Pakistan Journal of Commerce and Social Sciences
2025, Vol. 19(2), 249-278
Pak J Commer Soc Sci

Green Human Resource Management Practices to Promote Environmental Performance in the Hotel Industry: The Moderating Role of Environmental Knowledge and Green Transformational Leadership

Hummaira Qudsia Yousaf [1], Memoona Naseer [2]* and Muhammad Zia Aslam [3]
[1,2,3] Superior University (CMACED), Lahore, Pakistan
* Corresponding author Email: memoona.naseer@superior.edu.pk

Article History

Received: 13 Apr 2025 Revised: 18 June 2025 Accepted: 16 June 2025 Published: 30 June 2025

Abstract

In the current era, this world is facing environmental complications that affect sustainable development and overall environmental performance. This study investigates the role of Green Human Resource (GHRM) management practices, Green Innovation (GI), and Green Empowerment (GE) to promote the Environmental Performance (EP) of hotels. The study also investigates how Green Transformational Leadership (GTL) and Environmental Knowledge (EK) enhance the relationship between these factors, which is the focus of the research. This study is based on the Ability-Motivation-Opportunities (AMO) theory and employs a cross-sectional methodology. Data was collected from high-level, middle-level, and front-line management staff members of ten hotels in Lahore, Pakistan, categorized as 5-star and 4-star. A total of 340 individuals completed the questionnaire, and 307 responses were finalized for analysis after removing missing and outlier values. The acquired responses were analyzed using the Partial Least Squares-Structural Equation Modeling (PLS-SEM) technique on SmartPLS for measurement and structural modeling. The findings indicate that GHRM practices are positively associated with green empowerment and green innovation, which are strongly linked to environmental performance. The results also found the positive moderating effects of green transformational leadership and environmental knowledge. Furthermore, this research expands the scope of GHRM by integrating variables such as environmental performance and knowledge, highlighting their importance for effective performance in the hotel sector.

Keywords: Green HRM practices, green empowerment, green innovation, green transformational leadership, environmental knowledge, environmental performance, Pakistan.

1. Introduction

Over the years, environmental resources have been depleted due to industrial revolutions; these environmental issues should be addressed for economic and ecological sustainability. Due to a fluctuating environment, major disruptions, international competition, and economic variations, the hotel industry has shifted from a stable to a vulnerable and dynamic service industry (Sohail et al., 2020; Veidemane, 2022). Since 1950, the industry has witnessed constant competitiveness on a global scale (Prakash et al., 2023; Yusoff et al., 2020). Additionally, it is anticipated that over the following ten years, the number of foreign visitors will rise by 4% yearly (Adamiak & Szyda, 2022; Voumik et al., 2023). More than 200 million tourists stay in more than 300,000 accommodations the hotel sector provides each year in Europe alone (Yusoff et al., 2020). According to recent research, the tourism sector currently makes up 9.3% of the world's GDP (AlKahtani et al., 2021). According to Statista 2023, the hotel sector's sales cost in 2022 exceeded USD 1 trillion. The area comprising Asia and the Pacific boasts an occupancy rate of over 80% and the lowest tourism and transportation costs. The hotel industry in Pakistan is one of the service sectors with the quickest growth rate and excellent financial rewards. In addition, Pakistan is growing as an essential investment location for developing new hotels. Pakistani hotels are seeing a significant increase in average rate and occupancy, which will likely continue. It is also estimated that 9.1% of Pakistan's overall investment comes from the tourist sector (Ahmed et al., 2024; Khan et al., 2020), Which has a positive and beneficial impact on the economy. However, despite its rapid expansion, the hotel sector has come under pressure for its unsustainable practices, including excessive water and energy use (Legrand et al., 2022). Hotels must, therefore, adhere to eco-friendly practices and exhibit an accountable attitude towards the environment, notwithstanding the industry's remarkable growth over the years. Due to waste emissions, hotels are overburdened with the responsibility to consider their environmental performance. Regarding Pakistan's waste production, numerous examples of inadequate water handling and the open discharge of sewage, sludge, and other waste materials for bacteria pollution have been documented (Hayder et al., 2022). A new study claims that if the adverse effects of the tourism and hotel industries are not effectively controlled, they could pose a severe threat to the environment (Nisar et al., 2022). Therefore, this study has focused on how hotels may embrace environmental performance while considering how sensitive the hotel business is to ecological concerns and sustainability.

GHRM practices are one strategy that various organizations have adopted to enhance sustainability (Aftab et al., 2023; Luu, 2023; Najam et al., 2025). "HRM activities, which enhance positive environmental outcomes," are called GHRM (Hameed et al., 2020). Adopting several practices, including green recruiting and selection, green training, green performance management, evaluation and rewards, green empowerment, and green induction, is essential in improving green environmental behavior (Alghamdi, 2021). Therefore, by encouraging environmental corporate practices, GHRM can promote a culture of environmental sustainability (Rana & Arya, 2024). In the hotel industry,

employees can be empowered with the support of all practices by offering them the ability, opportunity, and voice to participate in environmental operations as well as contribute to solving problems (Iftikar et al., 2022). Decentralization, a component of employee empowerment, allows employees to submit original ideas for improving the hotel's environmental performance. Moreover, green HRM includes actions that need to be implemented to cut costs, improve employee engagement, and increase productivity, all of which assist organizations in finding innovative ways to lower their carbon footprints. Green Innovation (GI) is a contemporary solution encouraging organizations to generate less harmful products and services (Malik et al., 2024). Another study claimed that green HRM practices have become crucial for innovativeness to obtain an advantage over competitors as well as the most remarkable environmental results, which impacts the level of client satisfaction, confidence, trustworthiness, and preference (Yen et al., 2020). Furthermore, research suggested that to develop the internal competencies necessary for GI and achieve EP, the management of an organization must implement GHRM and GTL procedures. There is limited research has on the relationship between GTL and GI, according to Malik et al. (2024) GTL is important in inducing GI in different organizations. However, the function of GTL as a moderator between GHRM practices and green innovation is absent (Niazi et al., 2023). This study addresses this gap by strengthening the goals of GHRM practices. Also, hotel employees who have completed intensive green training will undoubtedly learn more about environmental concerns and have access to more resources to address them (Pinzone et al., 2019). This illustrated that the absence of ecological knowledge may create a sense of coercion and lead people to avoid engaging in environmentally friendly behavior. Due to the importance of environmental knowledge, this study focuses on how EK strengthens the association of GHRM practices and empowerment.

This research adds to the expanding evidence supporting the effectiveness of green human resource management (GHRM) practices. A recent study first examined the connection between green HRM and green empowerment, as well as its impact on environmental performance. Secondly, the study found a direct correlation between GHRM practices and green innovation, which is also linked to improved environmental performance. Thirdly, green transformational leadership explains the moderating influence of factors such as green HRM practices and innovation. Fourthly, environmental knowledge serves as a moderator, illustrating how green HRM practices and green empowerment function in the hotel industry. Finally, previous research omitted to include components like environmental knowledge and environmental performance in a hotel; consequently, this study has included these variables to be researched. By promoting environmental awareness, organizations can achieve a level of care-maintained sustainability and implement environmentally responsible employee behavior. It is always expected from the organization to constantly improve its environmental performance, according to (Kim et al., 2019). This study offers theoretical implications concerning the AMO theory. Which

addresses and defines human behavior (Abbas et al., 2022). According to this theory, it was thought that the "Ability" aspect of the theory covers green hiring and training of green HRM, the "motivation" aspect of the theory includes green performance management and a system of rewards for green HRM, and the "opportunity" aspect of the theory covers green participation and green empowerment of GHRM to solve environmental issues. This study also offers practical insights for HR professionals and hotel managers looking to improve environmental performance by implementing GHRM practices, green awareness, and green innovation.

The study aims to identify and fill in the research gaps by considering potential variables of GHRM practices, green empowerment, green innovation, green transformational leadership, environmental knowledge, and environmental performance. These constructs are crucial to addressing environmental challenges. These factors significantly impact how employees conduct and think because they set an example for the hotel's good practices.

2. Literature Review

2.1 Underpinning Theory

The theory of Ability-Motivation-Opportunities (AMO) was created by (Appelbaum, 2000), who claimed that the outstanding performance of workers is constructed by three key components: individual abilities, motivation, and participation opportunities. Workers need certain skills to execute specific duties, motivation from managers or supervisors to accomplish particular tasks, and the chance to enhance their abilities and participate in several decision-making processes and programs to boost performance output. Based on theory, it is stated that HR practices are vital in influencing workers' attitudes and performance. According to this theory, it was thought that the "Ability" aspect of the theory covers green hiring and training of green HRM, the "motivation" aspect of the theory includes green performance management and a system of rewards for green HRM, and the "opportunity" aspect of the theory covers green participation and green empowerment of GHRM to solve environmental issues. The AMO theory addresses and defines human behavior (Abbas et al., 2022). Green training raised employees' expertise, environmental knowledge, and abilities, which improved performance in environmental-related tasks (Sheeba & Christopher, 2020). Hotels are attempting to lessen environmental pollution as they address the problems generated by the emissions of gases. More focus is being placed on green innovation, which describes the actions taken to lessen the adverse effects of operations, emphasizing improving the processes, technologies, systems, products, and management techniques (Asadi et al., 2020). GI uses innovative practices for green products to combat environmental problems like reducing harmful materials, energy conservation, pollution control, waste minimization, and recycling (Rajmohan et al., 2019). Additionally, leaders with a clear vision, charisma, and motivation can inspire their teams to add new creative strategies that will improve hotel operations. These leaders empower their subordinates and utilize the opportunity to invest in green procedure-related activities

to improve the ecological performance of their hotel industry (Rehman & Yaqub, 2021; Wiriya & Soontornthum, 2021).

2.2 Hypothesis Development

2.2.1 Green HRM Practices and Green Empowerment

The duties of green human resource management (GHRM) are comparable to those of conventional HRM but with an added: "green bend"(Darvishmotevali & Altinay, 2022b). The phrase "GHRM" has been used in various contexts. GHRM aims to support the organization's environmental objectives, which can be accomplished through organizing and executing HRM practices and policies and encouraging staff members to adopt environmentally friendly behavior (Ogiemwonyi et al., 2023; Ren et al., 2018). Concerning AMO theory, GHRM practices affect workers' motivation and ability to achieve green objectives and facilitate the possibilities to do so. The GHRM approach is considered the most effective technique to assist hotels in implementing environmentally friendly policies, mainly because it produces eco-aware workers who can identify environmental issues in regular operations. At the same time, one of the core issues facing hotels and other organizations today is GHRM practices, which have been recognized as an essential tactic in the context of rising global competition (Nawangsari & Sutawidjaya, 2019) While a significant component of achieving the hotel's goals related to green plans is green empowerment (GE) (Alam, 2021; Shahzad et al., 2023).Some of the essential advantages of promoting green workers are described by (Bhutta et al., 2022). The benefits include a higher level of commitment, job satisfaction, increased work quality, and self-esteem (Pham et al., 2022; Yandi & Havidz, 2022). For a green environment, numerous hotels may employ human resources activities as a relationship with the environment. For instance, hotels may improve employers' inspiration for social and economic well-being related to employee empowerment by offering training and participation programs to the workforce. The relationship between GHRM and GE is thus illustrated as follows:

- H1: Green HRM practices have a positive relationship with green empowerment.

2.2.2 Green Empowerment and Environmental Performance

Employees can engage in various green activities due to green empowerment (GE). Hotel personnel are stimulated to take part in a variety of green projects. Employee empowerment means that the hotel has allowed them the freedom to take the lead on eco-friendly projects, present different concepts, and participate fully in eco-friendly conduct (Afsar & Umrani, 2020; Pan et al., 2022). The participation of employees in these activities might generate a variety of suggestions for promoting environmentally friendly projects. Hotel employees can offer suggestions to strengthen the hotels' emphasis on and contribute to supporting green activities. The hotel's environmental performance also brought attention to the importance of green employment for workers, as it not only promotes a more sustainable and responsible sector but also opens up job options that are in line with eco-friendly

practices and helps ensure a greener future for all (Al-Swidi et al., 2021; Kim et al., 2019). According to earlier studies, empowerment raises hotel staff engagement and satisfaction (Alagarsamy et al., 2023). Improving and encouraging the usage of empowerment has a good impact on employee engagement, which raises environmental performance (Adeel et al., 2022; Afsar & Umrani, 2020). Because of their increased sense of empowerment, workers may be more motivated to use discretion when it comes to ecological policy (Hameed et al., 2020). Furthermore, past research has shown that GE indirectly influences organizational citizenship behavior toward the environment. Another study depicted that, through employee empowerment, GHRM research can enhance an organization's environmental initiatives (Hutomo et al., 2020). No research, however, has examined the positive motivational effects of GE on undertaking green projects and enhancing a hotel's environmental performance. Consequently, it is assumed:

- H2: Green empowerment has a positive relationship with environmental performance.

2.2.3 Green HRM and Green Innovation

Green innovation (GI) is defined as improvements to processes or products that lessen the environmental effects of all company business operations by reducing energy use, preventing pollution, and recycling trash to influence environmental management (Awan et al., 2021; Yurdakul & Kazan, 2020). Additionally, green innovation helps hotels improve their edge over competition (Kuo et al., 2022). Environmental issues prompted the start of the management change in modern organizations. The capacity to develop innovations and provide positive consequences for the environment and society exists in contemporary society, which is primarily concerned with the consumption and effective management of natural resources (Asiaei et al., 2022). The HR function may take the lead in promoting environmentally sustainable development. Green, innovative methods can successfully increase resource productivity while reducing pollution. During the environmental period, green innovation has emerged as one of the most important green business practices in hotels (Khalil et al., 2022; Waqas et al., 2021). Hotels encourage the development of solutions for society through innovative technology, design, process, and product. Regarding AMO theory, GHRM offers a chance to assess initiatives, projects, and advancements in the environment for long-term business success (Zhao et al., 2021). Human resource management has been found to help hotels foster the knowledge, skills, and capabilities of their workers, hence promoting the development of new goods and procedures (Kim et al., 2019). Based on this, this research includes three aspects to show how green HRM supports green innovation. First, environmentally conscientious individuals can improve the effectiveness of the hotel's environmental management since they engage in more environmentally favorable activities (Fuentes-Moraleda et al., 2019; Rehman et al., 2023) As a consequence of being recruited. Second, staff members with high levels of environmental aptitude and awareness can come up with ever more unique and advantageous environmental management goals, enhancing the company's green

innovation (Zhang & Ma, 2021). Third, to encourage and retain green innovation through green performance management and reimbursement practices, hotels should choose personnel who are devoted to environmental responsibility (Karmoker et al., 2020; Muisyo & Qin, 2021). As a result, the following hypothesis can be suggested:

- H3: Green HRM has a positive relationship with green innovation.

2.2.4 Green Innovation and Environmental Performance

To meet and surpass public expectations regarding the environment, an organization's environmental performance (EP) relies on actions beyond mere adherence to basic norms and regulations (Imran et al., 2021; Zameer et al., 2022). According to the regulatory requirements, it considers the environmental impact of organizational activities, goods, and resource use (Razzaq et al., 2021). The production of eco-friendly commodities, the creation of green processes and products, and the incorporation of environmentally eco-friendly practices into business operations and product development are all said to be the foundations for environmental performance, according to previous research (Jermsittiparsert et al., 2019; Singh, Del Giudice, et al., 2020).GI, also called eco-innovation, emphasizes energy conservation, pollution prevention, trash recycling, and generating products that are less harmful to the environment. GI is associated with an improvement in environmental performance in a hotel's environmental management strategy (Singh, Del Giudice, et al., 2020). It also reduces a hotel's environmental impact while enhancing its economic and social performance through cost and waste reduction (Seman et al., 2019). Based on earlier studies, GI should not be seen as a company's reactive response to stakeholder demands but rather as motivated organizational intents and operations to improve environmental performance to gain a competitive edge (Agustia et al., 2019; Chan et al., 2022). Another study evaluated that green processes and product innovation will be critical organizational assets that firms use to enhance their environmental performance and win the confidence of key stakeholders (Singh et al., 2019). However, the current research examines that GI is a vital resource that influences EP; consequently, a hotel may use it to meet the goals of the management of the environment. Therefore, it is assumed:

- H4: Green innovation has a positive relationship with environmental performance.

2.2.5 Green Transformational Leadership as a Moderator

The term green transformational leadership (GTL) refers to a leader with a clear vision, charisma, personal inspiration, and the ability to motivate and provide staff with unwavering support to achieve specified environmental goals (Mittal & Dhar, 2016). Transformational leadership fosters a sense of belonging in those they work with, which boosts their motivation, confidence, unity, loyalty, and performance (Mohsin et al., 2021). The GTL has just recently come into being as a result of empirical research into

environmental performance, as evidenced by literature that already exists (Zhao & Huang, 2022). This study reveals a considerable effect on green performance and GI. As opposed to conventional HRM, green HRM refers to environmentally beneficial methods and aids the hotels in identifying, encouraging, and promoting green employee job behavior (Hameed et al., 2020). By motivating followers to go above and beyond what is anticipated, transformational leaders play a significant part in inspiring teams or individuals (Li et al., 2020). They energize their workers by encouraging them. These leaders apply the best tactics to persuade their followers to behave appropriately. Transformational leaders have a favorable impact on green outcomes and behaviors, claim (Kusi et al., 2021). A leader prioritizing going green instills green behaviors and culture into their workforce (Rizvi & Garg, 2021). Additionally, green transformational leaders drive the application of green strategies to achieve green outcomes, like encouraging green innovation (Chen et al., 2025). The GTL stimulates employees to implement new, innovative methods that can improve the functioning of an organization (Dranev et al., 2020; Soto-Acosta et al., 2018). The leader also invests in activities related to green procedures to improve the ecological performance of the company. Moreover, green HRM procedures that will maintain staff members' empowerment and engagement are recruiting and selection, training and development, performance appraisal and management, and pay and incentive systems; GTL will be more proactive about encouraging them. Considering the theory of AMO, it is content that GTL uses green HRM practices to improve workers motivation and capabilities and to offer possibilities for environmental management-related activities for green innovations and EP (Awan et al., 2023; Haddock-Millar et al., 2016). As a result, the following hypothesis is presented:

- H5: As a moderator, green transformational leadership strengthens the relationship between green HRM and green innovation.

2.2.6 Environmental Knowledge as a Moderator

Environmental knowledge is a multifaceted term that affects a person's awareness, attitudes, propensity, conduct, aspirations, initiatives, and activities (Hai Ming et al., 2022). It is also stated that environmental knowledge is awareness and the consciousness of ecological problems and remedies. A deficient environmental awareness may cause fear and a desire to avoid environmental obligations (Ali & Kaur, 2021; Saleh & Jawabreh, 2020). The "4 R's" of environmental knowledge are reduce, reuse, recycle, and rethink (Khanna & Dhaimade, 2019). An effective strategy to enhance hotels' environmental behavior and green performance is to promote ecological knowledge after understanding environmental issues. According to AMO theory, green HRM improves employees' environmental knowledge by allowing them to share knowledge. GHRM is believed to be a procedure to inform and motivate all employees to become more environmentally knowledgeable to support organizational goals more effectively (Sas et al., 2021). Another study evaluated that an environmental awareness-based training program improves employees' ecological protection knowledge. It boosts their green empowerment to

enhance the hotel's environmental performance (Darvishmotevali & Altinay, 2022a). Hotel staff members become passionate proponents of eco-friendly practices when they are thoroughly aware of environmental issues, sustainable practices, and the importance of their contributions to lowering the carbon footprint. Employee participation in putting green plans into practice, from energy saving to waste reduction and responsible sourcing, is made possible by this knowledge, promoting a sense of workplace responsibility. An early study examined how EK influences the association between pro-environmental behavior and green HRM practice (green empowerment) (Afsar et al., 2016) However, this study examines how environmental knowledge strengthens the association between green HRM and green empowerment. Thus, the following hypothesis has been proposed:

- H6: Environmental knowledge as a moderator strengthens the relationship between green HRM and empowerment.

Theoretical framework of the study is presented in Figure 1.

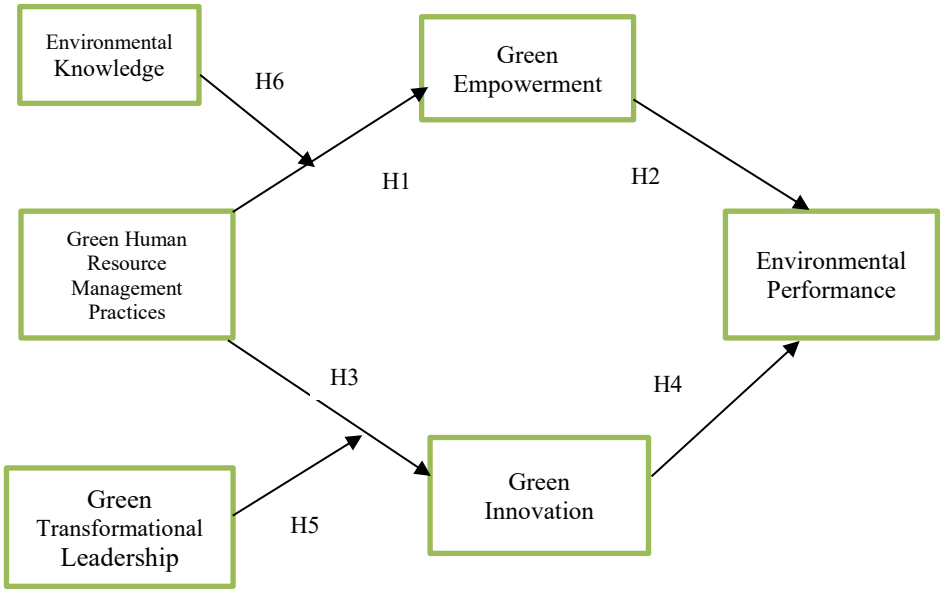

Figure 1: Theoretical Framework

3. Materials and Methods

3.1 Participants and Data Collection

The research data were collected from high-level, middle-level, and front-line management staff members of ten hotels in Lahore, Pakistan, categorized as 5-star and 4-star hotels due to their established processes and standards (Hussain et al., 2019). Contacted just 10 hotels

conveniently, all of which agreed to participate in the study. Employees with a proven history of effective management were invited to participate in the survey, as they believed they possessed the relevant knowledge and skills needed to answer the study questions. The hotel's HR departments managed the selection of participants. The assessment of effective management history relied on specific criteria, such as designation, performance appraisals, and assigned roles. The internal data, along with assistance from the HR department, facilitated the distribution of the questionnaire. It was requested that HR distribute the questionnaire internally instead of posing qualifying questions directly to employees. Only staff members who had been employed for over six months received the questionnaire with the assistance of HR teams. After initial contact with HR and line managers, the researcher distributed the questionnaire, and participants were approached personally. The personnel were requested to participate voluntarily, and questionnaires were self-administered.

This study adopts a functionalist approach and employs a deductive research methodology focused on descriptive and explanatory objectives. Data were gathered at a single point in time via cross-sectional methods utilizing a questionnaire survey. Drop-and-collect technique and convenience sampling were used to gather the data. Convenience sampling is the most popular non-probability sampling technique, according to Stratton (2021), since it is affordable, quick, and simple to carry out. A total of 400 questionnaires were distributed, and 340 responses were received, resulting in a response rate of 85%. After excluding 20 incomplete surveys, 307 valid questionnaires were included in the final analysis. This was conducted to improve the reliability of the observations, similar to previous studies in hotel industry (Chi et al., 2020; Ghaedi et al., 2021).

3.2 Instrument:

The existing literature served as the source for some well-researched items. The variables shown in Fig.1 were green HRM practices, green empowerment, green innovation, environmental performance, environmental knowledge, and green transformational leadership. The latent variables in the study were measured using a five-point Likert scale, where '1' stood for strongly disagree and '5' for strongly agree. In this case, the items for each latent variable were gathered from earlier research (Table 1).

Table 1: Measuring Instrument

Variables	Source	No. of Items
GHRM Practices	(Tang et al., 2018)	8
Green Empowerment	(Gohar et al., 2019; Hanaysha, 2016)	7
Green Innovation	(Asadi et al., 2020; Momayez et al., 2023)	5
Environmental Performance	(Singh, Del Giudice, et al., 2020)	5
Environmental Knowledge	(Saeed et al., 2019)	7
Green Transformational Leadership	(Zhang et al., 2020)	5

3.3 Common Method Bias (CMB)

Data is collected through self-reported questionnaires from the employees in the hotel industry, and there is a possibility of CMB. To evaluate the CMB, the Variance Inflation Factors (VIF) were calculated through a comprehensive collinearity test. The test model may not have the CMB problem if its scores are fewer than the cutoff value of 3.3 (Kock, 2015). The results showed that all VIF scores for the latent variables were below the threshold value, which means that the CMB inaccuracy did not infect the data. Thus, CMV was not an issue, enabling the continuation of investigations for further analysis.

3.4 Data Analysis

The theoretical framework was analyzed through the Partial Least Squares - Structural Equation Modeling (PLS-SEM) technique by using Smart PLS 4.0. This technique is appropriate when the primary objective of the investigation is to predict one or more dependent variables (Hair et al., 2019; Hult et al., 2018). The PLS-SEM approach is suitable for this study to examine correlations between the variables. Additionally, the PLS-SEM method is a more sophisticated model with fewer data limitations and is effective across a broader range of sample sizes (Hair Jr et al., 2021). For this study PLS-SEM chosen instead of CB-SEM due to complexity of model as this model has multiple constructs. According to Hair et al. (2017), goodness of fit is difficult to achieve in CB-SEM as compare to PLS-SEM. Also, convergent validity and composite reliability are typically higher using PLS-SEM. Moreover, PLS-SEM is substantially better than CB-SEM when comparing the variance explained in the dependent variable indicators (Hair et al., 2017). The PLS-SEM involves two steps: the measurement model and structural model assessment.

4. Results

The majority of the respondents were males, 231 (69.8%), and females, 92 (30.2%). In the study, most of the respondents, 131 (43%), were in the 25-34 age range; while only 5 (1.60%) respondents were in the 55+ age range; 52 (17%) were in the 18-24 age range; 73 (23.9%) were in the 35-44 age range, and 44 (14.4%) were in the 45-54 age range. The distribution of respondents by educational level revealed that 101 respondents had master's degrees, making up 33.1% of the sample; 79 respondents had BS degrees, making up 25.9% of the sample; 71 respondents had M.Phil. degrees, making up 23.3% of the sample; only five respondents had Ph.D.'s, making up 1.6% of the sample; and the remaining 49 respondents had other degrees and educational levels, making up 16.1% of the sample. In terms of designation, 119 (39%) participants belonged to lower first-line management; 150 (49.2%) were middle-level management personnel, and 36 (11.8%) respondents were top-level management. Additionally, 95 (31.1%) of the respondents were from 4-star hotels, while 210 (68.9%) came from 5-star hotels.

4.1 Measurement Model Assessment

At this point in the analysis, the measurement model evaluates factor loadings, reliability, discriminant validity (DV), and convergent validity (CV) to look at the accuracy of the data (Hair Jr et al., 2021). Concerning Table 2, each scale's item loading exceeded the cutoff point of 0.70, considerably influencing each construct. The CV assesses the relationship between variables using Cronbach's alpha (higher than 0.70), composite reliability (CR) (higher than 0.70), average variance extracted (AVE) (higher than 0.50), and factor loading (higher than 0.70) as criteria for evaluation (Hair et al., 2019). The values shown in Table 2, suggested that every variable has a reasonable level of convergent validity. Any item, having a value of factor loading less than 0.70, was eliminated, thus, GHRM2 with a value of 0.43 was deleted.

Table 2: Reliability and Convergent Validity

Constructs	Items	Loadings	Alpha	CR	AVE
GHRM Practices	GHRM1	0.805	0.915	0.932	0.664
	GHRM3	0.817			
	GHRM4	0.793			
	GHRM5	0.782			
	GHRM6	0.877			
	GHRM7	0.774			
	GHRM8	0.851			
Green Empowerment	GE1	0.805	0.923	0.938	0.684
	GE2	0.817			
	GE3	0.793			

	GE4	0.782			
	GE5	0.877			
	GE6	0.774			
	GE7	0.851			
Green Innovation	GI1	0.863	0.896	0.923	0.707
	GI2	0.88			
	GI3	0.868			
	GI4	0.816			
	GI5	0.773			
Environmental Performance	EP1	0.824	0.904	0.930	0.727
	EP2	0.918			
	EP3	0.866			
	EP4	0.919			
	EP5	0.72			
Environmental Knowledge	EK1	0.753	0.887	0.910	0.657
	EK2	0.785			
	EK3	0.714			
	EK4	0.754			
	EK5	0.833			
	EK6	0.801			
	EK7	0.737			
Green Transformational Leadership	GTL1	0.938	0.885	0.911	0.674
	GTL2	0.831			
	GTL3	0.874			
	GTL4	0.754			
	GTL5	0.684			

The heterotrait-monotrait ratio (HTMT) was used to test the discriminant validity. Many researchers recommended the HTMT test discriminant validity because the Monte Carlo simulation demonstrated that it was a more effective way than the Fornell-Larcker criterion (Henseler et al., 2015). The HTMT ratio from all variables needs to be less than 0.85 to be

considered a conceptually separate entity (Hair et al., 2019). All the constructs in this research have HTMT ratios of less than 0.85, supporting the conclusion that the investigation successfully established discriminant validity (Table 3).

Table 3: Discriminant Validity (HTMT Ratio)

	EK	EP	GE	GHRM Practices	GI	GTL
Environmental Knowledge (EK)						
Environmental Performance (EP)	0.791					
Green Empowerment (GE)	0.721	0.82				
Green HRM Practices (GHRM Practices)	0.705	0.788	0.713			
Green Innovation (GI)	0.794	0.644	0.671	0.832		
Green Transformational Leadership (GTL)	0.625	0.149	0.151	0.719	0.714	

4.2 Structural Model Assessment

Structural modeling is used to evaluate the hypothesis after confirming the reliability and validity of the model through the measurement model analysis. The standard error path coefficient t-values derived from the collected data illustrate the model's relationship. The value of the path coefficient indicates whether the hypothesis is supported. In Smart PLS-4, the bootstrapping approach is a crucial step in determining how reliable the structural model is for determining the effects of moderation. Table 4 and Fig 2 display the results of the structural model and the corresponding hypothesis.

Table 4: Path Analysis

Hypoth	Relationship	Beta	SD	t-Value	P Value	LL	UL	Decision
H1	GHRM Practices-> GE	0.741	0.072	10.272	0	0.437	0.772	Supported
H2	GE -> EP	0.743	0.217	3.419	0.018	0.058	0.617	Supported
H3	GHRM Practices -> GI	0.707	0.12	5.902	0	0.703	0.954	Supported
H4	GI -> EP	0.214	0.086	2.793	0	0.298	0.843	Supported
H5	GTL * GHRM Practices -> GI	0.437	0.208	2.101	0.001	0.038	0.391	Supported
H6	EK* GHRM Practices -> GE	0.449	0.144	3.729	0	0.219	0.735	Supported

GHRM practices have a positive correlation with green empowerment (β = 0.741, t = 10.272, p = 0.00, LL = 0.437, UL = 0.772). Thus, Hypothesis 1 (H1) is supported, indicating that enhancing GHRM practices improves the green empowerment. The results indicated a positive relationship between green empowerment and environmental performance, with a coefficient of β = 0.743, t = 3.419, and p = 0.018 (LL = 0.058, UL = 0.617). Therefore, Hypothesis 2 (H2) is accepted, suggesting that increased green empowerment positively correlates with enhanced environmental performance. GHRM practices have a statistically significant association with green innovation, shown by the following results: β = 0.707, t = 5.902, p = 0.000, with a lower limit (LL) of 0.703 and an upper limit (UL) of 0.954. Therefore, hypothesis H3 is supported, indicating that implementing GHRM practices is positively related to green innovation.

Moreover, the relationship between green innovation and environmental performance is significant (β = 0.214, t = 2.793, p = 0.000, LL = 0.298, UL = 0.843). Therefore, H4 is accepted, indicating that green innovation is positively related to environmental performance. Additionally, the findings indicated that green transformational leadership is a significant and positive moderator in the relationship between GHRM practices and green innovation and strengthens the relationship. The analysis showed a beta coefficient of 0.437, a t-value of 2.101, and a p-value of 0.001, with a lower limit of 0.038 and an upper limit of 0.391. Therefore, hypothesis H5 is supported. Environmental knowledge as a moderator strengthens the relationship between GHRM practices and green empowerment (β = 0.449, t = 3.729, p = 0.00, LL = 0.219, UL = 0.735). Therefore, H6 is considered valid.

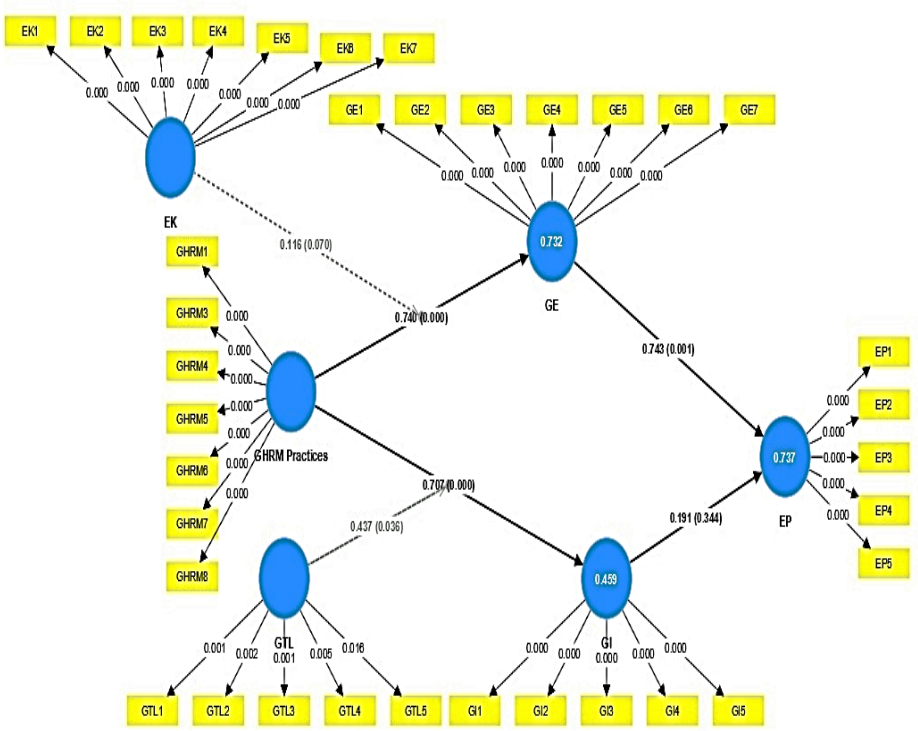

Figure 2: Structural Model

5. Discussion

This study reveals exciting insights into the role of green human resource management (GHRM) practices that can enhance environmental performance in Pakistan's hotel industry. The findings of this research indicate that GHRM practices are positively linked to green empowerment, which in turn improves environmental performance. These findings support previous research by showing a relationship between GHRM practices and green empowerment in the hotel sector (Hutomo et al., 2020; Islam et al., 2022). Hotels that use effective green HR practices (e.g., employee training, awards, and recognitions) interact and empower their staff members, which improves the environmental performance of the organization. Workers believe that GHRM procedures increase workers' dedication to take part in the organization's environmental activities for the attaining of sustainable results. This study supports earlier findings that GHRM practices encourage eco-friendly behaviors by enabling employees to champion sustainability initiatives (Karatepe et al., 2022; Liu et al., 2023; Malik et al., 2021). According to recent research, employees who experience environmental anxiety put more of an emphasis on implementing green

behavior practices, preserving the environment, and improving environmental performance. Empowering employees to improve their performance through green practices demonstrates that people are more willing to contribute (Paillé & Francoeur, 2022). Findings revealed that green empowerment has a positive influence on environmental performance. The current study links green empowerment with ecological performance in the hotel sector. These results support previous studies (Al-Swidi et al., 2021; Kim et al., 2019).

This study demonstrates a crucial connection between GI and GHRM practices. When a hotel implements GHRM practices, it can create a favorable environment for green work, inspiring people to take creative actions that improve environmental performance. Thus, the present study adds and suggests that hotels could be able to enhance their environmental performance using green HRM practices and innovative techniques (Ren et al., 2018). The findings are aligned with previous studies which focus on GHRM practices and innovation (Alshuaibi et al., 2024; Shah & Soomro, 2023). Moreover, these findings illustrated the connection between GI and environmental performance and green. Workers can be involved in and add to the establishment of environmental initiatives, which can raise the standard of environmental performance at work. The findings align with previous studies that indicate organizations implementing GHRM practices promote innovative solutions that are eco-friendly among employees, encouraging their involvement in the development of environmental initiatives, which can enhance overall environmental performance in the workplace (Awan et al., 2023; Kanan et al., 2023; Rana & Arya, 2024; Roscoe et al., 2019). Through GHRM practices, employees are more likely to develop their green skills, take up eco-initiatives, and use innovative solutions to solve a range of environmental problems. The findings of this study support the earlier research conducted in other countries and industries such as the manufacturing industry in India (Rana & Arya, 2024).

Outcomes show that GTL as a moderator, fortifies the association between green GHRM practices and GI. To advance GI and environmental performance based on an ongoing GTL assessment role, this research supports and advances the AMO theory (Appelbaum, 2000), which states that leaders in an organization should provide opportunities and use GHRM strategies for attracting, retaining, training, and inspiring green workers for green innovation. These findings are a valuable addition to the current literature. Previous studies show that leaders who adopt a transformational style can inspire and motivate employees to embrace change, think innovatively, and strive for sustainability goals (Chen et al., 2025; Li et al., 2020; Malik et al., 2024; Singh, Giudice, et al., 2020) However, the function of GTL as a moderator between GHRM practices and green innovation is absent (Niazi et al., 2023). This study addresses this gap by strengthening the goals of GHRM practices. Transformational leaders foster an organizational atmosphere that promotes green innovation, which subsequently improves environmental performance.

The findings confirm that employees' environmental knowledge of environmental issues significantly boosts the link between GHRM practices and green empowerment. While past studies have indicated a linkage between green HRM practices and environmental awareness (Anwar et al., 2020; Saeed et al., 2019), no study has looked into how environmental knowledge affects the relationship between GHRM practices and green empowerment. Therefore, it can be inferred that hiring personnel with a high degree of environmental knowledge and managing them under GHRM will likely empower them to achieve favorable outcomes, including improved performance of the environment. These findings strengthen previous research. (Darvishmotevali & Altinay, 2022a).

5.1 Theoretical Implications

This research has a few significant theoretical implications. It expands the AMO theory (Appelbaum, 2000) by applying the HR management context related to environmental management. GHRM Practices which covers the ability aspect of theory affect workers' motivation towards green innovation and environmental performance (Shahzad et al., 2023). Moreover, green empowerment as an opponent contributes to more sustainable environment. and ability to achieve green objectives and facilitate the possibilities to do so. The positive influence of these factors on environmental performance empirically supports and extends the AMO framework into the domain of sustainability (Zhao et al., 2021). This study adds the contextual contribution as there were previously less studies related to these specific constructs in hotel industry of Pakistan**.** This study covered the gap in literature by providing empirical evidence about GTL as moderator between GHRM practices and GI. Additionally, this study offers a holistic understanding of how organizational GHRM practices drive environmental outcomes while considering GI, green empowerment, green knowledge and GTL within a single theoretical framework.

5.2 Practical Implications

Recent research has many practical implications for Pakistani hotels. To improve the hotel's ability to execute environmentally linked policies and strategies successfully and efficiently, this study informs hotel management regarding the substantial correlation between the relative value of green HRM practices. Since the management team is responsible for carrying out the organization's fundamental goal in the management environment, hotels must empower their team members by involving them in green HRM initiatives. Additionally, green HRM may foster a passion for the environment in workers, by utilizing appraisals for performance and executing remuneration and reward schemes for staff members who initiate notable ecological initiatives (Yong et al., 2019). Furthermore, the management can provide environmentally friendly opportunities by encouraging staff members to take on green leadership roles and training them to contribute to green activities. GTL also helps to accelerate green innovation by offering a clear ecological vision, motivating individuals with green ecological policies, strengthening worker dedication to meeting environmental goals, and stimulating staff to create and disseminate novel green concepts and methods (Li et al., 2020). The results demonstrate

how transformational leaders who model environmentally conscious behavior in their workforce motivate their staff to act sustainably and foster green innovation. To strengthen the GTL style in hotels, there should be training sessions and initiatives to raise employee awareness of environmental concerns and encourage eco-friendly behaviors (Ali & Anjum, 2024; Mehak & Batcha, 2024). Consequently, transformational leaders have a lot of opportunities to execute green potential successfully. This research may be used by hotel management to develop green innovation processes and products, which will result in exceptional green performance and environmental sustainability. To further support the organization's green principles, personnel possessing environmental knowledge through green training are also granted tremendous encouragement and authorization to carry out the primary activities associated with the work activity to participate more in the green values of the organization. This study also provides a proactive strategy that hotels may apply to boost their environmental performance and adhere to the established regulatory authorities. These suggested strategies tailored to the hotel industry can contribute significantly to achieving sustainable environmental performance.

5.3 Limitations and Future Directions

There are significant limitations to this study that present opportunities for additional research. Firstly, the cross-sectional method was employed for the current research, which limited the findings that could draw causal inferences. Therefore, future research should evaluate our model over time to conclude causality using a longitudinal research design and qualitative techniques to explore factors in depth. Secondly, a self-reported questionnaire assesses GHRM, GI, GE, GTL, environmental knowledge, and environmental performance, which may introduce common method variance. However, the VIF test has confirmed that this issue is not evident in this study. Thirdly, only one country, i.e., Pakistan, and one industry category (hotels) were the study's subjects. Variations in the physical, legal, and cultural contexts might help or hinder an organization's efforts to create environmental policies and accomplish goals connected to environmental sustainability. These cultural contexts could also affect how staff members view and understand the company's HRM procedures and regulations. Hence, validating the current model in cross-cultural and cross-industry contexts could further improve the generalizability of the recent outcomes. Fourthly, convenience sampling is used in this study, which limits its generalizability. Other studies should collect data through a random sampling technique to get the results from a broad perspective. Moreover, this study is based on a single theoretical framework. With the integration of other theories, such as Resource-Based View (RBV) Theory, future research can be expanded. Lastly, this study considers limited variables related to green HRM, empowerment, and environmental performance. Other potentially influential variables, such as different leadership styles and organizational culture, should also be included. The present study utilized EK and GTL as moderators for environmental performance; however, other constructs, such as green

intellectual capital and organizational environment, may serve as mediators in future research. Furthermore, it is worthwhile to explore proactive service performance as a moderator in future studies.

5.4 Conclusion

This study highlights the key role of GHRM practices in enhancing environmental performance, particularly in Pakistan's hotels. The study's findings illustrate that GHRM practices are positively associated with green empowerment, which leads to environmental performance, and environmental knowledge work as a moderator, which empowers or motivates hotel workers to feel they have the expertise, abilities, and procedures to engage in eco-friendly behavior. Moreover, the study depicted that GHRM practices promote GI, which enhance the environmental performance. This study also concludes that GTL works as a moderator in the association between GHRM and GI. To satisfy the hotel's environmental requirements and expectations, GTL is necessary, which could encourage GI through green practices. In summary, hotels can improve their environmental protection efforts by employing conscientious employees, giving training and growth opportunities, and sustaining green standards.

Research Funding

The authors received no research grant or funds for this research study.

REFERENCES

Abbas, Z., Khan, A. G., Smaliukienė, R., Zámečník, R., Hussain, K., & Mubarik, S. (2022). Green HRM pursuit of social sustainability in the hotels: AMO theoretical perspective. *Calitatea*, *23*(190), 41-50.

Adamiak, C., & Szyda, B. (2022). Combining conventional statistics and big data to map global tourism destinations before Covid-19. *Journal of Travel Research*, *61*(8), 1848-1871.

Adeel, M., Mahmood, S., Khan, K. I., & Saleem, S. (2022). Green HR practices and environmental performance: The mediating mechanism of employee outcomes and moderating role of environmental values. *Frontiers in Environmental Science*, *10*, 1001100.

Afsar, B., Badir, Y., & Kiani, U. S. (2016). Linking spiritual leadership and employee pro-environmental behavior: The influence of workplace spirituality, intrinsic motivation, and environmental passion. *Journal of Environmental Psychology*, *45*, 79-88.

Afsar, B., & Umrani, W. A. (2020). Corporate social responsibility and pro-environmental behavior at workplace: The role of moral reflectiveness, coworker advocacy, and environmental commitment. *Corporate Social Responsibility and Environmental Management*, *27*(1), 109-125.

Aftab, J., Abid, N., Cucari, N., & Savastano, M. (2023). Green human resource management and environmental performance: The role of green innovation and environmental strategy in a developing country. *Business Strategy and the Environment*, *32*(4), 1782-1798.

Agustia, D., Sawarjuwono, T., & Dianawati, W. (2019). The mediating effect of environmental management accounting on green innovation-Firm value relationship. *International Journal of Energy Economics and Policy*, *9*(2), 299-306.

Ahmed, K., Rahpoto, S., & Ahmed, F. (2024). Tourism in Pakistan: An Economic Analysis. *Journal of Development and Social Sciences*, *5*(2), 434-446.

Al-Swidi, A. K., Gelaidan, H. M., & Saleh, R. M. (2021). The joint impact of green human resource management, leadership and organizational culture on employees' green behaviour and organisational environmental performance. *Journal of Cleaner Production*, *316*, 128112.

Alagarsamy, S., Mehrolia, S., & Aranha, R. H. (2023). The mediating effect of employee engagement: how employee psychological empowerment impacts the employee satisfaction? A study of Maldivian tourism sector. *Global Business Review*, *24*(4), 768-786.

Alam, M. A. A. (2021). Impact of GHRM on organization's environmental performance: mediating role of green employee empowerment. *Journal of Business*, *6*(2), 15-30.

Alghamdi, S. (2021). Effect of green human resource practices on the employee performance and behavior: A Systematic. *International Journal of Economics, Business and Management Research*, *5*(3), 450-464.

Ali, S. S., & Kaur, R. (2021). Effectiveness of corporate social responsibility (CSR) in implementation of social sustainability in warehousing of developing countries: A hybrid approach. *Journal of Cleaner Production*, *324*, 129154.

Ali, Y., & Anjum, F. (2024). Decision Framework for Eco-Friendly Hospitality: A Sustainable Future for Hotel Industry in High-Altitude Regions. *Journal of Quality Assurance in Hospitality & Tourism*, 1-38.

AlKahtani, N., Iqbal, S., Sohail, M., Sheraz, F., Jahan, S., Anwar, B., & Haider, S. (2021). Impact of employee empowerment on organizational commitment through job satisfaction in four and five stars hotel industry. *Management Science Letters*, *11*(3), 813-822.

Alshuaibi, M. S. I., Alhebri, A., Khan, S. N., & Sheikh, A. A. (2024). Big data analytics, GHRM practices, and green digital learning paving the way towards green innovation and sustainable firm performance. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(4), 100396.

Anwar, N., Mahmood, N. H. N., Yusliza, M. Y., Ramayah, T., Faezah, J. N., & Khalid, W. (2020). Green Human Resource Management for organisational citizenship behaviour towards the environment and environmental performance on a university campus. *Journal of Cleaner Production*, *256*, 120401.

Appelbaum, E. (2000). *Manufacturing advantage: Why high-performance work systems pay off*. Cornell University Press, Ithaca and London.

Asadi, S., Pourhashemi, S. O., Nilashi, M., Abdullah, R., Samad, S., Yadegaridehkordi, E., Aljojo, N., & Razali, N. S. (2020). Investigating influence of green innovation on sustainability performance: A case on Malaysian hotel industry. *Journal of Cleaner Production*, *258*, 120860.

Asiaei, K., Bontis, N., Alizadeh, R., & Yaghoubi, M. (2022). Green intellectual capital and environmental management accounting: Natural resource orchestration in favor of environmental performance. *Business Strategy and the Environment*, *31*(1), 76-93.

Awan, F. H., Dunnan, L., Jamil, K., & Gul, R. F. (2023). Stimulating environmental performance via green human resource management, green transformational leadership, and green innovation: a mediation-moderation model. *Environmental Science and Pollution Research*, *30*(2), 2958-2976.

Awan, U., Arnold, M. G., & Gölgeci, I. (2021). Enhancing green product and process innovation: Towards an integrative framework of knowledge acquisition and environmental investment. *Business Strategy and the Environment*, *30*(2), 1283-1295.

Bhutta, U. S., Tariq, A., Farrukh, M., Raza, A., & Iqbal, M. K. (2022). Green bonds for sustainable development: Review of literature on development and impact of green bonds. *Technological Forecasting and Social Change*, *175*, 121378.

Chan, S. W., Abid, S. K., Sulaiman, N., Nazir, U., & Azam, K. (2022). A systematic review of the flood vulnerability using geographic information system. *Heliyon*, *8*(3), e09075.

Chen, X., Chen, Y., Zhang, X., & He, Q. (2025). Green transformational leadership and green innovation in megaprojects: is green knowledge sharing a missing link? *Engineering, Construction and Architectural Management*, *32*(1), 194-213.

Chi, C. G.-Q., Wen, B., & Ouyang, Z. (2020). Developing relationship quality in economy hotels: the role of perceived justice, service quality, and commercial friendship. *Journal of Hospitality Marketing & Management*, *29*(8), 1027-1051.

Darvishmotevali, M., & Altinay, L. (2022a). Green HRM, environmental awareness and green behaviors: The moderating role of servant leadership. *Tourism Management*, *88*, 104401.

Darvishmotevali, M., & Altinay, L. (2022b). Toward pro-environmental performance in the hospitality industry: Empirical evidence on the mediating and interaction analysis. *Journal of Hospitality Marketing & Management*, *31*(4), 431-457.

Dranev, Y., Izosimova, A., & Meissner, D. (2020). Organizational ambidexterity and performance: assessment approaches and empirical evidence. *Journal of the knowledge economy*, *11*, 676-691.

Fuentes-Moraleda, L., Lafuente-Ibáñez, C., Muñoz-Mazón, A., & Villacé-Molinero, T. (2019). Willingness to pay more to stay at a boutique hotel with an environmental management system. A preliminary study in Spain. *Sustainability*, *11*(18), 5134.

Ghaedi, A., Ozturen, A., & Safshekan, S. (2021). Workplace mistreatment and spiritual leadership: new cure for ancient curse. *Current Issues in Tourism*, *24*(3), 340-353.

Gohar, E. A., Rady, A., & Zaki, M. (2019). Green human resource management: achieving high performance of human resource systems at travel agencies and hotels. *International Journal of Tourism and Hospitality Management*, *2*(1), 187-215.

Haddock-Millar, J., Sanyal, C., & Müller-Camen, M. (2016). Green human resource management: a comparative qualitative case study of a United States multinational corporation. *The International Journal of Human Resource Management*, *27*(2), 192-211.

Hai Ming, L., Gang, L., Hua, H., & Waqas, M. (2022). Modeling the influencing factors of electronic word-of-mouth about CSR on social networking sites. *Environmental Science and Pollution Research*, *29*(44), 66204-66221.

Hair, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107-123.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European business review*, *31*(1), 2-24.

Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., Ray, S., Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). Evaluation of reflective measurement models. *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook*, 75-90.

Hameed, Z., Khan, I. U., Islam, T., Sheikh, Z., & Naeem, R. M. (2020). Do green HRM practices influence employees' environmental performance? *International Journal of Manpower*, *41*(7), 1061-1079.

Hanaysha, J. (2016). Examining the effects of employee empowerment, teamwork, and employee training on organizational commitment. *Procedia-Social and Behavioral Sciences*, *229*, 298-306.

Hayder, R., Hafeez, M., & Zaheer, M. (2022). Challenges for sustainable water use in the northern part of Pakistan focusing on hydrology assessment of non-industrial zone. *Journal of Cleaner Production*, *349*, 131166.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, *43*, 115-135.

Hult, G. T. M., Hair Jr, J. F., Proksch, D., Sarstedt, M., Pinkwart, A., & Ringle, C. M. (2018). Addressing endogeneity in international marketing applications of partial least squares structural equation modeling. *Journal of International Marketing*, *26*(3), 1-21.

Hussain, M., Al-Aomar, R., & Melhem, H. (2019). Assessment of lean-green practices on the sustainable performance of hotel supply chains. *International Journal of Contemporary Hospitality Management*, *31*(6), 2448-2467.

Hutomo, A., Marditama, T., Limakrisna, N., Sentosa, I., & Yew, J. L. K. (2020). Green human resource management, customer environmental collaboration and the enablers of green employee empowerment: enhanching an environmental performance. *Dinasti International Journal of Economics, Finance & Accounting*, *1*(2), 358-372.

Iftikar, T., Hussain, S., Malik, M. I., Hyder, S., Kaleem, M., & Saqib, A. (2022). Green human resource management and pro-environmental behaviour nexus with the lens of AMO theory. *Cogent business & management*, *9*(1), 2124603.

Imran, M., Arshad, I., & Ismail, F. (2021). Green organizational culture and organizational performance: The mediating role of green innovation and environmental performance. *Jurnal Pendidikan IPA Indonesia*, *10*(4), 515-530.

Islam, M. A., Hack-Polay, D., Haque, A., Rahman, M., & Hossain, M. S. (2022). Moderating role of psychological empowerment on the relationship between green HRM practices and millennial employee retention in the hotel industry of Bangladesh. *Business Strategy & Development*, *5*(1), 17-29.

Jermsittiparsert, K., Siriattakul, P., & Wattanapongphasuk, S. (2019). Determining the environmental performance of Indonesian SMEs influence by green supply chain practices with moderating role of green HR practices. *International Journal of Supply Chain Management*, *8*(3), 59-70.

Kanan, M., Taha, B., Saleh, Y., Alsayed, M., Assaf, R., Ben Hassen, M., Alshaibani, E., Bakir, A., & Tunsi, W. (2023). Green Innovation as a Mediator between Green Human Resource Management Practices and Sustainable Performance in Palestinian Manufacturing Industries. *Sustainability*, *15*(2), 1077.

Karatepe, O. M., Hsieh, H., & Aboramadan, M. (2022). The effects of green human resource management and perceived organizational support for the environment on green and non-green hotel employee outcomes. *International Journal of Hospitality Management*, *103*, 103202.

Karmoker, K., Zannat, T., & Roy, B. (2020). Can green HRM practices influence hotel employees' green behavior? Evidence from Khulna city hospitality industry, Bangladesh. *International Journal of Human Resource Studies*, *10*(4), 149-167.

Khalil, N., Che Abdullah, S. N., Haron, S. N., & Hamid, M. Y. (2022). A review of green practices and initiatives from stakeholder's perspectives towards sustainable hotel operations and performance impact. *Journal of Facilities Management*, 22(4), 653-682.

Khan, A., Bibi, S., Lorenzo, A., Lyu, J., & Babar, Z. U. (2020). Tourism and development in developing economies: A policy implication perspective. *Sustainability*, *12*(4), 1618.

Khanna, S. S., & Dhaimade, P. A. (2019). Green dentistry: a systematic review of ecological dental practices. *Environment, Development and Sustainability*, *21*, 2599-2618.

Kim, Y. J., Kim, W. G., Choi, H.-M., & Phetvaroon, K. (2019). The effect of green human resource management on hotel employees' eco-friendly behavior and environmental performance. *International Journal of Hospitality Management*, *76*, 83-93.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (ijec)*, *11*(4), 1-10.

Kuo, F.-I., Fang, W.-T., & LePage, B. A. (2022). Proactive environmental strategies in the hotel industry: eco-innovation, green competitive advantage, and green core competence. *Journal of Sustainable Tourism*, *30*(6), 1240-1261.

Kusi, M., Zhao, F., & Sukamani, D. (2021). Impact of perceived organizational support and green transformational leadership on sustainable organizational performance: A SEM approach. *Business Process Management Journal*, *27*(5), 1373-1390.

Legrand, W., Chen, J. S., & Laeis, G. C. (2022). *Sustainability in the hospitality industry: Principles of sustainable operations*. Taylor & Francis / Routledge, London.

Li, W., Bhutto, T. A., Xuhui, W., Maitlo, Q., Zafar, A. U., & Bhutto, N. A. (2020). Unlocking employees' green creativity: The effects of green transformational leadership, green intrinsic, and extrinsic motivation. *Journal of Cleaner Production*, *255*, 120229.

Liu, R., Yue, Z., Ijaz, A., Lutfi, A., & Mao, J. (2023). Sustainable Business Performance: Examining the Role of Green HRM Practices, Green Innovation and Responsible Leadership through the Lens of Pro-Environmental Behavior. *Sustainability*, *15*(9), 7317.

Luu, T. T. (2023). Can green creativity be fostered? Unfolding the roles of perceived green human resource management practices, dual mediation paths, and perceived environmentally-specific authentic leadership. *The International Journal of Human Resource Management*, *34*(6), 1246-1273.

Malik, M. S., Ali, K., Amir, M., Tariq, K., & Ramzan, M. (2024). Green transformational leadership, environmental strategy, and green innovation: Mediated moderation of knowledge sharing and green absorptive capacity. *Pakistan Journal of Commerce and Social Sciences*, *18*(2), 503-526.

Malik, S. Y., Hayat Mughal, Y., Azam, T., Cao, Y., WAN, Z., ZHU, H., & Thurasamy, R. (2021). Corporate Social Responsibility, Green Human Resources Management, and

Sustainable Performance: Is Organizational Citizenship Behavior towards Environment the Missing Link? *Sustainability*, *13*(3), 1044.

Mehak, S. S., & Batcha, H. M. (2024). Analyzing the influence of green human resource practices on organizational sustainability: the role of green attitudes and performance of employees'. *Environment, Development and Sustainability*, Early online; 25 June 2024.

Mittal, S., & Dhar, R. L. (2016). Effect of green transformational leadership on green creativity: A study of tourist hotels. *Tourism Management*, *57*, 118-127.

Mohsin, M., Zhu, Q., Naseem, S., Sarfraz, M., & Ivascu, L. (2021). Mining industry impact on environmental sustainability, economic growth, social interaction, and public health: an application of semi-quantitative mathematical approach. *Processes*, *9*(6), 972.

Momayez, A., Rasouli, N., Alimohammadirokni, M., & Rasoolimanesh, S. M. (2023). Green entrepreneurship orientation, green innovation and hotel performance: the moderating role of managerial environmental concern. *Journal of Hospitality Marketing & Management*, 32(8), 981-1004.

Muisyo, P. K., & Qin, S. (2021). Enhancing the FIRM'S green performance through green HRM: The moderating role of green innovation culture. *Journal of Cleaner Production*, *289*, 125720.

Najam, Z., Waqas, M., Naseer, M., & Khan, A. (2025). Impact of Green HR Practices on Organizational Performance: The Mediating Role of Organizational Citizenship Behaviour for Environment. *The Asian Bulletin of Big Data Managment*, *5*(2) 42-55.

Nawangsari, L. C., & Sutawidjaya, A. H. (2019). How the Green Human Resources Management (GHRM) process can be adopted for the organization business? 1st International Conference on Economics, Business, Entrepreneurship, and Finance (ICEBEF 2018),

Niazi, U. I., Nisar, Q. A., Nasir, N., Naz, S., Haider, S., & Khan, W. (2023). Green HRM, green innovation and environmental performance: the role of green transformational leadership and green corporate social responsibility. *Environmental Science and Pollution Research*, *30*(15), 45353-45368.

Nisar, Q. A., Akbar, A., Naz, S., Haider, S. A., Poulova, P., & Hai, M. A. (2022). Greening the workforce: A strategic way to spur the environmental performance in the hotel industry. *Frontiers in Environmental Science*, *10*, 110.

Ogiemwonyi, O., Alam, M. N., & Alotaibi, H. S. (2023). Connecting green HRM practices to pro-environmental behavior through green human capital in the hospitality sector. *Business Strategy & Development*, *6*(4), 1053-1071.

Paillé, P., & Francoeur, V. (2022). Enabling employees to perform the required green tasks through support and empowerment. *Journal of Business Research*, *140*, 420-429.

Pan, C., Abbas, J., Álvarez-Otero, S., Khan, H., & Cai, C. (2022). Interplay between corporate social responsibility and organizational green culture and their role in employees' responsible behavior towards the environment and society. *Journal of Cleaner Production*, *366*, 132878.

Pham, H. C., Phan, T. T. H., Le, Q. H., Bui, V. H., Dang, T. T. G., & Tran, M. D. (2022). The Influence of Physical Activities on Job Satisfaction: Mediating Role of Self-efficacy, Self-esteem and Moderating Role of Stress Management. *American Journal of Health Behavior*, *46*(6), 794-808.

Pinzone, M., Guerci, M., Lettieri, E., & Huisingh, D. (2019). Effects of 'green'training on pro-environmental behaviors and job satisfaction: Evidence from the Italian healthcare sector. *Journal of Cleaner Production*, *226*, 221-232.

Prakash, A. S., Gupta, A. K., & Kaur, S. (2023). Economic Aspect of Implementing Green HR Practices for Environmental Sustainability. *IMIB Journal of Innovation and Management Decision*, *1*(1), 94-106.

Rajmohan, K. V. S., Ramya, C., Viswanathan, M. R., & Varjani, S. (2019). Plastic pollutants: effective waste management for pollution control and abatement. *Current Opinion in Environmental Science & Health*, *12*, 72-84.

Rana, G., & Arya, V. (2024). Green human resource management and environmental performance: mediating role of green innovation – a study from an emerging country. *foresight*, *26*(1), 35-58.

Razzaq, A., Ajaz, T., Li, J. C., Irfan, M., & Suksatan, W. (2021). Investigating the asymmetric linkages between infrastructure development, green innovation, and consumption-based material footprint: Novel empirical estimations from highly resource-consuming economies. *Resources Policy*, *74*, 102302.

Rehman, A., & Yaqub, M. S. (2021). Determining the influence of green transformational leadership, green innovation and green hrm practices on environmental performance of hospitality industry of pakistan: A moderating role of individual employee behaviour under COVID-19. *Bulletin of Business and Economics*, *10*(2), 100-114.

Rehman, S. U., Elrehail, H., Alshwayat, D., Ibrahim, B., & Alami, R. (2023). Linking hotel environmental management initiatives and sustainable hotel performance through employees' eco-friendly behaviour and environmental strategies: a moderated-mediated model. *European Business Review*, *35*(2), 184-201.

Ren, S., Tang, G., & E Jackson, S. (2018). Green human resource management research in emergence: A review and future directions. *Asia Pacific Journal of Management*, *35*, 769-803.

Rizvi, Y. S., & Garg, R. (2021). The simultaneous effect of green ability-motivation-opportunity and transformational leadership in environment management: the mediating role of green culture. *Benchmarking: An International Journal*, *28*(3), 830-856.

Roscoe, S., Subramanian, N., Jabbour, C. J., & Chong, T. (2019). Green human resource management and the enablers of green organisational culture: Enhancing a firm's environmental performance for sustainable development. *Business Strategy and the Environment*, *28*(5), 737-749.

Saeed, B. B., Afsar, B., Hafeez, S., Khan, I., Tahir, M., & Afridi, M. A. (2019). Promoting employee's proenvironmental behavior through green human resource management practices. *Corporate Social Responsibility and Environmental Management*, *26*(2), 424-438.

Saleh, M. M. A., & Jawabreh, O. A. (2020). Role of environmental awareness in the application of environmental accounting disclosure In tourism and hotel companies and its impact on Investor's decisions in Amman Stock Exchange. *International Journal of Energy Economics and Policy*, *10*(2), 417.

Sas, M., Reniers, G., Ponnet, K., & Hardyns, W. (2021). The impact of training sessions on physical security awareness: Measuring employees' knowledge, attitude and self-reported behaviour. *Safety science*, *144*, 105447.

Seman, N. A. A., Govindan, K., Mardani, A., Zakuan, N., Saman, M. Z. M., Hooker, R. E., & Ozkul, S. (2019). The mediating effect of green innovation on the relationship between green supply chain management and environmental performance. *Journal of Cleaner Production*, *229*, 115-127.

Shah, N., & Soomro, B. A. (2023). Effects of green human resource management practices on green innovation and behavior. *Management Decision*, *61*(1), 290-312.

Shahzad, M. A., Jianguo, D., & Junaid, M. (2023). Impact of green HRM practices on sustainable performance: mediating role of green innovation, green culture, and green employees' behavior. *Environmental Science and Pollution Research*, *30*(38), 88524-88547.

Sheeba, M. J., & Christopher, P. B. (2020). Exploring the role of training and development in creating innovative work behaviors and accomplishing non-routine cognitive jobs for organizational effectiveness. *Journal of critical reviews*, *7*(4), 263-267.

Singh, S. K., Chen, J., Del Giudice, M., & El-Kassar, A.-N. (2019). Environmental ethics, environmental performance, and competitive advantage: Role of environmental training. *Technological Forecasting and Social Change*, *146*, 203-211.

Singh, S. K., Giudice, M. D., Chierici, R., & Graziano, D. (2020). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change*, *150*, 119762.

Sohail, M., Iqbal, S., Asghar, W., & Haider, S. A. (2020). Corporate social responsibility for competitive advantage in project management: evidence from multinational fast-food companies in Pakistan. *Journal of Business and Social Review in Emerging Economies*, *6*(4), 1277-1288.

Soto-Acosta, P., Popa, S., & Martinez-Conesa, I. (2018). Information technology, knowledge management and environmental dynamism as drivers of innovation ambidexterity: a study in SMEs. *Journal of Knowledge Management*, *22*(4), 824-849.

Stratton, S. J. (2021). Population research: convenience sampling strategies. *Prehospital and disaster Medicine*, *36*(4), 373-374.

Tang, G., Chen, Y., Jiang, Y., Paillé, P., & Jia, J. (2018). Green human resource management practices: scale development and validity. *Asia pacific journal of human resources*, *56*(1), 31-55.

Veidemane, A. J. S. (2022). Education for sustainable development in higher education rankings: Challenges and opportunities for developing internationally comparable indicators. *14*(9), 5102.

Voumik, L. C., Rahman, M. H., Nafi, S. M., Hossain, M. A., Ridzuan, A. R., & Mohamed Yusoff, N. Y. (2023). Modelling sustainable non-renewable and renewable energy based on the EKC hypothesis for Africa's ten most popular tourist destinations. *Sustainability*, *15*(5), 4029.

Waqas, M., Honggang, X., Ahmad, N., Khan, S. A. R., & Iqbal, M. (2021). Big data analytics as a roadmap towards green innovation, competitive advantage and environmental performance. *Journal of Cleaner Production*, *323*, 128998.

Wiriya, K., & Soontornthum, T. (2021). *Sustainability practices in hotel business: a case study of 5-star hotel in Phuket, Thailand*.

Yandi, A., & Havidz, H. B. H. (2022). Employee performance model: Work engagement through job satisfaction and organizational commitment (A study of human resource management literature study). *Dinasti International Journal of Management Science*, *3*(3), 547-565.

Yen, C.-H., Teng, H.-Y., & Tzeng, J.-C. (2020). Innovativeness and customer value co-creation behaviors: Mediating role of customer engagement. *International Journal of Hospitality Management*, *88*, 102514.

Yong, J. Y., Yusliza, M. Y., Ramayah, T., & Fawehinmi, O. (2019). Nexus between green intellectual capital and green human resource management. *Journal of Cleaner Production*, *215*, 364-374.

Yurdakul, M., & Kazan, H. (2020). Effects of eco-innovation on economic and environmental performance: Evidence from Turkey's manufacturing companies. *Sustainability*, *12*(8), 3167.

Yusoff, Y. M., Nejati, M., Kee, D. M. H., & Amran, A. (2020). Linking green human resource management practices to environmental performance in hotel industry. *Global Business Review*, *21*(3), 663-680.

Zameer, H., Wang, Y., Yasmeen, H., & Mubarak, S. (2022). Green innovation as a mediator in the impact of business analytics and environmental orientation on green competitive advantage. *Management Decision*, *60*(2), 488-507.

Zhang, Q., & Ma, Y. (2021). The impact of environmental management on firm economic performance: The mediating effect of green innovation and the moderating effect of environmental leadership. *Journal of Cleaner Production*, *292*, 126057.

Zhang, W., Xu, F., & Wang, X. (2020). How green transformational leadership affects green creativity: Creative process engagement as intermediary bond and green innovation strategy as boundary spanner. *Sustainability*, *12*(9), 3841.

Zhao, F., Kusi, M., Chen, Y., Hu, W., Ahmed, F., & Sukamani, D. (2021). Influencing mechanism of green human resource management and corporate social responsibility on organizational sustainable performance. *Sustainability*, *13*(16), 8875.

Zhao, W., & Huang, L. (2022). The impact of green transformational leadership, green HRM, green innovation and organizational support on the sustainable business performance: Evidence from China. *Economic research-Ekonomska istraživanja*, *35*(1), 6121-6141.