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Exploring the synergy of green HRM, corporate entrepreneurship, and green innovation in enhancing environmental performance

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Abstract: This study aims to delve into the connection between green HRM, corporate entrepreneurial orientation, and green innovation and their effects on environmental performance. This research not only adds new information to the existing body of literature on the subject, but it also has the potential to widen its scope. The research formed several hypotheses based on previously published research and appropriate theoretical frameworks. Hypothesis testing was performed using comprehensive dataset, and its collection was accomplished through the survey method. The study utilised a technique known as structural equation modelling for the purpose of conducting the data analysis. Findings reveal that green HRM significantly improves green innovation capabilities. The moderation of corporate entrepreneurial orientation confirms the positive moderation in green HRM's effect on green innovation. Finally, the link between green HRM and environmental performance is discovered to be facilitated by green innovation.

Keywords: green innovation; environmental performance; green HRM; corporate entrepreneurial orientation.

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1 Introduction

The China-Pakistan Economic Corridor (CPEC) presents numerous potential benefits for Pakistan's economy, such as promoting economic growth and generating employment opportunities (Tong, 2014; Wang, 2017). The significant investment involved in the project is expected to encourage the Pakistani government to enhance country's business environment and attract more business ventures. However, the increasing economic and business activity could lead to severe environmental issues (van Zanten and van Tulder, 2021). Mohaddes et al. (2023) indicated that how economic activity in the country affected by climate change. As a result, one could say that concerns pertaining to the economy, business, and the environment all move in synchronisation with one another. In the same manner, environmental protection has emerged as an urgent matter of general concern as a direct result of the deteriorating climatic and natural environment as well as the ongoing growth of corporate environmental pollution incidents. Therefore, to fulfil environmental protection goals, businesses need to effectively implement environmental strategies to solve complex environmental concerns and to manage the needs of a variety of stakeholders, including the government and customers. There is a growing focus around the world on 'green development' and the adoption of efficient technology to mitigate the adverse impacts that businesses have on the environment in which they operate. Specifically, this is done to reduce the degree of pollution that is released into the atmosphere.

The improvement of environmental performance of enterprises is a systematic development, and it is difficult to achieve only by a single management practice. Similarly, it needs to rely on all-round improvement and system function of the internal capabilities and skills of the enterprise to maintain it. Because green HRM is a contributing factor to organisational strategy and can provide comprehensive capability support for the realisation of organisational goals (Chaudhary, 2020). As green HRM pays special attention to green, it is likely to effectively enhance organisational green behaviours in turn achieve positive environmental performance. Additionally, green HRM is the process by which a company incorporates environmental sustainability principles into its various human resource (HR) practices and initiatives. It is based on the idea that organisations may significantly enhance their environmental performance by aligning their human resource policies with environmental goals and on the recognition that employees play a key role in driving a company's environmental performance in modern era.

Previous research (Hameed et al., 2020; Yusoff et al., 2020; Ojo et al., 2022) has attempted to investigate how green HRM can reinforce company's environmental performance, leading to presumption that it could be a driving force behind positive environmental outcomes. However, these studies emphasised on technology and service

sector. To make significant progress toward tackling critical environmental concerns like climate change, resource depletion, and pollution, it is crucial to understand the role that green HRM could play in CPEC participant businesses towards its environmental performance. One-way companies can assist in build a more sustainable future is by providing incentives for employees to engage in sustainable practices. Although, the importance of companies working under CPEC project, existing research has not properly emphasised on it. According to best of our knowledge, existing studies have not directly investigated this in the context of companies participating in the CPEC project.

To summarise, this research focuses on businesses participating in the CPEC project as the primary research unit. It performs an in-depth investigation into the relation concerning green HRM and environmental performance, as well as an investigation into the ideas of green innovation and corporate entrepreneurial orientation. Additionally, this study examines the mechanisms, such as moderations and mediations, through which this influence occurs. Several conceptual advances can be attributed to this investigation as compared to previous studies: it begins by investigating green HRM's impact on green innovation, then moves on to analyse green innovation's role as a mediator between green HRM and environmental performance, and finally rounds out the causal chain by considering how fundamental resources figure into the relationship between green HRM and environmental outcomes at organisations. From a perspective of organisational characteristics, this research analyses how the presence of a corporate entrepreneurial orientation moderates the effectiveness of green HRM. Third, this paper focuses on the moderating effect of corporate entrepreneurial orientation from the perspective of organisational characteristics and can more comprehensively understand the contingency space and mechanism of the effectiveness of green HRM. The study unveils major implications for the environmental governance based on a comprehensive analysis of green HRM and its contributions towards environmental performance.

2 Literature review

Over the past hundred years, human society gone through various transformations. During the time of transformation, humans have used countless resources. As a result, environmental problems, resource crises, and other barriers to social development continue to emerge. Similarly, human beings have no choice but to achieve long-term development to explore a new path of sustainable resource acquisition and utilisation (Bhuiyan, 2022). People began to reflect on the problems in production and management, and more environmentally friendly and greener production management ideas emerged. HRM occupies an important position in the production management system. HRM systems have evolved from traditional to a more participatory and supportive stage where employees have more opportunities to upgrade their skills, comprehension, and awareness (Chaudhary, 2020; Zhou et al., 2019). The notion of 'green development', which encompasses environmental management and resource sustainable development, demands that an organisation's plan for managing its human resources be aligned with its overall corporate development strategy (Aftab et al., 2023). Pham et al. (2020) argued that green HRM is a strategy that has an impact on corporate environment and ecology and is related to corporate environmental strategies and employees' green behaviours. Dumont et al. (2017) argued green HRM as an integral part of sustainable HRM which basically focuses on corporate environmental management practices. The study of Alukal

et al. (2022) performed systematic literature survey on green human resource management and highlighted the importance of green initiatives within the context of human resource management.

According to Yusoff et al. (2020), green HRM involves green selection (GS), development, green performance appraisal (GPA), training, and green compensation (GC). Singh et al. (2020) measured green HRM using three practices which includes green motivation green ability, and green opportunity. The study of Yong et al. (2019) indicated green HRM include GS, green training (GT), green rewards, and green performance assessment. Pham et al. (2020) performed a comprehensive review of studies on green HRM and highlighted selection, training, performance appraisal, reward system, job analysis, employee empowerment, organisation culture, organisation learning and green safety as practices of green HRM. In combining with the efforts of theoretical and empirical studies, we can classify several green HRM practices that has been frequently used to measure green HRM. Based on critical analysis from the recent literature, we classified GS, GT, GC, and GPA as practices of green HRM. The classified green HRM practices mentioned above are endorsed by recent published theoretical and empirical papers (Aftab et al., 2023; Amrutha and Geetha, 2020; Haddock-Millar et al., 2016; Pham et al., 2020; Saeed et al., 2019).

Further, in the current era of digitalisation, customers' demands for products are diverse, individualised, and have a shorter life cycle in the extremely competitive market. On the other hand, the awareness about the environmental issues is increasing and global environmental governance is also put into place following the consensus of world leaders at COP21 and COP26 (Zameer et al., 2023). The abovementioned factors work together to make green innovation the key to the high-quality and sustainable growth of manufacturing firms. Academic research demonstrates that corporate HRM affects both ability and motivation for innovation, which in turn affects the implementation of green innovation (Kianto et al., 2017; Laursen and Foss, 2003). HRM's main objective is to maximise each employee's potential to enable them to contribute the most value to their organisations while performing their jobs (Manzoor et al., 2019). Employee retention, training, performance appraisal and reward systems are some of the corresponding measures that could be taken to utilise potential of the employees (Islam et al., 2020). Employee selection is the process to identify high-performing people and the areas in which those employees may excel better (Bolander and Sandberg, 2013; Villegas et al., 2019). Shah et al. (2023) indicated that lack of environmental knowledge and lack of government support are among key barriers to the adoption of green human resource management in the manufacturing sectors of the economy.

Considering the recent developments related to the environment, businesses has started to understand that promoting themselves as environmentally conscious is a strong means in the process of recruiting employees (Phillips, 2007). Once selection process of employees is completed, the next step in any organisation its training. In the wider context of green HRM, 'GT' generally refers to programs designed to teach workers how to adopt habits, acquire knowledge and skills that will slow or stop the deterioration of similar elements in the natural environment (Zoogah, 2011). The study of Yong et al. (2020) indicated the GS and GT positively contributes towards environmental sustainability. The focus of institutional theory (Dacin et al., 2002) is on the ways in which institutions, such as regulations, conventions, and policies, influence the behaviour of organisations as well as individuals. Within the framework of GS, it investigates the

factors, including as rules and incentives, that contribute to the adoption of green innovation. Chaudhary (2020) selected automobile sector of India to explore the role of GT in promoting green behaviour of employees. The study indicated GT as a significant way to reinforce employee green behaviour. Song et al. (2021) found that managerial green concern along with GT could improve green innovation. Additionally, Singh et al. (2020) also indicated that green HRM practices could drive green innovation. However, they have adopted different green HRM practices such as green motivation and green ability. Although, the practices used in that study are different from our study, but it gives a clue to presume the relation of green HRM with green innovation. Similarly, the following hypotheses have been presented considering the preceding discussion.

H1 GS significantly improves green innovation.

H2 GT is significantly important to reinforce green innovation.

Employees contribute actively to business performance through innovation, especially green innovation, when they are offered compensation incentives that are proportional with the degree of effort they put in (Wheatley and Doty, 2010; Xiaofang and Zhuohang, 2022). The study of Flammer et al. (2019) also emphasised over significance of executive compensation for the organisation outcomes. According to stakeholder theory (Freeman et al., 2010), businesses not only have a responsibility toward their shareholders, but also toward other stakeholders, such as their employees, their customers, and the environment. It is possible to view GC as a means of bringing the interests of employees into alignment with the environmental aims of the firm. In contrast, Biggerstaff et al. (2019) argued that option based compensation is not an antecedent factor of innovation. In addition, Easa and Orra (2021) performed a systematic literature review and argued that compensation shown to be associated with innovation outcomes, but further empirical evidence is needed. Several studies indicated green innovation as an organisational outcome (Shahzad et al., 2020; Zhang et al., 2020). Similarly, keeping in view green innovation as an organisation outcome, it can be presumed that GC will strengthen green innovation. Consequently, to add empirical evidence to confirm the relation among GC and green innovation, we propose:

H3 GC strengthens green innovation.

Furthermore, a GPA can help an organisation establish a sustainable culture by demonstrating to employees that environmental performance is appreciated and rewarded. This can support the creation of a sustainable culture inside an organisation (Al-Swidi et al., 2021). Enhanced employee engagement and motivation can foster sustainability activities, hence stimulating green innovation (Alnaim et al., 2022; Hu et al., 2023). A GPA can assist a business demonstrate its commitment to sustainability to external stakeholders, such as consumers, investors, and regulators, in addition to driving innovation within the organisation itself. These stakeholders include customers, investors, and regulators. This has the potential to improve the organisation's reputation and make it easier to bring in and keep customers and investors who are environmentally conscious. An equal emphasis is placed on a company's economic, social, and environmental outcomes, according to the concept of the triple bottom line (Adams et al., 2013). The idea, when applied to the process of GPA, advocates for evaluating and compensating workers for their efforts to promote social and environmental sustainability in addition to their financial success. This is in addition to evaluating and compensating workers for

their financial success. On the other hand, research reveals that green performance evaluations may not be sufficient on their own to stimulate innovation in environmentally friendly practices. Other elements, such as organisational culture, support from leadership, and access to resources, are also critical in the process of stimulating green innovation and cultivating a culture that values sustainability (Begum et al., 2022). For example, if an organisation's culture does not prioritise sustainability or if its leadership is not committed to green innovation, then GPAs are unlikely to be effective in driving change. Similarly, if employees do not have access to the resources, they need to implement sustainable practices, then they may not be able to make the changes required to achieve green innovation. In summing up, it can be argued that relevant research has not shown consensus on the relationship of GPA with green innovation. Similarly, to confirm said linkage in the context of companies participating in CPEC project, fresh evidence is required. Hence, to bring fresh evidence, we propose:

H4 GPA is important to drive green innovation.

Green innovation focuses on an organisation's ability to come up with new ideas, builds the idea of ecological sustainability into the way its products are made, uses more eco-friendly raw materials to cut down on pollution, and reduces raw materials use (Albort-Morant et al., 2018; Takalo and Tooranloo, 2021). Green innovation effectively reduces negative consequences of the organisational operations and improve social as well as financial performance (Aguilera-Caracuel and Ortiz-de-Mandojana, 2013). Moreover, the concept environmental performance usually includes the green impact of corporate operations, products, and resource consumption to meet organisation green demand (Long et al., 2017; Wang et al., 2022). The study of Singh et al. (2020) highlighted that green innovation could predict environmental performance of the firm. Rehman et al. (2021) studies in the context of large manufacturing firms and argued that green innovation improves environmental performance. Zameer et al. (2021) indicated that environmental orientation and green innovation both are important factors that could drive firm environmental performance. Based on the findings from prior investigations, the following hypotheses can be put forward for companies participating in the CPEC project.

H5 Green innovation improves environmental performance.

As previously stated, green HRM has the potential to strengthen the firms' capacities in green innovation. However, one may argue that there are significant disparities in the ways in which important knowledge and information is perceived and utilised by different industries. These discrepancies, in turn, would lead to distinct utilisation consequences of green HRM. Similarly, conducting comprehensive analysis is quite vital for comprehending how successfully businesses may apply green HRM. Corporate entrepreneurial orientation is basically strong dedication to both incremental and radical innovations in terms of their strategic significance to the business as well as their strategic relevance to the company's operations and procedures (Kemelgor, 2002). The corporate entrepreneurial orientation promotes the idea that it should encourage firms to accelerate innovation and risk-taking in organisational activities (Rauch et al., 2009; Wales, 2016). Further, innovation, and risk-taking indicate the organisation's strong will to innovate, produce knowledge, and invest in uncertain conditions. Firm decision-making style can influence how employees regard specific HRM practices

(Alkaraki et al., 2022; O'Donohue and Torugsa, 2016; Rosenbusch et al., 2011). Based on the discussion, this study presumes that when firm corporate entrepreneurial orientation is at a higher level, the positive effect of green HRM on green innovation is stronger. The reasoning behind this assumption is that businesses with a strong corporate entrepreneurial orientation can utilise information and knowledge within functional departments and within each level in a more efficient manner, which might be helpful to accelerate innovation. Similarly, it can be presumed that corporate entrepreneurial orientation could significantly moderate the influence of green HRM on green innovation. Hence, we posit that:

H6 Corporate entrepreneurial orientation moderates the relationship among green HRM practices and green innovation.

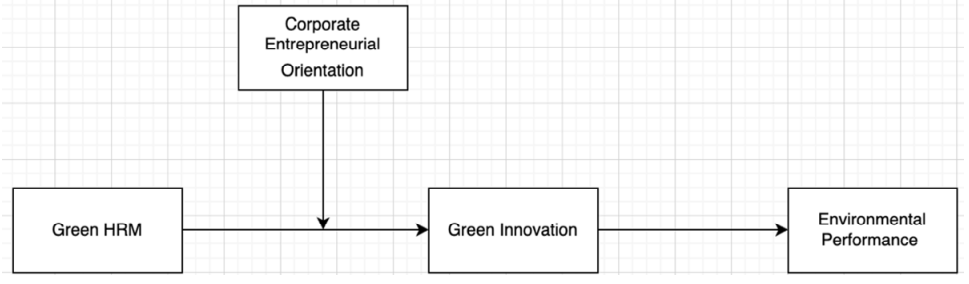
Wernerfelt (1984) resource-based view posits that the resources and capabilities of a company are among the most important factors in determining that overall performance of company. In the case of natural resource-based view, one can argue that resources and capabilities of a firm includes its innovation capacity and its ability to manage its human resources in an environmentally conscious manner (Hart, 1995). The term 'green innovation' refers to the creation and introduction of novel eco-friendly technologies, procedures, and products that have a beneficial effect on the surrounding natural environment. It involves the integration of environmental concerns into the innovation process, which can lead to the creation of sustainable products and services. Green HRM, on the other hand, involves the implementation of practices and policies that promote environmental sustainability within the organisation (Renwick et al., 2013). The study of Boyer and Boulatoff (2023) indicated that companies that issue green bonds can improve their environmental performance. Environmental performance can be simplified to mean the effect that an organisation's activities have on the surrounding environment (Zameer et al., 2023). This includes the carbon footprint of the firm, as well as its waste management methods and its utilisation of natural resources. The purpose of human resource management that is environmentally friendly is to enhance the environmental performance of a business by lowering the organisation's environmental footprint. Because the role of green innovation as a mediator in the relationship between green HRM and environmental performance has not been fully investigated, it has been discovered through an examination of the existing body of literature that there is now available. There has been relatively few research done in the past that have looked at mediation, but the results have not been able to reach a consensus. For instance, Awan et al. (2022) conducted research to investigate the role that green innovation plays in mediating the connection that exists between green HRM and environmental performance. According to the findings of the research, green innovation seems to play a function in mediating the relationship between green HRM and environmental performance. This is evidenced by the fact that green innovation appears to play a role in mediating the relationship. This demonstrates that organisations who implement green HRM practices have a larger likelihood of engaging in green innovation, which eventually leads in greater environmental performance for the organisation. Another research by Aftab et al. (2022), also highlight the mediating role of green innovation. Although, these studies show the mediating role of green innovation, but none of the study has explored mediating role of green innovation in the context of companies participating in CPEC project. In addition, no study focused or exploring the moderating role of corporate environmental orientation in said perspective. Therefore, it is significant

to explore whether the green innovation moderate the link between green HRM and environmental performance of companies participating in CPEC project. To fill knowledge gap and answer questions discussed above, the following hypothesis is proposed for empirical testing.

H7 Green innovation mediates the relation among green HRM practices and environmental performance.

Green HRM, corporate entrepreneurial orientation, green innovation, and environmental performance are all important concepts in the field of sustainability and organisational management. Research has shown that these concepts are interrelated and can influence each other in various ways. Based the existing literature, seven hypotheses have been proposed in this paper. To summarise, we have developed following theoretical framework (shown in Figure 1).

Figure 1 Theoretical framework



3 Methodology

This study utilised primary data collected through a survey method to investigate relations among four key variables including green HRM, corporate entrepreneurial orientation, green innovation, and environmental performance. Based on previously conducted research, a questionnaire was constructed, and data was collected from managers using a five-point Likert scale. Green HRM practices scale was adopted from the study of Ojo et al. (2022). To measure GS and GT we adopted four-item scale for each. GC is measured using three-item scale and GPA was measured using five-item scales. Measures for green innovation were adapted from Cuerva et al. (2014) study, we retained four-item scale. The environmental performance was evaluated using a four-point scale developed by Latan et al. (2018). Finally, corporate entrepreneurial orientation was measured based on the study of Chen et al. (2015), we retained five-item.

The data collection was done using questionnaires method which is a common data collection method used in managerial level research. Questionnaire-based surveys can be carried out in a variety of formats, including paper-based questionnaires, internet surveys, phone surveys, and in-person interviews with the use of a questionnaire. In this study mixed method of survey was adopted using online, phone and paper version which was combined prior to further processing. The criteria adopted for respondent selection for this study includes the diversity and size of the company participating in CPEC project. Moreover, we also emphasised on choosing respondents based on decision making

authority and human resource knowledge in the company. Structural equation modelling was employed for empirical analysis, using valid data of 218 respondents obtained from managers working in companies participating in the CPEC project. The demographic information shows that about 68% were male and rest were female respondents. Majority of respondents (42%) were in the age group of 25–35 years, followed by (39%) 36–45 years of age, remaining were above 45 years. The education related information show that majority of respondents hold bachelor's degree (48%), followed by holding master's degree (44%), remining selected diploma's/other qualification. The detailed demographic information is shown in the Table 1. Data screening and exploratory factor analysis were conducted using SPSS, followed by confirmatory factor analysis using AMOS graphics to ensure reliability and validity through composite, discriminant, and convergent validity checks.

Table 1 Demographic information

		Number of respondents	*Percentage*
Gender	Male	148	68%
	Female	70	32%
Age	25–35 years	92	42%
	36–45 years	85	39%
	45 years and above	41	19%
Education	Master's degree	96	44%
	Bachelor's degree	105	48%
	Diploma's/other qualification	17	8%
Total		N = 218	100%

4 Results and findings

In the previous section, it was discussed that the study initially establishes the validity and reliability of various scales found in the literature. After this step, the study proceeds to test the hypotheses formulated in earlier sections. Four key variables are being investigated in the study to understand how green HRM, corporate entrepreneurial orientation and green innovation reinforce environmental performance of companies participating in the CPEC project. The study has developed five hypotheses to examine direct connections and an additional two hypotheses to assess the moderation and mediation effects. Table 2 displays factor loadings obtained from confirmatory factor analysis, along with information on composite reliability, and average variance extracted.

Table 2 demonstrates that all constructs factor loadings exceeds the required level of 0.50 and are significant at a 0.001 percent. Additionally, the developed model satisfies the criteria of goodness of fit indices, including RMR, RMSEA, CFA, and NFI, as prescribed in the previous studies (Hair et al., 2010). The indicator reliability is determined by the factor loading values. According to Bagozzi and Yi (1991), if the value is above 0.5, the indicator reliability is considered satisfactory. The final results of the confirmatory factor analysis are presented in Table 2, which confirms that all factors are appropriately loaded. To evaluate internal consistency, composite reliability is the benchmark suggested by Hair et al. (2010), and the values are above 0.70, hence it meets

the prescribed criteria. Variance analysis was used to measure convergent validity, as recommended by Hair et al. (2010), and Table 2 reveals that the variance for all factors is above 0.5, satisfying the criteria prescribed by Hair et al. (2010).

Table 2 Statistics on factor loadings and reliability

Construct	*Std. loading (>0.5)*	*CR (>0.7)*	*Variance (>0.5)*
Green selection		0.865	0.617
GRSL1	0.78		
GRSL2	0.82		
GRSL3	0.79		
GRSL4	0.75		
Green training		0.833	0.557
GRT1	0.81		
GRT2	0.77		
GRT3	0.72		
GRT4	0.68		
Green compensation		0.771	0.529
GRCN1	0.69		
GRCN2	0.71		
GRCN3	0.78		
Green performance appraisal		0.880	0.596
GPAPR1	0.84		
GPAPR2	0.75		
GPAPR3	0.83		
GPAPR4	0.68		
GPAPR5	0.75		
Corporate entrepreneurial orientation		0.866	0.565
CEO1	0.77		
CEO2	0.84		
CEO3	0.67		
CEO4	0.75		
CEO5	0.72		
Green innovation		0.835	0.558
GRINN1	0.75		
GRINN2	0.77		
GRINN3	0.73		
GRINN4	0.74		
Environmental performance		0.884	0.707
ENVPER1	0.71		
ENVPER2	0.69		
ENVPER3	0.65		
ENVPER4	0.78		

Source: Authors estimation

Following these analyses, we proceeded to run a structural model to test the hypotheses. The model fitting results indicate that the CFI is 0.976, GFI is 0.953, RMR is 0.044, RMSEA is 0.021, and CMIN/DF is 2.463, meeting the goodness of fit criteria for the model. Based on the model fitting, we moved to next step for hypothesis testing. The results for direct relation hypothesis are shown in Table 3.

Table 3 Hypothesis of direct effects

	Independent variable		*Dependent variable*	*β*	*SE*	*CR*	*P*	*Decision*
H1	Green selection	→	Green innovation	0.151	0.047	2.751	0.006	Supported
H2	Green training	→	Green innovation	0.349	0.070	5.471	0.000	Supported
H3	Green compensation	→	Green innovation	0.208	0.087	2.762	0.003	Supported
H4	Green performance appraisal	→	Green innovation	0.141	0.075	2.217	0.027	Supported
H5	Green innovation	→	Environmental performance	0.376	0.044	6.152	0.000	Supported

Source: Author's estimation

The results presented in Table 3 shows that GS has positive relation with green innovation, the results are significant, hence hypothesis (H1) is supported. GS emphasises on environmental and sustainability factors to guarantee that new hired employees would share the company's commitment to sustainability and have the skills and experience to promote green innovation. The second hypothesis (H2) confirms that GT has capability to improve green innovation. GT increases awareness, skills, collaboration, opportunity, and innovation culture which helps companies to reduce their environmental footprint through fostering green innovation. The results from this paper are apparent that GC can have a positive link with green innovation, hypothesis (H3) is supported. Similarly, it can be argued that by compensating individuals or organisations for ecologically sustainable behaviour, GC can assist to develop a culture of sustainability and drive innovation. Further, we also find the evidence to support H4 that show GPA of employees has a positive relationship with green innovation, hence H4 is supported. Green performance evaluations motivate employees to improve their environmental performance and provide sustainable solutions by aligning goals, increasing awareness, providing incentives, encouraging behavioural change, fostering innovation, providing feedback, demonstrating leadership commitment, encouraging peer influence, putting an emphasis on long-term thinking, and integrating sustainability into the culture of the organisation. This can boost green innovation in the company, such as the creation of eco-friendly products and procedures. Finally, we found that green innovation improves environmental performance, hypothesis H5 is supported. Similarly, it can be said that green innovation will reduce carbon emissions by inventing cleaner and more efficient technology which could ultimately improve environmental performance of companies.

Once direct relation hypothesises are evaluated, the next step is to evaluate mediation and moderation analysis hypothesis. Similarly, the hypothesis was evaluated for mediation analysis the results are shown in Table 4 and moderation analysis are shown in Figure 2.

Table 4 Mediating effects

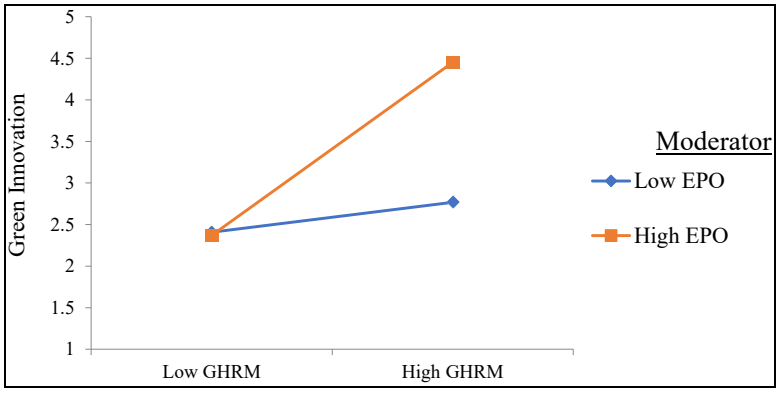
	Independent variable	*Mediating variable*	*Dependent variable*	*Estimate*	*SE*	*P*	*Decision*
H6	GHRM	GRINN	ENVPER	0.251	0.054	0.001	Supported

Notes: GHRM is green HRM, GRINN is green innovation, and ENVPER is environmental performance.

Source: Author's estimation

The results from mediation analysis show that green innovation perform a crucial role in mediating the relation between green HRM and environmental performance. Hence the Hypothesis H6 is supported. Green HRM practices are designed to encourage environmentally responsible behaviour among employees, and when combined with green innovation, can lead to considerable improvements in the environmental performance.

Figure 2 Moderation analysis (see online version for colours)



Hypothesis H7 was proposed that corporate entrepreneurial orientation plays a positive moderating effect on the relation among green HRM and green innovation. The results of the moderation analysis are presented in Figure 2, and it shows that the interaction term between green HRM and corporate entrepreneurial orientation has a significant positive relation with green innovation. This finding suggests that when the level of entrepreneurial orientation present in the company is high, the positive effect of green HRM on green innovation is stronger. As a result, the H7 hypothesis is validated. It indicates that companies driven by entrepreneurial orientation are more comfortable with taking chances and are more willing to test out new ideas. This orientation, when applied to green innovation, encourages employees to suggest and implement ecologically beneficial ideas, products, or processes. Green HRM strategies have the potential to encourage risk-taking by cultivating a culture that encourages and recognises the value of efforts to innovate in a sustainable manner. In summary, an entrepreneurial orientation inside a company, when aligned with methods for green HRM, can help to cultivate an atmosphere that stimulates the development of environmentally friendly innovations. The corporation can design and implement innovative approaches that address environmental concerns while simultaneously driving business growth and gaining a competitive edge

because of the synergy that exists between entrepreneurial characteristics and sustainable practices.

5 Conclusions and implications

5.1 Conclusions

The increasingly rigorous environmental regulatory policies implemented by the governments worldwide along with rapid increase in consumers' awareness of environmental protection, businesses are faced with the challenge of figuring out how to effectively improve their environmental performance to achieve sustainable development. Enterprises will frequently be accompanied in the process of implementing environmental management by the development of HRM systems. However, very few studies have systematically investigated how specific green HRM can improve green innovation capabilities and improve environmental performance. In this perspective, this study explored the effects of green HRM on green innovation, and then discusses the mediating role of green innovation in the impact of green HRM on environmental performance. To perform further in-depth analysis, we also incorporated the role of entrepreneurial orientation as a moderator in the relation of green HRM and green innovation. It is concluded that green innovation serves as a bridge among green HRM and environmental performance. The mediating role of green innovation in the impact of green HRM on environmental performance suggests that green innovation can act as a mechanism through which green HRM influences environmental performance. By promoting green innovation, green HRM can lead to the development of new environmentally sustainable products, services, and processes that can reduce the environmental impact of the organisation. Therefore, it is concluded that the environmental performance of companies will be considerably improved by the implementation of green HRM practices. Green HRM has the potential to effectively incentivise employees to take part in environmental protection efforts, enhance the distinctive capabilities of businesses in this area, and give employees meaningful opportunities to take part in environmental protection in innovative ways. Because green HRM is a specific HRM practice system that points to sustainable development.

Further, it has been concluded that a corporate entrepreneurial orientation strengthens the beneficial influence that green HRM has on green innovation. This is also found that green HRM had a positive impact on green innovation. The fact that a company's entrepreneurial orientation plays a moderating function in the relationship between green HRM, and green innovation provides evidence that a corporate entrepreneurial orientation can influence the connection between green HRM and green innovation. A high level of corporate entrepreneurial orientation can enhance the positive effect of green HRM on green innovation by providing the necessary resources and support for innovation. Conversely, a low level of corporate entrepreneurial orientation can hinder the effect of green HRM on green innovation, as there may be a lack of resources or a risk-averse culture that discourages innovation.

5.2 Research implications

Green HRM emphasises the incorporation of ecological considerations into HR policies and practices, which can have substantial implications for environmental governance. Initially, green HRM can result in the creation of more sustainable organisations. By incorporating environmental concerns into HR procedures and regulations, businesses can reduce their environmental impact by encouraging employees to take more environmentally responsible actions. It is suggested to create a holistic strategy within the organisation for enhancing the environmental performance of a business that can be accomplished by embedding green HRM principles into the very foundation of the organisation. Companies can lessen their impact on the environment, improve their brand reputation, and make a positive contribution to the overall health of the planet if they connect their HR processes with their sustainability goals and take advantage of the skills and commitment of their workforce. Second, green human resource management has the potential to contribute to the development of a workforce that is more environmentally responsible. A workforce that is prepared with the information, skills, and attitudes essential to promote sustainability is referred to as a sustainable workforce. Through the provision of learning and development opportunities with a concentration on environmental concerns, green HRM has the potential to become an incredibly significant component in the formation of a sustainable workforce that could drive ambitions of environmental governance. Employees can be assisted in comprehending the significance of sustainability and the way their activities might contribute to a more sustainable future if, for instance, firms provide training on sustainability for the aim of supporting employees in understanding the concept of sustainability.

Thirdly, green HRM can promote environmental governance by promoting organisations to play an active role in the formulation of environmental policy. Organisations can raise employee and consumer knowledge of environmental issues by incorporating green thinking into HR practices and policies. This understanding can lead to a more proactive approach to environmental policymaking and advocacy. We can argue that green HRM is an important component that contributes to the development of environmental governance inside enterprises. Green HRM contributes to the efficient management of environmental concerns and the building of a culture of responsible ecological stewardship through the incorporation of environmental sustainability concepts into HR practices. The higher management is responsible for promoting environmental governance through a firm dedication to sustainability. This dedication serves as an example for future green HRM initiatives across the company. Therefore, it is suggested that higher management should take a lead and educate employees working under their supervision on a consistent basis about environmental challenges and their participation in environmental governance through the provision of regular training and awareness initiatives.

5.3 Limitations and future work

The findings of our research should, in our opinion, also be considered considering the limitations described in the following paragraphs. First, the purpose of our study was to investigate the direct and indirect connections that exist between green HRM, green innovation, corporate entrepreneurial orientation, and environmental performance. This was done within the context of the companies participating in CPEC project, which limits

the scope of the study and the extent to which its findings and conclusions can be generalised. Second, the data for the study came from a survey that included only closed-ended questions, and it is impossible to rule out the possibility that the survey instrument itself contained design issues. We have done everything in our power to ensure that the responders we include are well-informed in the terminology that is used in the questionnaire. Third, in this study, we only concentrated on the only companies participating in CPEC project and ignored other companies. We consider it limitation of our study as ignoring other companies may have further restricted the scope of the study, making it more difficult to generalise the results and conclusions to other companies. In view of the limitations, it is suggested that future work maybe carried on by overcoming these limitations to bring fresh insights for environmental governance.

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