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Green training, green rewards, and employee green performance in Bangladesh's ready made garment sector: The mediating role of environmental knowledge

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Abstract

Green human resource management is widely promoted as a route to environmental sustainability, but evidence on how specific practices shape individual employee green performance in developing country manufacturing remains limited. Drawing on Ability, Motivation, and Opportunity (AMO) theory, this study examines the effects of green training and green rewards on employee green performance and tests environmental knowledge as a mediator. A cross sectional questionnaire survey, distributed through Google Forms and in print, collected 321 valid responses from managerial and functional employees of ready made garment firms registered with the Bangladesh Garment Manufacturers and Exporters Association. The sample size was set with Slovin's formula from an estimated population of 1,404. Data were analysed using SPSS and Partial Least Squares Structural Equation Modelling. Green rewards ($\beta = 0.230$) and green training ($\beta = 0.222$) each had a significant positive direct effect on employee green performance, and both strongly predicted environmental knowledge ($\beta = 0.460$ and $\beta = 0.430$). Environmental knowledge had the strongest direct effect on green performance ($\beta = 0.531$) and partially mediated both relationships (indirect effects of $\beta = 0.244$ and $\beta = 0.229$). The model explained 78.2% of the variance in employee green performance and showed better predictive performance than an indicator average benchmark. The findings suggest that firms should pair training and reward systems with continuous knowledge building. The cross sectional design, self reported data, and single sector sample limit causal and general conclusions.

***Keywords*:** Green Training, Green Rewards, Employee Green Performance, Environmental Knowledge, Green Human Resource Management, AMO Theory, Ready Made Garment Industry, Bangladesh

JEL Classification: M12, M52, M53

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1. Introduction

In recent times, the role of human-resource management in fostering environmentally responsible behavior within organizations has gained increasing significance. Globally, climate change has intensified and awareness from researchers around the world on environmental sustainability has reached significance. Recent work on green human resource management (GHRM) shows that strategic practices such as green recruitment, green training, and environmentally aligned performance rewards can meaningfully reduce an organization's ecological footprint. Further enhancing employee motivation and overall employee environmental sustainability performance (Gazi et al., 2025). Bangladesh's vulnerability to climate change further amplifies the relevance of GHRM. Bangladesh continues to face severe impacts such as salinity intrusion, floods, riverbank erosion, and other ecological stresses. The recent climate-adaptation research highlights these as growing national priorities (Rahman et al., 2025). Such conditions requires every industry to step in for resource conservation. Since 2025, the interim government has intensified enforcement of environmental governance which reinstated the national ban on single-use plastics. Such actions expanded plastic-free zones, restoring river and forest ecosystems, and instructing institutions to adopt renewable-energy solutions such as rooftop solar systems (Ministry of Environment, Forest and Climate Change, 2025). The government has also emphasized that industrial sectors, including garment manufacturers, must strengthen environmental compliance through water-efficiency measures, waste management, pollution control, and adherence to labor and environmental standards. Violations of such regulations will result in strict penalties (Bangladesh Pratidin, 2025; The Business Standard, 2025). These regulatory pressures, combined with global buyer expectations for environmental sustainability, directly link to the growing need for GHRM. Thus organizations must rely on trained, environmentally aware employees to meet both national policies and international compliance standards (The Business Standard, 2025; Khan et al., 2025).

Bangladesh's ready-made garment (RMG) industry remains the cornerstone of the nation's export economy, contributing more than US$38 billion in 2024 and maintaining its position as the world's second-largest garment exporter after China (The Daily Star, 2024a). The country's total export earnings reached approximately USD 48.3 billion. RMG sector contributed about USD 39 billion, accounting for more than 80% of total exports (Export Promotion Bureau Bangladesh, 2025). Bangladesh's RMG industry is deeply integrated into global supply chains, where international buyers increasingly demand compliance with environmental standards and sustainability certifications. As a result, organizations must ensure that employees are aware of and actively participate in green practices to remain competitive in export markets (Islam et al., 2020). GHRM studies provide insights into how firms can align employee behavior with these global sustainability expectations.

The implementation of policies and the internal commitment of organizations to sustainable practices continue to show significant difference (Hossain & Alamgir, 2021). The deficiency in

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employee understanding and engagement in green initiatives, primarily due to insufficient training, incentives, and organizational support systems, worsen this issue. Environmental knowledge and green self-efficacy demonstrated to have a significant role in moderating the relationship between GHRM and green behavior. This further indicates that GHRM alone is insufficient until the abilities of internal employee engage in policy implementation (Alam et al., 2024). While initiatives such as green remuneration and recruitment enhance employee performance. However, green training has no anticipated impact. This signifies a discrepancy between organizational green strategies and employee engagement or capability, prompting inquiries regarding the implementation and reception of training programs (Rupa et al., 2023). Despite the increasing adoption of GHRM functions, their impact on actual employee behavior and performance in environmentally sustainable contexts remains largely unexamined.

2. Literature Review

Most studies on textiles and garments in Bangladesh investigate Green HRM at an aggregate level, linking it to general outcomes such as sustainable performance, environmental performance, or employee-related performance, rather than treating employee green performance as a separate concept, in-role construct (Ali et al., 2024). Also garment studies in Bangladesh sometimes emphasize the term "green" factories (e.g., internationally branded/eco-friendly garment organizations), which may not accurately reflect the conditions of conventional RMG factories resulting in a generalizability gap for the broader industry (Rubel & Rimi, 2024). Evidence from Bangladesh predominantly emphasizes organizational-level performance, such as firm environmental performance, often using employee green behavior as the primary mechanism. This focus results in insufficient examination of employee green performance. Further complicating the determination of whether Green HR practices yield quantifiable employee green performance outcomes in RMG contexts (Hosain et al., 2025). Moreover, studies focusing on the RMG sector emphasize that although green recruitment and green training are frequently acknowledged as vital practices. The evidence based in Bangladesh's RMG industry remains unclear, necessitating additional in-depth, practice-specific research and stronger explanatory frameworks (Chowdhury, 2023). The identified gaps and current contribution of this study is given in Table 1:

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Table 1. Identified Gaps & Contribution of Current Study

Recent Literature	Identified Gap	Contribution of Current Study
Benevene & Buonomo (2020)	Most GHRM studies focus on employee green behavior rather than employee green performance.	Examines Employee Green Performance (EGP) as the primary dependent variable.
Amrutha & Geetha (2021)	Limited understanding of the mechanisms explaining how GHRM influences environmental outcomes.	Investigates Environmental Knowledge as a mediating mechanism.
Uddin (2022)	Limited evidence from developing countries and manufacturing industries.	Examines Bangladesh's RMG-ready-made industry.
Xie & Lau (2023)	Employee green performance remains underexplored compared with employee green behavior.	Focuses specifically on employee green performance.
Mahdy et al. (2023)	Lack of evidence regarding the impact of specific GHRM practices on employee green performance.	Examines green recruitment, green training, and green rewards simultaneously.
Kamboj & Eronimus (2024)	Employee green performance is still an emerging construct within GHRM literature.	Contributes empirical evidence on employee green performance.
Li et al. (2024)	Need for industry-specific investigations in environmentally sensitive sectors.	Focuses on the Ready-Made Garment (RMG) sector.
Lawter & Garnjost (2025)	Need for stronger theoretical development and broader contextual validation in GHRM research.	Integrates AMO Theory and Herzberg's Two-Factor Theory to explain employee green performance.

There remains a lack of empirical studies measuring employee-level green performance in Bangladesh garment sector. Most existing research evaluates firm-level outcomes or general job satisfaction rather than specific pro-environmental actions of individual employees (Azad et al.,

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2022; Chowdhury et al., 2023). In addition, although a small number of recent studies have explored green behavior in workplace settings in Bangladesh outside the garment context for instance in service sectors, these do not address the ready-made garment (RMG) industry, highlighting a contextual gap (Miah et al., 2024). Furthermore, there remain significant implementation gaps in GHRM practices within the garment industry: qualitative evidence from garment factories shows that poor organizational support, limited managerial interest, absence of formal green-HR policies, high implementation costs, and high employee turnover hamper effective adoption of GHRM (Islam et al., 2024). A 2023 study by Noor et al. revealed that HR managers across several Bangladeshi organizations had inadequate awareness of Green Human Resource Management (GHRM), indicating a significant gap in employee education and engagement regarding environmental issues. Despite advancements in the sector, including the addition of 24 LEED-certified factories in 2023, bringing the total to 206, employee engagement in these sustainable initiatives remains minimal. Employees are thereby deprived of the necessary tools, training, or incentives to effectively promote environmental objectives. In Bangladesh's garment sector, the concept of green performance remains nascent and underdeveloped; HR managers continue to have challenges in demonstrating how Green Human Resource Management (GHRM) can enhance organizational environmental outcomes and employee conduct (Yasmin, 2020). This study seeks to address these deficiencies by examining the effective application of GHRM strategies to enhance employee green performance, promote environmental accountability, and advance green objectives within the Bangladeshi garment industry.

Recent empirical evidence continues to emphasize the strategic importance of green recruitment and green training as fundamental dimensions of Green Human Resource Management (GHRM). Green recruitment enables organizations to attract environmentally conscious employees whose values align with sustainability objectives, thereby strengthening organizational sustainability and environmental performance (Alhaider & Din, 2026). Green training equips employees with environmental knowledge, skills, and awareness necessary to implement sustainable work practices and improve eco-friendly behaviours. Previous studies have demonstrated that organizations investing in environmental training and development experience higher levels of employee engagement, organizational image, and sustainability outcomes (Pandey et al., 2026). Furthermore, Alsakarneh (2026) found that integrated GHRM practices, including green recruitment and green training, positively influence environmental performance and corporate social responsibility, particularly in emerging economies. This evidence suggest that green recruitment and green training serve as strategic human resource mechanisms that foster employees' environmental commitment and ultimately contribute to long-term organizational sustainability and enhanced environmental performance.

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2.1 Theoretical Background

The Ability–Motivation–Opportunity (AMO) theory explains that green training increases employees' abilities and competencies, thereby improving green performance outcomes. Studies indicate that green training positively affects employee green behavior, environmental performance, and organizational sustainability initiatives by improving employees' environmental understanding and eco-friendly skills (Pham et al., 2021; Amjad et al., 2021). Recent evidence further confirms that green training significantly improves employee green performance through psychological and behavioral mechanisms. For example, research in the mining sector demonstrated that green training directly enhances employee green performance while also fostering organizational green culture and ethical behavior (Kabeya et al., 2024). Similarly, studies in the hospitality sector found that daily green training positively influences employees' in-role and extra-role green behavior (Kim et al., 2026).

The present framework is underpinned by the Ability–Motivation–Opportunity Theory (AMO Theory), which explains that employee performance is impacted by three fundamental components: ability, motivation, and opportunity. In light of AMO theory, employees perform effectively when they have the necessary skills and knowledge (ability), are motivated to perform (motivation), and are provided with opportunities to apply their competencies in the workplace. Recent studies have widely applied AMO theory to explain how GHRM practices impact employee green behavior and environmental performance outcomes (Zito et al., 2025).

2.2 Green Training and Employee Green Performance

Recent studies consistently demonstrate the positive relationship between green training and employee green performance. A study conducted in the mining sector found that green training significantly improves employee green performance by strengthening organizational green culture and work ethic (Kabeya et al., 2024). Similarly, research in the hospitality industry revealed that green training positively influences employees' in-role and extra-role green behavior, particularly when supported by ethical leadership (Kim et al., 2026). Additionally, empirical evidence indicates that green training contributes to organizational sustainability by enhancing employees' environmental awareness and encouraging environmentally responsible workplace behavior. Studies indicate that green training positively affects employee green behavior, environmental performance, and organizational sustainability initiatives by improving employees' environmental understanding and eco-friendly skills (Pham et al., 2021; Amjad et al., 2021).

2.3 Green Rewards and Employee Green Performance

Research has shown that green compensation and reward mechanisms significantly enhance organizational environmental performance and employee green behavior (Saiyed et al., 2025). Recent empirical studies have showed that green reward systems positively influence employee green behavior and environmental performance outcomes. Research conducted in the Chinese

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electric vehicle sector found that green reward management significantly affects employee green behavior within the broader GHRM framework grounded in AMO theory (Zhang et al., 2024). Similarly, contemporary GHRM reviews indicate that green pay and reward systems are among the most influential drivers of pro-environmental employee behavior and green psychological climate within organizations (Zito et al., 2025). Green rewards also contribute to employees' psychological commitment toward sustainability because employees perceive environmental initiatives as valued organizational priorities. As a result, employees become more engaged in environmentally friendly activities such as recycling, energy conservation, waste minimization, and sustainable operational practices.

2.4 Environmental Knowledge as a Mediator

Environmental knowledge refers to employees' awareness, understanding, and comprehension of environmental issues, sustainable practices, and ecological responsibilities within the workplace. Through training sessions and reward-based reinforcement, employees develop greater environmental knowledge, which subsequently enhances their green performance. Empirical evidence strongly supports the mediating role of environmental knowledge in GHRM frameworks. Studies have shown that GHRM practices significantly improve employees' environmental knowledge, which in turn promotes eco-friendly behavior and green performance (Amanullah et al., 2024). Likewise, research conducted in Bangladesh revealed that environmental knowledge management sequentially mediates the relationship between GHRM practices and employee green behavior (Islam et al., 2024). Moreover, environmental knowledge increases employees' ability to identify environmentally harmful practices and adopt sustainable alternatives in daily operations. Employees with strong environmental knowledge are more likely to engage in recycling, energy-saving behavior, waste reduction, and environmentally conscious decision-making.

A recent study that tested the mediation role of environmental knowledge in GHRM practices found that certain relationships between green HRM dimensions and environmentally voluntary behavior were statistically insignificant. Specifically, the indirect effect of green training through environmental knowledge on green voluntary behavior was not supported ($\beta = -0.017$, $p > .05$), indicating that environmental knowledge did not significantly mediate the relationship (Yusliza et al., 2024). Similarly, some studies suggest that employees may possess environmental knowledge but still fail to engage in green workplace behavior due to the absence of organizational encouragement, green leadership, or reward mechanisms. Research conducted in Bangladeshi manufacturing firms demonstrated that certain GHRM practices, particularly green compensation and benefits, had insignificant relationships with employee green behavior, thereby limiting the effectiveness of mediation mechanisms in explaining environmental performance outcomes (Hosain & Mitu, 2025). Prior research in the Bangladeshi garments industry tested environmental knowledge as a moderating variable instead of a mediating mechanism. The investigation suggested that environmental knowledge strengthens existing relationships between GHRM

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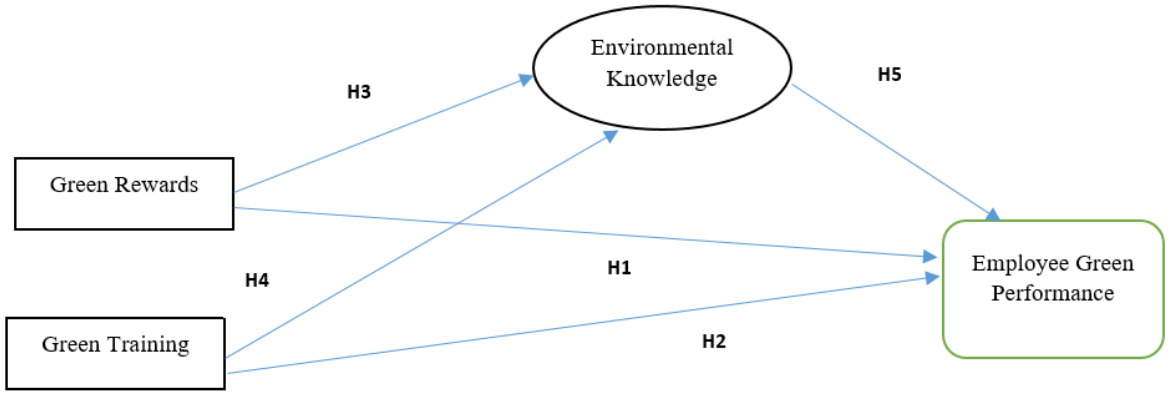
practices and employee green behavior rather than directly showing those effects (Karmoker et al., 2021).

These contradictory findings indicate that the mediating role of environmental knowledge remains theoretically and empirically inconclusive. Therefore, further investigation is required to determine whether environmental knowledge significantly mediates the relationship between green rewards, green training, and employee green performance.

Figure 1. Conceptual Framework



H_1- Green rewards have a significant impact on employee green performance.

H_2- Green training has a significant impact on employee green performance.

H_3- Environmental knowledge mediates the relationship between green rewards and employee green performance

H_4- Environmental knowledge mediates the relationship between green training and employee green performance

H_5- Environmental knowledge significantly increases employee green performance.

3. Methodology

3.1 Research Design

This study adopts a quantitative research design to examine the relationships between green training, green rewards, environmental knowledge, and employee green performance at the individual level. A cross-sectional approach was employed, with data collected at a single point in time using a structured questionnaire. The study is grounded in the Ability-Motivation-Opportunity (AMO) framework and aims to test both direct and mediated relationships among the variables.

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3.2 Population and Sample

The target population of the study comprises managerial and functional-level employees working in Bangladesh Garment Manufacturers and Exporters Association (BGMEA)-registered ready-made garment (RMG) companies in Bangladesh. Based on the typical organizational structure of RMG firms in Bangladesh, the population was estimated at approximately 1,404 managerial employees from 351 garment companies registered under BGMEA. The sample size was determined using Slovin's formula, resulting in a required sample of 311 respondents. A total of 321 valid responses were collected, exceeding the minimum requirement and ensuring adequate statistical power for analysis.

3.3 Ethical Statement & Disclosure

This research followed established ethical principles for studies involving human participants. In line with the institutional policy of the researcher's university, formal ethical committee approval was not required for this type of study. Nevertheless, ethical considerations were strictly observed, including voluntary participation of respondents, informed consent, confidentiality of responses, and anonymization of all collected data. No personal identifiers were collected at any stage of the research.

3.4 Data Collection

Primary data were collected through a structured survey questionnaire. The questionnaire was distributed using a combination of online (Google Forms) and offline (printed copies) methods to ensure broader participation. Respondents were informed about the purpose of the study and assured of confidentiality and anonymity to reduce response bias.

3.5 Measurement of Variables and Data Analysis Technique

All constructs in the study were measured using established multi-item scales adapted from prior literature. The questionnaire items were measured using a five-point Likert scale ranging from strongly disagree to strongly agree). Initially, SPSS was used for data screening, including checking for missing values, outliers, and descriptive statistics. Subsequently, Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed using SmartPLS to test the measurement and structural models.

3.6 Ethical Consideration

Participation in the study was voluntary, and respondents were assured of confidentiality and anonymity. No personally identifiable information was collected, and the data were used solely for academic research purposes.

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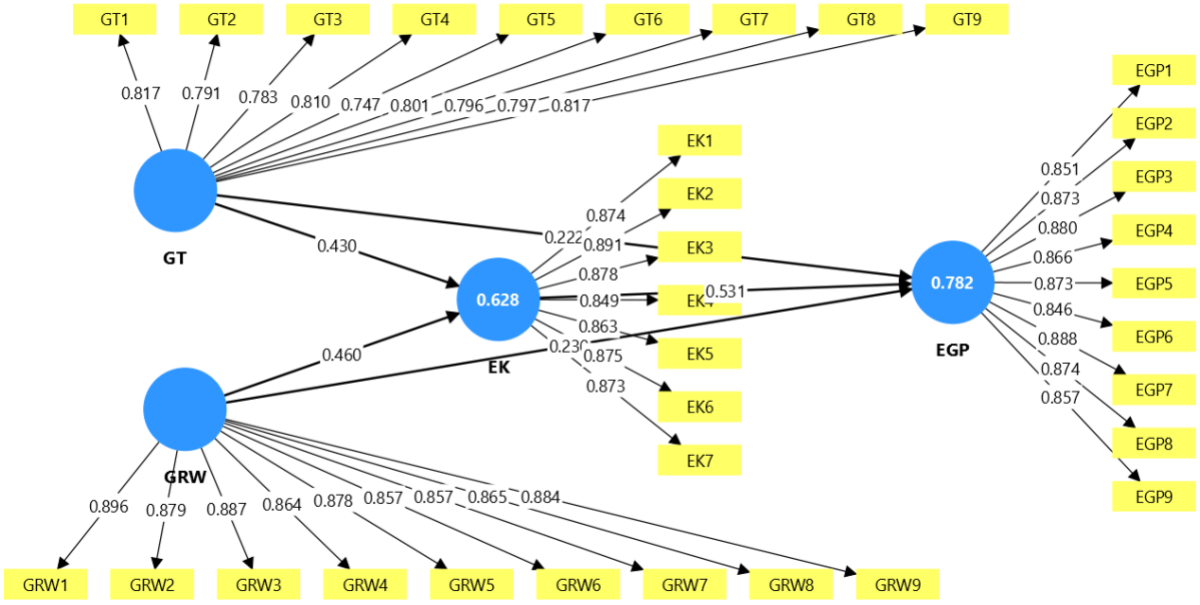
4. Results

4.1 Measurement Model

Figure 2. Measurement Model



4.2 Outer Loading

Table 2. Outer Loading

	EGP	EK	GRW	GT
EGP1	0.851			
EGP2	0.873			
EGP3	0.88			
EGP4	0.866			
EGP5	0.873			
EGP6	0.846			
EGP7	0.888			
EGP8	0.874			

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EGP9	0.857			
EK1		0.874		
EK2		0.891		
EK3		0.878		
EK4		0.849		
EK5		0.863		
EK6		0.875		
EK7		0.873		
GRW1			0.896	
GRW2			0.879	
GRW3			0.887	
GRW4			0.864	
GRW5			0.878	
GRW6			0.857	
GRW7			0.857	
GRW8			0.865	
GRW9			0.884	
GT1				0.817
GT2				0.791
GT3				0.783
GT4				0.81
GT5				0.747

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GT6	0.801
GT7	0.796
GT8	0.797
GT9	0.817

The outer loadings of all measurement items were examined to assess indicator reliability. As shown, all items demonstrated loadings above the recommended threshold of 0.70, ranging from 0.747 to 0.891. This indicates satisfactory indicator reliability, as each item significantly contributes to its respective construct. No items were removed, as all loadings met the acceptable criteria. Overall, the results confirm that the measurement model exhibits strong item reliability.

4.3 Construct Reliability and Validity

Table 3. Construct Reliability & Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
EGP	0.959	0.959	0.965	0.753
EK	0.948	0.948	0.957	0.761
GRW	0.961	0.962	0.967	0.764
GT	0.927	0.928	0.939	0.633

As presented, all constructs demonstrated high internal consistency, with Cronbach's alpha values ranging from 0.927 to 0.961 and composite reliability values between 0.939 and 0.967, exceeding the recommended threshold of 0.70. Although some values exceeded 0.95, they remain within acceptable limits, indicating strong reliability. Convergent validity was also established, as all AVE values ranged from 0.633 to 0.764, surpassing the minimum threshold of 0.50. These results confirm that the constructs explain a substantial portion of the variance in their respective indicators.

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4.4 Heterotrait–Monotrait ratio (HTMT)

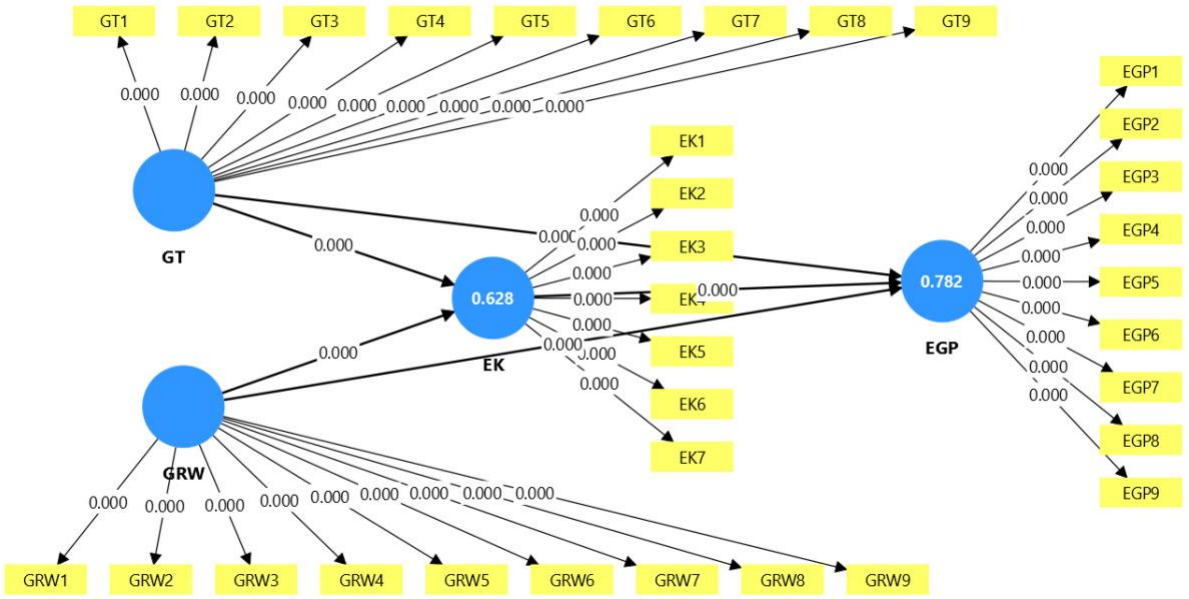
Table 4. HTMT

	EGP	EK	GRW	GT
EGP				
EK	0.891			
GRW	0.767	0.744		
GT	0.769	0.744	0.617	

Heterotrait–Monotrait ratio (HTMT) was used to check discriminant validity . As shown, all HTMT values were below the recommended threshold of 0.90, indicating adequate discriminant validity among the constructs. Although the HTMT value between environmental knowledge and employee green performance (0.891) was relatively high and approached the conservative threshold of 0.85, it remained within the acceptable limit of 0.90. This suggests that while the constructs are closely related, they are empirically distinct.

4.5 Structural Model

Figure 3. Structural Model



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4.6 Path Coefficient

Table 5. Path Coefficient

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
EK -> EGP	0.531	0.534	0.081	6.577	0.000
GRW -> EGP	0.23	0.227	0.057	4.025	0.000
GRW -> EK	0.46	0.458	0.068	6.794	0.000
GT -> EGP	0.222	0.22	0.059	3.79	0.000
GT -> EK	0.43	0.432	0.068	6.33	0.000

The structural model was assessed using path coefficients, t-values, and p-values obtained through bootstrapping. The results show that all hypothesized relationships are positive and statistically significant ($p < 0.001$). Environmental knowledge has the strongest direct effect on employee green performance ($\beta = 0.531$, $t = 6.577$), highlighting its critical role in enhancing environmentally responsible behavior. Both green rewards ($\beta = 0.230$, $t = 4.025$) and green training ($\beta = 0.222$, $t = 3.790$) also show significant positive effects on employee green performance, although with relatively smaller effect sizes. Additionally, green rewards ($\beta = 0.460$, $t = 6.794$) and green training ($\beta = 0.430$, $t = 6.330$) significantly influence environmental knowledge, indicating that these practices are effective in building employees' environmental awareness.

4.7 Specific Indirect Effect

Table 6. Specific Indirect Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
GRW -> EK -> EGP	0.244	0.246	0.057	4.256	0.000
GT -> EK -> EGP	0.229	0.231	0.052	4.364	0.000

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The mediating role of environmental knowledge was examined through the analysis of specific indirect effects using bootstrapping. The results indicate that environmental knowledge significantly mediates the relationship between green rewards and employee green performance ($\beta = 0.244$, $t = 4.256$, $p < 0.001$), as well as between green training and employee green performance ($\beta = 0.229$, $t = 4.364$, $p < 0.001$). Since both the direct and indirect effects are statistically significant, the findings support the presence of partial mediation. This suggests that green training and green rewards influence employee green performance both directly and indirectly through the enhancement of environmental knowledge.

4.8 R Square

Table 7. R Square

	R-square	R-square adjusted
EGP	0.782	0.78
EK	0.628	0.626

The coefficient of determination (R^2) was assessed to evaluate the explanatory power of the model. The results indicate that the model explains 78.2% of the variance in employee green performance ($R^2 = 0.782$), suggesting substantial explanatory power. Similarly, the R^2 value for environmental knowledge is 0.628, indicating that green training and green rewards jointly explain 62.8% of its variance. According to established guidelines, these values reflect strong predictive accuracy of the model.

4.9 Effect Size f^2

Table 8. Effect Size

	EGP	EK	GRW	GT
EGP				
EK	0.483			
GRW	0.116	0.375		
GT	0.113	0.328		

The effect size (f^2) was assessed to evaluate the influence of each exogenous construct to the endogenous variables. The results indicate that environmental knowledge has a large effect on

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employee green performance ($f^2 = 0.483$). In contrast, green rewards ($f^2 = 0.116$) and green training ($f^2 = 0.113$) exhibit small effect sizes on employee green performance. Regarding environmental knowledge, green rewards demonstrate a large effect ($f^2 = 0.375$), while green training shows a moderate-to-large effect ($f^2 = 0.328$). These findings suggest that green HR practices primarily influence employee green performance indirectly by enhancing environmental knowledge.

4.10 Model Fit

Table 9. Model Fit

	Saturated model	Estimated model
SRMR	0.036	0.036
d_ULS	0.761	0.761
d_G	0.634	0.634
Chi-square	1120.082	1120.082
NFI	0.899	0.899

Model fit was assessed using the standardized root mean square residual (SRMR) and the normed fit index (NFI). The SRMR value of 0.036 indicates an excellent model fit, as it is well below the recommended threshold of 0.08. Additionally, the NFI value of 0.899 suggests an acceptable level of model fit, approaching the ideal benchmark of 0.90. Other fit indices, including d_ULS and d_G, also fall within acceptable ranges, further supporting the adequacy of the model.

4.11 CVPAT LV Summary PLS SEM vs. Indicator Average (IA)

Table 10. CVPAT Analysis

	PLS loss	IA loss	Average loss difference	t value	p value
EGP	0.354	0.709	-0.354	5.016	0
EK	0.375	0.702	-0.327	4.846	0
Overall	0.363	0.706	-0.342	5.075	0

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The predictive performance of the model was examined by the cross-validated predictive ability test (CVPAT), comparing the PLS-SEM model with an indicator average (IA) benchmark. The results indicate that the PLS-SEM model outperforms the IA benchmark for both endogenous constructs. Specifically, the average loss differences for employee green performance (−0.354, $t = 5.016$, $p < 0.001$) and environmental knowledge (−0.327, $t = 4.846$, $p < 0.001$) are negative and statistically significant. Furthermore, the overall model comparison also shows a significant negative loss difference (−0.342, $t = 5.075$, $p < 0.001$), confirming that the proposed model demonstrates superior predictive performance compared to the benchmark. These findings provide strong evidence of the model's out-of-sample predictive capability.

4.12 Discussion

This study examined the effects of green training and green rewards on employee green performance, with environmental knowledge as a mediating mechanism. The conceptualization is done within the framework of Ability-Motivation-Opportunity (AMO) theory. The findings show robust support for the proposed relationships and offer important insights at the individual employee level in the context of the ready-made garment (RMG) industry in Bangladesh. Consistent with AMO theory, the results demonstrate that green training and green rewards substantially increase employee green performance. Green training contributes to the development of employees' environmental skills and competencies, reflecting the "ability" dimension, while green rewards reinforce motivation by incentivizing environmentally responsible behavior. These findings are aligned with prior research by Renwick et al. and Jabbour, who emphasize the role of green human resource management (GHRM) practices in shaping individual-level environmental outcomes. However, the relatively smaller direct effects observed in this study suggest that these practices alone may not fully translate into improved performance without an enabling cognitive mechanism.

Environmental knowledge emerges as the most influential predictor of employee green performance, highlighting its critical role at the individual level. This finding reinforces the argument that employees must not only be trained and motivated but also possess a clear understanding of environmental issues and practices to effectively translate intentions into action. Within the AMO framework, environmental knowledge strengthens the "ability" component, enabling employees to perform environmentally responsible tasks more effectively in their daily roles. The mediation analysis further reveals that environmental knowledge partially mediates the relationships between green training, green rewards, and employee green performance. Importantly, the indirect effects are comparable to, and in some cases stronger than, the direct effects, indicating that environmental knowledge is a central medium. Through such medium GHRM practices influence individual behavior. This finding extends the existing literature by providing empirical evidence that knowledge-based processes are essential for converting organizational practices into individual-level performance outcomes. From a contextual

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perspective, this study contributes to the growing body of GHRM literature by focusing on the RMG sector in Bangladesh an industry characterized by high labor intensity and significant environmental impact. The findings suggest that, in such settings, enhancing employee-level environmental knowledge can serve as a cost-effective and sustainable approach to improving environmental performance.

5. Conclusion, Implications, Limitations, and Future Research Directions

This study investigated the effects of green training and green rewards on employee green performance. It emphasized the mediating role of environmental knowledge through the Ability-Motivation-Opportunity (AMO) framework. The findings confirm that green HRM practices significantly influence employee green performance at the individual level of employees in the RMG sector. Environmental knowledge emerges as the most critical factor, both as a direct predictor and as a mediator linking green training and green rewards to performance. While green HRM practices contribute directly to employee behavior, their effectiveness is substantially enhanced when they were channeled through employees' environmental knowledge. This highlights the importance of integrating ability and motivation enhancing practices. Knowledge development can play a significant role to achieve meaningful behavioral change. The study also demonstrates strong explanatory and predictive power which reinforces the sound validity of the proposed model. In the context of the ongoing global energy crisis, where efficient resource utilization has become increasingly critical, these findings suggest that organizations, particularly in energy-intensive sectors such as the RMG industry can achieve sustainable outcomes by fostering employee-level environmental awareness and behavior. Promoting environmental knowledge among employees can lead to more efficient use of energy and resources. Thus reducing operational waste without requiring extensive structural changes. Overall, the study provides empirical evidence that a knowledge-driven approach to green human resource management can effectively promote employee green performance and support broader organizational sustainability goals in a resource-constrained world.

5.1 Managerial Implications (RMG Industry)

The results offer several practical implications for managers in the RMG industry. Organizations should prioritize structured and continuous green training programs that go beyond basic awareness and focus on developing practical environmental knowledge among employees. Training initiatives should be tailored to individual job roles to ensure relevance and applicability on the production floor. Green reward systems should be strategically designed to reinforce desired green behaviors at the individual level. Rather than relying solely on monetary incentives, managers can incorporate recognition-based rewards, performance appraisals, and non-monetary incentives that encourage employees to adopt environmentally responsible practices. Given the strong mediating role of environmental knowledge, managers should integrate knowledge-building initiatives into daily operations. This may include on-the-job learning, environmental

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briefings, visual reminders, and peer learning mechanisms that continuously reinforce sustainable practices.

In the context of the ongoing global energy crisis, fostering employee-level environmental awareness can lead to more efficient resource utilization, reduced waste, and improved sustainability outcomes without requiring extensive external enforcement. By focusing on individual behavior, RMG firms can achieve meaningful environmental improvements while maintaining operational efficiency.

Overall, this investigation provides a clear view of the fact that effectiveness of green HRM practices lies not only in their implementation but in their ability to enhance employees' knowledge and capabilities. By aligning training, rewards, and knowledge development, organizations can create a workforce that actively contributes to environmental sustainability.

5.2 Theoretical Contribution

The findings extend the application of the Ability-Motivation-Opportunity (AMO) theory to the domain of environmental sustainability by empirically demonstrating how green HRM practices influence employee green performance at the individual level. Prior studies (e.g., Renwick et al., 2013; Jabbour, 2013) have emphasized the role of GHRM in promoting organizational sustainability; however, the present study provides more nuanced evidence of how these practices operate through distinct AMO mechanisms. Green training enhances employees' abilities, while green rewards strengthen motivation, thereby reinforcing the theoretical applicability of AMO in a sustainability context.

The study further contributes by identifying environmental knowledge as a critical mediating mechanism linking GHRM practices to employee green performance. Although prior research has acknowledged the importance of employee awareness and skills in environmental management, limited empirical work has explicitly examined environmental knowledge as a mediator within a unified framework. The results demonstrate that the indirect effects of green training and green rewards through environmental knowledge are substantial, indicating that knowledge development serves as a central pathway through which GHRM practices translate into behavioral outcomes rather than merely functioning as a by-product.

An additional contribution lies in the provision of individual-level evidence from a developing country context. Much of the existing GHRM literature has focused on organizational-level outcomes or has been conducted in developed economies. By examining managerial employees in the Bangladeshi ready-made garment (RMG) sector, this study responds to calls for more context-specific and micro-level investigations. The findings suggest that individual cognition particularly environmental knowledge plays a decisive role in shaping pro-environmental behavior, thereby bridging the gap between organizational practices and employee-level performance. From a methodological perspective, the study strengthens the literature by employing PLS-SEM alongside

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predictive validation using CVPAT to assess both explanatory and predictive power. Previous research has predominantly emphasized explanatory relationships. But the inclusion of predictive assessment enhances the robustness of the findings and demonstrates the model's applicability in real-world settings.

5.4 Limitations and Future Direction

The current study has several limitations that needs to be addressed. The study uses a cross-sectional research design**.** Such design limits the ability to establish causal relationships among the variables. Although the findings are consistent with theoretical expectations. But future research could employ longitudinal designs to better capture the dynamic nature of GHRM practices and their impact on employee behavior over time. The data was collected through self-reported measures from individual employees, which may introduce common method bias. Statistical tests were done like multicollinearity test to check VIF and Tolerance. All the values were within the required threshold. Future studies could incorporate multi-source data, such as supervisor ratings or objective environmental performance indicators, to enhance the robustness of the findings.

The investigation focuses specifically on managerial employees of the RMG sector in Bangladesh**.** It may limit the generalizability of the results to other industries or contexts. Future research could extend this model to different sectors, such as manufacturing, services, or multinational organizations, to examine whether the observed relationships hold across diverse settings. While this study examines environmental knowledge as a mediator, other potential mechanisms such as environmental commitment, green organizational culture, or psychological green climate were not included. Future studies could explore multiple mediators or moderators to provide a more comprehensive understanding of how and under what conditions GHRM practices influence employee behavior. Although the study demonstrates strong predictive performance, future research could further enhance predictive analysis by incorporating advanced techniques or comparing alternative models to validate the robustness of the findings.

Declarations

Generative AI tools, including ChatGPT, Quillbot and Grammarly, were used to enhance grammar and language clarity, summarization of content during manuscript preparation. All conceptualization, model formulation, data analysis, and interpretation of the research were conducted solely by the authors.

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