals computed with method: Standard (Delta method)
Note. Betas are completely standardized effect sizes

The mediation analysis examined whether Green Innovation mediated the relationship between Green Human Resource Management (GHRM) and Sustainable Performance (SP). The results revealed that the direct effect of GHRM on SP was strong and statistically significant ($\beta = 0.9436$, $p < 0.001$), indicating that GHRM practices directly enhanced sustainable performance in the hospitality industry. However, the indirect effect of GHRM on SP through Green Innovation (GI) was not significant ($\beta = 2.39e-6$, $p = 0.986$), and both individual component paths—from GHRM to GI and from GI to SP—also yielded non-significant results ($p > 0.90$). This suggests that, although organizations perceived themselves as implementing both GHRM and green innovation practices at a very high level, Green Innovation did not significantly mediate the relationship between GHRM and SP in this study. Thus, GHRM independently contributed to sustainable outcomes without relying on innovation as a linking mechanism.

DISCUSSIONS

The study aimed to investigate the effect of Green Human Resource Management (GHRM) on Sustainable Performance (SP), with a particular focus on whether Green Innovation (GI) mediates the relationship between GHRM and SP in hospitality organizations within the National Capital Region (NCR), Philippines. The analysis, conducted using Structural Equation Modeling (SEM), revealed that GHRM had a strong and statistically significant direct effect on SP ($\beta = 0.9436$, $p < 0.001$). However, the mediated impact of GI did not reach a statistically significant level ($p = 0.986$).

This strong direct pathway between GHRM and SP contributes to the growing literature on strategic HRM and sustainability, particularly in service-oriented sectors like hospitality. As proposed by Barney (2001) and elaborated through the Resource-Based View (RBV), internal capabilities—especially human capital systems organized as

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synergistic bundles—can serve as key drivers of organizational performance. This finding aligns with the work of Afsar et al. (2022), who observed that in organizations where sustainability practices are relatively mature, the relationship between GHRM and GI is not necessarily sequential. Rather, GHRM and GI can function as parallel strategic pillars, each independently supporting sustainability outcomes.

When examined through a sector-specific lens, the study highlighted distinct patterns within the hospitality industry. In contrast to manufacturing or high-tech firms, where GI often results in tangible innovations such as product redesigns or patented technologies (Gul et al., 2022), innovation in hospitality tends to focus on operational improvements—such as waste reduction, water conservation, or the adoption of eco-friendly guest services. These initiatives are often regarded as service imperatives rather than strategic differentiators, potentially explaining their diminished role as mediators between GHRM and SP. As Adnan et al. (2022) suggested, in service-based industries, such innovations may be seen as baseline expectations rather than distinctive value-adding practices.

Interestingly, the mean value for GI (M = 4.80) was the highest among the three variables measured, indicating that hospitality organizations in NCR perceive themselves as actively engaging in green innovation. However, these practices do not appear to be sufficiently embedded in organizational structures to serve as a robust mediating mechanism between HR strategies and performance outcomes. This echoes findings from a 2023 PMC study, where Knowledge Sharing (KS), modeled as a moderating variable, was found to significantly enhance the impact of Green Organizational Culture (GOC) on GI in high-tech firms. In the hospitality sector, however, hierarchical and task-oriented organizational designs may inhibit open information flow and limit the transformational potential of innovation practices.

Additionally, the study's cross-sectional design constrained the ability to assess the temporal dynamics of sustainability outcomes. Gul et al. (2022), in a longitudinal study, found that the mediating effect of GI became significant only after 18 months of sustained GHRM implementation. This suggests that innovation impacts may require time to materialize. In the context of this study, it is plausible that the innovation practices observed in hotels and resorts are still relatively nascent and not yet fully integrated into core operations, hence their limited measurable impact on performance indicators. Future research may benefit from adopting longitudinal frameworks to explore these lagged effects and provide a more comprehensive understanding of how innovation evolves over time within hospitality settings.

Another plausible explanation stems from Institutional Theory, particularly the concept of institutional isomorphism, which posits that organizations may adopt certain practices primarily for legitimacy rather than for performance gains. In this case, environmental practices in the hospitality industry may be implemented more as symbolic gestures to align with stakeholder expectations, industry norms, or regulatory requirements, rather than as strategic initiatives designed to drive technical efficiency. This may be reflected in the high SP mean (M = 4.62), despite the non-significant mediating role of GI. As Adnan et al. (2022) observed in the Pakistani hospitality sector, many organizations attain a symbolic sustainability identity through certifications or eco-labels without fundamentally altering their business processes or innovation frameworks. In such contexts, GI functions more as a normative instrument than as a mechanism for building strategic capabilities.

Collectively, these findings provide a nuanced understanding of how GHRM influences sustainable performance in a developing country context, specifically within the hospitality industry. While GHRM emerged as a strategic enabler of sustainability, the absence of a significant mediating role for GI highlights the need for deeper integration of innovation across organizational systems. Enhancing information sharing, enabling flatter communication structures, and allowing sufficient time for innovation practices to mature could strengthen the connection between GHRM and performance outcomes.

For policymakers and industry practitioners in the hospitality sector, the implication is clear: investments in GHRM must be supported by systemic efforts to cultivate innovation ecosystems. Without this, green HR practices may remain isolated efforts with limited impact on broader sustainability goals.

Overall, this study addresses critical gaps in the GHRM literature by demonstrating that, particularly in the service sector of developing economies, the role of innovation as a mediator is highly context-dependent—shaped by sectoral characteristics, institutional dynamics, and the maturity of organizational learning systems.

Based on the findings of this study, several recommendations were proposed to enhance sustainable performance in the hospitality industry through the strategic implementation of Green Human Resource Management (GHRM) and improved alignment with Green Innovation (GI). Firstly, it was recommended that hospitality establishments strengthen the institutionalization of GHRM practices at all levels of the organization. This included integrating green values into recruitment criteria, providing regular sustainability training for employees, incorporating environmental objectives into performance appraisals, and recognizing or rewarding eco-friendly behaviors within the workplace.

Secondly, although Green Innovation was rated at a very high level by respondents, its lack of a significant mediating effect suggested a need for better strategic integration with HR functions. Hospitality organizations were encouraged to ensure that innovation efforts—such as the adoption of eco-friendly technologies, sustainable service designs, and green operational processes—were directly supported and driven by HR initiatives. This could be achieved by forming cross-functional teams, aligning green innovation goals with employee performance indicators, and fostering a culture of creativity and collaboration focused on environmental outcomes.

Thirdly, establishments in the hospitality industry were advised to adopt a more holistic approach to sustainability. This involved aligning environmental goals with broader social and economic objectives, enhancing transparency through sustainability reporting, and engaging stakeholders in co-developing sustainable solutions. Hospitality businesses were also encouraged to use global frameworks such as ESG (Environmental, Social, and Governance) metrics or GRI (Global Reporting Initiative) standards to measure and communicate their sustainability progress effectively.

In addition, it was recommended that government agencies and local government units provide more robust policy support to encourage the adoption of GHRM and GI practices in the hospitality sector. This support could take the form of tax incentives, grants, training programs, and recognition awards for organizations demonstrating leadership in environmental responsibility and sustainable innovation.

Finally, future researchers were encouraged to explore other potential mediating or moderating variables—such as organizational culture, environmental leadership, or technological readiness—that may influence the relationship between GHRM and sustainable performance. Longitudinal and industry-comparative studies may also offer deeper insights into how these dynamics evolve over time and across different segments of the hospitality industry.

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