



Strategic Role of Green Orientation Environment in Shaping Employee Green Behavior: A Study of State-Owned Energy Enterprises in Indonesia

Fivi Rahmatus Sofiyah^{1*}, Prihatin Lumbanraja², Yeni Absah², Amlys Syahputra Silalahi²

¹ Postgraduate Student Program in Management Sciences, Universitas Sumatera Utara, Medan 20155, Indonesia

² Doctoral Program in Management Sciences, Universitas Sumatera Utara, Medan 20155, Indonesia

Corresponding Author Email: fivi.rahmatus@usu.ac.id

Copyright: ©2025 The authors. This article is published by IIETA and is licensed under the CC BY 4.0 license (<http://creativecommons.org/licenses/by/4.0/>).

<https://doi.org/10.18280/ijstdp.200913>

ABSTRACT

Received: 4 August 2025

Revised: 23 September 2025

Accepted: 25 September 2025

Available online: 30 September 2025

Keywords:

Employee Green Behavior (EGB), green human resource management, Green Involvement Management (GIM), Green Orientation Environment (GOE), Green Training (GT), mediation analysis, SEM-PLS, sustainable workplace

Green orientation is increasingly essential for organizations aiming for long-term sustainability. However, the mechanisms through which green management practices influence employee behavior remain understudied. This study investigates the strategic role of the Green Orientation Environment (GOE) as a mediator between Green Involvement Management (GIM), Green Training (GT), and Employee Green Behavior (EGB) in Indonesia's state-owned energy enterprises. A quantitative approach using SmartPLS 4.0 was employed to analyze responses from 230 employees, selected through proportional random sampling. The structural model included five latent constructs and twenty indicators. The analysis revealed significant direct effects from GIM to GOE ($\beta = 0.761$; $p < 0.001$) and from GOE to EGB ($\beta = 0.667$; $p < 0.001$), indicating a full mediation effect of GOE. The R^2 value for EGB was 0.724, suggesting strong explanatory power. Green orientation serves as a critical strategic bridge that transforms management involvement and training into tangible green behavior among employees. The study offers both theoretical insights and practical implications for the implementation of green human resource management (HRM) strategies.

1. INTRODUCTION

It is widely recognized that economic development often has a negative correlation with environmental conditions. Today, not only governments but also the public are increasingly aware of the environmental degradation that can accompany economic growth [1]. Environmental activists have long urged both industrial companies and governments to adopt "go green" initiatives. The industrial revolution led to the massive exploitation of energy resources, which in turn contributed to serious environmental damage. In response, the Indonesian government has required all companies to improve their environmental practices [2].

To reinforce this effort, the government enacted Government Regulation (PP) No. 22 of 2021 concerning the Implementation of Environmental Protection and Management. Additionally, the Ministry of Environment and Forestry issued Regulation No. 3 of 2021, which outlines standards for business activities under risk-based licensing in the environmental and forestry sectors. These regulations were issued in light of persistent environmental damage across Indonesia. Prior to these governmental efforts, the Ministry of State-Owned Enterprises had already mandated corporate environmental responsibility through Regulation No. PER-01/MBU/2011 concerning the Implementation of Good Corporate Governance in State-Owned Enterprises. This regulation instructs all directors to ensure environmental sustainability in all operational areas of state-owned

enterprises (SOEs) [3]. As a result, corporate management has increasingly been driven to implement environmentally responsible practices. This implies that all companies, particularly those engaged in production, must prioritize environmental stewardship. Environmentally friendly production begins with adopting a "Go Green" philosophy [4].

PT Perusahaan Gas Negara Tbk, a state-owned enterprise engaged in natural gas production, is equally obligated to integrate the "Go Green" philosophy as a tangible commitment to sustainability. While the company operates branches across Indonesia, two branches Medan and Dumai are suspected of not fully adopting employee green behavior. As a large enterprise with a nationwide presence, it is the responsibility of management to ensure that all employees uphold a shared commitment to environmental sustainability. To provide an initial overview of employee green behavior, a preliminary survey was conducted between October 2 and October 31, 2023. The results are presented below.

Figure 1 shows that Employee Green Behavior (EGB) at PT Perusahaan Gas Negara, Tbk, particularly at the Medan and Dumai branches remains suboptimal. This situation poses a serious risk to the company's ability to sustain its operations, as failure to support environmental sustainability may lead to long-term reputational and regulatory consequences. The company could face environmental disputes with communities, environmental NGOs, and even local governments that perceive the company as negligent in preserving the environment.

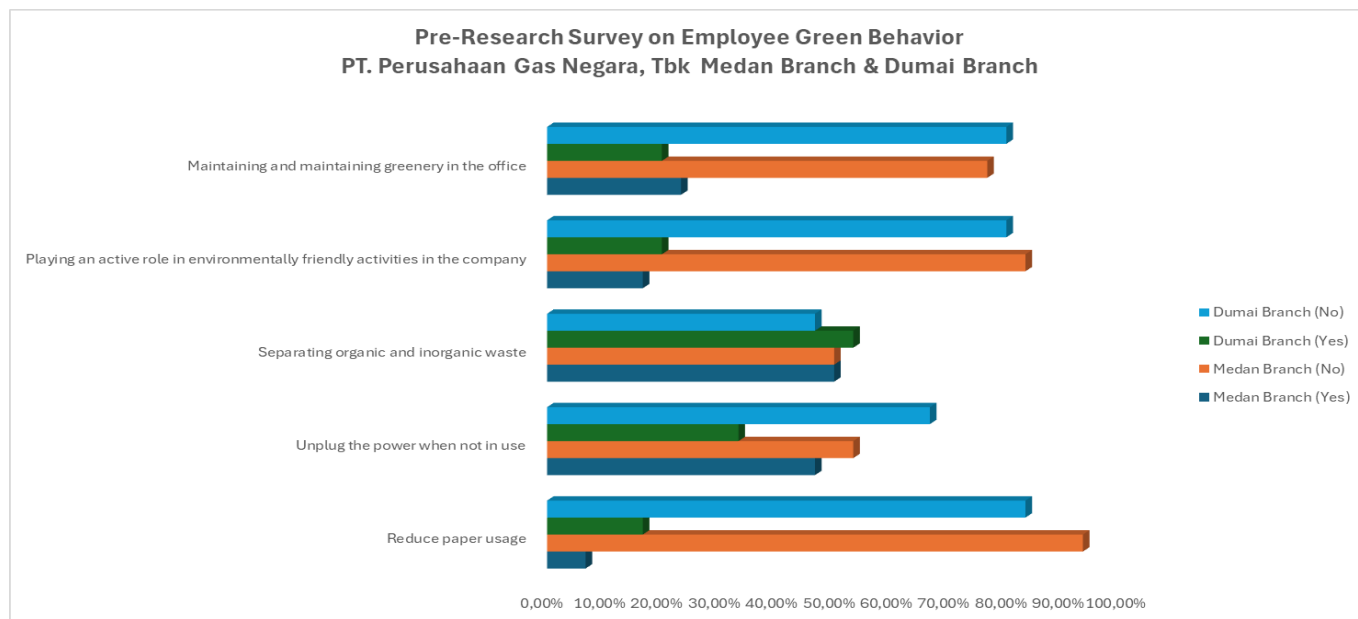


Figure 1. Pre-research survey on employee green behavior in PT
Perusahaan gas negara, tbk medan branch & dumai branch

A low level of EGB is detrimental to the organization, as prior research shows that companies that foster and support EGB tend to experience greater profitability and operational efficiency [5]. Consequently, it becomes imperative for companies to proactively support and monitor their employees' environmental behavior [6]. Employees must cultivate a strong orientation toward environmental awareness and are ethically obliged to contribute directly to the sustainability of their work environment. To explain the observed deficiency in green behavior, this study introduces Green Orientation Environment (GOE) as a key variable. This construct reflects an employee's awareness and understanding of environmental issues and the application of eco-friendly practices in daily operations. Although GOE has not been widely investigated in prior studies, we propose that it has a significant influence on EGB. Fundamentally, GOE involves personal responsibility for environmental protection, including small but impactful actions such as reducing energy use, saving water, managing waste effectively, and minimizing carbon emissions [7].

This study also integrates Green Involvement Management (GIM) as a predictor of both GOE and EGB. Organizational actions and policies, especially those driven by top management, are instrumental in shaping employees' environmental attitudes and behaviors. This aligns with findings from Montabon et al. [8] and Pinzone et al. [9], which emphasize the role of leadership and managerial engagement in establishing a sustainable work culture. Previous studies suggest that visible support from management positively correlates with employees' willingness to act in environmentally conscious ways [10, 11]. However, research by Doghan et al. [12] challenges this relationship, indicating that GIM may not always influence EGB directly, thus reinforcing the need for further investigation.

Furthermore, this study introduces Green Training (GT) as an additional factor influencing GOE and EGB. Supported by previous research [1, 7, 13], GT is shown to increase employees' awareness, knowledge, and adoption of sustainable workplace practices. GT equips employees with the tools to minimize resource consumption and waste

production, thereby aligning personal behavior with organizational environmental goals. GT facilitates the internalization of eco-friendly habits among employees [14], although findings from Hakro et al. [15] suggest that GT may negatively impact task-related behaviors in certain contexts. These conflicting findings underscore the necessity of continued exploration into the dynamics between GT and EGB. By integrating these three variables GIM, GT, and GOE this study aims to provide a comprehensive explanation for variations in EGB and contribute new insights into the development of green human resource management strategies.

2. MATERIAL AND METHODS

2.1 GIM and GOE

Management involvement in environmental sustainability initiatives is essential not only for leadership visibility but also for fostering a workplace culture oriented toward environmental awareness. As noted by previous studies [16, 17], environmentally friendly policies initiated by top management serve as behavioral cues that shape employees' orientation toward sustainability. These managerial actions influence how employees internalize environmental values and translate them into workplace behaviors, thereby strengthening the organization's GOE [18].

According to green human resource management (GHRM) theory, creating a green orientation is a managerial responsibility. When leadership fails to foster or support green awareness, employee commitment to environmental goals will remain weak or superficial [19]. Therefore, GIM has a pivotal role in shaping the cognitive and affective orientation of employees toward environmental sustainability. To the best of our knowledge, no prior studies have explicitly examined the impact of GIM on GOE. This theoretical gap establishes the novelty of this research. However, related work by Wang et al. [20] demonstrated the influence of managerial involvement on environmental sustainability, providing justification for the following hypothesis:

H₁: GIM has a positive and significant effect on GOE at PT Perusahaan Gas Negara (Tbk) in the Medan and Dumai branches.

2.2 GIM and EGB

Managerial participation in green practices significantly contributes to shaping employee attitudes and behaviors aligned with environmental values. Ecocentric Management Theory argues that corporate success must be balanced with ecological responsibility. Accordingly, policies introduced by management regarding resource conservation, emission reduction, and waste management play an educational role for employees, increasing their awareness and encouraging pro-environmental behavior.

When green policies are embedded in corporate strategies such as formal mission statements, reporting frameworks, or environmental SOPs employees are more likely to adopt green behaviors. This is supported by prior research [21], which finds a strong link between managerial involvement and EGB. However, conflicting findings from Moradeke et al. [22] highlight the need for deeper examination of contextual factors that may moderate this relationship. Hence, this study proposes:

H₂: GIM has a positive and significant effect on EGB at PT Perusahaan Gas Negara (Tbk) in the Medan and Dumai branches.

2.3 GT and GOE

GT plays a vital role in equipping employees with the knowledge, values, and competencies required to support sustainable operations [12, 22, 23]. As a core component of GHRM theory [24], GT fosters a cognitive and emotional shift in employees, increasing their awareness and shaping their orientation toward environmental goals.

The more frequently and effectively GT is delivered, the stronger the resulting green orientation among employees. Despite its theoretical importance, no studies have specifically examined the impact of GT on GOE, constituting another research gap addressed in this study. Prior research [13] confirms the positive effects of GT on sustainable behavior, leading to the following hypothesis:

H₃: GT has a positive and significant effect on GOE at PT Perusahaan Gas Negara (Tbk) in the Medan and Dumai branches.

2.4 GT and EGB

GT also directly influences employee behavior by increasing knowledge and providing practical tools for environmental action. Training initiatives aligned with environmental objectives enable employees to translate learning into daily work routines, such as energy conservation and waste reduction [25, 26]. According to GHRM theory [27], training must be institutionalized through structured programs that promote eco-awareness and behavior change. Numerous studies [28, 29] have confirmed this positive relationship. However, some studies, such as Yamin [30], show reveal inconsistencies, particularly in task-related domains, suggesting the need for further research.

H₄: GT has a positive and significant effect on EGB at PT Perusahaan Gas Negara (Tbk) in the Medan and Dumai branches.

2.5 GOE and EGB

Modern organizations increasingly expect employees to possess a strong orientation toward environmental stewardship. Ecocentric Management Theory reinforces the idea that employees are not only economic agents but also environmental stewards. An internalized orientation toward sustainability empowers employees to behave in eco-conscious ways. While no prior research has examined GOE as a distinct construct influencing employee behavior, several studies have highlighted the role of individual environmental orientation in predicting green workplace behavior [31, 32]. These findings support the novelty and relevance of this research.

H₅: GOE has a positive and significant effect on EGB at PT Perusahaan Gas Negara (Tbk) in the Medan and Dumai branches.

2.6 Conceptual framework design

To empirically test the relationships described above, a comprehensive conceptual model is constructed. This model comprises four key latent constructs: GIM, GT, GOE, and EGB. Each construct is operationalized through multi-dimensional indicators derived from validated literature.

- 1) GIM is adapted from Hair and Alamer [33] using 6 dimensions (2 indicators each), totaling 12 items.
- 2) GT is derived from Hair et al. [34] and Shmueli et al. [35], comprising 5 dimensions with 2 indicators each (10 items).
- 3) GOE consists of 4 dimensions with 2 indicators each (8 items).

EGB is measured using a modification of Unsworth et al. [36], based on 2 dimensions with 3 indicators each (6 items). This framework is grounded in the integration of GHRM and Ecocentric Management Theory, providing a theoretical lens for understanding the mediating role of GOE in the relationship between organizational initiatives and employee behavior. The conceptual model is presented in Figure 2, which illustrates the hypothesized direct and indirect causal paths between constructs.

As illustrated in Figure 2, the conceptual framework presents a comprehensive structure for the Structural Equation Modeling (SEM) approach employed in this study. Each latent construct GIM, GT, GOE, and EGB is operationalized through multiple first-order indicators, indicating the multidimensional nature of the constructs. The directional arrows represent the hypothesized causal relationships among variables. Specifically, both GIM and GT are hypothesized to influence EGB directly and indirectly through the mediating role of GOE. The inclusion of second-order constructs allows the model to capture the complex structure of each variable more accurately. This framework not only facilitates the empirical validation of the proposed hypotheses but also provides a theoretical lens to examine how organizational green initiatives are translated into sustainable employee behaviors, thereby reinforcing the strategic importance of environmental orientation within corporate human resource practices.

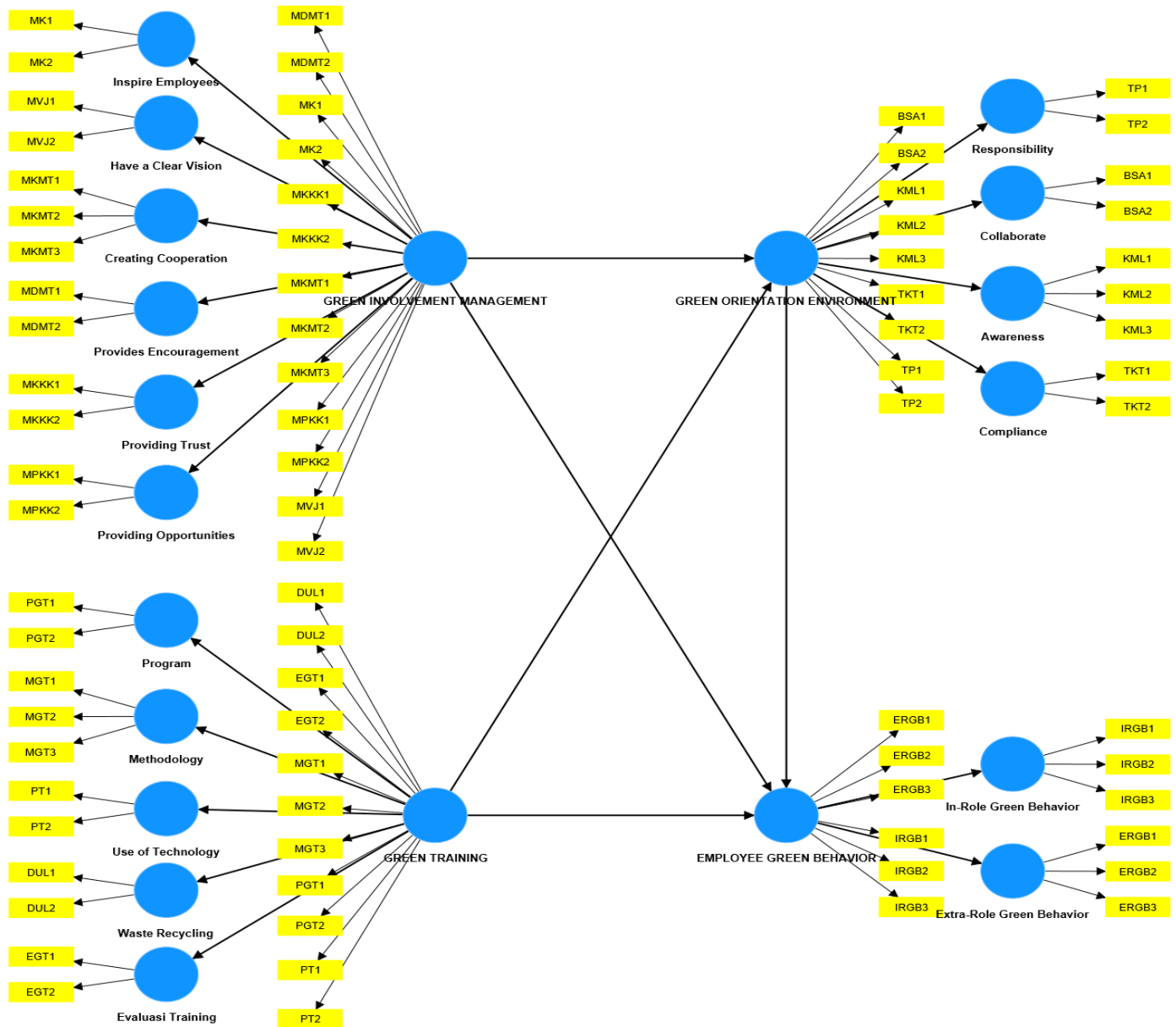


Figure 2. Conceptual framework

3. RESULTS AND DISCUSSIONS

3.1 Demographic characteristics of respondents

To provide a deeper contextual understanding of the study population, this section presents the demographic profile of the respondents drawn from two operational branches of PT Perusahaan Gas Negara, Tbk, located in Medan and Dumai. The demographic data include four key variables: gender, working period, age, and educational level. These attributes are essential to consider, as they may shape the respondents' awareness, orientation, and behavioral responses related to environmental sustainability and organizational practices.

Understanding the demographic structure also enables identification of potential structural or cultural differences between branches that could influence employee engagement with green initiatives. Furthermore, variations in these characteristics may provide insights into how GIM and GT are perceived and internalized across different respondent segments. Table 1 summarizes the distribution of respondents by demographic categories.

Table 1. Demographic characteristics of respondents

Characteristic	Sub Features	Medan Branch		Dumai Branch	
		Count	%	Count	%
Gender	Male	87	37.83	48	20.87
	Female	58	25.22	37	16.08
	< 1	3	1.30	0	0.00
Working Period (year)	1-5	21	9.13	12	5.22
	6-10	40	17.39	14	6.09
	11-15	51	22.17	35	15.22
	> 15	30	13.04	24	10.44
	< 25	19	8.26	10	4.35
Age (year)	25-35	23	10.00	15	6.52
	36-45	48	20.87	32	13.91
	46-55	36	15.65	22	9.57
	> 55	19	8.26	6	2.61
Education	Degree	99	43.04	61	26.52
	Master	37	16.09	19	8.26
	Ph.D.	9	3.91	5	2.18

Before proceeding to inferential analysis, it is essential to assess the distributional properties of the primary research

constructs through descriptive statistics. This step provides a foundational understanding of central tendencies and variability in respondent perceptions, while also supporting an initial review of normality assumptions. The following key indicators are evaluated for each construct: number of observations (N), minimum and maximum values, mean, standard deviation (SD), skewness, and kurtosis. These measures serve as the basis for ensuring that the data are suitable for Partial Least Squares Structural Equation Modeling (PLS-SEM) and for identifying any initial trends in perceptions of GIM, GT, GOE, and EGB. A summary of the descriptive statistics for each construct is presented in Table 2.

Table 2. Demographic characteristics of respondents

Variable	N	Min	Max	Mean	SD	Skewness	Kurtosis
GIM	230	2	5	3.53	0.71	-0.13	-0.23
GT	230	2	5	3.62	0.76	-0.08	-0.35
GOE	230	2	5	3.35	0.76	0.08	-0.35
EGB	230	2	5	3.44	0.66	0.08	-0.20

As presented in Table 2, each construct was assessed using data from 230 respondents, with all variables exhibiting a minimum value of 2 and a maximum value of 5. This distribution suggests the absence of extreme outliers and confirms that responses remained within the expected range of the Likert scale. Among the four constructs, GT recorded the highest mean ($M = 3.62$), indicating a generally positive perception among employees toward the environmental training initiatives implemented by the organization. Conversely, GOE had the lowest mean ($M = 3.35$), suggesting that while training is actively conducted, the internalization and personal adoption of green values may still require reinforcement.

The standard deviations ranged from 0.66 to 0.76, reflecting moderate variability in responses across all constructs. The lowest variability was observed in EGB ($SD = 0.66$), implying a relatively consistent perception among respondents regarding green behavioral practices in their workplace. Furthermore, the skewness and kurtosis values for all variables fall well within the acceptable range of ± 2 , indicating that the data is approximately normally distributed. This supports the suitability of the dataset for parametric analysis, such as Structural Equation Modeling using PLS-SEM. These statistical indicators collectively demonstrate that the dataset

meets the assumptions for advanced modeling and is robust enough for subsequent hypothesis testing.

3.2 Measurement model estimation

The evaluation of the measurement model in this study employed a second-order factor approach, consistent with the hierarchical nature of the theoretical constructs. Each variable, including GIM, GT, GOE, and EGB, was conceptualized as a higher-order latent construct, composed of several first-order dimensions and their corresponding indicators.

The embedded two-stage approach was applied, wherein the first stage validates the indicator dimension relationship (first order), followed by the second stage evaluating the dimension construct relationship (second order).

In Stage 1, the outer loadings of all indicators within their respective dimensions were found to exceed 0.70, indicating strong indicator reliability. Additionally, the composite reliability (CR) scores for each dimension were all above the threshold of 0.70, demonstrating internal consistency reliability.

Furthermore, the Average Variance Extracted (AVE) values for each dimension surpassed 0.50, supporting good convergent validity. Lastly, the Heterotrait-Monotrait Ratio (HTMT) values were all below the accepted cutoff of 0.90, confirming the discriminant validity between dimensions. These results affirm the robustness of the measurement model and the adequacy of the reflective indicators used in capturing the latent constructs, as summarized in Table 3.

As shown in Table 3, all HTMT values between pairs of dimensions are below the critical threshold of 0.90, thereby confirming the discriminant validity of the constructs in the first-order measurement model. Among the notable values, the HTMT score between In-Role Green Behavior and Extra-Role Green Behavior stands at 0.895. Although relatively high, it remains within the acceptable range, indicating no issue of multicollinearity. Likewise, theoretically related constructs such as Awareness and Responsibility ($HTMT = 0.887$) and Use of Technology and Methodology ($HTMT = 0.865$) demonstrate strong conceptual connections while maintaining distinct statistical identities. These findings reinforce the discriminant strength and structural soundness of the measurement model, ensuring that each dimension contributes uniquely to its respective latent construct.

Table 3. Discriminant validity-HTMT stage first

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Waste Recycling																	
Evaluasi Training	0.862																
Extra-Role Green Behavior	0.422	0.424															
In-Role Green Behavior	0.491	0.500	0.895														
Compliance	0.326	0.289	0.499	0.412													
Collaborate	0.464	0.365	0.593	0.454	0.811												
Awareness	0.358	0.321	0.488	0.456	0.866	0.888											
Provides Encouragement	0.440	0.387	0.460	0.284	0.291	0.330	0.298										
Providing Trust	0.483	0.426	0.418	0.258	0.248	0.429	0.315	0.825									
Providing Opportunities	0.435	0.397	0.550	0.356	0.372	0.459	0.446	0.792	0.827								
Have a Clear Vision	0.395	0.345	0.363	0.247	0.324	0.369	0.356	0.834	0.782	0.733							
Creating Cooperation	0.283	0.245	0.249	0.158	0.259	0.298	0.276	0.801	0.677	0.585	0.826						
Inspire Employees	0.424	0.353	0.629	0.486	0.464	0.549	0.485	0.797	0.682	0.771	0.851	0.780					
Methodology	0.742	0.719	0.572	0.485	0.374	0.513	0.424	0.656	0.646	0.551	0.643	0.495	0.640				
Use of Technology	0.773	0.661	0.594	0.464	0.357	0.485	0.444	0.554	0.545	0.574	0.510	0.476	0.575	0.865			
Program	0.664	0.612	0.549	0.486	0.397	0.434	0.412	0.707	0.678	0.693	0.594	0.546	0.604	0.805	0.729		
Responsibility	0.480	0.457	0.458	0.420	0.680	0.887	0.706	0.207	0.393	0.331	0.286	0.220	0.451	0.516	0.480	0.348	

Table 4. Loading factor, composite reliability, AVE

Variable Laten	Dimensi	Loading Factor	CR	AVE
GIM	Inspiring Employees	0.830	0.912	0.635
	Have a Clear Vision	0.798		
	Creating Cooperation	0.721		
	Provides Encouragement	0.814		
	Providing Trust	0.785		
	Providing Opportunities	0.826		
	Program	0.765		
GT	Methodology	0.863	0.900	0.644
	Use of Technology	0.836		
	Waste Recycling	0.793		
GOE	Evaluasi Training	0.752	0.908	0.712
	Responsibility	0.804		
	Collaborate	0.899		
	Awareness	0.863		
	Compliance	0.805		
EGB	In-Role Green Behavior	0.892	0.902	0.821
	Extra-Role Green Behavior	0.920		

To further evaluate the reliability and convergent validity of the second-order constructs, three standard PLS-SEM criteria were assessed: factor loadings, CR, and AVE. Factor loadings above 0.70 indicate robust indicator reliability, while CR values exceeding 0.70 confirm satisfactory internal consistency. Similarly, AVE values greater than 0.50 ensure adequate convergent validity. All second-order constructs in this study meet these thresholds, establishing a reliable and valid measurement foundation for structural model analysis. The detailed results are presented in Table 4.

As shown in Table 4, all loading factor values for the respective dimensions exceed the recommended threshold of 0.70, indicating that the observed indicators reliably represent their associated latent constructs. For instance, the loading for Extra-Role Green Behavior under the EGB construct is particularly high at 0.920, reflecting strong indicator relevance. All constructs exhibit CR scores above 0.90 specifically, GIM (0.912), GT (0.900), GOE (0.908), and EGB (0.902) which demonstrates excellent internal consistency. Similarly, the AVE values for all constructs surpass the minimum criterion of 0.50, confirming convergent validity by explaining more than half of the variance in their respective indicators. Notably, EGB records the highest AVE at 0.821, reinforcing the strong construct validity of this latent variable. Collectively, these findings establish the reliability and validity of the measurement model, ensuring that each construct is measured both accurately and consistently. This robust measurement foundation enables reliable interpretation of the structural model in the next stage of analysis. To assess discriminant validity at the construct level, the HTMT of correlations was calculated for the four second-order latent variables. HTMT values below 0.90 confirm that constructs are statistically distinct and do not overlap conceptually. The results are summarized in Table 5.

As presented in Table 5, the HTMT values among all second-order latent constructs remain well below the recommended threshold of 0.90, thereby establishing discriminant validity at the construct level. The highest inter-

construct correlation is between GIM and GT (HTMT=0.678), which is theoretically plausible given their shared function as internal organizational enablers. The HTMT value between EGB and GOE is 0.556, indicating a moderately strong relationship that supports the mediating role of GOE. Additionally, GT and EGB are related with an HTMT of 0.611, affirming the hypothesized influence of training on green workplace practices. These results demonstrate that each construct is conceptually and statistically distinct, reinforcing the structural model's empirical soundness and validity. To assess the overall model fit and predictive relevance, several quality criteria were employed:

- 1) R-Squared (R^2) values indicate the explained variance of endogenous constructs. The R^2 for EGB is 0.326, while GOE has an R^2 of 0.245, both of which fall within the moderate explanatory power category [33]. This suggests that the exogenous variables provide meaningful, though not exhaustive, explanation for the target constructs.
- 2) Q-Squared (Q^2) values, which evaluate predictive relevance, are 0.254 for EGB and 0.169 for GOE. These values exceed the minimum threshold of zero, indicating moderate predictive relevance [34].
- 3) Standardized Root Mean Square Residual (SRMR) was calculated to assess model fit. The SRMR value of 0.071 falls below the critical cutoff of 0.08 [35], indicating an acceptable model fit between the empirical and predicted correlation matrices.

Table 5. Discriminant validity

	EGB	GIM	GOE	GT
EGB				
Gren Involvement Management	0.436			
GOE	0.556	0.449		
GT	0.611	0.678	0.534	

Table 6. Model quality criteria

Measurement Items	Model PLS		Model LM	
	RMSE	MAE	RMSE	MAE
Extra-Role Green Behavior	0.876	0.690	0.863	0.699
In-Role Green Behavior	0.915	0.736	0.894	0.729
Compliance	0.948	0.766	0.972	0.779
Collaborate	0.894	0.704	0.903	0.704
Awareness	0.921	0.741	0.938	0.746
Responsibility	0.917	0.734	0.914	0.736

Together, these indicators provide robust evidence that the model not only fits the data well but also possesses reasonable explanatory and predictive power. To further evaluate the model's out-of-sample predictive capability, the PLS Predict procedure was employed. The results are detailed in Table 6 and discussed in the following section.

As illustrated in Table 6, the results of the PLS Predict analysis offer a comprehensive evaluation of the model's out-of-sample predictive power. Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) values are compared between the PLS-SEM model and a naïve linear regression (LM) benchmark for each of the key indicators under the endogenous constructs. In the case of Extra-Role Green Behavior, the LM model yields slightly lower RMSE (0.863 vs. 0.876) and MAE (0.699 vs. 0.690), indicating marginally better predictive accuracy. Similarly, for In-Role Green Behavior, the PLS model produces a marginally higher RMSE

(0.915) and MAE (0.736) than LM, suggesting slightly inferior performance on this indicator.

However, for the majority of the other indicators including Compliance, Collaborate, Awareness, and Responsibility the PLS model performs consistently and competitively, with MAE values that are either lower or very close to the LM benchmark. Notably, PLS achieves better MAE on 'Responsibility' (0.734) and matches LM performance on 'Collaborate' (0.704). Although RMSE values for PLS are slightly higher in some cases, they remain within acceptable margins, and the overall predictive errors are not excessive.

These findings collectively indicate that while the LM model performs marginally better in a few specific cases, the PLS model maintains robust and reliable predictive relevance across the board. This result justifies the selection of PLS-SEM, particularly given its ability to handle complex models, account for mediation effects, and provide meaningful insights even with modest sample sizes. The PLS Predict analysis thus reinforces the external validity and generalizability of the proposed model in predicting green behavioral outcomes in organizational contexts.

As shown in Table 7, the path coefficient from GIM to EGB is not statistically significant ($\beta = 0.091$, $p = 0.165$), suggesting that direct managerial involvement alone does not substantially influence employees' green behavior. However, GIM has a significant effect on GOE ($\beta = 0.210$, $p = 0.002$), which in turn significantly predicts EGB ($\beta = 0.274$, $p < 0.001$). This confirms the indirect effect of GIM via GOE ($\beta = 0.058$, $p = 0.007$), establishing a statistically significant mediating pathway.

Table 7. Parameter estimates and mediating effect

	Original Sample (O)	STDEV	T Statistics (O/STDEV)	P Values	Decision
GIM → EGB	0.091	0.065	1,390	0.165	Not Accepted
GIM → GOE	0.210	0.066	3,173	0.002	Accepted
GOE → EGB	0.274	0.058	4,684	0.000	Accepted
GT → EGB	0.323	0.067	4,796	0.000	Accepted
GT → GOE	0.338	0.073	4,664	0.000	Accepted
GT → GOE → EGB	0.093	0.030	3,043	0.002	Accepted
GIM → GOE → EGB	0.058	0.021	2,722	0.007	Accepted

Similarly, GT exerts a strong direct influence on both GOE ($\beta = 0.338$, $p < 0.001$) and EGB ($\beta = 0.323$, $p < 0.001$). It also demonstrates a significant indirect effect through GOE ($\beta = 0.093$, $p = 0.002$). These results validate the proposed mediation model and emphasize the strategic role of GOE in translating organizational initiatives into observable behavioral outcomes. In summary, while the direct effect of GIM on EGB is limited, its indirect influence through environmental orientation is pivotal. Conversely, GT exerts both direct and mediated effects, reinforcing employee awareness and commitment to environmentally responsible practices. These findings underscore the importance of cultivating a green-oriented culture as a critical intermediary in achieving sustainable workplace behavior.

3.3 Discussions

The findings of this study reveal nuanced insights regarding

the mechanisms through which organizational strategies shape environmentally responsible employee behavior. Notably, GIM did not demonstrate a significant direct influence on EGB ($\beta = 0.091$, $p > 0.05$), contradicting previous studies that positioned managerial involvement as a primary driver of pro-environmental conduct in the workplace [21, 36]. This suggests that managerial efforts, when not internalized or operationalized at the employee level, may have limited behavioral impact. However, GIM exerted a significant indirect effect on green behavior via GOE (indirect $\beta = 0.058$, $p < 0.01$), highlighting the importance of shaping environmental values and awareness as a mediating mechanism. This supports the assertion that managerial influence is most effective when it fosters an internalized orientation toward sustainability rather than merely enforcing top-down initiatives [19].

The Ecocentric Management Theory emphasizes the dual responsibility of organizations to achieve profitability and to maintain environmental sustainability. In line with this principle, the study confirms that employees with strong environmental orientation tend to exhibit higher levels of green behavior ($\beta = 0.274$, $p < 0.001$). This reinforces the role of internal values and awareness in mediating the relationship between organizational strategies and individual actions. Employees who perceive environmental protection as part of their professional identity are more likely to translate that orientation into tangible eco-friendly practices both within the workplace and in their surrounding community. Equally important, the role of GT emerged as both directly and indirectly influential. The training significantly enhanced both GOE ($\beta = 0.338$, $p < 0.001$) and EGB ($\beta = 0.323$, $p < 0.001$), and its indirect pathway through orientation was also statistically significant ($\beta = 0.093$, $p < 0.01$). These findings align with previous literature [1, 7, 15, 16], validating the critical function of training as a strategic tool in GHM frameworks [24]. Training equips employees with knowledge, reshapes attitudes, and empowers behavior change.

From a practical standpoint, the study suggests that management should not solely rely on policy mandates or managerial supervision to instill green behavior. Instead, a more sustainable approach lies in embedding environmental orientation through training and cultural reinforcement. Employees are more likely to adopt consistent and voluntary green behaviors when they understand the purpose behind environmental initiatives and align those values with their personal and professional goals. While direct management involvement may have limited behavioral influence, its capacity to shape orientation remains vital. Moreover, GT serves as a powerful lever providing both knowledge and motivation to foster a culture of environmental stewardship within organizations. This study provides empirical evidence for the mediated pathways by which organizational strategies can be translated into behavioral outcomes, underscoring the importance of environmental orientation as a central construct in driving sustainable workplace transformation.

4. CONCLUSIONS

This study confirms the critical mediating role of the GOE in translating internal organizational strategies specifically GIM and GT into measurable EGB. The findings demonstrate that while GIM does not significantly affect EGB directly, it exerts a meaningful indirect influence through the

enhancement of environmental orientation. Conversely, GT shows both significant direct and indirect effects, underscoring its dual role in promoting sustainability-oriented behavior among employees.

The results highlight that an increase in employees' environmental orientation strongly contributes to improved green behavior, which in turn delivers long-term benefits for the company, both financially and non-financially. In this regard, the strategic cultivation of green behavior not only aligns with corporate social responsibility but also supports sustainable business operations.

For managerial practice, the study provides practical guidance on the importance of tailoring green training programs to specific employee roles. For example, the training needs of administrative personnel differ from those of production staff. Therefore, effective planning and customization of training content are essential to maximizing its impact. Such targeted approaches can significantly enhance employee orientation toward environmental sustainability, which acts as a catalyst for behavioral change. Moreover, the study affirms that when management actively fosters a culture of environmental responsibility, it contributes to the internalization of green values among employees. This culture of compliance and engagement fosters not only individual behavioral change but also reinforces collective accountability for environmental stewardship. Companies especially those in environmentally intensive sectors should treat GOE not merely as an outcome, but as a strategic lever. By optimizing green training and reinforcing managerial involvement, organizations can effectively shape employee attitudes and behaviors to support a greener, more sustainable operational ecosystem.

REFERENCES

- [1] Pham, N.T., Phan, Q.P.T., Tučková, Z., Vo, N., Nguyen, L.H.L. (2018). Enhancing the organizational citizenship behavior for the environment: The roles of green training and organizational culture. *Management & Marketing-Challenges for the Knowledge Society*, 13(4): 1174-1189. <https://doi.org/10.2478/mmcks-2018-0030>
- [2] Ramanathan, R. (2018). Understanding complexity: The curvilinear relationship between environmental performance and firm performance. *Journal of Business Ethics*, 149(2): 383-393. <https://doi.org/10.1007/s10551-016-3088-8>
- [3] Jabbour, C.J.C., Jugend, D., De Sousa Jabbour, A.B.L., Gunasekaran, A., Latan, H. (2014). Green product development and performance of Brazilian firms: Measuring the role of human and technical aspects. *Journal of Cleaner Production*, 87(1): 442-451. <https://doi.org/10.1016/j.jclepro.2014.09.036>
- [4] Gilal, F.G., Ashraf, Z., Gilal, N.G., Gilal, R.G., Channa, N.A. (2019). Promoting environmental performance through green human resource management practices in higher education institutions: A moderated mediation model. *Corporate Social Responsibility and Environmental Management*, 26(6): 1579-1590. <https://doi.org/10.1002/csr.1835>
- [5] Li, W., Abdalla, A.A., Mohammad, T., Khassawneh, O., Parveen, M. (2023). Towards examining the link between green HRM practices and employee green in-role behavior: Spiritual leadership as a moderator. *Psychology Research and Behavior Management*, 16: 383-396. <https://doi.org/10.2147/PRBM.S396114>
- [6] Zacher, H., Rudolph, C.W., Katz, I.M. (2023). Employee green behavior as the core of environmentally sustainable organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, 10(1): 465-494. <https://doi.org/10.1146/annurev-orgpsych-120920-050421>
- [7] Pellegrini, C., Rizzi, F., Frey, M. (2018). The role of sustainable human resource practices in influencing employee behavior for corporate sustainability. *Business Strategy and the Environment*, 27(8): 1221-1232. <https://doi.org/10.1002/bse.2064>
- [8] Montabon, F., Morrow, P.C., Cantor, D.E. (2016). Promoting environmental citizenship behaviour. *International Journal of Integrated Supply Management*, 10(1): 63-88. <https://doi.org/10.1504/IJISM.2016.074424>
- [9] Pinzone, M., Guerci, M., Lettieri, E., Redman, T. (2016). Progressing in the change journey towards sustainability in healthcare: The role of "Green" HRM. *Journal of Cleaner Production*, 122: 201-211. <https://doi.org/10.1016/j.jclepro.2016.02.031>
- [10] Wheeler, D., Fabig, H., Boele, R. (2002). Paradoxes and dilemmas for stakeholder responsive firms in the extractive sector: Lessons from the case of shell and the Ogoni. *Journal of Business Ethics*, 39(3): 297-318. <https://doi.org/10.1023/A:1016542207069>
- [11] Kim, Y.J., Kim, W.G., Choi, H.M., Phetvaroon, K. (2019). The effect of green human resource management on hotel employees' eco-friendly behavior and environmental performance. *International Journal of Hospitality Management*, 76: 83-93. <https://doi.org/10.1016/j.ijhm.2018.04.007>
- [12] Doghan, M.A.A., Abdelwahed, N.A.A., Soomro, B.A., Alayis, M.M.H.A. (2022). Organizational environmental culture, environmental sustainability and performance: The mediating role of green HRM and green innovation. *Sustainability*, 14(12): 7510. <https://doi.org/10.3390/su14127510>
- [13] Danirmala, L., Prajogo, W. (2022). The mediating role of green training to the influence of green orfanizational culture to green organizational citizenship behavior a nd green employee involvement. *IJHCM (International Journal of Human Capital Management)*, 6(1): 66-75. <https://doi.org/10.21009/ijhcm.06.01.6>
- [14] Wardhani, R., Puspa, T. (2019). Pengaruh employee green involvement, green training dan green image terhadap perception for corporate social responsibility perusahaan pada PT cabot Indonesia Jakarta. *Jkbm (Jurnal Konsep Bisnis Dan Manajemen)*, 6(1): 52-68. <https://doi.org/10.31289/jkbm.v6i1.2860>
- [15] Hakro, T.H., Siddiqui, M.B., Banbhan, A.A. (2022). Investigating the relationship between HRM practices and employee green behavior. *Research Journal of Social Siceince & Economic Review*, 3(4): 64-72. [https://doi.org/10.36902/rjsser-vol3-iss4-2022\(64-72\)](https://doi.org/10.36902/rjsser-vol3-iss4-2022(64-72))
- [16] Saputro, A., Nawangsari, L.C. (2021). The effect of green human resource management on organization citizenship behaviour for environment (OCBE) and its implications on employee performance at PT Alan Bakti Niaga. *European Journal of Business and Management Research*, 6(1): 174-181. <https://doi.org/10.24018/ejbmr.2021.6.1.716>

- [17] Sinaga, S.A., Nawangsari, L.C. (2019). The effect of green recruitment, green training on employee performance in PT TRU using organization citizenship for environment as mediation variable. *Dinasti International Journal of Management Science*, 1(2): 204-216. <https://doi.org/10.31933/DIJMS>
- [18] Zhang, H., Sun, S. (2021). Cognitive dissonance of self-standards: A negative interaction of green compensation and green training on employee pro-environmental behavior in China. *Psychology Research and Behavior Management*, 14: 1399-1418. <https://doi.org/10.2147/PRBM.S325091>
- [19] Joyce, M.D., Vijai, C. (2020). A theoretical study on green human resource management (GHRM): An innovative practice for organizational sustainability. In *European Journal of Molecular & Clinical Medicine*, 7(11): 3007-3013.
- [20] Wang, Q., Shi, R., Zhang, F., Wang, X., Gao, Y. (2022). How organizational psychological ownership affects corporate green operations-based on a social exchange theory perspective. *Frontiers in Psychology*, 13: 985017. <https://doi.org/10.3389/fpsyg.2022.985017>
- [21] Haugh, H.M., Talwar, A. (2010). How do corporations embed sustainability across the organization? *Academy of Management Learning & Education*, 9(3): 384-396. <https://doi.org/10.5465/amle.9.3.zqr384>
- [22] Moradeke, F.T., Ishola, G.K., Okikiola, O.L. (2021). Green training and development practices on environmental sustainability: Evidence from WAMCO PLC. *Journal of Educational Management and Social Sciences*, 2(1): 1-19. <https://doi.org/10.48112/jemss.v1i2.212>
- [23] Hosain, S., Rahman, M.D.S. (2016). Green human resource management: A theoretical overview. *IOSR Journal of Business and Management (IOSR-JBM)*, 18(6): 54-59. <https://doi.org/10.9790/487X-1806035459>
- [24] Katz, I.M., Rauvola, R.S., Rudolph, C.W., Zacher, H. (2022). Employee green behavior: A meta-analysis. *Corporate Social Responsibility and Environmental Management*, 29(5): 1146-1157. <https://doi.org/10.1002/csr.2260>
- [25] Bissing-Olson, M.J., Iyer, A., Fielding, K.S., Zacher, H. (2013). Relationships between daily affect and pro-environmental behavior at work: The moderating role of pro-environmental attitude. *Journal of Organizational Behavior*, 34(2): 156-175. <https://doi.org/10.1002/job.1788>
- [26] Darvishmotevali, M., Altinay, L. (2022). Green HRM, environmental awareness and green behaviors: The moderating role of servant leadership. *Tourism Management*, 88: 104401. <https://doi.org/https://doi.org/10.1016/j.tourman.2021.104401>
- [27] Özgül, B., Zehir, C. (2023). Top management's green transformational leadership and competitive advantage: The mediating role of green organizational learning capability. *Journal of Business and Industrial Marketing*, 38(10): 2047-2060. <https://doi.org/10.1108/JBIM-01-2022-0043>
- [28] Xie, X., Zhu, Q., Qi, G. (2020). How can green training promote employee career growth? *Journal of Cleaner Production*, 259: 120818. <https://doi.org/10.1016/j.jclepro.2020.120818>
- [29] Aboramadan, M. (2022). The effect of green HRM on employee green behaviors in higher education: The mediating mechanism of green work engagement. *International Journal of Organizational Analysis*, 30(1): 7-23. <https://doi.org/10.1108/IJOA-05-2020-2190>
- [30] Yamin, S. (2023). *Olah data statistik smartpls 3 smartpls 4 Amos & Stata (Mudah & Praktis) edisi iii*. Dewangga Energi Internasional Publishing. (Third Edition). PT Dewangga Energi Internasional.
- [31] Sarstedt, M., Hair, J.F., Cheah, J.H., Becker, J.M., Ringle, C.M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal (AMJ)*, 27(3): 197-211. <https://doi.org/10.1016/j.ausmj.2019.05.003>
- [32] Chin, W.W. (1998). The partial least squares approach for structural equation modeling. In *Modern methods for business research*. Lawrence Erlbaum Associates Publishers. Psychology Press, pp. 295-336.
- [33] Hair, J., Alamer, A. (2022). Partial least squares structural equation modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics*, 1(3): 100027. <https://doi.org/10.1016/j.rmal.2022.100027>
- [34] Hair, J.F., Risher, J.J., Sarstedt, M., Ringle, C.M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1): 2-24. <https://doi.org/10.1108/EBR-11-2018-0203>
- [35] Shmueli, G., Ray, S., Velasquez Estrada, J.M., Chatla, S.B. (2016). The elephant in the room: Predictive performance of PLS models. *Journal of Business Research*, 69(10): 4552-4564. <https://doi.org/10.1016/j.jbusres.2016.03.049>
- [36] Unsworth, K.L., Dmitrieva, A., Adriasola, E. (2013). Changing behaviour: Increasing the effectiveness of workplace interventions in creating pro-environmental behaviour change. *Journal of Organizational Behavior*, 34(2): 211-229. <https://doi.org/10.1002/job.1837>