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The Mediating Role of Green Work Engagement in the Relationship between Green Human Resource Management and Sustainable Employee Performance: The Moderating Role of Green Organizational Culture

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Abstract. *Environmental sustainability increasingly requires organizations to align human resource practices with employee behavior and long-term organizational performance. This study examined the effects of Green Human Resource Management (GHRM) on sustainable employee performance by positioning green work engagement as a mediating variable and green organizational culture as a moderating variable. A quantitative explanatory design was employed using survey data collected from 250 employees working in organizations that had implemented environmental or sustainability programs. Respondents were selected through purposive sampling, and the data were analyzed using Partial Least Squares Structural Equation Modeling. The findings demonstrated that GHRM positively affected green work engagement and sustainable employee performance. Green work engagement also positively influenced sustainable employee performance and partially mediated the relationship between GHRM and sustainable employee performance. Furthermore, green organizational culture strengthened the positive effect of GHRM on green work engagement. These findings confirm that sustainable employee performance is shaped by the alignment of formal green HR practices, employee psychological involvement, and supportive organizational values. Organizations should therefore integrate green recruitment, environmental training, sustainability-oriented performance evaluation, rewards, leadership commitment, and cultural development to foster environmentally responsible and sustainably performing employees.*

Keywords: *Green HRM; Green Organizational Culture; Green Work Engagement; Sustainable Employee Performance; Workplace Sustainability.*

1. INTRODUCTION

Organizations are under growing pressure to integrate environmental sustainability into their strategies and daily operations as climate change, resource scarcity, regulatory demands, and stakeholder expectations reshape the business environment. Human resource management has consequently become a strategic mechanism for translating corporate environmental commitments into employee-level practices. Green Human Resource Management (GHRM) embeds sustainability principles in recruitment, training, performance appraisal, compensation, and employee participation, thereby aligning workforce behavior with environmental objectives (Ali et al., 2024; Chaudhary, 2020). Beyond regulatory compliance, GHRM can strengthen employer branding, organizational reputation, and sustainable competitive advantage by developing valuable green human capabilities (Chiarini & Bag, 2024; Rodrigues et al., 2026). Its implementation can also encourage employees to conserve resources, reduce waste, participate in environmental initiatives, and propose sustainable workplace improvements. These developments make GHRM increasingly important within contemporary

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management and business research because organizational sustainability ultimately depends not only on formal policies and technologies but also on employees' willingness and capacity to implement environmental values consistently in their work (Efranto et al., 2026; Talukder & Akhter, 2026).

Previous studies have established that GHRM positively influences employee green behavior, environmental performance, organizational effectiveness, and corporate sustainability (Ali et al., 2024; Sabokro et al., 2021). Recent evidence also indicates that work engagement helps convert green HR practices into stronger employee commitment and environmental behavior because engaged employees demonstrate greater energy, dedication, and participation in sustainability initiatives (Gupta & Jangra, 2024; Hossain & Hasan, 2026). Meanwhile, green organizational culture provides shared values and behavioral norms that support the implementation of environmentally oriented HR practices and reinforce sustainable performance (Dilip & Ragini, 2026; Legese et al., 2026). Nevertheless, the literature commonly examines employee engagement, individual green values, leadership, psychological climate, or organizational culture separately (He et al., 2024; Kaur & Gupta, 2025). Limited empirical attention has been given to a unified model that positions green work engagement as a mediator and green organizational culture as a moderator of the relationship between GHRM and sustainable employee performance. Integrating these mechanisms therefore offers novelty by simultaneously explaining the individual and organizational conditions through which GHRM produces sustainable outcomes.

Accordingly, this study aims to examine the direct and indirect effects of GHRM on sustainable employee performance by incorporating green work engagement as a mediating variable and green organizational culture as a moderating variable. Specifically, the study investigates whether environmentally oriented recruitment, training, performance evaluation, rewards, and employee involvement directly improve employees' economic, social, and environmental performance. It also evaluates whether GHRM enhances sustainable employee performance by fostering employees' energy, dedication, and active involvement in workplace environmental initiatives. Furthermore, the study assesses whether a supportive green organizational culture strengthens the capacity of GHRM to generate green work engagement. Based on these objectives, the study addresses three principal research questions: Does GHRM directly influence sustainable employee performance? Does green work engagement mediate the relationship between GHRM and sustainable employee performance? Does green organizational culture strengthen the relationship between GHRM and green work engagement? Answering these questions is expected to clarify how formal HR practices,

employee psychological involvement, and organizational environmental values interact in producing sustainability-oriented employee outcomes.

This study argues that GHRM alone may not automatically produce sustainable employee performance unless employees become psychologically engaged with environmental objectives and operate within a culture that consistently supports green values. Green work engagement constitutes an important behavioral and motivational mechanism because it transforms formal HR policies into dedicated participation, discretionary effort, and sustained environmental action (Idowu et al., 2025; Kurniasih et al., 2026). Green organizational culture, in turn, provides the collective norms, leadership signals, and institutional support needed to strengthen employees' responses to GHRM practices (Muisyo et al., 2022; Utami et al., 2026). The proposed model contributes theoretically by connecting strategic HRM, employee engagement, and organizational culture within an integrated explanation of sustainable employee performance. It also extends contemporary GHRM research by testing mediation and moderation effects simultaneously. Managerially, the findings can guide organizations in aligning green recruitment, development, appraisal, and reward systems with cultural transformation initiatives. Such alignment can help managers foster a committed workforce, improve sustainable performance, strengthen organizational resilience, and generate long-term competitive value through responsible business practices.

2. LITERATURE REVIEW

Green Human Resource Management

Green Human Resource Management (GHRM) refers to the integration of environmental sustainability into human resource policies and practices to align employee behavior with organizational environmental objectives. Its principal dimensions include green recruitment and selection, green training and development, and green performance appraisal and rewards. Green recruitment attracts applicants whose environmental values match organizational priorities, while green training develops the knowledge and competencies needed to perform environmentally responsible work. Green appraisal and reward systems establish environmental targets and recognize employee contributions to sustainability initiatives (Kumari, 2026; Taneja & Bansal, 2025). When implemented consistently, these practices encourage resource efficiency, employee participation, and pro-environmental behavior. GHRM therefore represents a strategic management system that connects human capital development with environmental performance, organizational sustainability, and long-term competitiveness (Ahmad et al., 2025; Suharti & Sugiarto, 2020).

Green Work Engagement

Green work engagement refers to employees' energy, dedication, and active involvement in environmentally responsible work. It reflects the extent to which employees are enthusiastic about achieving environmental objectives and willing to participate in sustainability programs beyond basic job requirements. Environmentally engaged employees are more likely to conserve resources, reduce waste, solve ecological problems, and support green innovation. Such engagement can be strengthened through environmental passion, managerial support, meaningful work, and opportunities to participate in sustainability initiatives (Khan et al., 2024; Sethumadhavan et al., 2025). GHRM supports green work engagement by providing environmental training, recognizing green contributions, and communicating the strategic importance of sustainability. Consequently, green work engagement functions as a psychological mechanism that translates formal environmental policies into consistent employee actions and meaningful contributions to organizational sustainability (Alfadel et al., 2025; Tran, 2023).

Sustainable Employee Performance

Sustainable employee performance refers to employees' ability to achieve work objectives consistently while supporting the economic, social, and environmental sustainability of the organization. Its economic dimension concerns productivity, efficiency, and value creation; its social dimension encompasses employee well-being, ethical conduct, collaboration, and responsibility toward stakeholders; and its environmental dimension includes resource conservation, waste reduction, and environmentally responsible behavior. This concept extends traditional performance measurement by balancing immediate productivity with long-term employee and organizational sustainability (La et al., 2026). Sustainable performance requires employees to integrate sustainability considerations into routine decisions and job responsibilities. GHRM can support this integration by establishing clear environmental expectations, developing relevant competencies, and rewarding responsible performance. Accordingly, sustainable employee performance is an appropriate outcome for assessing whether organizational sustainability strategies have been successfully translated into measurable employee-level contributions (Aggarwal et al., 2023; ud Din & Khan, 2025).

Green Organizational Culture

Green organizational culture represents shared values, beliefs, norms, and practices that position environmental sustainability as an important organizational priority. It is reflected in leadership commitment, sustainability-oriented communication, environmental learning,

employee participation, and organizational support for green innovation (Gürlek, 2026; Lopes et al., 2025). A strong green culture guides employees in interpreting expected environmental behavior and increases the credibility of sustainability-oriented human resource practices. When leaders demonstrate environmental responsibility and organizational systems consistently reinforce green values, employees are more likely to support environmental objectives. Conversely, inconsistencies between formal policies and actual managerial practices may weaken employee trust and participation. Green organizational culture therefore provides the contextual foundation for converting GHRM practices into employee engagement and sustainable outcomes. It also supports pro-environmental behavior, cultural transformation, and long-term organizational environmental performance (Subrahmanyam, 2025; Vargas-Hernandez & Vargas-González, 2024).

GHRM and Green Work Engagement

GHRM can strengthen green work engagement by providing employees with the motivation, capabilities, and organizational support required to participate in sustainability activities. Green recruitment creates compatibility between employee and organizational environmental values, whereas green training improves employees' knowledge and confidence in performing environmentally responsible tasks. Green appraisal and reward systems further demonstrate that management values employee contributions to environmental objectives. These practices encourage employees to invest greater energy, dedication, and attention in green workplace initiatives (Alfadel et al., 2025; Sharma et al., 2025). Empirical evidence also shows that GHRM contributes to stronger employee involvement in environmental activities when supported by appropriate leadership and organizational practices (Tran, 2023). Therefore, employees who perceive GHRM practices positively are expected to demonstrate higher green work engagement. H1: GHRM has a positive and significant effect on green work engagement.

GHRM and Sustainable Employee Performance

GHRM can directly enhance sustainable employee performance by incorporating environmental and social objectives into workforce management. Green recruitment brings sustainability-oriented employees into the organization, green training develops their environmental competencies, and green performance management aligns individual responsibilities with sustainability targets. Reward systems subsequently reinforce behaviors that improve resource efficiency, employee well-being, and environmental outcomes (Aggarwal et al., 2023; Tari & Nirmala, 2023). As an integrated management system, GHRM helps employees balance conventional work targets with broader environmental and social

responsibilities. It can also develop sustainability-oriented human capabilities that support green innovation, organizational resilience, and long-term competitiveness. Studies associate the implementation of GHRM with sustainable workforce development and stronger organizational performance, particularly when its practices are strategically aligned (Cen, 2023; Legese et al., 2026). H2: GHRM has a positive and significant effect on sustainable employee performance.

Green Work Engagement and Sustainable Employee Performance

Green work engagement can improve sustainable employee performance because engaged employees invest greater effort in implementing organizational environmental objectives. Their energy, dedication, and active participation encourage responsible resource use, waste reduction, compliance with environmental standards, and involvement in green innovation. Participation in meaningful sustainability initiatives can also improve employees' work experiences by strengthening their sense of purpose and connection with organizational values (Chowdhury et al., 2025). Employees with strong green engagement do not merely understand sustainability policies; they incorporate those principles into daily decisions and work routines. This behavioral consistency can simultaneously support productivity, social responsibility, and environmental performance. Therefore, green work engagement represents an important individual-level antecedent of sustainable performance and connects employees' psychological involvement with measurable sustainability outcomes (Alfadel et al., 2025; Sharma et al., 2025). H3: Green work engagement has a positive and significant effect on sustainable employee performance.

Mediating Role of Green Work Engagement

GHRM may not automatically improve sustainable employee performance because its effectiveness depends on how employees interpret and respond to environmental HR practices. Green work engagement explains this psychological and behavioral process. When employees perceive green recruitment, training, appraisal, and rewards as meaningful and consistently implemented, they are more likely to invest energy and dedication in environmental activities. This engagement encourages employees to apply their environmental knowledge and motivation to routine work, thereby improving sustainable performance. Previous research suggests that work engagement can transmit the influence of green HR practices to employee behavior and organizational sustainability outcomes (Cen, 2023; Kaur & Gupta, 2025). Without engagement, GHRM may remain an administrative arrangement with limited behavioral consequences. H4: Green work engagement positively mediates the relationship between GHRM and sustainable employee performance.

Moderating Role of Green Organizational Culture

Green organizational culture can strengthen the relationship between GHRM and green work engagement by creating a supportive context for environmental HR practices. When green values are embedded in leadership behavior, communication, workplace norms, and strategic priorities, employees are more likely to perceive GHRM initiatives as authentic and important. This consistency reinforces the motivational effects of green recruitment, training, appraisal, and rewards on employees' involvement in sustainability activities. In contrast, when managerial actions do not reflect stated environmental commitments, employees may regard GHRM practices as symbolic and demonstrate weaker engagement. Research integrating employee engagement with organizational culture indicates that cultural conditions can determine the effectiveness of sustainability-oriented HR systems (Cen, 2023; Legese et al., 2026). H5: Green organizational culture positively moderates the relationship between GHRM and green work engagement, such that this relationship is stronger at higher levels of green organizational culture.

3. RESEARCH METHOD

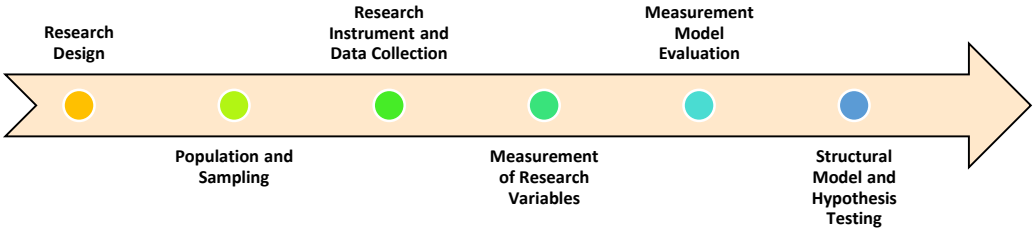


Figure 1. The structure of the research flow diagram.

Research Design

This study employed a quantitative approach with an explanatory research design to examine the relationships among Green Human Resource Management (GHRM), green work engagement, green organizational culture, and sustainable employee performance. The design was selected because the study sought to test theoretically developed hypotheses concerning direct, mediating, and moderating effects among the research constructs. Data were collected through a cross-sectional survey, in which respondents provided information at one specific point in time. GHRM was treated as the exogenous variable, green work engagement as the mediating variable, sustainable employee performance as the endogenous variable, and green organizational culture as the moderating variable. The unit of analysis was the individual

employee because the study focused on employees' perceptions of organizational HR practices, cultural conditions, work engagement, and sustainable work outcomes.

Population and Sampling

The research population consisted of employees working in organizations that had implemented environmental or sustainability programs. These organizations could operate in manufacturing, services, hospitality, healthcare, or other business sectors with identifiable environmental initiatives. Respondents were selected using purposive sampling to ensure that they possessed sufficient experience and knowledge to evaluate the research variables. Eligible respondents were required to be active employees, have worked for their organization for at least six months, and be familiar with environmental policies or sustainability-related workplace activities. Employees who did not meet these criteria were excluded from the analysis. The required sample size was determined by considering the complexity of the structural model, the number of predictors, and the statistical power needed to identify the hypothesized effects. Participation was voluntary, and respondents' identities were kept confidential.

Research Instrument and Data Collection

Primary data were collected using a structured questionnaire administered either directly or through an online survey platform. The questionnaire consisted of screening questions, respondent characteristics, and measurement statements representing the four research constructs. All construct indicators were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Before the main survey, the questionnaire was reviewed to ensure that each statement was clear, relevant, and consistent with the conceptual definition of its construct. A preliminary test was also conducted with employees who possessed characteristics similar to those of the target respondents. Their feedback was used to refine ambiguous wording and improve the questionnaire's readability. Respondents received an explanation of the research purpose, voluntary participation, data confidentiality, and instructions for completing the questionnaire before providing their responses.

Measurement of Research Variables

GHRM was measured through employee perceptions of green recruitment and selection, environmental training and development, green performance evaluation, green rewards, and participation in sustainability initiatives. Green work engagement was assessed through employees' energy, dedication, enthusiasm, and active involvement in environmentally responsible work. Sustainable employee performance covered employees'

contributions to economic efficiency, social responsibility, personal well-being, resource conservation, waste reduction, and organizational environmental objectives. Green organizational culture was measured through shared environmental values, leadership support, sustainability-oriented norms, internal environmental communication, and collective commitment to green practices. Each construct was modeled reflectively because its indicators were treated as manifestations of the underlying concept. Higher scores indicated stronger employee perceptions of GHRM implementation, green work engagement, sustainable employee performance, and green organizational culture. Demographic information was collected to describe the respondents without being incorporated into the principal measurement model.

Measurement Model Evaluation

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The first analytical stage evaluated the measurement model to determine whether the indicators measured their respective constructs consistently and accurately. Indicator reliability was assessed using outer loading values, while internal consistency reliability was examined through Cronbach's alpha, composite reliability, and reliability coefficient rho_A. Convergent validity was evaluated using the average variance extracted for each construct. Discriminant validity was examined to confirm that every construct was empirically distinct from the other constructs in the model. Indicators with insufficient loading values were evaluated carefully by considering their statistical contribution and theoretical relevance before removal. The measurement model was considered acceptable only when the reliability and validity requirements were fulfilled. This evaluation was completed before testing structural relationships to ensure that hypothesis testing was based on adequate measurements.

Structural Model and Hypothesis Testing

After establishing measurement quality, the structural model was evaluated for collinearity, explanatory power, effect magnitude, predictive relevance, and predictive performance. Path coefficients were used to determine the direction and strength of relationships among the constructs, while the coefficient of determination assessed the proportion of variance explained in green work engagement and sustainable employee performance. Effect size analysis evaluated the contribution of each predictor, whereas predictive relevance and out-of-sample prediction procedures assessed the model's predictive capability. Bootstrapping with a large number of resamples was conducted to estimate standard errors, t statistics, confidence intervals, and significance levels. The mediation test examined the indirect effect of GHRM on sustainable employee performance through green work

engagement. The moderation test evaluated the interaction between GHRM and green organizational culture in predicting green work engagement. All hypotheses were assessed using consistent significance criteria.

4. RESULTS AND DISCUSSION

A total of 250 valid questionnaires were included in the analysis. The respondents consisted of 137 men (54.8%) and 113 women (45.2%), with most participants aged between 26 and 35 years (40.4%). Based on organizational tenure, 38.8% had worked for three to five years, indicating sufficient experience to evaluate their organizations' environmental practices. Respondents represented manufacturing (38.4%), services (27.6%), and hospitality (18.0%), and healthcare organizations (16.0%). The descriptive analysis showed favorable perceptions of GHRM (M = 4.01, SD = 0.61), green work engagement (M = 3.94, SD = 0.65), sustainable employee performance (M = 4.06, SD = 0.58), and green organizational culture (M = 3.98, SD = 0.63). These scores indicate that the participating organizations had implemented sustainability-oriented HR practices and developed relatively strong employee engagement, organizational culture, and sustainable performance.

Table 1. Descriptive Statistics and Measurement Model Evaluation.

Construct	Mean	SD	Loading Range	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Green Human Resource Management	4.01	0.61	.728–.891	.918	.923	.932	.632
Green Work Engagement	3.94	0.65	.761–.904	.889	.895	.918	.691
Sustainable Employee Performance	4.06	0.58	.735–.887	.907	.912	.926	.641
Green Organizational Culture	3.98	0.63	.749–.896	.901	.906	.923	.666

Note. AVE = average variance extracted; SD = standard deviation.

The measurement model met the required reliability and validity criteria. Outer loadings ranged from .728 to .904, Cronbach's alpha and rho_A values exceeded .70, composite reliability values ranged from .918 to .932, and AVE values exceeded .50. HTMT values ranged from .541 to .823, confirming discriminant validity. Variance inflation factor values ranged from 1.284 to 2.193, indicating no critical collinearity. The model explained 47.2% of the variance in green work engagement (R^2 = .472) and 51.9% of sustainable employee performance (R^2 = .519). Predictive relevance was established for green work engagement (Q^2 = .331) and sustainable employee performance (Q^2 = .365). GHRM significantly affected green work engagement and sustainable employee performance, while

green work engagement significantly affected sustainable employee performance. The indirect and interaction effects were also significant; therefore, H1–H5 were supported.

Table 2. Structural Model and Hypothesis Testing.

Hypothesis	Relationship	β	*t*	*p*	f^2	Decision
H1	GHRM → Green Work Engagement	.563	10.214	< .001	.451	Supported
H2	GHRM → Sustainable Employee Performance	.287	4.905	< .001	.106	Supported
H3	Green Work Engagement → Sustainable Employee Performance	.421	7.162	< .001	.227	Supported
H4	GHRM → Green Work Engagement → Sustainable Employee Performance	.237	5.981	< .001	—	Supported

Note. GHRM = Green Human Resource Management; β = standardized path coefficient.

Discussion

The positive effect of GHRM on green work engagement confirms that sustainability-oriented HR practices can increase employees' energy, dedication, and involvement in environmental activities. Green recruitment facilitates compatibility between employee values and organizational environmental objectives, while green training gives employees the knowledge and confidence needed to perform responsible work. Environmental performance appraisal and rewards further communicate that sustainability-related contributions are recognized by management. GHRM also directly improved sustainable employee performance, although its effect was smaller than its effect on green work engagement. This pattern indicates that formal HR practices can influence employee performance directly by establishing environmental expectations and indirectly by shaping employees' psychological involvement. Green work engagement produced a stronger effect on sustainable employee performance, demonstrating that employees' active participation is essential for translating environmental policies into efficient, socially responsible, and environmentally sustainable work outcomes.

The significant indirect effect demonstrates that green work engagement partially mediates the relationship between GHRM and sustainable employee performance. Partial mediation occurred because the direct effect of GHRM remained significant after green work engagement was incorporated into the model. This result indicates that GHRM improves sustainable employee performance through two complementary mechanisms. First, it directly develops employees' capabilities and clarifies environmental performance standards. Second, it fosters psychological engagement that motivates employees to apply sustainability principles consistently in their daily responsibilities. The significant moderating effect also confirms that green organizational culture strengthens the relationship between GHRM and green work engagement. Employees respond more positively to GHRM when environmental values are reinforced through leadership behavior, workplace norms, internal communication, and

collective practices. Thus, green culture provides the organizational context that increases the credibility and motivational effectiveness of environmental HR initiatives.

The findings contribute to sustainable human resource management by integrating green work engagement as an individual psychological mechanism and green organizational culture as an organizational contextual factor. This combined model explains both how and under what conditions GHRM produces sustainable employee performance. Managers should therefore avoid implementing green recruitment, training, appraisal, and reward practices as isolated administrative programs. These practices should be aligned with leadership commitment, environmental communication, employee participation, and shared sustainability values. Organizations can provide practical environmental training, establish measurable green performance targets, recognize employee contributions, and create opportunities for employees to participate in sustainability decisions. Consistency between formal GHRM practices and organizational culture can develop environmentally responsible employees, strengthen sustainable performance, support employee well-being, improve resource efficiency, and enhance long-term organizational competitiveness.

5. CONCLUSIONS AND RECOMMENDATIONS

The study concludes that Green Human Resource Management (GHRM) contributes positively to sustainable employee performance by integrating environmental objectives into recruitment, training, performance evaluation, rewards, and employee participation. These practices improve employees' ability to achieve economic, social, and environmental work outcomes. GHRM also provides employees with the competencies, motivation, and organizational support required to conserve resources, reduce waste, maintain responsible workplace behavior, and contribute to sustainability initiatives. Therefore, GHRM should be regarded as a strategic human resource system that connects employee development with organizational sustainability rather than as a collection of isolated environmental programs.

Green work engagement was confirmed as a psychological mechanism connecting GHRM with sustainable employee performance. Employees who perceived strong GHRM practices demonstrated greater energy, dedication, and participation in environmentally responsible work, which subsequently enhanced their sustainable performance. Green organizational culture also strengthened the effect of GHRM on green work engagement. When environmental values were consistently reflected in leadership behavior, workplace norms, internal communication, and organizational practices, employees responded more positively to GHRM initiatives. The findings demonstrate that sustainable performance is most effectively

developed through the alignment of formal HR practices, employee psychological engagement, and a supportive organizational culture.

Organizations should integrate environmental principles throughout the complete human resource management cycle. Green criteria should be included in recruitment and selection to attract employees whose values align with organizational sustainability objectives. Environmental training should develop practical competencies in resource efficiency, waste reduction, and responsible decision-making. Performance evaluations should incorporate measurable sustainability indicators, while financial and nonfinancial rewards should recognize meaningful employee contributions to environmental programs. Organizations should also provide opportunities for employees to participate in sustainability planning, problem-solving, and green innovation. These integrated practices can strengthen engagement and ensure that environmental responsibilities become part of employees' routine work.

Managers should reinforce GHRM through leadership behavior and organizational values that consistently support environmental sustainability. Leaders must demonstrate personal commitment, communicate clear environmental priorities, and provide sufficient resources for employee-led green initiatives. Future studies should test the proposed model across different industrial sectors, organizational sizes, and employment levels to improve the generalizability of the findings. Comparative research could examine whether the relationships differ between manufacturing and service organizations or between managerial and nonmanagerial employees. Longitudinal designs are also recommended to assess changes in green work engagement and sustainable employee performance over time and provide stronger evidence regarding the causal relationships among the research constructs.

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