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Research Article

The Impact of Green Human Resource Management on Corporate Sustainable Performance

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ABSTRACT

This study investigates how GHRM practices—specifically green recruitment, performance evaluation, rewards, and training —affect CSP. By examining various GHRM practices, the research highlights their essential role in supporting companies' progress toward sustainable development goals.

This paper employed a quantitative survey design, collecting cross-sectional data from 23 manufacturing companies in Shandong Province. A total of 600 structured questionnaires were distributed, yielding 253 complete and valid responses from HR managers and directors. To ensure scientific rigor and reliable findings, data were analyzed using SMART PLS-SEM. Measurement and structural models were created to ensure the tool's reliability and validity and to evaluate the research hypotheses.

The data analysis results indicate that the research tool demonstrated good performance in terms of Composite Reliability, Factor Loadings, Cronbach's α, and AVE, meeting statistical standards. The structural model results verified that all hypotheses were supported, showing a significant positive link between green recruitment, performance evaluation, rewards, and training and corporate sustainable performance. This indicates that adopting GHRM practices helps improve a company's performance in environmental, social, and economic aspects of sustainability.

The uniqueness of this study is in its empirical confirmation of the beneficial effect of GHRM practices on CSP. It provides practical guidelines for corporate management, emphasizing the importance of green recruitment(GRe), training(GT), rewards(GR), and performance evaluation(GPE) in driving sustainable outcomes, and establishes a solid foundation for future research. By optimizing these practices, companies can more effectively address growing environmental pressures and gain a competitive advantage in the global sustainability race.

Keywords: Corporate Sustainable Performance (CSP), Green Human Resource Management (GHRM), PLS-SEM

INTRODUCTION

Nowadays, as environmental protection and sustainable development have gained prominence, GHRM has become a major focus in academic research. HRM scholars are increasingly examining how GHRM strategies and practices assist organizations in meeting environmental objectives (Yong et al., 2020). By integrating environmental management principles, GHRM weaves environmental responsibility into core HRM functions, including (GRe), (GT), (GPE), (GR), and employee management. This approach enables companies to achieve both environmental and economic benefits in their everyday operations (Aftab et al., 2023).

In today's world, GHRM is emerging as a highly promoted field within management science, combining employees' sustainable performance with environmental management practices. Green talent management is becoming critical for organizational survival and success, particularly in the manufacturing industry (Aftab et al., 2023). Some scholars argue that GHRM represents an evolution of traditional HRM, aimed at helping employees achieve sustainable work performance (Malik et al., 2021). GHRM plays an essential role in formulating policies, enforcing regulations, and promoting environmental awareness, while also educating employees on the importance of environmental protection

through training programs. Therefore, GHRM practices have become crucial in improving environmental performance and gaining a competitive edge for businesses (Ren et al., 2018).

As a vital support for sustainable development, GHRM is increasingly recognized as a core tool for driving green strategies and environmental management practices (Veerasamy et al., 2024). Through integrating green recruitment, training, rewards, and performance evaluation, GHRM helps companies reduce resource consumption and environmental pollution and raises employees' environmental awareness and work efficiency, achieving a win-win for both environmental and economic benefits. This makes GHRM a key initiative for companies to enhance their market competitiveness and fulfil social responsibilities in the current trend toward green transition and sustainable development (Longoni et al., 2018).

These practices reflect the importance businesses place on environmental protection and manifest in environmentally oriented HRM measures. Moreover, they not only contribute to long-term environmental performance but also significantly enhance a company's reputation within society. Given the crucial role of GHRM in corporate sustainability, companies are expanding and deepening its implementation to ensure better outcomes in environmental protection and competitive advantage (Tang et al., 2018).

In the past several years, a growing body of research has concentrated on the influence of GHRM on corporate sustainability performance, revealing its positive effects (Malik et al., 2021). By way of example, according to Roscoe et al. (2019) it was found thatGHRM contributes to fostering a green organizational culture, which positively influences a company's sustainability performance and overall sustainable development. However, despite extensive research into GHRM's effects on both individual and organizational performance, further studies are needed to understand under what conditions and through which mechanisms GHRM enhances a company's green innovation capabilities (Song et al., 2021).

Based on human capital theory, Chen (2008) introduced the concept of "green human capital," referring to the diverse capabilities that employees possess in the areas of environmental protection and sustainable development. These capabilities include environment-related skills, knowledge, wisdom, experience, and commitment to environmental causes. Green human capital is not only a crucial resource for businesses to address environmental challenges but also plays a crucial role in promoting green innovation. GHRM employs various practices, such as green training, green compensation and reward mechanisms, and employee green engagement, to enhance employees' competencies, motivation, and creativity. These initiatives not only help employees improve their environmental knowledge and skills but also inspire their intrinsic motivation to actively participate in the company's green strategies and practices.

By continuously strengthening human capital, GHRM not only cultivates a workforce with a strong sense of environmental responsibility but also drives innovation in green products and processes, thereby enhancing the company's competitiveness and sustainability during its green transition (Song et al., 2021). This systematic improvement enables employees to better adapt to the demands of green development and provides strong support for companies in achieving sustainable performance, optimizing green production processes, and designing eco-friendly products. It further helps companies maintain a leading position in increasingly stringent global environmental markets (Yong et al., 2020).

Therefore, this study selects GHRM as a key variable to explore its relationship with corporate sustainable performance. Specifically, GHRM encompasses four core practices: GRe, GT, GR, and GPE. These practices systematically guide employees to actively engage in the company's environmental strategies, thereby improving overall corporate sustainable performance. For example, in green recruitment, companies screen and attract employees with environmental awareness and a sustainable development mindset to build a talent pool with green capabilities. Green training enhances employees' skills and innovation in green work by providing specialized training in environmental knowledge. At the same time, the green rewards system links incentives to environmental performance, motivating employees' environmental efforts, while green performance evaluation systematically assesses employees' environmental performance, ensuring that they actively fulfil their environmental responsibilities within the company's sustainability framework (Yong et al., 2020).

Based on this, the theoretical model of this study is shown in Figure 1. The remaining sections of this paper are organized as follows: First, a theoretical model is constructed, and four research hypotheses are proposed. Next, the data collection process, research methods, , and variable measurement techniques are introduced. Following that,

structural equation modelling is used to test the hypotheses. Lastly, this study's theoretical and practical contributions are examined, along with its limitations and suggestions for future research. Through this structure, the paper provides a detailed exploration of how GHRM drives improvements in corporate sustainable performance through these key practices.

1.1 Green Recruitment and Corporate Sustainable Performance

Okwurume and Ogbu Edeh (2019) pointed out that green recruitment is an innovative hiring approach in which organizations consider environmental awareness as a key criterion for talent selection. By implementing paperless processes, green recruitment minimizes potential environmental impacts. Specifically, companies utilize online platforms, including email, global talent databases, and online application forms, to gather applications. Additionally, green recruitment reduces the environmental harm associated with the hiring process by conducting interviews through video or phone calls. Compared to traditional media like brochures or newspaper advertisements, online recruitment can disseminate information to a larger audience at the same time, significantly expanding the reach while reducing negative environmental effects. By utilizing digital platforms, companies can eliminate the need for paper and printed materials, thereby reducing resource consumption and waste production, and contributing to environmental protection (Davidescu et al., 2020).

Furthermore, green recruitment promotes a strategy that prioritizes candidates who are willing to work in organizations with strong environmental awareness and a commitment to ecological sustainability. To attract talent that aligns with the company's sustainability goals, businesses should create job descriptions that reflect those objectives (Masri & Jaaron, 2017).

Green recruitment is gaining increasing attention from companies. HR professionals are showing great interest in attracting and retaining highly qualified talent with environmental awareness and recommend adopting a systematic, multidisciplinary approach to evaluating candidates. When companies engage in activities related to sustainability and environmental protection, they can attract well-trained, highly skilled employees who meet the requirements. In contrast to conventional methods such as brochures or newspaper advertisements, online recruitment enables companies to share more comprehensive information about their environmental initiatives (Renwick et al., 2013). Additionally, green recruitment helps companies more easily attract employees with environmental awareness and experience related to sustainable performance (Zaid et al., 2018). Employees are also more inclined to join companies that are committed to sustainability. The findings of Masri and Jaaron (2017) indicate that green recruitment has a significant positive impact on sustainability. Therefore, this study proposes the following hypothesis:

H1: Green recruitment (GRe) has a positive effect on CSP.

1.2 Green Rewards and Corporate Sustainable Performance

To effectively motivate employees and shape positive behaviors, organizations often employ a variety of rewards that cater to both financial and non-financial needs. Financial incentives, such as promotions, cash bonuses, and awards, are traditional methods that acknowledge employee contributions and aim to boost performance (Renwick et al., 2013). However, non-financial incentives, including flexible working hours, additional leave, and professional development opportunities, are increasingly recognized for their role in promoting job satisfaction, reducing burnout, and fostering loyalty.

In recent years, as organizations strive to integrate sustainable practices into their operations, the concept of green rewards has gained popularity as a powerful motivator. Green rewards refer to rewards that encourage employees to participate in sustainability initiatives and environmentally friendly practices within the organization (Abdalla, 2025). By aligning individual goals with organizational objectives, green rewards not only foster a sense of purpose among employees but also support long-term sustainable performance. For instance, companies may implement green performance metrics, incentivize eco-friendly practices, or reward employees for participating in sustainability projects, all of which contribute to building an environmentally conscious corporate culture (Amjad et al., 2021).

Research indicates that green reward programs are instrumental in the implementation of GHRM (Jackson et al., 2011a). By integrating green goals into the reward structure, organizations can reinforce positive environmental behaviors, making sustainability an integral part of the company ethos. Consequently, green rewards are not only beneficial for environmental outcomes but also enhance employee engagement, loyalty, and morale, as employees feel that their work aligns with a larger, meaningful purpose.

Green rewards have a strong link to corporate sustainable performance. By implementing GHRM, companies can use green rewards and training to effectively boost their environmental performance. These incentives not only encourage employees to pay greater attention to environmental protection in their daily tasks but also strengthen their identification with the company's sustainability goals, thereby improving overall environmental performance. Such practices align with societal expectations for corporate sustainability and also contribute to enhancing a company's market competitiveness and brand image (Rawashdeh, 2018). By integrating green rewards into a comprehensive strategy, companies can more effectively drive improvements in sustainable performance and foster innovation. Therefore, this study proposes the following hypothesis:

H2: Green rewards (GR) have a positive effect on CSP.

1.3 Green Training and Corporate Sustainable Performance

Green training plays a crucial role in embedding environmental consciousness within an organization's culture, significantly elevating employees' awareness of environmental protection's importance (Al-Swidi et al., 2024). This form of training goes beyond traditional learning, instilling not only knowledge but also values that align with sustainability objectives. As employees become more environmentally conscious, they are better equipped to incorporate eco-friendly practices into their work routines, making environmental responsibility a fundamental part of their daily tasks.

Through green training, employees acquire an in-depth understanding of sustainability principles, including resource conservation, energy efficiency, and waste reduction strategies (Amrutha & Geetha, 2020). For example, training can focus on specific methods to minimize energy usage, such as turning off unnecessary equipment, optimizing heating and cooling systems, or utilizing natural light. Employees can also learn to reduce paper usage by digitizing documents and adopting paperless methods wherever feasible. Furthermore, comprehensive recycling programs can be implemented, enabling employees to recycle a range of materials, from office supplies to packaging. Such structured, practical training programs ensure that employees are not only aware of sustainable practices but also proficient in applying them effectively within their roles (Jabbour, 2015).

Moreover, green training helps foster a proactive attitude toward environmental initiatives within the workplace. Employees are encouraged to participate actively in company-wide sustainability efforts, whether through collaborative environmental projects, workshops, or sustainability committees. This engagement promotes a team-oriented approach, with employees working together to meet the company's green objectives. When individuals are motivated to contribute, it creates a ripple effect that strengthens the organization's commitment to sustainability. Employees feel empowered, knowing their efforts are part of a larger mission to achieve environmental goals. This involvement is essential, as it not only enhances team cohesion but also instills a sense of pride and responsibility toward sustainable development, which is vital for long-term organizational growth and reputation (Paillé et al., 2014).

Green training is more than a technical skill enhancement; it is a transformative process that shapes employees' perspectives on sustainability (Roscoe et al., 2019). As companies integrate these practices into their training programs, they foster an environment where every employee feels accountable for and invested in environmental stewardship. Over time, this builds a workforce that is not only skilled but also passionately aligned with the company's sustainability goals, contributing to both environmental protection and organizational success (Singh et al., 2020).

According to research, GT also referred to as environmental training, provides employees with knowledge about the company's environmental policies, activities, and required behaviors. This type of training not only promotes environmental values but also motivates employees to voluntarily engage in eco-friendly activities (Jabbour et al., 2010). By implementing this strategy, employees enhance their ability to identify environmental issues and acquire relevant green awareness and skills. Moreover, green training encourages participation in various environmental protection activities (Boiral, 2009). Research has indicated that companies adopting green training programs see a substantial positive effect on sustainable performance, enhancing their environmental initiatives and corporate social responsibility (Malik et al., 2021). Consequently, this study suggests the following hypothesis:

H3: Green training (GT) has a positive effect on CSP.

1.4 Green Performance Evaluation and Corporate Sustainable Performance

Green performance evaluation is an essential tool for organizations aiming to cultivate an environmentally conscious culture (Mishra, 2017). It refers to the systematic assessment and documentation of an employee's environmental performance throughout their career. Unlike traditional performance evaluations, green performance evaluations specifically focus on how employees contribute to the organization's sustainability objectives, providing a structured way to track and encourage eco-friendly behaviours and actions (Shoaib et al., 2022). By doing so, organizations can foster a more sustainable workplace and ensure that environmental considerations are embedded in everyday operations.

Green performance evaluations involve assessing employees based on their adherence to sustainable practices, such as minimizing resource consumption, reducing waste, and supporting environmentally friendly initiatives (Mousa & Othman, 2020). This assessment might include tracking specific metrics, such as energy usage in workspaces, adherence to recycling protocols, or participation in sustainability programs. For instance, employees may be recognized for reducing paper usage, promoting digital solutions, or using energy-efficient equipment. These evaluations can be tailored to different roles within the organization, ensuring that each employee's contribution to sustainability is relevant to their specific responsibilities and context. This approach not only aligns individual performance with the organization's environmental goals but also promotes a holistic understanding of sustainability across all workforce levels (Jabbour et al., 2010).

Regular feedback is a core component of green performance evaluations, as it allows employees to understand how their actions impact the company's environmental objectives and provides guidance on how to improve further (Shoaib et al., 2022).. Positive reinforcement, such as recognizing and rewarding employees who consistently demonstrate eco-friendly behaviors, can be highly motivating. This acknowledgement helps to build a sense of accomplishment and encourages employees to actively engage in sustainable practices. Additionally, such feedback helps employees identify areas where they can improve, making sustainability a continual focus (Roscoe et al., 2019). By providing structured opportunities for reflection and improvement, green performance evaluations play a critical role in keeping environmental responsibility top of mind for employees.

Incorporating environmental responsibility into the performance management process gives employees clear guidance, outlining their responsibilities and objectives in environmental management. Regular feedback on employees' environmental performance enhances their awareness, abilities, and professional skills in this area, encouraging more active involvement in the company's sustainability strategy (Jackson et al., 2011b). Performance evaluations are commonly utilized to guide compensation decisions and assess employee strengths and areas for improvement, and provide feedback to improve operational efficiency, drive business growth, and support organizational transformation. Without a formal evaluation mechanism, organizational discipline may weaken, and employees' potential for improvement and development may be limited (Yong et al., 2020).

Green performance evaluation specifically focuses on assessing employees' environmental performance, aiming to measure their contributions to advancing the company's sustainability goals. To ensure employees actively participate in green practices, organizations should emphasize managing and improving their green performance. This can be achieved by setting clear key performance indicators (KPIs) for employees, covering environmental goals and specific tasks such as reducing resource waste, improving energy efficiency, or enhancing corporate sustainability performance (Rashid & Alam, 2020). Previous research has shown that green performance management plays a positive role in promoting corporate sustainability. Although organizations may face challenges in effectively evaluating employee performance, GPE can have a significant positive impact on CSP (Rawashdeh, 2018). Thus, the fourth hypothesis proposed by this study is:

H4: Green performance evaluation (GPE) has a positive effect on CSP.

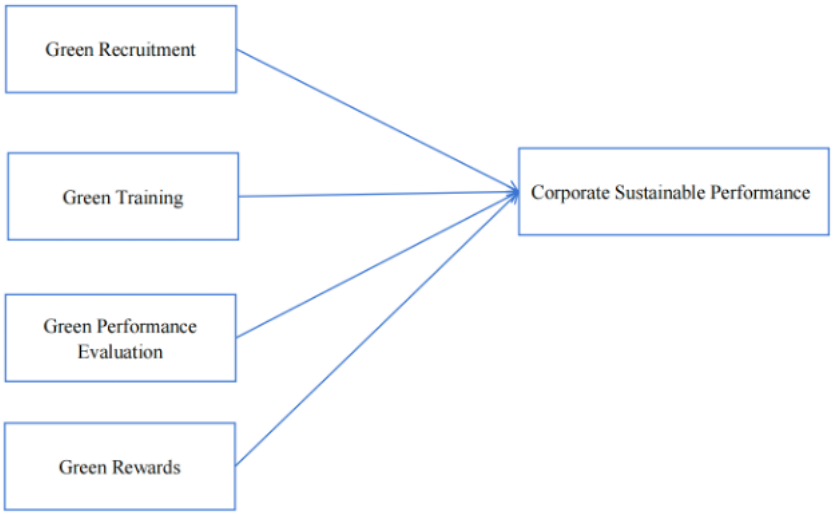

Figure 1 Framework

MATERIALS AND METHODS

2.1 Population and procedure

The data collection targets managers from medium to large manufacturing enterprises in Shandong Province (with over 50 employees). These managers are core members of their organizations, possessing vital internal information. The manufacturing industry was chosen as the research context for this study, as it is widely recognized as a key driver of economic development, significantly influencing regional stability and growth. There are several reasons for selecting manufacturing enterprises for data collection: first, Shandong Province's GDP reached approximately 9.2 trillion RMB in 2023, with a year-on-year growth of 6%, making the goal of becoming a trillion-yuan province attainable (Shandong Provincial Bureau of Statistics, 2023). Second, the manufacturing sector is a major contributor to this economic output, propelled by industries such as high-end equipment, transportation, information technology, and the marine economy. The manufacturing industry continues to play a crucial role in Shandong's economic development, benefiting from modernization and green initiatives in its industrial foundation. Third, the growth of manufacturing has led to significant environmental pressures, with many companies facing increasingly stringent environmental standards and regulations. Addressing how to achieve a green transformation while reducing energy consumption and pollution is a key challenge for Shandong's manufacturing sector. Studying how manufacturing enterprises in Shandong can effectively reduce their environmental footprint by adopting GHRM and promoting environmental protection behaviors is, therefore, essential. and fulfilling Environmental and Social Responsibilities (ESR) is of great importance. As the global sustainable development agenda advances, companies must not only pursue economic benefits but also take on greater environmental responsibilities. Through GHRM practices like GRe, GT, GR, and GPE, companies can encourage employees to engage actively in environmental protection efforts, foster eco-consciousness, and promote the green transformation of the enterprise. Moreover, fulfilling environmental social responsibilities not only reduces excessive consumption of natural resources but also enhances a company's credibility and competitiveness in society and the market. This dual approach of improving sustainability through green management and social responsibility will support the long-term sustainable development goals of Shandong's manufacturing enterprises and contribute positively to the establishment of a green economic system.

This research employs a cross-sectional approach and gathers data using self-reported techniques. To ensure diversity and representativeness in the data, the research team adopted a multi-respondent survey approach, implementing a rigorous sampling and survey process. First, the team collaborated with relevant chambers of commerce to randomly select 223 manufacturing enterprises from Shandong Province as the sample pool. The selection criteria for these samples were based on industry type, company size, and whether they had implemented GHRM. Researchers contacted the human resources managers of these companies to gain detailed insights into their specific practices related to environmental sustainability, particularly in areas such as GRe, GT, GR, and GPE. Only companies that had adopted GHRM measures were invited to participate in the study to ensure the accuracy of the survey and the relevance of the subjects.

After obtaining formal consent from the companies, the research team distributed 600 questionnaires to senior managers in these enterprises between September and November 2024. Each questionnaire was meticulously designed and included an explanatory letter detailing the research background, objectives, and assurances of anonymity and confidentiality for participants. This approach aimed to reduce any psychological concerns from the managers and increase their willingness to participate and provide honest responses. To further enhance the response rate, the research team sent reminders every two weeks after the initial distribution, totalling three reminders. Ultimately, 300 completed questionnaires were received from managers at 23 manufacturing companies. However, during the data cleaning and analysis phase, only 253 questionnaires (84.33% of the total collected) met the research criteria and were included in the final analysis.

Notably, the questionnaire was originally drafted in English to ensure the professional quality and consistency of the measurement tool. To guarantee that managers could accurately comprehend the questionnaire and respond effectively, the research team paid special attention to precise semantic expression during the drafting process, avoiding potential ambiguities arising from cross-language translation issues. In summary, this study strictly adhered to scientific sampling and data collection procedures, ensuring the reliability and validity of the research data while providing a solid foundation for subsequent analysis.

The descriptive analysis results provide a detailed overview of the demographic and professional characteristics of participants within the sample, shedding light on the typical profile of employees in Shandong's manufacturing enterprises. According to the data, a majority of the participants were male, making up 58.1% of the sample, indicating a slight gender imbalance, which is relatively common in the manufacturing industry. This gender distribution highlights a predominantly male workforce, which may reflect broader trends within the industrial sector in Shandong, where male employees often occupy a larger proportion of roles, particularly in technical and managerial positions.

The age distribution among participants shows a relatively mature workforce, with most individuals aged 36 and above, representing 43.5% of the total sample. This was followed by the age group of 26 to 34 years, who made up 36.4% of participants. These figures indicate an older demographic, suggesting that the workforce in Shandong's manufacturing sector is primarily composed of individuals who have had substantial experience in their field. This older age profile may also imply a strong base of experienced professionals who likely possess deep expertise and skills honed over years of service, which can be advantageous for organizations seeking to maintain stability and knowledge continuity.

Educational attainment among participants was generally high, with 68.4% holding graduate degrees, underscoring a highly educated workforce. This significant proportion of employees with advanced education levels suggests that Shandong’s manufacturing enterprises place a strong emphasis on hiring or promoting individuals with higher educational qualifications, possibly due to the technical and specialized nature of roles in this sector. This high educational level may also reflect an industry trend towards modernization and adaptation of advanced technologies, requiring employees with robust educational backgrounds who can effectively manage and operate complex manufacturing processes.

The marital status of participants shows that 87.4% were married, reflecting a workforce with significant family responsibilities. This high percentage of married individuals may contribute to a stable and mature organizational environment, as employees with family commitments may exhibit a greater inclination toward stable employment and long-term career development. Furthermore, it highlights the potential need for companies to consider family-oriented benefits and support systems, as a substantial portion of their workforce may value work-life balance and family support.

Job levels among participants were primarily concentrated in middle or upper management, with 61.2% occupying these positions. This distribution points to a considerable representation of decision-makers and leaders within the sample, suggesting that the data could reflect perspectives from a managerial or supervisory standpoint. This management-heavy sample may provide insights into strategic priorities and operational practices typical of the industry, as well as highlighting the role of experienced leaders in driving performance and organizational goals in Shandong's manufacturing enterprises.

Lastly, the data on work experience reveal that 64.4% of participants had either 7 to 10 years or more than 10 years of experience in the industry. This level of experience implies a workforce that is not only knowledgeable about the

industry's demands but also familiar with the specific practices and challenges of the manufacturing sector. Employees with this extent of experience are likely well-versed in the technical, operational, and managerial aspects of their roles, which is critical for maintaining productivity and adapting to new industry trends.

In summary, the demographic and professional characteristics identified in the sample indicate that Shandong's manufacturing sector workforce consists predominantly of experienced, highly educated, and relatively mature professionals, with a strong representation of managerial-level employees. This profile suggests an environment that values stability, expertise, and educational qualifications, all of which may contribute to a productive and well-organized manufacturing sector in the region.

2.2 Measurements

The survey tool in this study was adapted from existing sources. A 5-point Likert scale was utilized to assess GHRM and CSP, with response options ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). All scales demonstrated acceptable reliability levels Cronbach's alpha > 0.70) (Hair et al., 2019). The GHRM scale, based on Yong et al. (2020), consists of 12 items across four dimensions: green recruitment, training, rewards, and performance evaluation. The green recruitment (GRe) dimension includes four items, green training (GT) contains three items, green performance evaluation (GPE) is measured by three items, and green rewards (GR) is assessed through two items. For example: "A company's environmental performance draws interest," "Environmental training is ongoing," "Each employee has designated environmental targets to meet," and "Financial incentives are offered to acknowledge environmental achievements." The Corporate Sustainable Performance(CSP) scale, adapted from Malik et al. (2021), comprises ten items, including: "Reduction in costs for material procurement" and "Improved compliance with environmental standards."

2.3 Data Analysis Tools and Techniques

Structural Equation Modeling (SEM) was employed in this study to analyze the collected data. According to Hair et al. (2019) pointed SEM can be divided into two types: CB-SEM and PLS-SEM.

Primarily used to confirm or reject theories, CB-SEM examines the inherent relationships among multiple variables. It achieves this by assessing the model's ability to estimate the covariance matrix of the sample data set.

On the other hand, PLS-SEM is based on variance, considering total variance to estimate parameters (Hair et al., 2017). This approach is causal and predictive, focusing on estimating predictions within statistical models and designed to offer causal explanations (Chin et al., 2020). This technique addresses the apparent dichotomy often emphasized in academic research between explanation and prediction, which is fundamental for developing management insights (Hair et al., 2019). According to the above summary, PLS-SEM is more suitable for this study.

RESULTS

3.1 Measurement Model

The results of the measurement model for GHRM—including green recruitment, performance evaluation, rewards, and training—as well as Corporate Sustainable Performance(CSP) are presented in Table 1. All constructs have Outer Loadings exceeding 0.7, CR exceeding 0.70, AVE greater than 0.50, and Cronbach's α coefficients above 0.7. The measurement model in this study (Figure 2) is deemed to have strong reliability and validity based on the findings presented in Table 1.

Table 1. Measurement Model

Variable	Indicator	Factor Loadings	AVE	CR	Cronbach's alpha
Corporate Sustainable Performance (CSP)	CSP1	0.775	0.562	0.928	0.913
	CSP2	0.727			
	CSP3	0.705			
	CSP4	0.761			
	CSP5	0.783			
	CSP6	0.752			
	CSP7	0.731			
	CSP8	0.757			
	CSP9	0.76			

	CSP10	0.739			
Green Performance Evaluation (GPE)	GPE1	0.848	0.723	0.887	0.809
	GPE2	0.854			
	GPE3	0.849			
Green Rewards (GR)	GR1	0.880	0.800	0.889	0.751
	GR2	0.908			
Green Recruitment (GRe)	GRe1	0.822	0.684	0.898	0.848
	GRe2	0.827			
	GRe3	0.840			
	GRe4	0.819			
Green Training (GT)	GT1	0.834	0.760	0.905	0.843
	GT2	0.879			
	GT3	0.901			

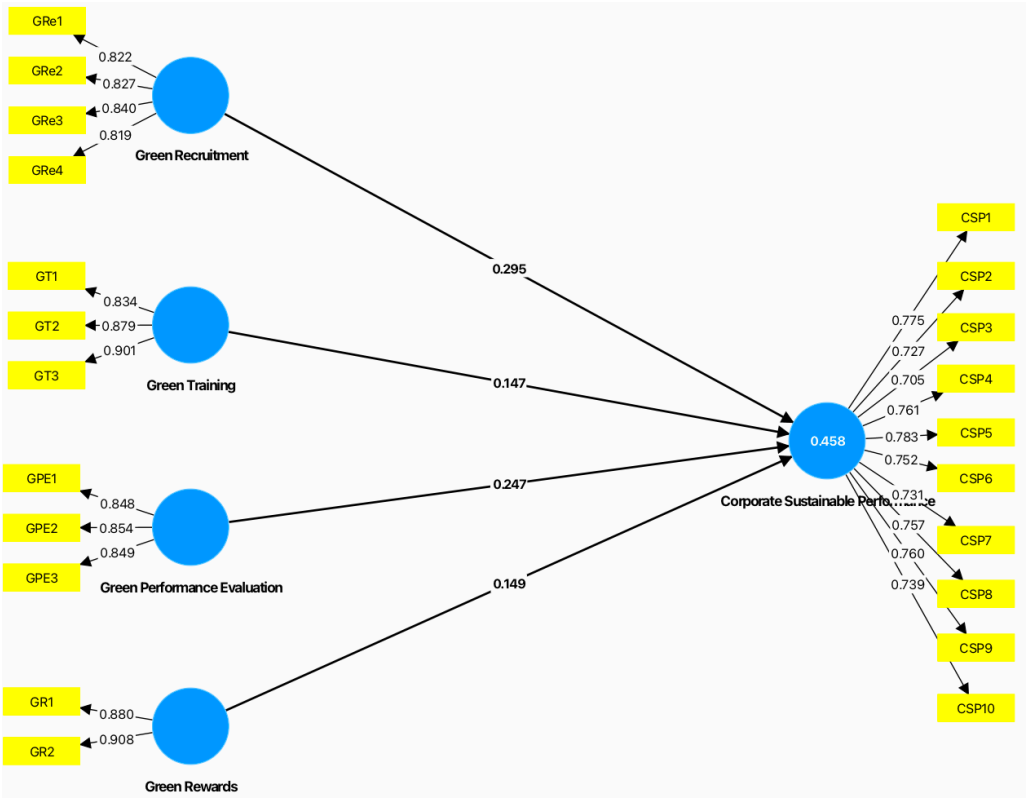

Figure 2 Measurement Model

To examine the interrelationships within the structural model of this study, the Discriminant Validity of the constructs, based on the HTMT (Hair et al., 2021), is presented in Table 2. All values for HTMT fall below 0.85, demonstrating that our constructs exhibit good discriminant validity.

Table 2. Discriminant Validity

	CSP	GPE	GRe	GR	GT
CSP					
GPE	0.647				
GRe	0.664	0.636			
GR	0.575	0.632	0.603		
GT	0.594	0.667	0.704	0.559	

3.2 Structural Model

In the structural model (Figure 3), this study assess the research hypotheses after analyzing the relationships between the proposed constructs. First, we examine the issue of multicollinearity among the constructs, as shown in Table 3, where the VIF values are used as a measure of multicollinearity.

To avoid significant multicollinearity impacts on the structural model estimates, VIF values for predictive variables should ideally be below 5, with a preference for values under 3 (Hair et al., 2021). In this study, all VIF values are below 5, confirming that multicollinearity is not a concern.

Table 3. Collinearity Statistics (VIF)

	VIF
CSP1	3.075
CSP2	2.545
CSP3	2.133
CSP4	2.819
CSP5	2.848
CSP6	2.906
CSP7	2.554
CSP8	2.432
CSP9	2.719
CSP10	2.531
GPE1	1.779
GPE2	1.809
GPE3	1.701
GR1	1.566
GR2	1.566
GRe1	1.792
GRe2	1.886
GRe3	1.990
GRe4	1.853
GT1	1.855
GT2	2.023
GT3	2.261

Next, we assess the model's relevance and fit by examining the R^2 and Q^2, to investigate the predictive relevance of the research model (Hair et al., 2021). As shown in Table 4:

R^2 value for Corporate Sustainable Performance is 0.458, which is considered acceptable. If the coefficient of determination is close to 0, it suggests minimal impact, while higher values indicate greater predictive capability (Yusuf & Saragih, 2020).

In the structural model, predictive relevance is evaluated using Q^2 (Stone-Geisser). Smart PLS 4.0 applies the PLSpredict algorithm to determine Q^2 values. As per Cohen et al. (2000), Q^2 values above 0 indicate that the model has predictive relevance for a specific endogenous construct, whereas values of 0 or below suggest a lack of predictive relevance. Table 4 shows that the Q^2 value for Corporate Sustainable Performance is 0.435, indicating that the model possesses a significant level of predictive capability.

Table 4. R^2 and Q^2

	R-square	R-square adjusted	Predictive Relevance Q^2
CSP	0.458	0.449	0.435

In the step 2, the path coefficient indicates the relationship between IV and DV, determined using the bootstrapping method. If the t-statistic exceeds 1.96 and the significance level P-value <0.05, The hypothesis has been accepted, and the path coefficient results are displayed in Table 5.

Table 5. Hypothesis testing results

Hypothesis	Interaction	Original sample (O)	Standard deviation (STDEV)	T statistics	P values
H1	Green Recruitment -> Corporate Sustainable Performance	0.295	0.069	4.302	0
H2	Green Rewards -> Corporate Sustainable Performance	0.149	0.061	2.435	0.015
H3	Green Training -> Corporate Sustainable Performance	0.147	0.068	2.15	0.032
H4	Green Performance Evaluation -> Corporate Sustainable Performance	0.247	0.065	3.8	0

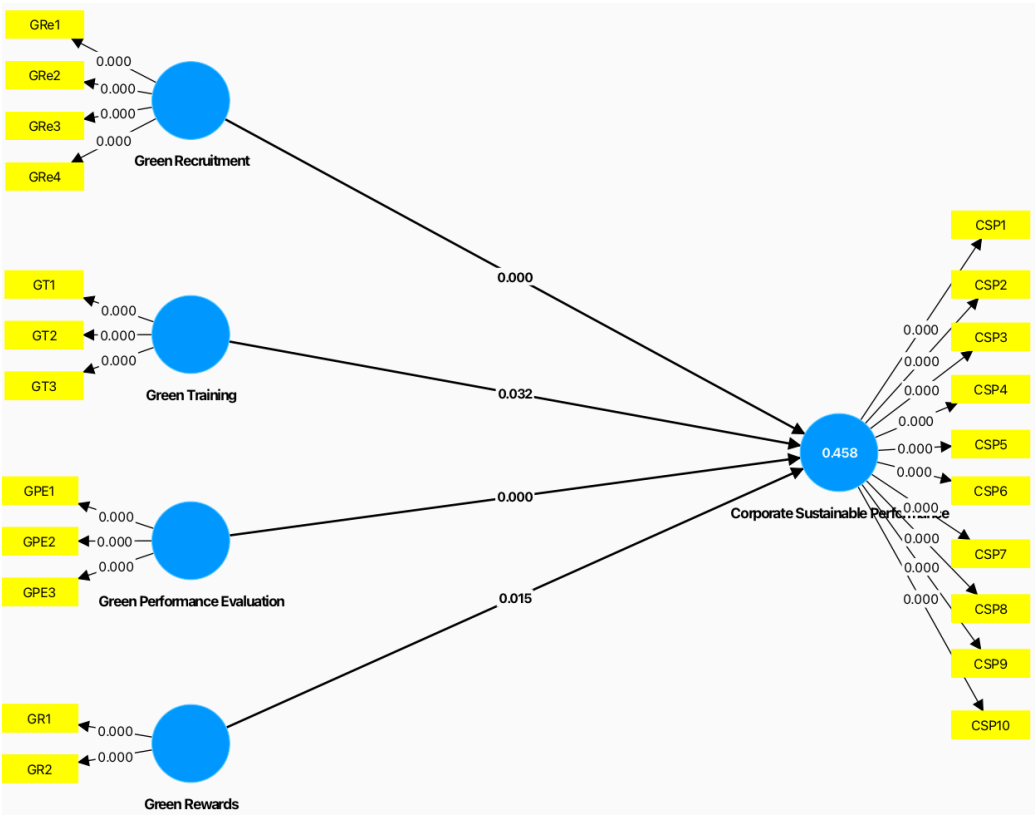

Figure 3 Structural Model

DISCUSSION

This study investigated the influence of GHRM, including green recruitment, training, rewards, and performance evaluation, on Corporate Sustainable Performance (CSP). This research hypothesizes a positive relationship between GHRM and CSP, adding to the current body of knowledge on GHRM and corporate sustainability. Data was collected

using scales developed in prior studies. Hypothesis testing was conducted using Smart PLS 4.0 for PLS-SEM analysis, allowing for simultaneous evaluation of both the measurement and structural models. Four hypotheses were proposed in total.

H1 sought to examine the impact of Green Recruitment (GRe) on CSP. The statistical findings reveal that green recruitment significantly and positively affects CSP, indicating that manufacturing firms implementing green recruitment demonstrate an interest in attracting environmentally conscious employees, potentially enhancing their competitiveness (Malik et al., 2021). This finding is consistent with Yong et al. (2020), who similarly identified a significant positive effect of green recruitment on CSP using SEM and data analysis. Thus, H1 is confirmed and accepted.

H2 was proposed to examine the impact of Green Rewards (GR) on CSP. Statistical analysis reveals that green rewards are vital in improving organizations' sustainable performance. Specifically, offering rewards tied to corporate sustainability performance can motivate employees' work behavior, encourage the timely completion of tasks, and improve the quality of service provided to the organization (Malik et al., 2020). These results are consistent with Rawashdeh's (2018) study, which examined GHRM —such as GRe GT, and GR. Within Jordanian healthcare organizations (hospitals) and identified a statistically significant positive relationship between GHRM and CSP. In light of this discussion, H2 is supported by the empirical conclusions of this study.

H3 aimed to explore the positive effect of green training on corporate sustainable performance. The analysis reveals a notable connection between Green Training (GT) and CSP, indicating that green training improves employees' environmental awareness, fosters green innovation skills, and strengthens commitment to sustainability. This, in turn, has a positive impact on the organization's environmental performance (Malik et al., 2021). This result aligns with Yong et al. (2020), who confirmed through PLS-SEM data analysis that green training positively influences CSP. Based on this discussion, H3 is accepted.

H4 proposed the impact of GPE on CSP. The data analysis results show a significant positive impact, indicating that green performance evaluation can substantially enhance corporate sustainable performance. This finding aligns with the results of Zaid et al. (2018), who conducted a survey of 121 companies in the most heavily polluting manufacturing sectors in Palestine, concluding that GPE has a direct effect on sustainable performance. In simple terms, if a company's GPE is inadequate, it will be difficult to maintain sustainable performance. In light of the preceding discussion, H4 is confirmed and accepted.

Based on the discussions and research findings, all four hypotheses have been accepted, affirming that the effective implementation of GHRM practices can significantly enhance CSP. These results highlight the crucial role GHRM plays in fostering environmentally responsible behaviours and practices within organizations, thereby contributing to their overall sustainability objectives.

The study highlights that GHRM practices not only support corporate environmental objectives but also foster a culture of sustainability among employees. Through incorporating green practices into HR activities, such as hiring, training, and performance evaluation, organizations can encourage employees to adopt eco-conscious behaviors, leading to a reduction in waste, efficient use of resources, and ultimately, improved environmental performance. This, in turn, strengthens the organization's reputation, attracts eco-conscious consumers, and aligns with the growing demand for corporate environmental responsibility.

Additionally, these findings suggest that organizations willing to adopt GHRM as part of their core strategies may experience not only environmental but also financial and social benefits, positioning themselves as leaders in sustainability within their industries. As environmental issues continue to influence global business practices, the integration of GHRM into corporate strategies becomes increasingly essential for long-term success.

This research contributes to the expanding body of evidence indicating that GHRM can play a crucial role in helping businesses tackle sustainability challenges more effectively. By incorporating environmentally-focused practices into HR strategies, GHRM enables organizations to align their human capital with sustainability objectives, fostering a culture of environmental responsibility throughout the workforce. This alignment is essential for companies seeking to reduce their ecological footprint while maintaining competitive performance. In this way, GHRM not only supports the pursuit of environmental goals but also strengthens the organization's ability to respond proactively to the

evolving demands of sustainable business practices, making it a vital component in achieving long-term corporate sustainability.

CONCLUSIONS

Significant Impact of GHRM on CSP: This research confirms that GHRM, including green recruitment, performance evaluation, training and rewards, have a significant positive effect on corporate sustainable performance. These practices are crucial in helping manufacturing firms improve their environmental, social, and economic sustainability.

Green Recruitment's Role in Enhancing Competitiveness:

Green recruitment practices are increasingly recognized as a strategic approach for companies aiming to strengthen their competitive edge in today's environmentally conscious market. Incorporating sustainability into recruitment processes enables companies to attract candidates who not only have the required skills but also share the organization's dedication to sustainable development. This alignment between employee values and corporate sustainability goals fosters a workplace culture that actively supports environmental responsibility and sustainability.

Green recruitment involves incorporating environmental criteria into job descriptions, highlighting the company's sustainability initiatives in recruitment materials, and promoting the company's commitment to environmental stewardship during the hiring process. This approach appeals to environmentally conscious individuals who are increasingly seeking employers whose values match their own, especially within younger generations who prioritize corporate social responsibility. Attracting such talent is beneficial for organizations as it brings in employees who are more likely to be motivated and committed to the company's sustainable objectives.

Additionally, green recruitment enhances the company's public image and brand reputation, signaling to clients, partners, and investors that it is forward-thinking and dedicated to sustainable development. This reputation not only differentiates the company from competitors but also attracts like-minded business partners who value environmental practices. Over time, this focus on sustainable recruitment can build a workforce dedicated to innovative, eco-friendly solutions, ultimately contributing to the company's long-term success and competitiveness.

By embedding green values at the very beginning of the employment relationship, companies create a strong foundation for a culture of sustainability that permeates all aspects of the organization. This culture becomes a powerful motivator for continuous improvement and innovation in sustainable practices, ensuring that the organization remains adaptable and resilient in an increasingly eco-conscious market. In this way, green recruitment not only enhances the firm's competitive advantage but also serves as a catalyst for sustainable business growth, ultimately leading to positive environmental and financial outcomes.

Green Rewards as a Motivational Tool:

Green rewards systems are instrumental in motivating employees to adopt sustainable behaviors by directly linking incentives to environmental performance outcomes. These incentives can come in different forms, such as monetary bonuses, acknowledgment programs, and opportunities for career growth, or non-monetary benefits like additional paid leave or eco-friendly gifts. By rewarding environmentally conscious actions, organizations communicate their commitment to sustainability, making it clear that sustainable practices are a core value. This approach fosters a culture of environmental stewardship, where employees are encouraged and feel personally invested in aligning their daily tasks with the company's sustainability goals. Over time, these reward systems help instill long-term behavioral changes among employees, not only boosting morale but also enhancing productivity. The result is a more cohesive organization that sees environmental responsibility as integral to corporate success, ultimately contributing to improved corporate performance and positive environmental outcomes.

Green Training as a Catalyst for Environmental Innovation:

Green training programs serve as a foundation for enhancing employees' environmental knowledge and skills, providing them with the tools they need to make more sustainable decisions in their roles. Training sessions can cover a range of topics, from energy conservation practices to waste reduction strategies, helping employees understand how their actions impact the environment. Moreover, these training initiatives encourage a culture of continuous learning and environmental mindfulness. By equipping employees with innovative thinking tools and environmentally friendly problem-solving skills, green training fosters a proactive approach to environmental

challenges. This newfound knowledge and motivation often lead to the development of innovative practices and technologies that reduce the company's ecological footprint, promoting a cycle of sustainable innovation. In turn, these advancements strengthen the company's position as an environmentally responsible entity, meeting sustainability objectives while achieving competitive advantage and increasing corporate environmental performance.

Green Performance Evaluation for Enhanced Environmental Accountability:

Regular evaluations of employee contributions to sustainability goals through green performance appraisals are critical for reinforcing environmental accountability within an organization. A structured green performance evaluation framework ensures that employees' environmental efforts are recognized, measured, and rewarded, promoting transparency and commitment to sustainability at all levels. By integrating environmental criteria—such as energy efficiency, waste reduction, and resource conservation—into performance reviews, organizations make it clear that sustainability is a key performance indicator alongside traditional metrics. This practice not only holds employees accountable for their impact on the environment but also strengthens their sense of responsibility toward corporate environmental objectives. Such evaluations encourage continuous improvement, fostering a workforce that is actively engaged in reducing the company's environmental footprint. By instilling a sense of duty to environmental goals, green performance evaluation supports the organization in achieving sustainable performance over the long term, ultimately benefiting both corporate operations and the wider community.

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