



Integrating green human resource practices and innovation to enhance environmental outcomes for sustainable development

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ABSTRACT

Climate change and environmental pollution impose the responsibility on global organizations to pursue environmentally friendly strategies. This study comprehensively explores the integration between green human resource management (GHRM) and environmental performance (EP), along with the mediating roles of green innovation (GI) and employee pro-environmental behavior (E-PEB) in this relationship, based on the ability, motivation, and opportunity theory. Furthermore, the study draws on strategy, structure, capability, and performance theory to examine the moderating role of environmental strategy (ES) on the relationship between GI and EP. The author conducts a survey of 360 manufacturers operating in Ho Chi Minh City, and the data are analyzed using partial least squares structural equation modelling. The results of the study emphasize the important role of GHRM, GI, and E-PEB in enhancing organizational EP, and ES was found not to moderate the relationship from GI to EP for sustainable development.

Keywords: green human resource management, environmental performance, green innovation, manufacturing, employees' pro-environmental behavior, environmental strategy

INTRODUCTION

Integrating environmental considerations into HRM policies and practices to promote sustainability is known as "green human resource management" (GHRM) (Nejati et al., 2017; Pham et al., 2019; Saeed et al., 2019; Yusliza et al., 2019). Moreover, GHRM is also considered a part of corporate social responsibility (de Souza Freitas et al., 2020; Niazi et al., 2023). Corporate attention to environmental issues has become increasingly critical, as minimizing negative environmental impacts enhances business performance and generates benefits for the community (Mousa & Othman, 2020).

This study focuses on Ho Chi Minh City (HCMC) due to the escalating environmental challenges there. The manufacturing industry is a major contributor to environmental problems such as waste production, climate change, resource depletion, air and water pollution, and more, according to Kraus et al. (2020). Thus, encouraging environmental initiatives is a necessary first step in tackling global issues.

Businesses that adopt GHRM practices improve their environmental performance (EP), according to earlier research (Aftab et al., 2023; Aggarwal & Agarwala, 2023; Tran et al., 2022). Additionally, several studies have looked at the moderating function of environmental strategy (ES) (Aftab et

al., 2023), the mediation role of green innovation (GI) (Singh et al., 2020; Sobaih et al., 2020; Yang & Li, 2023), and the employee pro-environmental behavior (E-PEB) (Tran et al., 2022). But some authors, including Yang and Li (2023) and Zhu et al. (2021) have addressed only one or two facets of these interactions. Interestingly, only a small number of frameworks apply all of the previously listed factors to HCMC.

Therefore, the primary objective of this study is to examine how E-PEB and GI mediate the relationship between EP and GRHM, and how ES influences the relationship between EP and GI in HCMC manufacturing firms for sustainable development.

DATA AND METHODS

Literature Review and Research Hypotheses

The ability, motivation, and opportunity (AMO) and strategy, structure, capability, and performance (SSCP) theories form the basis of this investigation. The characteristics of GHRM are supported by the AMO theory. Through GHRM practices, including environmental awareness, training, performance reviews, and incentives tied to environmental accomplishments, employees can gain a clear understanding of their company's position on environmental issues. Their obligations to the environment,

however, continue to worry them. Perception, competency development, reward motivation, and active engagement in sustainable environmental activities are the main causes of this awareness (Fawehinmi et al., 2020). According to the AMO theory, when given the right skills, opportunities, and incentives, employee performance and behavior are maximized to align with company goals (Jackson et al., 2014). Eden (1993) expanded on this idea from the AMO theory, suggesting that people are more likely to take decisive action to protect the environment when they believe they can act in ways that benefit the environment and acknowledge their own responsibility for negative environmental effects.

The ability, motivation, and opportunity components of the AMO theory can be used to best implement GHRM's components to influence employees' pro-environmental behavior. Initially, the capacity is based on green hiring and selection practices, as well as green training and development to raise staff members' knowledge and equip them with the skills they need to carry out green projects (Fawehinmi et al., 2020). Performance management, which distributes monetary and non-monetary incentives according to workers' green performance, is the next factor that motivates employees. Employee efforts to meet green performance targets are strengthened by this strategy (Fawehinmi et al., 2020). Lastly, opportunities include empowerment, awareness, and involvement, which motivate staff to take part in eco-friendly activities. Green opportunities give staff members a forum to offer suggestions and comments that enhance the efficiency of the company (Marin-Garcia & Martinez Tomas, 2016).

In addition to highlighting how strategy and structure alignment improve organizational performance, the SSCP framework contends that firms can only improve performance when their capabilities are built through strategy and structure alignment (Chen et al., 2009; Galbraith & Kazanjian, 1986). To understand how a company's ES affects its organizational efforts to improve EP and drive GI, this study extends the SSCP framework to the GHRM setting. The research proposes that a company's proactive ES is a crucial strategic objective. A proactive corporate ES leads organizations beyond compliance with legal and regulatory requirements by addressing environmental issues at a high level (Bowen et al., 2001). The arrangement of a company's resources might be considered its structure (Hall & Saias, 1980). According to earlier research, a competitive advantage can result from a capacity for continual innovation that is based on proactive environmental management (Sharma & Vredenburg, 1998). To improve performance, a company can gain a competitive edge by aligning its strategic environmental priorities with GI processes, as outlined in the SSCP framework within the scope of GHRM.

Grounded in AMO theory, GHRM enhances employees' abilities, motivation, and opportunities through green training, green rewards, and empowerment, thereby stimulating E-PEB and GI. Meanwhile, the SSCP framework explains how environmental strategy and green innovation jointly influence EP.

Therefore, AMO provides a micro-level behavioral mechanism, while SSCP offers the macro-level strategic-performance linkage. The integration of these frameworks enables a multilevel explanation of EP.

Environmental performance

An organization's contribution to environmental protection is known as EP (Paillé et al., 2020). It refers to an organization's efforts to meet and surpass environmental standards set by society (Chan, 2005). According to previous studies, standards for environmentally friendly products, the creation of green products and processes, and the incorporation of ecological sustainability concerns into corporate operations and product development are the foundations of EP (Fang et al., 2022; Oliva et al., 2019; Singh et al., 2020).

In this study, EP is conceptualized as managers' perceptions of the extent to which their organizations reduce environmental impacts through improved processes, products, and resource efficiency.

Green human resource management

The term "green human resource management" refers to a range of organizational procedures and policies that promote eco-friendly practices while ensuring both personal and corporate benefits (Faisal, 2023). Green employee relations, green employee involvement, green performance management, green training and development, green compensation management, and green recruitment and selection are all included in GHRM (Faisal, 2023).

The importance of GHRM in improving an organization's EP is increasingly recognized. The study by El Baroudi et al. (2023) in the hospitality industry found that GHRM positively affects workers' EP. Liu et al. (2023) explored the impact of GHRM, GI, and responsible leadership on EP was explored, particularly in the banking sector. Furthermore, a recent study by Xie et al. (2023) emphasized the importance of GHRM in promoting employees' pro-environmental behavior. Based on this foundation, the author proposes the following hypotheses:

H1. GRHM positively impacts EP.

H2. GRHM positively impacts GI.

H5. GRHM positively impacts on employees' pro-environmental behavior.

Green innovation

To meet environmental standards for corporate social responsibility, GI refers to technological advancements in green service design, energy conservation, pollution reduction, waste recycling, and corporate environmental management (Li et al., 2019). GI helps to improve EP and is closely related to a company's environmental management strategy (Singh et al., 2020). Companies implement strategies and actions that include green and creative activities to enhance employees' working environment and positively affect their well-being (Yahya & Zargar, 2023). By adopting GI and utilizing environmentally friendly production methods, companies can improve EP, enhance ecological and energy efficiency, reduce resource consumption, and ultimately lower overall costs (Awwad Al-Shammari et al., 2022). According to Rehman et al. (2021) argue that employees working in innovation-related fields can help organizations perform better, leading to a sustainable competitive advantage. The study's findings suggest that analyzing the relationship

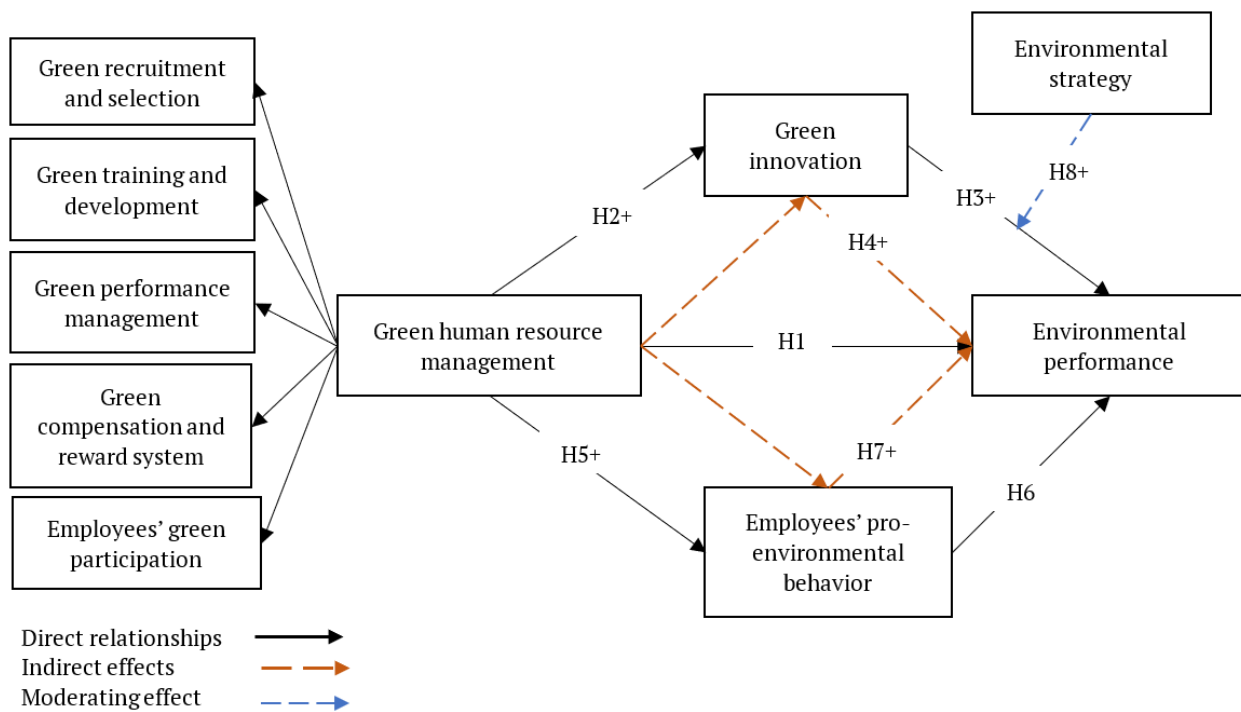


Figure 1. Conceptual model (Source: Authors' own elaboration)

between GI and GRHM can help comprehend how these elements affect sustainable performance. Based on this foundation, the author proposes the following hypotheses:

H3. GI positively impacts EP.

H4. GI mediates the relationship between GRHM and EP.

Employee pro-environmental behavior

E-PEB refers to individuals' conscious efforts to reduce the negative environmental impact of their activities. Since a significant portion of time is spent at the workplace, fostering E-PEB among employees benefits the corporate environment and positively impacts their personal lives and broader societal communities (Schaltegger & Burritt, 2018). The effectiveness of corporate activities in achieving environmental sustainability depends on employees' endorsement and implementation of E-PEB. Fully integrating ecological sustainability into human resource strategies is a crucial challenge that human resource professionals face today (Liu et al., 2023). However, many eco-friendly corporate initiatives rely on employees' E-PEB for effectiveness and success. As a result, these behaviors are considered essential factors in corporate social and environmental activities and influence businesses, stakeholders, and the environment (Shah, 2019). Limited research on environmental management in the tourism sector indicates that hotel employees' E-PEB significantly and positively affects EP. Additionally, GRHM improves EP directly and indirectly through E-PEB and employee commitment (Kim et al., 2019). Based on this foundation, the author proposes the following hypotheses:

H6. E-PEB positively impacts EP.

H7. E-PEB mediates relationship between GRHM and EP.

Environmental strategy

According to Martín-de Castro et al. (2023), an ES is a proactive approach integrating environmental protection into

a firm's strategic processes through stakeholder engagement and environmental management. This strategy enables organizations to respond to climate emergencies by minimizing environmental risks, enhancing EP, and gaining a competitive advantage.

According to earlier studies, an organization's environment and the careful application of proactive tactics to support eco-friendly technologies can improve its financial results (Khan et al., 2019). An inefficient management culture, on the other hand, might make an ES too reactive rather than proactive, raising the risk of environmental catastrophes and harming a company's reputation (Rehman et al., 2021). The natural resource-based view theory considers pollution prevention, product stewardship, and sustainable development as critical components of ES that contribute to an organization's competitive advantage (Han et al., 2016). Recent studies have demonstrated the overall impact of ES on EP and its key mediating role in the relationship between corporate social responsibility and EP (Kraus et al., 2020). GI can be strengthened within an organization through proactive ES, whereas reactive environmental strategies tend to weaken it (Rehman et al., 2021). The study of Mustafa et al. (2022) found that ES significantly and positively moderates the relationship between GI and EP. Based on the aforementioned arguments, the following hypothesis is proposed:

H8. ES moderates the relationship between GI and EP.

Grounded in the research objectives, literature review, and hypothesis development, the research model is illustrated in **Figure 1**.

The author created measuring scales for the listed parameters based on the research model and hypotheses. The assessment items were modified from earlier research. A five-point Likert scale was used, with 1 denoting "strongly disagree" and 5 denoting "strongly agree." In this analysis, five items measuring GRHM were taken from the papers of Kim

et al. (2019), Ojo et al. (2022) and Dumont et al. (2017). Four items measuring GI were derived from the works of Sobaih et al. (2020) and Singh et al. (2020). The four items assessing E-PEB were adapted from Kim et al. (2019) and Ojo et al. (2022). Similarly, four items measuring ES were drawn from the studies of Chen et al. (2015) and Čater et al. (2018). Finally, four items evaluating EP were adapted from Aggarwal and Agarwala (2023) and Sobaih et al. (2020).

Research Methods

Three stages were included in the conduct of this study:

- Phase 1.** The research model and hypotheses were developed by integrating AMO and SSCP theories with prior studies on GHRM, GI, employees' pro-environmental behavior, ES, and EP. GHRM, GI, E-PEB, ES, and EP were identified as initial variables in the research model, with 21 observed variables.
- Phase 2.** The author designed a survey questionnaire, collected responses from 60 participants, filtered the data, and processed it using SPSS. For further analysis, the scales and observed variables that satisfied the necessary criteria were retained. Hair et al. (2021) state that 275 observations is the bare minimum needed for the partial least squares structural equation modeling (PLS-SEM) technique with a significance level of 5% and a minimum path coefficient of 0.15. However, to ensure robustness and dependability, the author polled 360 managers and employees working in manufacturing firms in HCMC. All collected survey data were coded and processed using SPSS and SmartPLS 4. Based on the perspectives of Nunnally (1978) and Peterson (1994), to ensure the reliability of observed variables in a measurement scale, Cronbach's alpha should exceed 0.6, and the item-total correlation should be greater than 0.3.
- Phase 3.** Using the PLS-SEM approach, the author carried out the main study and evaluated the research model. Hair et al. (2019) state that PLS-SEM applies the least squares regression technique to minimize errors in independent variables. This method effectively handles complex models with multiple relationships and is particularly suitable for reflective and formative measurement models. Two phases were used to validate the suggested research model and hypotheses:
 - (1) evaluation of the measurement model and
 - (2) evaluation of the structural model (Hair et al., 2014).

Key indicators such as Cronbach's alpha > 0.7 (DeVellis, 2019), composite reliability (CR) > 0.7 (Hair et al., 2014), average variance extracted (AVE) > 0.5 (Fornell & Larcker, 1981), and discriminant validity assessment using the Heterotrait-Monotrait (HTMT) ratio < 0.9 (Henseler et al., 2015) were used by the author to evaluate reliability and convergent validity in the measurement model. The author looked at the p-value threshold of 0.05 in the structural model to assess whether the hypotheses were accepted (Hair et al., 2014). Based on the findings, the study proposes managerial implications to help manufacturing firms

enhance EP and strengthen corporate social responsibility.

RESULTS

Descriptive Statistics

The findings outline the respondents' primary demographic traits. In particular, there were 189 male respondents (52.5%) and 171 female respondents (47.5%), suggesting a fairly balanced gender distribution that guarantees the research sample's representativeness. In terms of age distribution, 51.4% of respondents were between 18 and 25, 23.3% were between 26 and 35, 24.7% were between 36 and 45, and 0.6% were between 45 and 55. The survey sample's diversity across age groups is reflected in this distribution. The distribution of managerial levels within the industry indicates a wide variety of work types and responsibilities. In particular, entry-level workers made up the largest share of the sample (44.2%), followed by middle managers (15%), first-line managers (37.8%), and senior managers, who accounted for a relatively small proportion of 3.1%. This distribution highlights the hierarchical structure of the manufacturing industry and its potential influence on the perspectives and behaviors of managers at different levels regarding environmental issues.

The Measurement Model

In the measurement model, the author evaluates the outer loadings, reliability, convergent validity, and discrimination of the variables (Figure 2).

According to Table 1, the Cronbach's alpha values for the measurement scales range from 0.840 to 0.907, all of which exceed the 0.7 cutoff. Furthermore, the CR values, which provide additional validation of the constructs' internal consistency, range from 0.884 to 0.932. The measurement scales' AVE values, ranging from 0.655 to 0.758, exceed the 0.5 cutoff. These results guarantee convergent validity and demonstrate that all measurement scales have high reliability.

The data extracted from Table 2 indicate that the HTMT ratio values for all construct pairs in the model are below the 0.9 threshold, with the highest recorded value being 0.673. Therefore, all measurement scales satisfy the criteria for discriminant validity, as suggested by Henseler et al. (2015).

The Structural Model

The bootstrapping results (with 5,000 resamples) show that GHRM, GI, and E-PEB all positively and significantly influence EP. E-PEB has the strongest effect ($\beta = 0.477$, $p < 0.001$), followed by GI ($\beta = 0.207$, $p < 0.001$) and GHRM ($\beta = 0.173$, $p = 0.002$). GHRM also significantly enhances E-PEB ($\beta = 0.362$) and GI ($\beta = 0.442$). Mediation analysis confirms that both E-PEB ($\beta = 0.173$) and GI ($\beta = 0.091$) transmit the effect of GHRM on EP. However, ES does not moderate the GI-EP relationship ($p = 0.259$). In summary, all hypotheses are supported except the moderating effect (Table 3).

The results in Table 4 indicate that the explanatory power of the independent variables for E-PEB and GI is relatively weak, with adjusted R² values of 0.129 and 0.193, respectively.

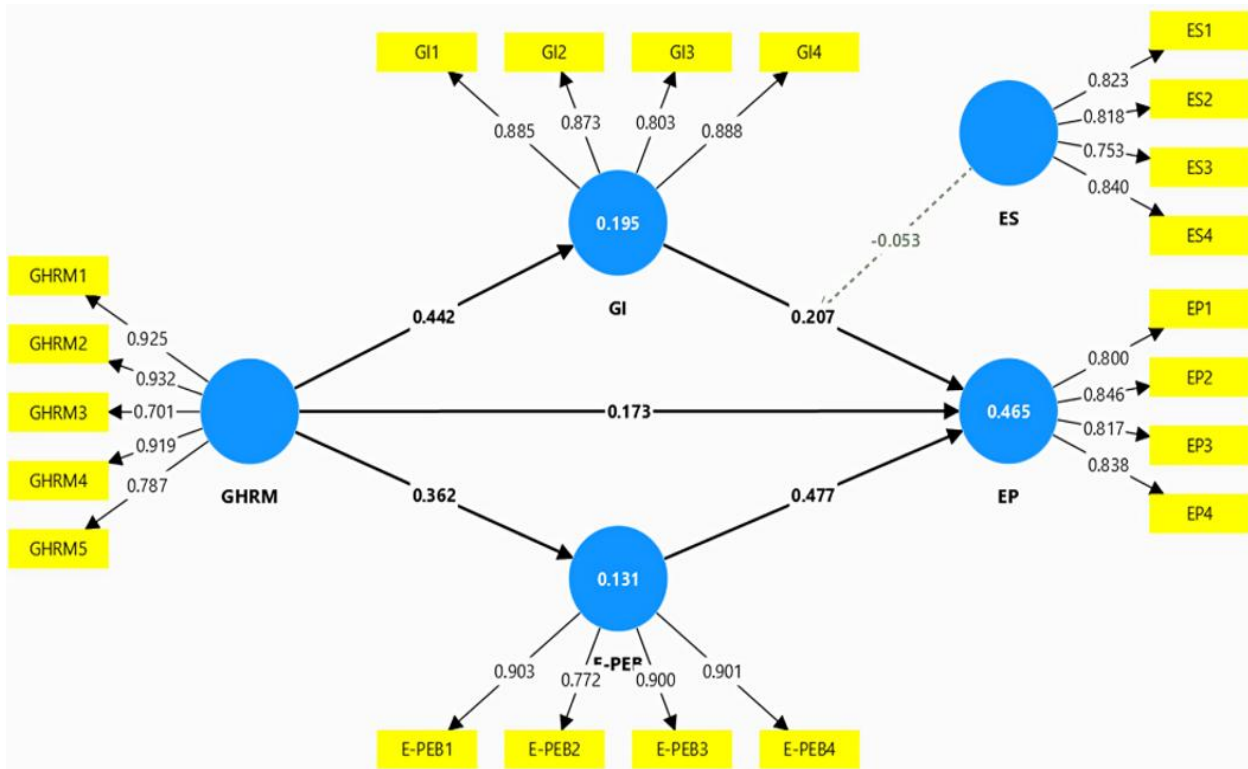


Figure 2. Measurement model (Source: Authors’ own elaboration, using analysis results of PLS-SEM)

Table 1. Results of the reliability and convergent validity assessment

The scale	Cronbach’s alpha	CR	AVE
E-PEB	0.892	0.926	0.758
EP	0.846	0.895	0.682
ES	0.840	0.884	0.655
GHRM	0.907	0.932	0.736
GI	0.886	0.921	0.745

Table 2. The HTMT ratio

	E-PEB	EP	ES	GHRM	GI
E-PEB					
EP	0.673				
ES	0.058	0.107			
GHRM	0.396	0.477	0.064		
GI	0.337	0.482	0.049	0.484	
ES × GI	0.058	0.031	0.275	0.075	0.036

Table 3. Results of hypothesis testing

	Path	Original sample	p	Decisions
H1	GHRM -> EP	0.173	0.002	Accepted
H2	GHRM -> GI	0.442	0.000	Accepted
H3	GI -> EP	0.207	0.000	Accepted
H4	GHRM -> GI -> EP	0.091	0.000	Accepted
H5	GHRM -> E-PEB	0.362	0.000	Accepted
H6	E-PEB -> EP	0.477	0.000	Accepted
H7	GHRM -> E-PEB -> EP	0.173	0.000	Accepted
H8	ES × GI -> EP	-0.053	0.259	Reject

However, the model’s primary dependent variable, EP, yields an adjusted R² of 0.458, suggesting moderate explanatory power.

Table 4. Adjusted coefficient of determination

	R ²	Adjusted R ²
E-PEB	0.131	0.129
EP	0.465	0.458
GI	0.195	0.193

Table 5. Result f²

	E-PEB	EP	ES	GHRM	GI	ES × GI
E-PEB		0.356				
EP					0.243	
GHRM	0.151	0.041				
GI		0.062				
ES × GI		0.004				

The results in Table 4 indicate that the explanatory power of the independent variables for E-PEB and GI is relatively weak, with adjusted R² values of 0.129 and 0.193, respectively. However, the model’s primary dependent variable, EP, yields an adjusted R² of 0.458, suggesting moderate explanatory power.

Table 5 indicates that GHRM’s explanatory power for EP is weak (f² = 0.041 < 0.15). In contrast, its explanatory power for E-PEB and GI is moderate (f² values of 0.151 and 0.243, respectively, both < 0.35). The influence of GI on EP has an effect size of 0.062, indicating a weak impact (f² < 0.15). The influence of E-PEB on EP is 0.356 (> 0.35), indicating a strong effect. Regarding the moderating variable, the results show that ES does not moderate the relationship between GI and EP (f² = 0.004).

DISCUSSION

First, GHRM has a positive impact on EP ($\beta = 0.173$). This result is consistent with previous studies (Aggarwal & Agarwala, 2023; Liu et al., 2023; Sobaih et al., 2020). The findings indicate that GHRM is crucial for achieving organizational goals and enhancing EP through employee engagement. Baroudi et al. (2023) also confirmed the essential role of GHRM in improving an organization's EP. Therefore, this study affirms that GHRM practices improve an organization's EP, including green recruitment and selection, green training and development, green performance management, green compensation and rewards, and employee green involvement for sustainable development.

Second, the results indicate that GHRM is directly and positively associated with GI ($\beta = 0.442$). According to Setyaningrum and Muafi (2023), GHRM activities influence employees' knowledge, skills, and competencies, fostering process and product innovation within companies. Similarly, a recent study by Singh et al. (2020) identified that effective GHRM practices accelerate GI. Furthermore, this study finds that GI positively affects EP ($\beta = 0.207$), aligning with prior research (Rehman et al., 2021; Tjahjadi et al., 2023). According to Kraus et al. (2020) demonstrated that GI enhances EP by reducing energy consumption, emissions, and harmful materials. Companies that adopt GI exhibit improved performance, mitigating adverse environmental impacts and strengthening EP (Allameh, 2018). Additionally, this study reveals that GHRM indirectly influences EP through GI, indicating that GI mediates the relationship between GHRM and EP ($\beta = 0.091$). Similar findings were reported by Fang et al. (2022) and Awwad Al-Shammari et al. (2022) who found that GI is a mediator between GHRM and EP. When companies implement GI in product design and development, they can minimize environmental damage, thereby enhancing EP.

Third, the findings suggest that the presence and effective implementation of GHRM encourage employees to exhibit E-PEB ($\beta = 0.362$). This result is consistent with previous studies (Veerassamy et al., 2024; Xie et al., 2023). When manufacturing companies emphasize environmental protection in recruitment processes, provide environmental training, promote eco-friendly behaviors, and implement environmentally supportive policies, employees tend to respond positively. Similarly, the results indicate that employees who engage in E-PEB at work contribute to improving the company's EP ($\beta = 0.477$). This finding supports prior research. Moreover, the study highlights that E-PEB mediates the relationship between GHRM and EP ($\beta = 0.173$). This aligns with the study by Liu et al. (2023), which demonstrated a strong connection between GHRM and EP through E-PEB.

Finally, this study examines whether ES moderates the relationship between GI and EP, specifically whether a company's ES enhances GI's effectiveness in improving EP. According to Han et al. (2016), firms must employ ES strategies, such as pollution prevention, waste minimization, sustainable development, and product management, to gain a competitive advantage. Based on this perspective, the study explores the role of ES in strengthening an organization's EP.

However, the results reveal that ES does not moderate the relationship between GI and EP ($\beta = -0.053$, $p = 0.259$), despite GI's direct impact on EP. This finding contradicts the results of Rehman et al. (2021) and Mustafa et al. (2022), who demonstrated that ES significantly moderates the relationship between GI and EP.

CONCLUSION AND IMPLICATIONS

First, the research findings indicate that E-PEB significantly impacts the EP of HCMC manufacturing enterprises, with a coefficient of $\beta = 0.477$. The study reveals that managers can leverage GHRM practices to foster E-PEB. Enterprises should recruit employees who are aware of environmental issues and establish evaluation systems that incentivize environmentally friendly behaviors. Specifically, companies should encourage employees to proactively propose effective environmental protection measures and foster an open work environment that welcomes and values innovative ideas for environmental sustainability. By integrating environmental objectives and criteria into performance appraisal processes, businesses can reward or recognize individuals who actively contribute to environmental conservation. Additionally, organising environmental protection activities and campaigns within the company and encouraging voluntary employee participation can enhance environmental awareness and actions across the organization. Beyond raising employees' awareness and knowledge of environmental issues, businesses should offer green training and development opportunities to effectively engage employees in environmental initiatives. Specifically, companies should train employees on the importance of sorting and recycling waste, provide categorized waste bins, and issue clear guidelines on workplace waste classification and recycling. Simultaneously, firms should promote the reuse of materials and resources in daily operations by providing the necessary resources and tools, such as designated storage areas and material exchange programs, to support sustainable development.

Second, the research findings show that GI directly impacts EP and serves as a mediating factor in the relationship between GHRM and EP. This indicates that GI-related strategies and measures provide a direct means to enhance EP and create a favorable context for GHRM effectiveness. Therefore, promoting GI is a means of improving EP and a crucial factor in building and sustaining a green, sustainable working environment. As a result, managers must demonstrate a strong commitment to GI by integrating sustainability visions into the company's long-term development strategy. To achieve this, companies should implement training programs that enhance employees' awareness and skills in green technologies and processes. Businesses can adopt advanced production technologies and processes to minimize energy and resource consumption while training employees on eco-friendly product design methods and techniques. Enterprises should establish and enforce policies that encourage the use of environmentally friendly materials and sustainable production processes, prioritize the procurement of materials and products with minimal negative environmental impact,

and apply sustainable design principles during product development to reduce environmental footprints. Furthermore, companies should foster a culture of continuous innovation throughout the organization, from research and development to production and supply chain management, ensuring they remain at the forefront of green solutions adoption. They must invest in energy-efficient equipment and technology, select sustainable suppliers by partnering with certified vendors, and use low-pollution materials to support environmental protection.

Finally, the HRM department is the most important component in corporate environmental management. The GHRM trend is essential for integrating environmental management, sustainability, and human resource management. According to the study's findings, among industrial companies in HCMC, GHRM has the least effect on EP ($\beta = 0.173$). Additionally, the findings show that GHRM activities have a positive impact on GI and E-PEB and indirectly influence EP through these two variables. Therefore, it is recommended that during the recruitment process, managers prioritize selecting employees who align with the company's green values, ensuring they adopt environmentally responsible behaviors once they commence employment. Enterprises should set green goals for employees, such as energy conservation (e.g., utilizing energy-efficient technologies, such as LED lighting and high-performance machinery, and optimizing production processes) and waste reduction (e.g., recycling and reusing materials). Organizations must guide employees in thinking and performing their tasks in an environmentally friendly manner while equipping them with the necessary technical skills and expertise. Moreover, businesses should cultivate a motivating and supportive work environment that encourages employees' active participation and innovation in environmental protection. Additionally, companies should establish performance evaluation criteria that measure business outcomes and assess employees' environmentally friendly behaviors and achievements. These criteria should be linked to performance-based compensation and rewards to incentivize employee engagement in green initiatives, fostering creativity and commitment to sustainability.

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AI statement: The authors stated that generative AI tools were used solely for language refinement and did not influence the study's analyses or scientific conclusions.

Declaration of interest: No conflict of interest is declared by the authors.

Data sharing statement: Data supporting the findings and conclusions are available upon request from corresponding author.

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