

How Green HRM Drives Green Performance: The Mediating Roles of Green Organizational Culture and Green Work Engagement in Southern Vietnamese SMEs



Nguyen Thi Bich Ngoc¹, Le Thi Kim Hoa^{1*}, Hoang Van Trung²

¹ Faculty of Business Administration, Industrial University of Ho Chi Minh City, Ho Chi Minh City 700000, Vietnam

² Internal Control Department, Hoa Sen Group Joint Stock Company – Ba Ria – Vung Tau Branch, Ho Chi Minh City 700000, Vietnam

Corresponding Author Email: lethikimhoa@iuh.edu.vn

Copyright: ©2026 The authors. This article is published by IIETA and is licensed under the CC BY 4.0 license (<http://creativecommons.org/licenses/by/4.0/>).

<https://doi.org/10.18280/ijdsdp.210405>

ABSTRACT

Received: 27 February 2026

Revised: 13 April 2026

Accepted: 23 April 2026

Available online: 30 April 2026

Keywords:

Green Performance, Green Human Resource Management, Green Organisational Culture, Green Work Engagement, Small and Medium-Sized Enterprises, Vietnam

The environmental challenges became increasingly acute, and sustainable development moved from a voluntary exercise to a strategic necessity for organisations to survive. Technological transitions are unavoidable, but the success of such strategies is fundamentally based on a systematic transformation of employee behaviour. This research explores the complex ‘black box’ relationship between Green Human Resource Management (GHRM) and Green Performance (GP) in the context of Southern Vietnamese Small and Medium-Sized Enterprises (SMEs). This research investigates the dual mediation effects of Green Organisational Culture (GOC) and Green Work Engagement (GWE) using an integrated framework of Ability-Motivation-Opportunity (AMO), Social Exchange Theory (SET), and the Resource-Based View (RBV). The data were collected from 350 employees in the South of Vietnam. The authors used the Structural Equation Modelling (SEM) for testing the research hypotheses. The results show that Green Pay and Rewards (GPR) have a strong direct impact on GP, while the effects of Green Recruitment (GR) and Green Training (GTN) are mostly indirect. In particular, these practices improve performance through a strong sequential mediation path (GHRM, GOC, GWE, GP), implying that cultural values are a prerequisite to developing the engagement needed to achieve environmental goals. These findings provide an important roadmap for SME managers to leverage intangible human resources and empirical evidence for policymakers who seek to promote a sustainable green economy.

1. INTRODUCTION

The global environment is currently confronting numerous challenges, including atypical climatic phenomena such as intense rainfall and flooding from tropical storms, as well as issues stemming from human activities, such as CO₂ emissions from fossil fuel combustion and deforestation, which jeopardize our ecosystems [1, 2]. Awareness of sustainability is increasingly improving in organizations, emphasizing the importance of sustainable development to meet the needs of the present without compromising the ability of future generations [3-5]. These environmental challenges pose significant organisational management challenges, requiring the identification and implementation of measures to reduce environmental impacts [5]. Not only Small and Medium-Sized Enterprises (SMEs) but also large enterprises are facing challenges in applying sustainability standards to their business operations. Enterprises are constantly striving to implement environmental solutions and Green Human Resource Management (GHRM) strategies to ensure sustainable development goals. However, previous studies that analyze and clarify the impact of GHRM on the sustainable development of businesses remain quite limited [6]. Many

SMEs often lack high-quality human resources, making it difficult to manage operations sustainably. To create more value, it is important to come up with an ecologically friendly human resource management strategy [7].

In Vietnam, environmental pollution remains a critical issue with severe repercussions for public health and the economy. Recent data indicate a worsening trend in health impacts; air pollution is responsible for at least 70,000 premature deaths in Vietnam annually [8], significantly higher than previous estimates. In terms of global standing, Vietnam was ranked 23rd among the most polluted countries worldwide [9], with Hanoi and Ho Chi Minh City continuing to record hazardous particulate matter levels that far exceed World Health Organization guidelines. In response to these escalating challenges, the Vietnamese government has intensified the enforcement of the Law on Environmental Protection 2020. Notably, by the end of 2025, Vietnam had significantly bolstered its environmental governance and sustainable development frameworks. The fourth quarter of 2025 [10] marked a period of intensified pollution control, contributing to a comprehensive year-end review of socio-economic and environmental management. Parallel to these enforcement efforts, Vietnam reached a pivotal milestone in its climate

strategy by officially piloting the domestic carbon trading exchange [11]. This initiative is designed to formalize carbon credit transactions, encouraging industrial sectors to adopt cleaner production technologies and align with the nation's long-term commitment to green growth and emission reduction.

In that context, GHRM is an important solution to help enterprises move towards a sustainable working environment and promote environmentally responsible behavior, thereby protecting natural resources and ecosystems [12, 13]. GHRM integrates environmental management into human resource strategy and changes organizational culture and management policies to achieve the enterprise's sustainability goals [14]. This strategy encourages employees to work environmentally responsibly, contributing to maintaining and enhancing sustainable development [15, 16]. It also benefits employees and businesses by enhancing employee engagement and commitment to environmental activities, thereby improving work productivity [17].

GHRM has gained substantial global attention [18]. However, empirical evidence that explains the internal transmission mechanisms remains patchy, especially in the resource-constrained settings of emerging economies. Current literature provides limited insights into the 'black box' of how organisational policies are operationalized into environmental outcomes through sequential psychological and cultural pathways. This absence of theory becomes particularly apparent in the case of Vietnamese SMEs that are under increasing pressure to reconcile economic survival with environmental protection. This study fills this gap by examining the complex interplay between GHRM and Green Performance (GP) by conceptualising Green Organisational Culture (GOC) and Green Work Engagement (GWE) as strategic intermediaries. By examining these sequential mediating roles, the study offers a more nuanced understanding of the mechanisms through which intangible human capital can be leveraged to drive sustainability. The results ultimately provide a robust empirical basis for managers and policymakers to formulate integrated strategies to facilitate Vietnam's transition to a sustainable green economy.

2. THEORETICAL FRAMEWORK AND RESEARCH HYPOTHESES

2.1 Theoretical framework

In this study, the Resource-Based View (RBV), Social Exchange Theory (SET), and Ability-Motivation-Opportunity (AMO) Theory are integrated to generally clarify the internal and external factors affecting environmental performance in organizations, especially SMEs. Within this foundational theoretical framework, RBV focuses on leveraging the organization's internal resources to create a sustainable competitive advantage; SET emphasizes fair exchange between the organization and its employees, promoting participation in environmental initiatives; and AMO highlights the importance of employees' capabilities, motivation, and opportunities to participate in environmental protection activities. The RBV, developed in the early 1980s and gaining prominence in the 1990s, examines an organization's sustainable competitive advantage through its ability to exploit internal resources that are valuable, rare, inimitable, and non-

substitutable [19]. Specialized knowledge, skills, and employee involvement within human resources are fundamental to achieving environmental objectives [20, 21]. According to the RBV, activities like GR, GTN, and GPR are crucial for creating a sustainable competitive advantage [17, 22]. This study applies the RBV to clarify the relationship between GHRM and GOC, emphasizing the importance of implementing GHRM strategies to achieve higher GP in SMEs.

The SET describes social relationships based on a balance between "giving" and "receiving", where individuals must perceive a correspondence between what they contribute and what they receive in return [21]. The SET theory is implemented in organizations when deploying sustainable environmental goals through activities such as GTN and GPR programs to enhance employee GWE and GP [23]. SET supports the study of the relationship between GHRM policies and GWE, showing that environmentally committed policies create mutual benefits, fostering employee responsibility and investment in organizational goals [23, 24].

The AMO Theory emphasizes the enhancement of employee capabilities (A), motivation (M), and opportunities (O) to foster their participation in environmental protection activities [24]. Increasing capabilities [25] through effective recruitment and training can deepen employee commitment to environmental tasks [26]. Motivation is strengthened through GPR, boosting work efficiency [27, 28]. Providing opportunities for employees to share knowledge and engage in green initiatives enhances GP and GOC [29, 30].

GP refers to the overall environmental performance of an enterprise, reflecting its commitment to environmental protection and compliance with environmental standards and regulations [31]. With the worsening environmental degradation, GP becomes increasingly essential, requiring businesses to strive for sustainable competitive advantage and natural environment protection [32, 33]. At the organizational level, GP is typically implemented through the organization's GP, encompassing specific aspects of green products and processes, such as energy saving, pollution prevention, waste recycling, green product design, and environmental technology innovation. Organizational GP refers to green products or processes, including energy saving, pollution prevention, waste recycling, green product design, and technological innovation in environmental management [34, 35]. This perspective emphasizes how businesses can balance between economic goals and environmental responsibilities toward a sustainable future. GP balances economic growth with environmental responsibility, aiming for a more sustainable future [33].

GHRM also includes three functions similar to Human Resource Management (HRM), including talent acquisition, training and development, performance appraisal, and other activities, but considers environmental issues [25, 36]. For instance, in training and development, HRM involves general training for employees, while GHRM includes environmental training. Similarly, in performance appraisal, while HRM evaluates employee performance and rewards contributions to the company's goals, GHRM integrates environmental aspects into performance assessments and rewards [36]. GHRM plays a crucial role in creating a sustainable work environment, with strategies such as Green Recruitment (GR), Green Training (GTN), and Green Pay and Rewards (GPR), which are all directed towards corporate social responsibility and sustainable performance [27].

GR attracts valuable employees with goals aligned with the organization's environmental objectives, thereby strengthening environmental management by selecting candidates focused on environmental protection to maintain the organization's environmental commitment. This process involves recruiting employees with environmental knowledge and conveying the company's environmental values, which helps save on training costs [37]. Therefore, interviewers will test candidates' environmental knowledge and ask environment-related questions during the interview process to attract candidates with compatible values and demonstrate the company's environmental commitment [38, 39].

Green Training (GTN) is essential to global environmental protection initiatives, aiming to increase employee commitment and satisfaction in organizations [39]. Attracting and retaining environmentally conscious employees is meaningful only when they are effectively trained to implement environmental management practices at work [40]. The goal of GTN is to improve the knowledge and skills of the workforce so that they can successfully apply environmental protection strategies [41].

GPR are increasingly becoming integral to HRM, mainly when organizations focus on social responsibility and environmental protection [42]. The GPR program includes monetary rewards and non-monetary incentives such as additional leave, exceptional benefits, and public recognition, encouraging environmentally protective behavior at work [43]. GPR aims to recognize individual achievements and motivate staff to participate in environmental conservation activities, thus improving the organization's environmental performance [44].

GOC encompasses the awareness of environmental risks within the workplace and the integration of vision and adaptation to changes in policies and markets [45]. GOC represents a model of behavior and values that respect the environment and is widely applied across policies, values, and beliefs [46]. GOC is determined as a collection of shared fundamental assumptions about issues and management, promoting appropriate actions or behaviors in various situations, especially concerning the environment [47].

GWE is when employees perform their duties while demonstrating a deep concern and commitment to the organization's environmental goals [48]. GWE is a positive psychological state that is fulfilling and related to work, including vitality, dedication, and passion [49]. GWE fosters employees' positive attitudes, helping them actively and enthusiastically participate in environmentally-focused activities [50, 51].

In summary, while RBV explains the strategic importance of GHRM as a resource, SET and AMO provide the psychological and operational mechanisms to understand how these practices translate into performance. Collectively, these theories form a solid foundation for the hypotheses developed in the following section.

2.2 Research hypotheses

2.2.1 Green Human Resource Management and Green Organisational Culture

GHRM is an effective tool for fostering a GOC, a system of beliefs and values reflecting sustainable commitment [52, 53]. Activities such as GR, GTN, and GPR enhance environmental awareness and embed eco-friendly behaviors into the organizational fabric [24, 36, 54]. Specifically, recruitment

and training strategies are pivotal for developing GOC [38, 55] while green rewards ensure the maintenance of environmental standards [56, 57]. Aligned with the AMO theory, GHRM practices institutionalize GOC by aligning individual green competencies and incentives with the organization's collective environmental value system. Based on these arguments, the authors propose the following hypothesis:

H1a, H2a, H3a: *GR, GTN, GPR positively influence GOC.*

2.2.2 Green Human Resource Management and Green Work Engagement

GHRM plays a vital role in fostering GWE and motivating sustainable behaviors. Grounded in SET, practices such as GR, GTN, and GPR enhance environmental awareness and positive attitudes [27]. These initiatives provide both material incentives and a sense of pride, creating a responsible work environment [57]. When employees perceive their organization's genuine commitment to sustainability, they reciprocate with higher vigor, dedication, and absorption [58]. Consequently, integrating green values into HR policies significantly strengthens the employee-organization bond, driving active engagement in environmental protection.

H1b, H2b, H3b: *GR, GTN, GPR positively influence GWE.*

2.2.3 Green Organisational Culture and Green Work Engagement

GOC plays a pivotal role in enhancing GWE among employees. Consistent with SET, a strong GOC creates a supportive environment where employees feel a psychological obligation to reciprocate the organization's commitment to sustainability by enhancing their own vigor and dedication toward green initiatives. This relationship is rooted in the positive impact that a strong GOC has on employees' environmental awareness and behavior, which encourages their participation in sustainable activities [59, 60]. GWE is defined by employees' enthusiasm and satisfaction in their roles [28]. Employees who are deeply immersed in a green culture tend to become champions of environmentally friendly programs, ensuring smooth operations aligned with the organization's objectives [49, 61]. Organizations with a strong GOC focused on environmental responsibility and sustainability are also likely to foster higher GWE, as a supportive green climate nurtures the psychological conditions necessary for engagement [62, 63]. Therefore, the research proposes the following hypotheses:

H4: *GOC positively influences GWE.*

2.2.4 Green Organisational Culture and Green Performance

Organizations increasingly institutionalize GOC to drive GP, which encompasses a holistic approach to environmental values, incorporating scientific, political, and aesthetic dimensions to promote sustainable development [63]. From the RBV perspective, a strong GOC serves as a valuable, rare, and inimitable intangible resource that enables firms to achieve superior environmental outcomes. A robust GOC facilitates the effective management of resources, minimizes environmental impact and energy consumption, thereby enhancing GP [64]. Recent studies indicate that GOC fosters innovation in reducing environmental impact and enhancing corporate social responsibility, ultimately leading to superior GP [61]. Integrating GOC into organizational practices, from environmental training to promoting eco-friendly behaviors, is pivotal in enhancing company GP [65]. Therefore, the research proposes the following hypotheses:

H5: *GOC positively influences GP.*

2.2.5 Green Work Engagement and Green Performance

GWE represents the energy an employee dedicates to tasks related to green work, their willingness to exert effort at a green level, and their integration into green tasks [48]. Aligned with the RBV, employees with high levels of GWE are regarded as a strategic human resource that provides a unique and non-substitutable competitive advantage to their organization. When employees feel fairly treated and valued by the organization, they are more likely to exhibit high GWE, which subsequently translates into superior GP through positive organizational interactions [28, 49]. Employees demonstrating high GWE actively champion the organization's green initiatives [55], positively impacting outcomes related to green work [66-68]. Empirical evidence suggests that employees more actively engaged in green job activities tend to achieve better GP [69, 70].

H6: *GWE positively influences GP.*

2.2.6 Green Human Resource Management and Green Performance

GHRM is an innovative strategy to integrate environmental standards into human resource management activities [18, 71]. GP was defined as the outcome of environmental protection activities within a company, has increasingly become a strategic priority for organizations worldwide [72]. Since 2011, research on GHRM has gained popularity, highlighting the significance of GR, GTN, and GPR in improving GP [36, 73, 74]. Grounded in the RBV, GHRM practices are viewed as strategic investments that develop unique human capital and internal capabilities, which serve as essential intangible

resources for achieving superior GP. Implementing GHRM enables organizations to attain superior GP through clean production, energy efficiency, and waste reduction [75]. GHRM practices not only cultivate a healthy work environment but also enhance staff knowledge, skills, and environmental capabilities, which are essential drivers of GP [76]. Therefore, the research proposes the following hypotheses:

H7a, H7b, H7c: *GR, GTN, GPR positively influence GP.*

2.2.7 The mediating role of Green Organisational Culture and Green Work Engagement

GHRM practices encourage environmental participation and motivation [25, 77]. Drawing on the RBV, this study conceptualizes GHRM, GOC, and GWE as a system of interconnected intangible resources that collectively drive superior GP. GOC plays a pivotal mediating role in transforming these strategies into tangible GP [56, 58, 78, 79]. From the RBV perspective, GOC and GWE act as strategic catalysts that translate GHRM efforts into sustained environmental outcomes. Consequently, GWE acts as a psychological catalyst that translates GHRM efforts into superior GP [80-82]. Therefore, the research proposes the following hypotheses:

H8a, H8b, H8c: *GOC acts as a mediator in the relationship between GR, GTN, GPR, and GP.*

H9a, H9b, H9c: *GWE acts as a mediator in the relationship between GR, GTN, GPR, and GP.*

H10a, H10b, H10c: *GOC and GWE sequentially mediate the relationship between GR, GTN, GPR, and GP.*

Based on the discussions, the authors have proposed a research model, as shown in Figure 1.

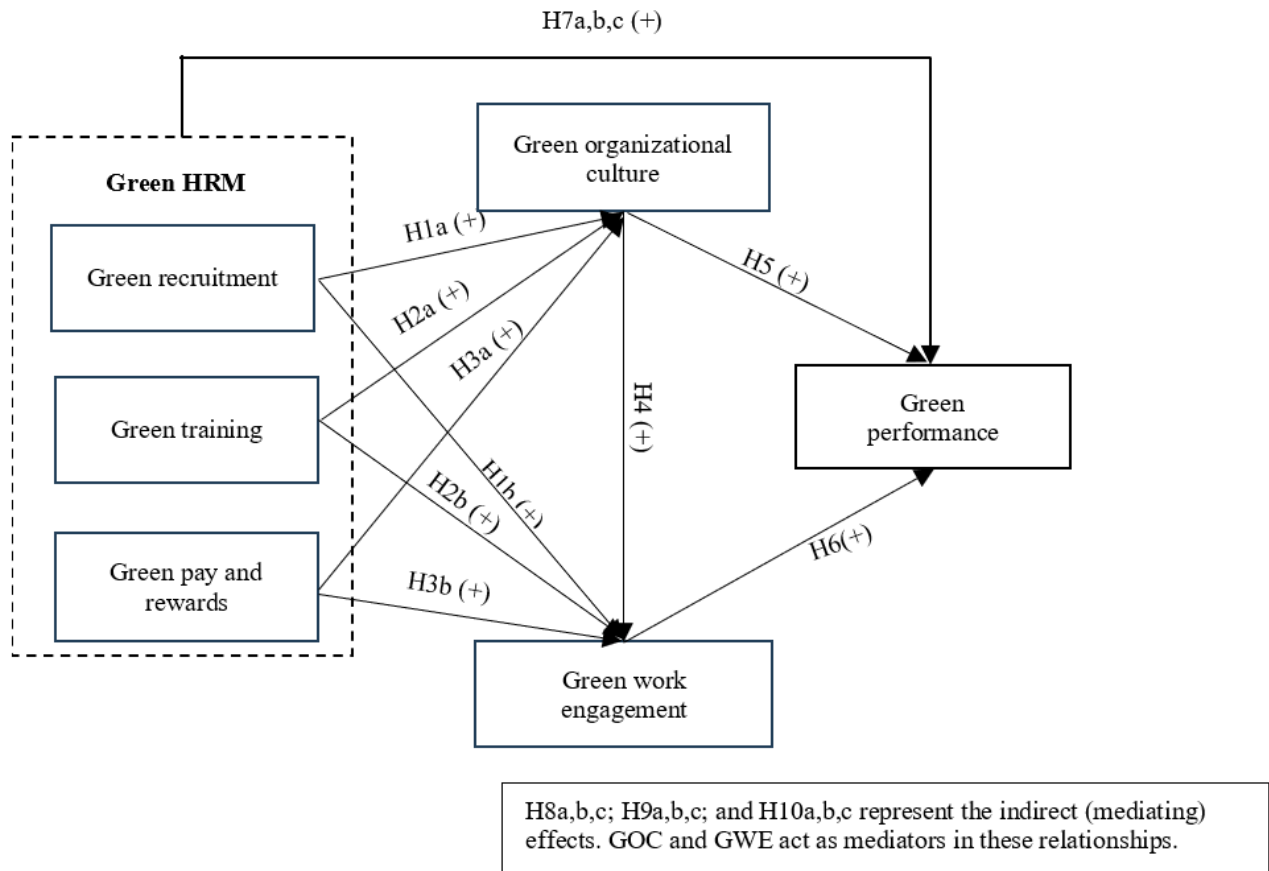


Figure 1. Proposed research model

3. METHODOLOGY

3.1 Method

This study employs both qualitative and quantitative methods. In the qualitative part, the research team conducted a comprehensive literature review and semi-structured interviews with five experts, including two HR Directors, two Managers, and one Talent Development Specialist. The insights from these interviews were used to refine the measurement scales to fit the current context better. For the quantitative part, the authors conducted a preliminary survey with 50 employees from SMEs to test the reliability of the measurement scales. The analysis showed that these scales met the reliability criteria and were applied in subsequent research steps. In the main quantitative study, the authors used Bootstrapping (N = 5,000) to test the research hypotheses and evaluate the measurement model. SPSS 25 and AMOS 24 software were utilized to assess the reliability and validity of the measurements, along with applying Structural Equation Modeling (SEM) to test the structural relationships and the proposed hypotheses.

3.2 Data collection and sample

The formal quantitative survey was conducted with employees working in SMEs in the South of Vietnam. Due to the lack of a comprehensive sampling frame for SME employees in this region, a non-probability convenience sampling method was employed to ensure data accessibility and efficiency. A total of 417 questionnaires were distributed. After a rigorous data screening process, 350 valid responses met the quality criteria and were retained for analysis, yielding a valid response rate of 83.9%.

3.3 Measurement

Following the qualitative phase, the original English scales were translated into Vietnamese and refined to suit the specific context of SMEs in South Vietnam. All 22 items were evaluated using a 5-point Likert scale (1: strongly disagree to 5: strongly agree). The constructs and their academic sources are summarized in Table 1.

Table 1. Measurement scales

Construct	Code	Number of Items	Source
Green Recruitment	GR	3	[18, 28]
Green Training	GTN	3	[18, 28]
Green Pay and Rewards	GPR	3	[18, 28]
Green Work Engagement	GWE	3	[28, 82]
Green Organisational Culture	GOC	5	[4, 36]
Green Performance	GP	5	[28, 29]

4. RESULTS

4.1 Descriptive statistics

A total of 350 valid responses were analyzed to understand the demographic profile of the participants. The characteristics examined include gender, age, and work experience, providing a comprehensive overview of the workforce within the

surveyed SMEs in South Vietnam. The detailed demographic distribution is presented in Table 2.

Table 2. Demographic characteristics

Characteristics		Frequency (n = 350)	Percentage (%)
Gender	Male	195	56
	Female	155	44
Age	Under 20 years	8	2.3
	20 to under 30 years	229	65.4
	30 to under 40 years	91	26
	Over 40 years	22	6.3
	Under 3 years	68	19.4
Work Experience	3 to under 5 years	136	38.9
	6 to under 10 years	90	25.7
Experience	10 to under 15 years	43	12.3
	15 to under 20 years	8	2.3
	Over 20 years	5	1.4

According to the results in Table 2, the sample exhibits a relatively balanced gender distribution, with males accounting for 56% and females for 44%. The workforce is predominantly young, as the majority of respondents (65.4%) are aged between 20 and 30 years. In terms of professional background, most participants have significant practical experience: 38.9% have worked for 3 to 5 years, and 25.7% for 6 to 10 years. This demographic structure suggests that the respondents are at an energetic and productive stage of their careers, making them a suitable group for assessing modern management practices like GHRM.

4.2 Scale validation results

The reliability and validity of the measurement scales were assessed using Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). As shown in Table 3, all indicators exceed the recommended thresholds, confirming the high internal consistency and convergent validity of the data.

The results confirm the high reliability of all constructs, with Cronbach's Alpha and CR values exceeding the 0.7 threshold [83-85]. Convergent validity is well-established as all factor loadings are above 0.5 and AVE values exceed 0.5, thereby satisfying the recommended criteria proposed by Fornell and Larcker [86]. Detailed standardized regression weights for all measurement items are provided in Table A1.

Table 3. Results of scale validation

Scale	Cronbach's Alpha	Factor Loading	CR	AVE	VIF
GP	0.895	0.670–0.864	0.895	0.632	—
GOC	0.862	0.728–0.761	0.862	0.557	1.596
GTN	0.868	0.767–0.848	0.868	0.567	1.771
GR	0.867	0.679–0.825	0.867	0.565	1.594
GWE	0.842	0.670–0.905	0.842	0.641	1.648
GPR	0.867	0.659–0.889	0.867	0.608	1.779

Note: CR = Composite Reliability; AVE = Average Variance Extracted; VIF = Variance Inflation Factor; GP = Green Performance; GOC = Green Organisational Culture; GTN = Green Training; GR = Green Recruitment; GWE = Green Work Engagement; GPR = Green Pay and Rewards.

Furthermore, discriminant validity is confirmed via the Fornell-Larcker criterion, where the square roots of the AVEs are higher than the inter-construct correlations. Finally, Harman's single-factor test indicates that the first factor

explains only 37.303% of the variance (below the 50% threshold), suggesting that Common Method Bias (CMB) is not a concern in this study. Nonetheless, to ensure the robustness of the results, the potential risk of CMB was further minimized through procedural remedies, such as ensuring respondent anonymity and clear item wording.

Table 4. Fornell-Larcker criterion

	GOC	GR	GTN	GPR	GWE	GP
GOC	0.746					
GR	0.546	0.752				
GTN	0.506	0.567	0.753			
GPR	0.583	0.639	0.630	0.780		
GWE	0.664	0.599	0.563	0.618	0.800	
GP	0.537	0.449	0.376	0.536	0.558	0.795

Note: GP = Green Performance; GOC = Green Organisational Culture; GTN = Green Training; GR = Green Recruitment; GWE = Green Work Engagement; GPR = Green Pay and Rewards.

Discriminant validity was assessed using the Fornell-Larcker criterion, as shown in Table 4. The results indicate that the square root of the AVE for each construct (diagonal values) is consistently higher than its correlations with any other constructs (off-diagonal values). This confirms that each latent variable shares more variance with its own indicators than with other variables in the model, establishing robust discriminant validity [86].

4.3 Assessment of measurement and structural model

The goodness-of-fit indices for the measurement and structural models are presented in Table 5. All indicators satisfy the recommended thresholds, confirming that the proposed model fits the empirical data excellently.

Confirmatory Factor Analysis (CFA) and SEM were employed to evaluate the structural integrity and overall fit of

the hypothesized model. The AMOS graphical output for the CFA model is presented in Figure A1, and the detailed measurement model fit indices are summarized in Table A2. As shown in Table 5 and Table A2, the results demonstrate an excellent fit between the model and the empirical data. Specifically, the minimum discrepancy per degree of freedom (CMIN/df) ratio of 1.092 is well within the acceptable limit of less than 3.0 [87]. The comparative fit index (CFI = 0.996) also exceeds the 0.90 threshold [88]. Furthermore, the root mean square error of approximation (RMSEA) (0.016) and standardized root mean square residual (SRMR) (0.038) are both below 0.05, suggesting that the model is highly accurate with minimal estimation error [89].

Table 5. Fit indices of measurement and structural models

Model	CMIN/df	CFI	RMSEA	SRMR
Recommended Values	≤ 3.0	≥ 0.90	≤ 0.05	≤ 0.08
Proposed Model	1.092	0.996	0.016	0.038

Note: The fit indices for both the measurement and structural models are identical, indicating that the structural paths did not degrade the model fit. CMIN/df = minimum discrepancy per degree of freedom; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

Then, the structural model was analyzed using AMOS 24 to examine the relationships between the constructs.

Figure 2 illustrates the results of the SEM, including the standardized path coefficients and the explanatory power (R-squared) of the model. The visual representation shows that the model is consistent with the data, as evidenced by the fit indices previously discussed. Specifically, the path diagrams display the direct effects of GHRM practices on GOC, GWE, and GP. The standardized estimates provided in Figure 2 serve as the primary basis for testing the proposed hypotheses.

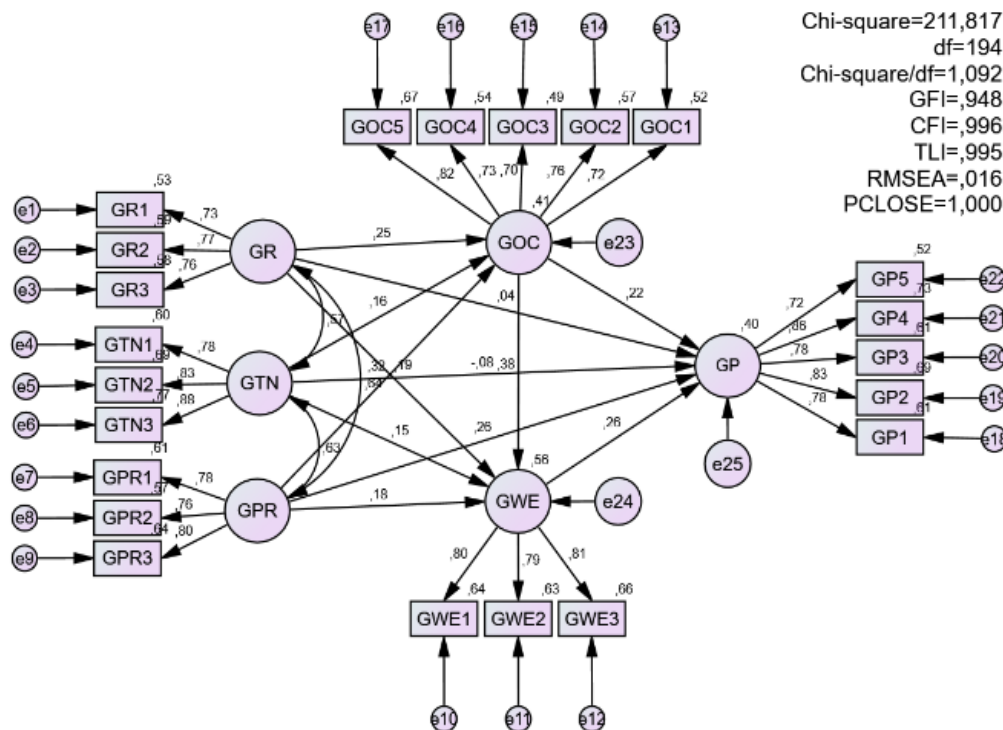


Figure 2. Structural equation modeling (SEM)

Note: GP = Green Performance; GOC = Green Organisational Culture; GTN = Green Training; GR = Green Recruitment; GWE = Green Work Engagement; GPR = Green Pay and Rewards.

4.4 Hypothesis testing results

The results of the structural path analysis and hypothesis testing are summarized in Table 6. The standardized path coefficients (β), standard errors (S.E.), critical ratios (C.R.), and p-values were used to determine the significance of the proposed relationships.

According to the results in Table 6, 10 out of 12 direct hypotheses were supported. Specifically, GHRM practices (GR, GTN, GPR) significantly and positively influence both GOC (H1a, H2a, H3a) and GWE (H1b, H2b, H3b) with p-values less than 0.05. GOC and GWE also significantly impact GP (H5, H6). Notably, for the direct impact on GP, only GPR (H7c) was supported ($\beta = 0.261$, $p = 0.004$). In contrast, GR (H7a) and GTN (H7b) did not show a significant direct effect on GP (p-values of 0.590 and 0.311, respectively). These findings suggest that GR and GTN may require mediating mechanisms, such as culture or engagement, to effectively drive environmental performance outcomes in the surveyed SMEs.

Table 6. Results of hypothesis testing

Hypo.	Relationship	β	S.E.	C.R.	P-Value
H1a	GR→GOC	0.248	0.092	3.000	0.003
H2a	GTN→GOC	0.163	0.084	2.156	0.031
H3a	GPR→GOC	0.322	0.090	3.636	< 0.001
H1b	GR→GWE	0.193	0.091	2.498	0.013
H2b	GTN→GWE	0.149	0.082	2.141	0.032
H3b	GPR→GWE	0.181	0.090	2.175	0.030
H4	GOC→GWE	0.378	0.074	5.418	< 0.001
H5	GOC→GP	0.222	0.078	2.806	0.005
H6	GWE→GP	0.265	0.082	3.011	0.003
H7a	GR→GP	0.045	0.091	0.539	0.590
H7b	GTN→GP	-0.075	0.082	-1.013	0.311
H7c	GPR→GP	0.261	0.091	2.894	0.004

Note: GP = Green Performance; GOC = Green Organisational Culture; GTN = Green Training; GR = Green Recruitment; GWE = Green Work Engagement; GPR = Green Pay and Rewards.

4.5 Mediating effect

To further investigate the indirect relationships, a bootstrapping procedure with 5,000 resamples was performed. This analysis evaluates the mediating roles of GOC and GWE in the relationship between GHRM practices and GP. The results of the mediation effects are presented in Table 7.

Table 7. Mediating effects

Hypo.	Impact Path	Indirect Effect	P-Value
H8a	GR→GOC→GP	0.055	0.006
H8b	GTN→GOC→GP	0.036	0.024
H8c	GPR→GOC→GP	0.072	0.009
H9a	GR→GWE→GP	0.051	0.017
H9b	GTN→GWE→GP	0.039	0.024
H9c	GPR→GWE→GP	0.048	0.040
H10a	GR→GOC→GWE→GP	0.025	0.005
H10b	GTN→GOC→GWE→GP	0.016	0.009
H10c	GPR→GOC→GWE→GP	0.032	0.002

Note: GP = Green Performance; GOC = Green Organisational Culture; GTN = Green Training; GR = Green Recruitment; GWE = Green Work Engagement; GPR = Green Pay and Rewards.

The results in Table 7 show that all indirect paths are statistically significant with p-values less than 0.05, supporting hypotheses H8, H9, and H10. Specifically, GOC

and GWE act as vital mediators that translate the effects of GR and GTN into GP. Notably, the sequential mediation paths (H10a, H10b, H10c) exhibit significant indirect effects, with the path GPR→GOC→GWE→GP showing the strongest impact ($\beta = 0.032$, $p = 0.002$). Additionally, in the simple mediation models, the path GPR→GOC→GP remains the most influential overall ($\beta = 0.072$, $p = 0.009$), further highlighting the critical role of GPR in driving performance through cultural transformation.

These findings confirm that while some GHRM practices may not impact performance directly, they create a strong foundation through culture and employee engagement to achieve sustainable environmental outcomes.

5. DISCUSSION

This research proposes and tests an empirical model to understand the complex relationships between GHRM practices, GWE, GOC, and GP in the context of SMEs in Southern Vietnam.

The findings support the view of Malik et al. [2] that the integration of these elements is not a fad but a necessity for sustainable business growth. The results on antecedents of culture and engagement suggest that GHRM activities, such as recruitment (GR), training (GTN), and rewards (GPR), are important in promoting GOC and GWE.

In particular, the study addresses the important role of GOC in facilitating GWE, bridging a gap in knowledge of the relationship between culture and employee psychology in green management. One of the most important highlights of this research is the difference between direct and indirect impacts on the GP. The results show that GPR are very directly influential on GP, but GR and GTN do not show such a direct effect. This finding is different from the studies by Huo et al. [28] and Yusoff et al. [74] in different markets, which assumed that GR and GTN have direct impacts. The reason for this difference lies in SMEs in South Vietnam, where GHRM is still a new concept, and the activities of recruitment and training may not show immediate results but need time to penetrate into the organisation through intermediary factors like culture and engagement.

Finally, the findings of the research confirm that the fundamental mechanism through which HR practices lead to environmental performance is a sequential mediation mechanism from GOC to GWE. The results confirm the full mediating role of culture and engagement for GR and GTN that strongly support the RBV and show that intangible resources, such as cultural values and employee commitment, are the real determinants of GP. In contrast, the partial mediation role of green rewards aligns with the AMO model, which suggests that financial incentives not only produce direct outcomes but also improve the cultural value system and employee passion of the firm. Collectively, these findings offer managers a strategic roadmap to optimise human resources for the simultaneous achievement of economic and environmental objectives.

6. CONCLUSION AND IMPLICATIONS

6.1 Conclusion

This study successfully investigated the complex

mechanisms through which GHRM practices influence GP in South Vietnamese SMEs. By integrating the RBV, SET, and AMO frameworks, the research highlights that while GPR directly drives performance, practices like GR and GTN rely entirely on internal catalysts to be effective.

The most significant contribution of this research is the identification of the "double-bridge" role played by GOC and GWE. The empirical results confirm that GHRM practices first build a strong environmental culture, which subsequently inspires employee engagement, ultimately leading to superior GP. This sequential mediation suggests that for SMEs, the human and cultural elements are just as critical as technical environmental strategies. In conclusion, to achieve sustainability goals, enterprises must adopt a holistic GHRM approach that treats employees not just as workers, but as active, engaged participants in a shared green mission.

6.2 Theoretical implications

This study makes a number of important theoretical contributions to the literature on GHRM in the context of emerging economies. This research integrates the RBV, SET, and the AMO framework to provide a multi-dimensional lens for understanding the process of organisational policies translation into environmental outcomes. This integrated approach captures the complex interplay of strategic resources, social reciprocity, and individual performance drivers beyond single theory explanations. One of the major contributions of this study is the explanation of the "black box" of transmission mechanisms via the confirmed sequential mediating roles of GOC and GWE. Unlike previous studies where these factors are often studied in isolation, our results show that GOC is a fundamental driver that triggers GWE, which in turn promotes GP. This explains why practices such as recruitment and training – which did not show any direct impact on performance in this particular context – remain important, as they deliver results through these essential cultural and psychological pathways. Moreover, as a pioneering empirical study focusing solely on Southern Vietnamese SMEs, this study provides a significant comparative context for green management research. It provides empirical evidence of the ability of small firms to leverage intangible resources to achieve sustainable competitive advantages despite significant resource constraints. These insights provide us with an understanding of how GHRM could work in Southeast Asian markets where organisational culture and employee commitment are key to the implementation of sustainability.

6.3 Managerial implications

From a practical point of view, SME managers should transition from considering GHRM as a collection of administrative functions to seeing GHRM as a strategic ecosystem. Since GOC is the central mediator in the model, cultural transformation needs to be regarded as the strategic base. Leaders must not just hire 'green' talent, but actively build a culture in which eco-friendly behaviours become the organisational norm and a collective moral imperative. By embedding these values into the core identity of the firm, sustainability becomes a self-sustaining practice on the part of the managers.

Moreover, managers should use rewards to gain immediate strategic impact, because the results show that GPR is the only

practice with a strong direct link to GP ($\beta = 0.261, p = 0.004$). Recognition programmes (such as performance-based bonuses for resource efficiency or "Green Innovation" awards) can provide the momentum needed for Vietnamese SMEs seeking "quick wins" and immediate environmental improvements, helping to sustain long-term environmental initiatives. These tangible rewards are a clear indication that the organisation is committed to its green goals.

Also, it is important to foster engagement that goes beyond simple technical capacity. The results indicate that recruitment and training do not necessarily lead to better performance. Therefore, GTN programmes should be inspirational rather than technical in nature. The aim should be to improve GWE, as a technically competent worker who lacks emotional and cognitive commitment is unlikely to contribute to the long-term sustainability goals.

Finally, owners and policymakers should seek to ensure holistic policy alignment across the employee life cycle. This means choosing candidates who share the organisation's green values and ensuring that employees have the organisational resources and autonomy they need to proactively innovate environmental solutions in the workplace. SMEs can create a strong roadmap for transitioning to a sustainable green economy in Vietnam by integrating sustainability into all the elements of human resource management.

6.4 Limitations and future research

Despite its significant contributions, this study is not without limitations that offer opportunities for further investigation. First, the sample size of 350 respondents is relatively small compared to the total workforce of SMEs in South Vietnam, which may limit the representativeness of the findings. Future studies should expand the sample to include a larger number of SMEs across different regions of Vietnam and other emerging economies to enhance generalizability.

Second, the use of a cross-sectional design captures only a snapshot of the relationships at a single point in time. Since organizational culture and employee engagement are evolving constructs, longitudinal or time-series research is recommended to better observe the long-term trends and the sustained impact of GHRM practices on GP.

Third, while this study focused on GOC and GWE as mediators, other factors such as leadership styles (e.g., transformational or green leadership) and individual psychological traits may also influence the success of GHRM initiatives.

Finally, although Harman's single-factor test results (37.303%) were within the acceptable range, the reliance on self-reported data from a single source may still pose a potential risk of CMB.

Future research could integrate these variables to provide a more holistic understanding of the internal mechanisms driving environmental goals. Finally, the reliance on self-reported data might introduce social desirability bias. Future studies could incorporate objective environmental performance metrics or multi-source data (e.g., combining manager and employee perspectives) to ensure even higher data accuracy and objectivity. Furthermore, employing a longitudinal data collection approach would allow future researchers to capture the dynamic evolution of green practices and verify the long-term causal relationships within the model, thereby further enhancing the validity of the findings.

REFERENCES

- [1] Gaur, N., Sharma, S., Yadav, N. (2024). Environmental pollution. In *Green Chemistry Approaches to Environmental Sustainability*, pp. 23-41. <https://doi.org/10.1016/B978-0-443-18959-3.00010-0>
- [2] 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. <https://doi.org/10.3390/su13031044>
- [3] Cabral, C., Chiappetta Jabbour, C.J. (2020). Understanding the human side of green hospitality management. *International Journal of Hospitality Management*, 88: 102389. <https://doi.org/10.1016/j.ijhm.2019.102389>
- [4] Masri, H.A., Jaaron, A.A.M. (2017). Assessing green human resources management practices in Palestinian manufacturing context: An empirical study. *Journal of Cleaner Production*, 143: 474-489. <https://doi.org/10.1016/j.jclepro.2016.12.087>
- [5] Piwowar-Sulej, K. (2021). Human resources development as an element of sustainable HRM – with the focus on production engineers. *Journal of Cleaner Production*, 278: 124008. <https://doi.org/10.1016/j.jclepro.2020.124008>
- [6] Billig, M., Badwan, A., Ankona, E., Anker, Y. (2022). Charcoal production in Palestinian villages-the paradox of resistance to innovation driving rural development. *Journal of Rural Studies*, 89: 25-34. <https://doi.org/10.1016/j.jrurstud.2021.11.009>
- [7] Elshaer, I.A., Azazz, A.M.S., Fayyad, S. (2023). Green human resources and innovative performance in small- and medium-sized tourism enterprises: A mediation model using PLS-SEM data analysis. *Mathematics*, 11(3): 711. <https://doi.org/10.3390/math11030711>
- [8] Nawangsari, L.C., Sutawidjaya, A.H. (2019). How the green human resources management (GHRM) process can be adopted for the organization business? In *Proceedings of the 1st International Conference on Economics, Business, Entrepreneurship, and Finance (ICEBEF 2018)*. <https://doi.org/10.2991/icebef-18.2019.100>
- [9] Pratt, A., Khalidi, R., Flowers, R. (2024). Vietnam's heavy air pollution needs stronger action. UNDP Blog. <https://www.undp.org/vietnam/blog/viet-nams-heavy-air-pollution-needs-stronger-action>, accessed on Jan. 14, 2026.
- [10] IQAir. Interactive global map of 2025 PM2.5 concentrations by city. <https://www.iqair.com/world-air-quality-report>, accessed on Apr. 9, 2026.
- [11] National Statistics Office. (2025). Socio-economic situation in the fourth quarter and 2025. <https://www.nso.gov.vn/en/data-and-statistics/2026/01/socio-economic-situation-in-the-fourth-quarter-and-2025/>, accessed on Apr. 9, 2026.
- [12] Vietnam Government News. (2026). Viet Nam pilots domestic carbon trading exchange. <https://en.baochinhphu.vn/viet-nam-pilots-domestic-carbon-trading-exchange-111260121104218671.htm>, accessed on Apr. 9, 2026.
- [13] Sabokro, M., Masud, M.M., Kayedian, A. (2021). The effect of green human resources management on corporate social responsibility, green psychological climate and employees' green behavior. *Journal of Cleaner Production*, 313: 127963. <https://doi.org/10.1016/j.jclepro.2021.127963>
- [14] Yong, J.Y., Yusliza, M.Y., Fawehinmi, O.O. (2019). Green human resource management. *Benchmarking: An International Journal*, 27(7): 2005-2027. <https://doi.org/10.1108/BIJ-12-2018-0438>
- [15] Jerónimo, H.M., Henriques, P.L., de Lacerda, T.C., da Silva, F.P., Vieira, P.R. (2020). Going green and sustainable: The influence of green HR practices on the organizational rationale for sustainability. *Journal of Business Research*, 112: 413-421. <https://doi.org/10.1016/j.jbusres.2019.11.036>
- [16] Farooq, R., Zhang, Z., Talwar, S., Dhir, A. (2022). Do green human resource management and self-efficacy facilitate green creativity? A study of luxury hotels and resorts. *Journal of Sustainable Tourism*, 30(4): 824-845. <https://doi.org/10.1080/09669582.2021.1891239>
- [17] Kuo, Y.K., Khan, T.I., Islam, S.U., Abdullah, F.Z., Pradana, M., Kaewsang-on, R. (2022). Impact of green HRM practices on environmental performance: The mediating role of green innovation. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.916723>
- [18] 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. <https://doi.org/10.1111/1744-7941.12147>
- [19] Khan, M.H., Muktar, S.N. (2021). What's next for green human resource management: Insights and trends for sustainable development. *International Journal of Sustainable Development and Planning*, 16(1): 181-194. <https://doi.org/10.18280/ijstdp.160119>
- [20] Hart, S.L. (1995). A natural-resource-based view of the firm. *Academy of Management Review*, 20(4): 986-1014. <https://doi.org/10.2307/258963>
- [21] Huselid, M.A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of Management Journal*, 38(3): 635-672. <https://doi.org/10.2307/256741>
- [22] Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1): 99-120. <https://doi.org/10.1177/014920639101700108>
- [23] Blau, P.M. (1964). *Exchange and Power in Social Life*. John Wiley & Sons, Inc.
- [24] Tran, N.K.H. (2023). An empirical investigation on the impact of green human resources management and green leadership on green work engagement. *Heliyon*, 9(11): e21018. <https://doi.org/10.1016/j.heliyon.2023.e21018>
- [25] Renwick, D.W.S., Redman, T., Maguire, S. (2013). Green human resource management: A review and research agenda. *International Journal of Management Reviews*, 15(1): 1-14. <https://doi.org/10.1111/j.1468-2370.2011.00328.x>
- [26] Ali Ababneh, O.M., Awwad, A.S., Abu-Haija, A. (2021). The association between green human resources practices and employee engagement with environmental initiatives in hotels: The moderation effect of perceived transformational leadership. *Journal of Human Resources in Hospitality & Tourism*, 20(3): 390-416.

- <https://doi.org/10.1080/15332845.2021.1923918>
- [27] Anwar, N., Nik Mahmood, N.H., Yusliza, M.Y., Ramayah, T., Noor Faezah, J., 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. <https://doi.org/10.1016/j.jclepro.2020.120401>
- [28] Huo, X., Azhar, A., Rehman, N., Majeed, N. (2022). The role of green human resource management practices in driving green performance in the context of manufacturing SMEs. *Sustainability*, 14(24): 16776. <https://doi.org/10.3390/su142416776>
- [29] 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. <https://doi.org/10.1016/j.jclepro.2020.125720>
- [30] Yu, W., Chavez, R., Feng, M., Wong, C.Y., Fynes, B. (2020). Green human resource management and environmental cooperation: An ability-motivation-opportunity and contingency perspective. *International Journal of Production Economics*, 219: 224-235. <https://doi.org/10.1016/j.ijpe.2019.06.013>
- [31] Paillé, P., Chen, Y., Boiral, O., Jin, J. (2014). The impact of human resource management on environmental performance: An employee-level study. *Journal of Business Ethics*, 121(3): 451-466. <https://doi.org/10.1007/s10551-013-1732-0>
- [32] Abbas, J. (2020). Impact of total quality management on corporate green performance through the mediating role of corporate social responsibility. *Journal of Cleaner Production*, 242: 118458. <https://doi.org/10.1016/j.jclepro.2019.118458>
- [33] Liang, Y., Zhao, C., Lee, M.-J. (2023). Institutional pressures on sustainability and green performance: The mediating role of digital business model innovation. *Sustainability*, 15(19): 14258. <https://doi.org/10.3390/su151914258>
- [34] Feng, T., Wang, D. (2016). The influence of environmental management systems on financial performance: A moderated-mediation analysis. *Journal of Business Ethics*, 135(2): 265-278. <https://doi.org/10.1007/s10551-014-2486-z>
- [35] Tosun, C., Parvez, M.O., Bilim, Y., Yu, L. (2022). Effects of green transformational leadership on green performance of employees via the mediating role of corporate social responsibility: Reflection from North Cyprus. *International Journal of Hospitality Management*, 103: 103218. <https://doi.org/10.1016/j.ijhm.2022.103218>
- [36] Jabbour, C.J.C., Santos, F.C.A., Nagano, M.S. (2010). Contributions of HRM throughout the stages of environmental management: Methodological triangulation applied to companies in Brazil. *The International Journal of Human Resource Management*, 21(7): 1049-1089. <https://doi.org/10.1080/09585191003783512>
- [37] Molina-Azorin, J.F., López-Gamero, M.D., Tari, J.J., Pereira-Moliner, J., Pertusa-Ortega, E.M. (2021). Environmental management, human resource management and green human resource management: A literature review. *Administrative Sciences*, 11(2): 48. <https://doi.org/10.3390/admsci11020048>
- [38] Faisal, S. (2023). Green human resource management—A synthesis. *Sustainability*, 15(3): 2259. <https://doi.org/10.3390/su15032259>
- [39] Pham, D.D.T., Paillé, P. (2020). Green recruitment and selection: An insight into green patterns. *International Journal of Manpower*, 41(3): 258-272. <https://doi.org/10.1108/IJM-05-2018-0155>
- [40] Amrutha, V.N., Geetha, S.N. (2021). Linking organizational green training and voluntary workplace green behavior: Mediating role of green supporting climate and employees' green satisfaction. *Journal of Cleaner Production*, 290: 125876. <https://doi.org/10.1016/j.jclepro.2021.125876>
- [41] Gardas, B.B., Mangla, S.K., Raut, R.D., Narkhede, B., Luthra, S. (2019). Green talent management to unlock sustainability in the oil and gas sector. *Journal of Cleaner Production*, 229: 850-862. <https://doi.org/10.1016/j.jclepro.2019.05.018>
- [42] Islam, M.A., Hunt, A., Jantan, A.H., Hashim, H., Chong, C.W. (2020). Exploring challenges and solutions in applying green human resource management practices for the sustainable workplace in the ready-made garment industry in Bangladesh. *Business Strategy & Development*, 3(3): 332-343. <https://doi.org/10.1002/bsd2.99>
- [43] Mandago, R.J. (2018). Influence of green reward and compensation practice on environmental sustainability in selected service based state corporations in Kenya. *European Journal of Business and Strategic Management*, 3(6): 1-12.
- [44] Papademetriou, C., Ragazou, K., Garefalakis, A., Passas, I. (2023). Green human resource management: Mapping the research trends for sustainable and agile human resources in SMEs. *Sustainability*, 15(7): 5636. <https://doi.org/10.3390/su15075636>
- [45] Cheng, Y., Liu, H., Yuan, Y., Zhang, Z., Zhao, J. (2022). What makes employees green advocates? Exploring the effects of green human resource management. *International Journal of Environmental Research and Public Health*, 19(3): 1807. <https://doi.org/10.3390/ijerph19031807>
- [46] 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. <https://doi.org/10.15294/jpii.v10i4.32386>
- [47] Yeşiltaş, M., Gürlek, M., Kenar, G. (2022). Organizational green culture and green employee behavior: Differences between green and non-green hotels. *Journal of Cleaner Production*, 343: 131051. <https://doi.org/10.1016/j.jclepro.2022.131051>
- [48] Tahir, R., Athar, M.R., Faisal, F., Shahani, N.N., Solangi, B. (2019). Green organizational culture: A review of literature and future research agenda. *Annals of Contemporary Developments in Management & HR*, 1(1): 23-38.
- [49] Aboramadan, M. (2022). The effect of green HRM on employee green behaviors in higher education: The mediating mechanism of green work engagement. *International Journal of Organizational Analysis*, 30(1): 7-23. <https://doi.org/10.1108/IJOA-05-2020-2190>
- [50] Aboramadan, M., Hamid, Z., Kundi, Y.M., El Hamalawi, E. (2022). The effect of servant leadership on employees'

- extra-role behaviors in NPOs: The role of work engagement. *Nonprofit Management and Leadership*, 33(1): 109-129. <https://doi.org/10.1002/nml.21505>
- [51] Çop, S., Olorunsola, V.O., Alola, U.V. (2021). Achieving environmental sustainability through green transformational leadership policy: Can green team resilience help? *Business Strategy and the Environment*, 30(1): 671-682. <https://doi.org/10.1002/bse.2646>
- [52] Maheshwari, S., Kaur, A., Renwick, D.W.S. (2024). Green human resource management and green culture: An integrative sustainable competing values framework and future research directions. *Organization & Environment*, 37(1). <https://doi.org/10.1177/10860266231217280>
- [53] Schein, E.H. (1990). Organizational culture. *American Psychologist*, 45(2): 109-119. <https://doi.org/10.1037/0003-066X.45.2.109>
- [54] Dumont, J., Shen, J., Deng, X. (2017). Effects of green HRM practices on employee workplace green behavior: The role of psychological green climate and employee green values. *Human Resource Management*, 56(4): 613-627. <https://doi.org/10.1002/hrm.21792>
- [55] Hadjri, M.I., Perizade, B., Zunaidah, Farla, W. (2019). Green human resource management, green organizational culture, and environmental performance: An empirical study. In *Proceedings of the 2019 International Conference on Organizational Innovation (ICOI 2019)*. <https://doi.org/10.2991/icoi-19.2019.25>
- [56] Aboramadan, M., Albashiti, B., Alharazin, H., Zaidoune, S. (2019). Organizational culture, innovation and performance: A study from a non-western context. *Journal of Management Development*, 39(4): 437-451. <https://doi.org/10.1108/JMD-06-2019-0253>
- [57] Hossain, M.I., Heng, T.B., Lee, C.L., Ong, T.S., Islam, M.T. (2022). Green human resource management, top management commitment, green culture, and green performance of Malaysian palm oil companies. *International Journal of Technology*, 13(5): 1106. <https://doi.org/10.14716/ijtech.v13i5.5818>
- [58] Roscoe, S., Subramanian, N., Jabbour, C.J.C., 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. <https://doi.org/10.1002/bse.2277>
- [59] Baykal, E., Bayraktar, O. (2022). Green human resources management: A novel tool to boost work engagement. *Frontiers in Psychology*, 13. <https://doi.org/10.3389/fpsyg.2022.951963>
- [60] Scaliza, J.A.A., Jugend, D., Jabbour, C.J.C., Latan, H., Armellini, F., Twigg, D., Andrade, D.F. (2022). Relationships among organizational culture, open innovation, innovative ecosystems, and performance of firms: Evidence from an emerging economy context. *Journal of Business Research*, 140: 264-279. <https://doi.org/10.1016/j.jbusres.2021.10.065>
- [61] Karatepe, T., Ozturen, A., Karatepe, O.M., Uner, M.M., Kim, T.T. (2022). Management commitment to the ecological environment, green work engagement and their effects on hotel employees' green work outcomes. *International Journal of Contemporary Hospitality Management*, 34(8): 3084-3112. <https://doi.org/10.1108/IJCHM-10-2021-1242>
- [62] Aggarwal, P., Agarwala, T. (2023). Relationship of green human resource management with environmental performance: Mediating effect of green organizational culture. *Benchmarking: An International Journal*, 30(7): 2351-2376. <https://doi.org/10.1108/BIJ-08-2021-0474>
- [63] Shao, J., Cherian, J., Xu, L., Zaheer, M., et al. (2022). A CSR perspective to drive employee creativity in the hospitality sector: A moderated mediation mechanism of inclusive leadership and polychronicity. *Sustainability*, 14(10): 6273. <https://doi.org/10.3390/su14106273>
- [64] García-Machado, J.J., Martínez-Ávila, M. (2019). Environmental performance and green culture: The mediating effect of green innovation. An application to the automotive industry. *Sustainability*, 11(18): 4874. <https://doi.org/10.3390/su11184874>
- [65] Wang, C.H. (2019). How organizational green culture influences green performance and competitive advantage. *Journal of Manufacturing Technology Management*, 30(4): 666-683. <https://doi.org/10.1108/JMTM-09-2018-0314>
- [66] Khalil, M.K., Muneenam, U. (2021). Total quality management practices and corporate green performance: Does organizational culture matter? *Sustainability*, 13(19): 11021. <https://doi.org/10.3390/su131911021>
- [67] Saks, A.M. (2006). Antecedents and consequences of employee engagement. *Journal of Managerial Psychology*, 21(7): 600-619. <https://doi.org/10.1108/02683940610690169>
- [68] Suliman, M.A., Abdou, A.H., Ibrahim, M.F., Al-Khaldy, D.A.W., Anas, A.M., Alrefae, W.M.M., Salama, W. (2023). Impact of green transformational leadership on employees' environmental performance in the hotel industry context: Does green work engagement matter? *Sustainability*, 15(3): 2690. <https://doi.org/10.3390/su15032690>
- [69] Huang, S.Y.B., Ting, C.W., Li, M.W. (2021). The effects of green transformational leadership on adoption of environmentally proactive strategies: The mediating role of green engagement. *Sustainability*, 13(6): 3366. <https://doi.org/10.3390/su13063366>
- [70] Azam, T., Jamil, K. (2024). Studying the role of corporate social responsibility, green HRM and green innovation to improve green performance of SMEs. *Journal of Business & Industrial Marketing*, 39(12): 2620-2637. <https://doi.org/10.1108/JBIM-02-2023-0087>
- [71] Pham, N.T., Vo-Thanh, T., Shahbaz, M., Duc Huynh, T.L., Usman, M. (2020). Managing environmental challenges: Training as a solution to improve employee green performance. *Journal of Environmental Management*, 269: 110781. <https://doi.org/10.1016/j.jenvman.2020.110781>
- [72] Guerci, M., Montanari, F., Scapolan, A., Epifanio, A. (2016). Green and nongreen recruitment practices for attracting job applicants: Exploring independent and interactive effects. *The International Journal of Human Resource Management*, 27(2): 129-150. <https://doi.org/10.1080/09585192.2015.1062040>
- [73] Paulet, R., Holland, P., Morgan, D. (2021). A meta-review of 10 years of green human resource management: Is green HRM headed towards a roadblock or a revitalisation? *Asia Pacific Journal of Human Resources*, 59(2): 159-183. <https://doi.org/10.1111/1744-7941.12285>
- [74] 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. <https://doi.org/10.1177/0972150918779294>

- [75] Benevene, P., Buonomo, I. (2020). Green human resource management: An evidence-based systematic literature review. *Sustainability*, 12(15): 5974. <https://doi.org/10.3390/su12155974>
- [76] Ogbeibu, S., Emelifeonwu, J., Senadjki, A., Gaskin, J., Kaivo-oja, J. (2020). Technological turbulence and greening of team creativity, product innovation, and human resource management: Implications for sustainability. *Journal of Cleaner Production*, 244: 118703. <https://doi.org/10.1016/j.jclepro.2019.118703>
- [77] Prasad, R.S. (2013). Green HRM-partner in sustainable competitive growth. *Journal of Management Sciences and Technology*, 1(1): 15-18.
- [78] Wang, J., Xue, Y., Sun, X., Yang, J. (2020). Green learning orientation, green knowledge acquisition and ambidextrous green innovation. *Journal of Cleaner Production*, 250: 119475. <https://doi.org/10.1016/j.jclepro.2019.119475>
- [79] Ehnert, I. (2009). *Sustainable Human Resource Management*. Physica Heidelberg. <https://doi.org/10.1007/978-3-7908-2188-8>
- [80] Pham, N.T., Tučková, Z., Chiappetta Jabbour, C.J. (2019). Greening the hospitality industry: How do green human resource management practices influence organizational citizenship behavior in hotels? A mixed-methods study. *Tourism Management*, 72: 386-399. <https://doi.org/10.1016/j.tourman.2018.12.008>
- [81] Yu, H., Shabbir, M.S., Ahmad, N., Ariza-Montes, A., et al. (2021). A contemporary issue of micro-foundation of CSR, employee pro-environmental behavior, and environmental performance toward energy saving, carbon emission reduction, and recycling. *International Journal of Environmental Research and Public Health*, 18(10): 5380. <https://doi.org/10.3390/ijerph18105380>
- [82] Bhutto, T.A., Farooq, R., Talwar, S., Awan, U., Dhir, A. (2021). Green inclusive leadership and green creativity in the tourism and hospitality sector: Serial mediation of green psychological climate and work engagement. *Journal of Sustainable Tourism*, 29(10): 1716-1737. <https://doi.org/10.1080/09669582.2020.1867864>
- [83] Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. (2010). *Multivariate Data Analysis: A Global Perspective*, 7th ed. Pearson Education.
- [84] Nunnally, J.C. (1978). *Psychometric Theory* (2nd edition). New York: McGraw.
- [85] Sarstedt, M., Ringle, C.M., Hair, J.F. (2021). Partial least squares structural equation modeling. In *Handbook of Market Research*, pp. 1-47. https://doi.org/10.1007/978-3-319-05542-8_15-2
- [86] Fornell, C., Larcker, D.F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1): 39-50. <https://doi.org/10.1177/002224378101800104>
- [87] Bagozzi, R.P., Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1): 74-94. <https://doi.org/10.1007/BF02723327>
- [88] Byrne, B.M. (1989). *A Primer of LISREL: Basic Applications and Programming for Confirmatory Factor*

Analytic Models. Springer New York.

- [89] Hu, L., Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1): 1-55. <https://doi.org/10.1080/10705519909540118>

APPENDIX

APPENDIX A: CONFIRMATORY FACTOR ANALYSIS

Table A1. Standardized regression weights (factor loadings)

Item	Factor	Estimate (Std.)	Item	Factor	Estimate (Std.)
GR1	←GR	0.729	GWE1	←GWE	0.797
GR2	←GR	0.766	GWE2	←GWE	0.794
GR3	←GR	0.760	GWE3	←GWE	0.810
GTN1	←GTN	0.776	GOC1	←GOC	0.718
GTN2	←GTN	0.830	GOC2	←GOC	0.756
GTN3	←GTN	0.877	GOC3	←GOC	0.701
GPR1	←GPR	0.781	GOC4	←GOC	0.733
GPR2	←GPR	0.757	GOC5	←GOC	0.817
GPR3	←GPR	0.800	GP1	←GP	0.779
			GP2	←GP	0.831
			GP3	←GP	0.778
			GP4	←GP	0.857
			GP5	←GP	0.722

Note: GP = Green Performance; GOC = Green Organisational Culture; GTN = Green Training; GR = Green Recruitment; GWE = Green Work Engagement; GPR = Green Pay and Rewards.

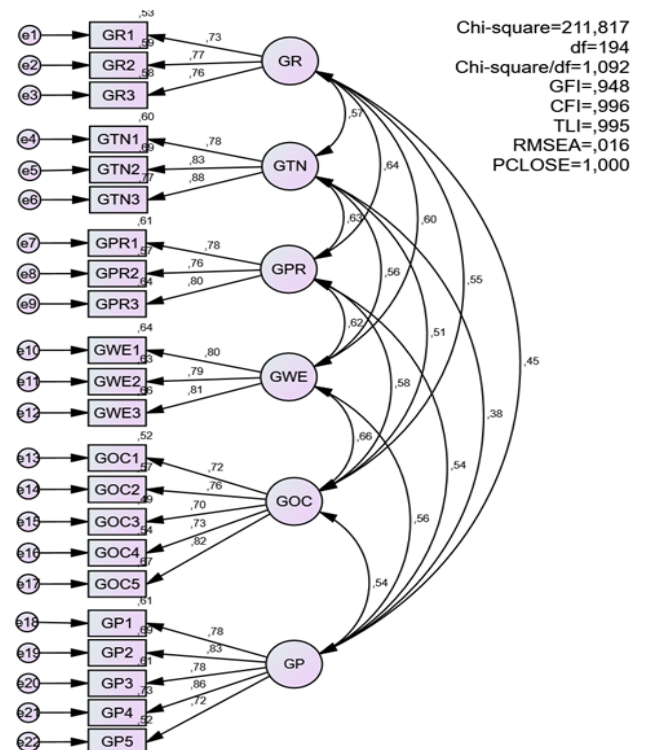


Figure A1. AMOS graphical output for Confirmatory Factor Analysis (CFA) model

Note: GP = Green Performance; GOC = Green Organisational Culture; GTN = Green Training; GR = Green Recruitment; GWE = Green Work Engagement; GPR = Green Pay and Rewards.

Table A2. Model fit indices for measurement model

Fit Index	Value	Threshold	Result
Chi-square/df	1.092	< 3.0	Satisfactory
GFI	0.948	> 0.9	Satisfactory
CFI	0.996	> 0.9	Satisfactory
TLI	0.995	> 0.9	Satisfactory
RMSEA	0.016	< 0.06	Satisfactory
PCLOSE	1.000	> 0.05	Satisfactory

Note: Chi-square/df = chi-square divided by degrees of freedom; GFI = goodness-of-fit index; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; PCLOSE = p-value for the test of close fit.

APPENDIX B: RESEARCH SURVEY

Dear Participants,

We are a research team from the Faculty of Business Administration at the Industrial University of Ho Chi Minh City. We are currently conducting a study to explore the impact of Green Human Resource Management on Green Performance in Small and Medium-sized Enterprises (SMEs). In this study, "green" refers to organizational activities, policies, and practices aimed at minimizing negative environmental impacts and promoting sustainable development. "Green criteria" include factors such as Green Recruitment, Green Training, and Green Pay and Rewards, all designed to enhance environmental awareness and responsible behavior among employees. We are also examining Green Work Engagement and Green Organizational Culture as pivotal factors influencing the implementation and effectiveness of these green policies.

Your responses will remain strictly confidential and will be used solely for academic research purposes. We highly appreciate your valuable time and contribution to this scientific endeavor.

(1: Strongly Disagree; 2: Disagree; 3: Neutral; 4: Agree; 5: Strongly Agree)

No.	Statement	1	2	3	4	5
I	Green Recruitment (GR)					
1.1	Our company uses green criteria to attract candidates to choose our organization.					
1.2	Our company utilizes green employer branding to attract eco-conscious employees.					
1.3	Our company recruits employees who possess environmental awareness.					
II	Green Training (GTN)					
2.1	Our company develops environmental management training programs to enhance employees' green awareness and expertise.					
2.2	Our company organizes training to encourage employee interest and commitment to environmental management.					
2.3	We manage environmental knowledge by integrating training with environmental behaviors to develop preventative solutions.					
III	Green Pay and Rewards (GPR)					
3.1	Our company prioritizes green benefits related to eco-friendly commuting and travel.					
3.2	Our company offers financial or tax benefits for sustainable practices (e.g., bike loans, low-emission vehicles).					
3.3	Our company rewards eco-conscious employees through public recognition, paid leave, bonuses, or vouchers.					
IV	Green Work Engagement (GWE)					
4.1	When I wake up in the morning, I look forward to performing environmental tasks at work.					
4.2	I enjoy my green-oriented job where environmental responsibility is required.					
4.3	While working, I am deeply focused and enthusiastic about tasks related to environmental protection.					
V	Green Organizational Culture (GOC)					
5.1	Environmental improvement and protection are considered top priorities of the company.					
5.2	Our company's vision and mission include a commitment to environmental protection.					
5.3	Leadership clearly communicates information and the value of environmental protection within the company.					
5.4	Our company has established disciplinary measures for behaviors that fail to protect the environment.					
5.5	Our company actively supports and promotes activities aimed at environmental protection.					
VI	Green Performance (GP)					
6.1	Our company is deeply concerned with reducing the amount of waste generated.					
6.2	Our company is committed to minimizing pollution.					
6.3	Our company emphasizes the economical and efficient use of resources.					
6.4	Our company focuses on minimizing incidents that negatively impact the environment.					
6.5	Our company is committed to implementing effective recycling practices.					

Should you have any questions or comments regarding this research, please feel free to contact the research team via email at: nguyenthibichngoc@iuh.edu.vn.

Consent Confirmation: Please confirm your voluntary participation in this survey:

- Agree
- Disagree (End of survey)

PART 1: SCREENING QUESTIONS

1. Are you currently working at an SME in Southern Vietnam?

- Yes
- No (End of survey)

2. Does your company implement any Green Human Resource Management (GHRM) practices? *(Examples: Green training for energy saving/waste sorting; Green rewards for environmental initiatives; Green recruitment prioritizing eco-conscious candidates).*

- Yes
- No (End of survey)

PART 2: DEMOGRAPHIC INFORMATION

1. Gender: Male Female

2. Age: Under 20 20–30 30–40 Over 40

3. Work Experience:

- Under 3 years
- 3–5 years
- 6–10 years
- 10–15 years
- 15–20 years
- Over 20 years

PART 3: MAIN SURVEY CONTENT

Please indicate your level of agreement with the following statements on a scale of 1 to 5