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THE IMPACT OF GREEN HUMAN RESOURCE MANAGEMENT ON SUSTAINABLE FIRM PERFORMANCE: THE SEQUENTIAL MEDIATING ROLE OF PRO-ENVIRONMENTAL BEHAVIOR AND GREEN CORPORATE SOCIAL RESPONSIBILITY

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ABSTRACT

The palm oil industry faces growing global scrutiny due to its environmental impact, highlighting the urgent need for sustainable management practices that go beyond technology and focus on human behavior. Green Human Resource Management (GHRM) has emerged as a strategic approach to promote environmental consciousness and enhance firm performance through behavioral change. This study investigates the causal relationships among GHRM, Pro-Environmental Behavior (PEB), Green Corporate Social Responsibility (GCSR), and Sustainable Firm Performance (SFP) within PT Hutan Sawit Lestari, Indonesia. The research emphasizes the sequential role of PEB and GCSR in translating HR practices into measurable sustainability outcomes. METHODS: A quantitative, cross-sectional design was applied using data collected from 275 employees through structured questionnaires. The model was tested using Structural Equation Modeling–Partial Least Squares (SEM-PLS) via SmartPLS 4. Reliability, validity, and mediation analyses were performed using bootstrapping with 5,000 resamples to ensure statistical rigor and robustness. FINDINGS: The results reveal that GHRM has a significant and positive impact on PEB ($\beta = 0.736$, $p < 0.001$), indicating that green HR practices strongly encourage employees' environmental engagement. PEB also exerts a substantial effect on GCSR ($\beta = 0.452$, $p < 0.001$), confirming that individual pro-environmental actions contribute to strengthening organizational responsibility. Furthermore, GCSR positively influences SFP ($\beta = 0.763$, $p < 0.001$), demonstrating that environmentally oriented CSR initiatives enhance financial, social, and ecological outcomes. Mediation analysis shows that PEB and GCSR partially and sequentially mediate the relationship between GHRM and SFP ($\beta = 0.254$, $p < 0.001$), indicating that behavioral transformation is a key mechanism

through which HR systems drive sustainability. The model exhibited strong explanatory power (R^2 = 0.701–0.807) and predictive relevance (Q^2 > 0.80), validating its empirical robustness. CONCLUSION: Drawing on the Ability–Motivation–Opportunity (AMO) and Theory of Planned Behavior (TPB) frameworks, this study demonstrates that sustainable firm performance in the palm oil sector is largely driven by human factors rather than technology alone. By fostering pro-environmental behaviors through recruitment, training, and incentive systems, organizations can cultivate a green culture that strengthens CSR engagement and ensures long-term competitiveness. These findings provide both theoretical advancement and practical guidance for integrating HR-driven sustainability strategies in environmentally sensitive industries.

KEYWORDS: GHRM, PEB; GCSR; SFP; Sequential Mediation; Palm Oil Industry.

1. INTRODUCTION

Across the world, environmental degradation has become an inevitable consequence of industrial growth. Climate change, deforestation, resource depletion, and biodiversity loss are now recognized as major global challenges that threaten human and ecological well-being. According to global sustainability reports, industrial activities contribute nearly 30% of total greenhouse gas emissions, with agriculture and plantation sectors among the most significant sources (Google Sustainability Report, 2021). As living standards improve and populations expand, the demand for natural resources continues to escalate, placing immense pressure on ecosystems (Murshed et al., 2021). Consequently, the global community is increasingly emphasizing sustainable development, environmental stewardship, and green innovation as essential components of corporate responsibility.

Indonesia, as one of the world's leading producers of palm oil, sits at the center of this environmental discourse. The palm oil industry contributes substantially to the national economy—supporting millions of jobs and generating billions in export revenues—but it also carries the burden of being a major contributor to deforestation, greenhouse gas emissions, and social conflicts (Nawangsari & Wardhani, 2022). International consumers and stakeholders are demanding stronger environmental commitments through global initiatives such as the **Roundtable on Sustainable Palm Oil (RSPO)**. Consequently, plantation companies like **PT Sawit Lestari** face growing pressure to integrate environmental, social, and governance (ESG) principles into their business models. However, while technological interventions—such as renewable energy use and waste recycling—have gained momentum, the human dimension of sustainability remains underexplored. Environmental degradation is not merely a technological issue but also a behavioral one, rooted in human attitudes, awareness, and workplace culture (Ahmad et al., 2023; Afsar & Umrani, 2020).

This growing realization has shifted the focus of sustainability research toward the behavioral and managerial domains, particularly **Green Human Resource Management (GHRM)**. GHRM refers to the systematic integration of environmental objectives into every function of human resource management—including recruitment, training, performance evaluation, and reward systems—to promote environmental consciousness among employees (Amrutha & Geetha, 2020; Hameed et al., 2022). Through this approach, organizations aim to create a "green workforce" that actively participates in sustainable practices and supports environmental initiatives. GHRM has become essential for organizations seeking to enhance environmental performance while maintaining productivity and profitability.

Recent studies demonstrate that GHRM practices have a significant influence on employees' **Pro-Environmental Behavior (PEB)**—that is, the voluntary actions employees take to minimize environmental harm, such as conserving resources, reducing waste, and promoting ecological innovation (Naz et al., 2023; Nguyen et al., 2025). The **Theory of Planned Behavior (TPB)** (Ajzen, 1991) and the **Ability–Motivation–Opportunity (AMO) theory** (Bos-Nehles et al., 2017) provide useful frameworks to explain this relationship. TPB suggests that attitudes, subjective norms, and perceived behavioral control drive individuals to act pro-environmentally, while the AMO framework posits that employees engage in such behaviors when they have the ability, motivation, and opportunity to do so. Within this perspective, GHRM acts as a strategic enabler that builds employees' capabilities through green training, motivates them through incentives and recognition, and provides opportunities for participation in environmental programs (Chouhan, 2025; Ahmad et al., 2023).

At the organizational level, these employee-driven initiatives often manifest as **Green Corporate Social Responsibility (GCSR)**—a form of CSR that focuses explicitly on environmental sustainability and community well-being. GCSR reflects a firm's commitment to reducing ecological footprints, engaging with stakeholders, and implementing socially responsible environmental policies (Carroll, 2021; Hameed et al., 2023). When employees are environmentally conscious and empowered, they are more likely to support and participate in GCSR programs, thereby enhancing the company's reputation and legitimacy (Ali et al., 2023; Luo & Qu, 2023). In turn, both GHRM and GCSR have been linked to **Sustainable Firm Performance (SFP)**—an integrated measure encompassing financial, social, and environmental outcomes (Malik et al., 2021; Úbeda-García et al., 2021).

However, despite increasing attention to GHRM and sustainability, critical research gaps persist, particularly in developing economies and resource-based sectors such as palm oil. Most previous studies have been conducted in the manufacturing or service industries of developed countries, examining the direct relationship between GHRM and performance outcomes (Amrutha & Geetha, 2020; Zafar & Suseno,

2024). Few have explored the **sequential mediating process** through which GHRM influences firm sustainability—first by shaping employee behavior (PEB) and subsequently by strengthening organizational-level responsibility (GCSR). This layered mechanism remains theoretically underdeveloped and empirically untested in the context of agribusiness, where social and environmental complexities are deeply intertwined (Ahmad et al., 2023; Alam et al., 2023; Ziyadeh et al., 2024).

In Indonesia, many plantation companies, including PT Sawit Lestari, have adopted sustainability certifications and environmental management systems. Yet, their effectiveness often depends on how deeply these practices are embedded within the workforce. For instance, workers' adherence to eco-friendly cultivation, waste management, and chemical usage largely depends on how HR policies are structured to encourage environmental behavior (Musofa et al., 2021). In many cases, sustainability initiatives remain superficial—limited to policy compliance rather than internalized green culture (Nawangsari & Wardhani, 2022). This highlights a key implementation gap between institutional frameworks and employee-level engagement.

Moreover, while prior studies have emphasized the independent roles of PEB and CSR, few have analyzed how these two mechanisms operate **sequentially** to translate HR initiatives into sustainable performance. It remains unclear whether employees' pro-environmental actions serve as a precursor that enables effective CSR implementation, ultimately improving firm performance (Hameed, Rehman, & Akhtar, 2024). Addressing this question is vital, particularly in the palm oil sector, where social responsibility and environmental stewardship are directly tied to market access and stakeholder trust.

To bridge these theoretical and empirical gaps, this study proposes a **sequential mediation model** linking GHRM to Sustainable Firm Performance through Pro-Environmental Behavior and Green Corporate Social Responsibility. This model integrates micro-level behavioral theories with macro-level sustainability concepts, offering a comprehensive explanation of how human resource practices drive sustainability outcomes in environmentally sensitive industries. The model assumes that GHRM first shapes employees' environmental behaviors (PEB), which in turn foster a culture of collective responsibility (GCSR), leading to improved sustainable firm performance (Danish et al., 2025).

From a theoretical standpoint, this study contributes to the integration of the **Theory of Planned Behavior (TPB)** and the **AMO framework** within the context of corporate sustainability, extending their application to developing economies and high-impact sectors. Empirically, it fills a contextual void by focusing on the Indonesian palm oil industry, which remains underrepresented in GHRM literature despite its global significance. Practically, the findings are expected to guide managers and policymakers in designing effective green HR strategies that not only improve environmental performance but also enhance community engagement and long-term competitiveness.

Therefore, the current study aims to examine the impact of Green Human Resource Management on Sustainable Firm Performance through the sequential mediating roles of Pro-Environmental Behavior and Green Corporate Social Responsibility. Specifically, the study has three primary objectives: (1) to assess the direct relationship between GHRM and Sustainable Firm Performance; (2) to investigate the mediating role of Pro-Environmental Behavior in the relationship between GHRM and Green Corporate Social Responsibility; and (3) to analyze the sequential mediating effect of Pro-Environmental Behavior and GCSR between GHRM and Sustainable Firm Performance.

In summary, this research offers both academic and practical contributions. It advances the theoretical understanding of the behavioral and organizational pathways linking HR practices to sustainability outcomes and provides empirical evidence from a critical yet underexplored context—Indonesia's palm oil plantations. The novelty of this study lies in its sequential mediation framework, which simultaneously captures individual-level environmental engagement and organization-level responsibility, offering a multi-level perspective on sustainable performance. By examining these relationships within **PT Sawit Lestari**, this research aims to demonstrate that achieving sustainability in resource-intensive industries requires not only technology and policy but also a fundamental transformation in human behavior and corporate culture.

2. MATERIALS AND METHODS

2.1. Research Design

This study adopted a quantitative research design guided by a positivist paradigm to empirically test the causal relationships among the constructs of

Green Human Resource Management (GHRM), Pro-Environmental Behavior (PEB), Green Corporate Social Responsibility (GCSR), and Sustainable Firm Performance (SFP).

The deductive approach was employed, beginning with theoretical conceptualization and hypothesis formulation based on existing frameworks—specifically the Ability–Motivation–Opportunity (AMO) theory and the Theory of Planned Behavior (TPB) (Ajzen, 1991; Bos-Nehles et al., 2017)—followed by empirical testing through statistical analysis.

Given the complexity of the research model and the presence of sequential mediation effects, Structural Equation Modeling using Partial Least Squares (SEM-PLS) was chosen as the primary analytical technique. SEM-PLS is particularly suitable for exploratory models involving latent constructs and hierarchical relationships, allowing simultaneous estimation of both the measurement and structural models (Hair et al., 2021).

The analysis was conducted using SmartPLS 4 software, while SPSS 26 was used for preliminary data screening, descriptive statistics, and reliability checks.

2.2. Research Population and Sampling

The population of this study comprised all full-time employees of PT Hutan Sawit Lestari, a palm oil plantation and processing company located in Indonesia, which actively implements environmental management and sustainability programs. Given the diverse operational divisions within the company, simple random sampling was applied to ensure every employee had an equal probability of selection, thereby reducing sampling bias and enhancing the representativeness of the findings.

A total of 300 questionnaires were distributed between March and May 2025 across plantation, mill, and head-office units. After screening for incomplete responses and outliers, 275 valid questionnaires were retained, resulting in a response rate of 91.6%. This sample size satisfies the minimum requirement for SEM-PLS, which typically recommends a sample size at least ten times the largest number of structural paths directed at a latent construct (Hair et al., 2021).

2.3. Research Instrument

Data were collected through a self-administered structured questionnaire comprising five main sections:

1. Demographic Information – gender, age, education level, tenure, and job position.
2. Green Human Resource Management (GHRM) – adapted from Dumont et al. (2017) and Tang et al. (2018), consisting of six dimensions: green recruitment and selection, green training and development, green performance management, green compensation and rewards, green organizational culture, and employee involvement in environmental programs.
3. Pro-Environmental Behavior (PEB) – adapted from Afsar and Umrani (2020) and Nguyen et al. (2025), capturing employees' voluntary behaviors such as eco-friendly initiatives, energy saving, and waste reduction.
4. Green Corporate Social Responsibility (GCSR) – adapted from Hameed et al. (2024) and Ali et al. (2023), reflecting environmentally oriented CSR initiatives like ethical production, environmental reporting, and community engagement.
5. Sustainable Firm Performance (SFP) – adapted from Malik et al. (2021) and Úbeda-García et al. (2021), encompassing economic, environmental, and social performance indicators.

All items were measured on a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). The questionnaire was pre-tested with five sustainability managers and three academic experts to ensure content validity, linguistic clarity, and contextual relevance to Indonesia's palm oil sector.

2.4. Data Analysis Procedures

Data analysis followed the two-step SEM-PLS approach as recommended by Hair et al. (2021):

1. Measurement Model Evaluation (Outer Model) – to assess indicator reliability, internal consistency reliability (Cronbach's Alpha and Composite Reliability), convergent validity (Average Variance Extracted ≥ 0.50), and discriminant validity using the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio.
2. Structural Model Evaluation (Inner Model) – to test hypothesized relationships among constructs by examining path coefficients, coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2) through bootstrapping procedures (5,000 resamples).

This analytical strategy enables a comprehensive evaluation of both the psychometric quality of constructs and the strength of causal relationships.

The sequential mediation analysis of PEB and GCSR was carried out using the bootstrapping method, as it provides more robust estimates for

indirect effects compared to traditional causal steps approaches.

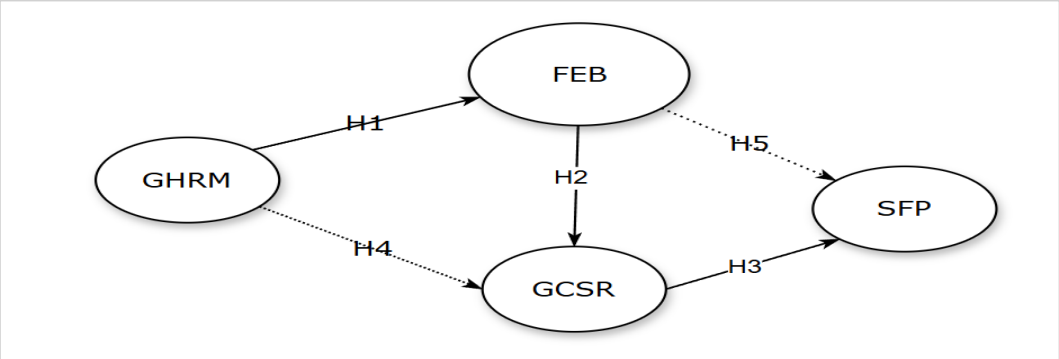

Fig. 2: Conceptual Framework.

3. RESULT AND DISCUSSION

3.1. Factor Analysis by PLS Algorithm

3.1.1. Construct Validity

Convergent Validity of Green Human Resource Management (GHRM)

Convergent validity was assessed to ensure that the indicators within each construct are highly correlated. An indicator is considered valid when its *loading factor* exceeds 0.60 and the *p-value* is below 0.05 (Hair et al., 2011).

Table 1: Valditas Green Human Resource Management (Ghrm) Test Results.

Dimension	Loading Factor	Indicators	Loading Factor	p-Value	Information
Green Training and Development	0,917	GTD1	0,847	<0,000	Valid
		GTD2	0,856	<0,000	Valid
		GTD3	0,832	<0,000	Valid
Green Compensation and Reward	0,938	GRC1	0,849	<0,000	Valid
		RCM2	0,828	<0,000	Valid
		GRC3	0,854	<0,000	Valid
		GRC4	0,823	<0,000	Valid
Green Performance Management	0,929	GPM1	0,831	<0,000	Valid
		GPM2	0,799	<0,000	Valid
		GPM3	0,841	<0,000	Valid
		GPM4	0,811	<0,000	Valid
Green Organizational Culture	0,931	OCC1	0,851	<0,000	Valid
		OCC2	0,792	<0,000	Valid
		OCC3	0,816	<0,000	Valid
		OCC4	0,849	<0,000	Valid
Green Recruitment and Selection	0,964	GRS1	0,814	<0,000	Valid
		GRS2	0,843	<0,000	Valid
		GRS3	0,797	<0,000	Valid
		GRS4	0,809	<0,000	Valid
		GRS5	0,790	<0,000	Valid
		GRS6	0,788	<0,000	Valid
		GRS7	0,759	<0,000	Valid
		GRS8	0,789	<0,000	Valid
Green Involvement	0,958	GL1	0,808	<0,000	Valid
		GL2	0,801	<0,000	Valid
		GL3	0,832	<0,000	Valid
		GL4	0,790	<0,000	Valid
		GL5	0,821	<0,000	Valid
		GL6	0,820	<0,000	Valid

Source: Primary Data Processed, 2025

The results indicate that all dimensions and indicators of the *Green Human Resource Management (GHRM)* construct meet the criteria for convergent validity, with all *loading factors* above 0.60 and *p-values* below 0.05. The highest loading value was observed in the *Green Recruitment and Selection (GRS)* dimension (0.964), while the lowest occurred in the *Green Training and Development (GTD)* dimension (0.917). These findings confirm that all dimensions and indicators of the GHRM construct demonstrate

adequate convergent validity and can be included in the structural model.

3.2. Convergent Validity of Pro-Environmental Behavior (PEB)

The analysis shows that all five dimensions of *Pro-Environmental Behavior (PEB)* have *loading factors* exceeding 0.60 and *p-values* < 0.05, confirming their validity. Likewise, all fifteen indicators demonstrate significant *loading factors* above 0.60 with *p-values* < 0.05. The highest indicator loading (0.803) is observed for PEB3.1 under the *Inquiry into Harmful Practices (PEB3)* dimension, while the lowest (0.741) is found for PEB1.3 under the *Suggestions for Environmentally Friendly Practices (PEB1)* dimension. At the dimensional level, *Environmental Knowledge Dissemination (PEB2)* shows the highest loading (0.870), whereas *Suggestions for Environmentally Friendly Practices (PEB1)* displays the lowest (0.851). These results indicate that all dimensions and indicators meet the requirements for *convergent validity*, allowing the PEB variable to be retained in the research model.

Table 2: Pro-Environmental Behavior (Peb) Valdity Test Results.

Dimension	Loading Factor	Indicators	Loading Factor	p-Value	Information
Advice on Environmentally Friendly Practices (PEB1)	0,851	PEB1.1	0,748	<0,000	Valid
		PEB1.2	0,801	<0,000	Valid
		PEB1.3	0,741	<0,000	Valid
Dissemination of Environmental Knowledge (PEB2)	0,87	PEB2.1	0,773	<0,000	Valid
		PEB2.2	0,755	<0,000	Valid
		PEB2.3	0,774	<0,000	Valid
Questions about Adverse Practices (PEB3)	0,861	PEB3.1	0,803	<0,000	Valid
		PEB3.2	0,749	<0,000	Valid
		PEB3.3	0,790	<0,000	Valid
Voluntary Environmental Task (PEB4)	0,866	PEB4.1	0,764	<0,000	Valid
		PEB4.2	0,746	<0,000	Valid
		PEB4.3	0,794	<0,000	Valid
Resource Waste Avoidance (PEB5)	0,869	PEB5.1	0,778	<0,000	Valid
		PEB5.2	0,792	<0,000	Valid
		PEB5.3	0,757	<0,000	Valid

Source: Primary Data Processed, 2025

3.3. Convergent Validity of Green Corporate Social Responsibility (G CSR)

The results demonstrate that all nine dimensions of *Green Corporate Social Responsibility (Green CSR)* exhibit *loading factors* exceeding 0.60 with *p-values* < 0.05, confirming their validity. Likewise, all twenty-seven indicators show *loading factors* above 0.60 and *p-values* < 0.05, indicating significant correlations between the indicators and their latent constructs. The highest indicator loading (0.845) is observed for CSR8.1 under the *Environmental Reporting (CSR8)* dimension, while the lowest (0.779) is found for CSR7.1 under the *Long-Term Consideration (CSR7)* dimension. At the dimensional level, *Future Investment (CSR2)* records the highest loading (0.909), whereas *Environmental Compliance (CSR6)* presents the lowest (0.882). These results confirm that all indicators and dimensions of the Green CSR construct satisfy the requirements of *convergent validity*, thereby justifying its inclusion in the structural research model.

Table 3: Results Of the Green Corporate Social Responsibility (Green CSR) Valditas Test.

Dimension	Loading Factor	Indicators	Loading Factor	p-Value	Information
Corporate Ethics (CSR1)	0,886	CSR1.1	0,827	<0,000	Valid
		CSR1.2	0,812	<0,000	Valid
		CSR1.3	0,842	<0,000	Valid
Future Investment (CSR2)	0,909	CSR2.1	0,839	<0,000	Valid
		CSR2.2	0,840	<0,000	Valid
		CSR2.3	0,841	<0,000	Valid
Environmental Protection Participation (CSR4)	0,890	CSR4.1	0,833	<0,000	Valid
		CSR4.2	0,814	<0,000	Valid
		CSR4.3	0,799	<0,000	Valid
Adoption of Production Ethics (CSR5)	0,891	CSR5.1	0,831	<0,000	Valid
		CSR5.2	0,812	<0,000	Valid
		CSR5.3	0,842	<0,000	Valid
Environmental Compliance (CSR6)	0,882	CSR6.1	0,843	<0,000	Valid
		CSR6.2	0,838	<0,000	Valid

		CSR6.3	0,809	<0,000	Valid
Long-Term Considerations (CSR7)	0,884	CSR7.1	0,779	<0,000	Valid
		CSR7.2	0,797	<0,000	Valid
		CSR7.3	0,823	<0,000	Valid
Environmental Reporting (CSR8)	0,885	CSR8.1	0,845	<0,000	Valid
		CSR8.2	0,785	<0,000	Valid
		CSR8.3	0,818	<0,000	Valid
Environmental Activities (CSR9)	0,891	CSR9.1	0,836	<0,000	Valid
		CSR9.2	0,811	<0,000	Valid
		CSR9.3	0,841	<0,000	Valid

Source: Primary Data Processed, 2025.

3.4. Convergent Validity of Sustainable Firm Performance (SFP)

The results indicate that all three dimensions of *Sustainable Firm Performance (SFP)* exhibit *loading factors* greater than 0.60 with *p-values* < 0.05, confirming their validity. Similarly, all eight indicators show *loading factors* exceeding 0.60 and statistically significant *p-values*, demonstrating strong correlations with their respective latent constructs. The highest indicator loading (0.861) is observed for SFP1.1 within the *Economic (SFP1)* dimension, while the lowest (0.759) appears for SFP1.2 in the same dimension. At the dimensional level, the *Social (SFP2)* dimension records the highest loading (0.923), whereas the *Economic (SFP1)* dimension shows the lowest (0.859). These findings confirm that all dimensions and indicators of the SFP construct satisfy the criteria for *convergent validity*, supporting the inclusion of this variable in the structural research model.

Table 4: Valditas Sustainable Firm Performance (Sfp) Test Results.

Dimension	Loading Factor	Indicators	Loading Factor	p-Value	Information
Economics (SFP1)	0,859	SFP1.1	0,861	<0,000	Valid
		SFP1.2	0,759	<0,000	Valid
Social (SFP2)	0,923	SFP2.1	0,797	<0,000	Valid
		SFP2.2	0,830	<0,000	Valid
		SFP2.3	0,784	<0,000	Valid
Environment (SFP3)	0,907	SFP3.1	0,812	<0,000	Valid
		SFP3.2	0,825	<0,000	Valid
		SFP3.3	0,799	<0,000	Valid

Source: Primary Data Processed, 2025.

3.5. Heterotrait-Monotrait Ratio (Htmt) - Matrix

The Heterotrait-Monotrait Ratio (HTMT) analysis was performed to assess the discriminant validity of the constructs within the research model. Following the guideline proposed by Henseler, Ringle, and Sarstedt (2015), HTMT values below the threshold of 0.90 indicate satisfactory discriminant validity. The results reveal that all HTMT values range between 0.696 and 0.858, demonstrating that each construct is empirically distinct and conceptually independent. These findings confirm the absence of multicollinearity issues and affirm that all constructs exhibit robust discriminant validity, thereby supporting their appropriateness for inclusion in the structural model.

Table 5: Heterotrait-Monotrait Ratio (HTMT).

	CSRG	**GHRM**	**FEB**	**SFP**
CSRG				
GHRM	0,858			
FEB	0,852	0,731		
SFP	0,829	0,701	0,696	

Source: Primary Data Processed, 2025

3.6. Fornell-Larcker Criterion

The Fornell–Larcker criterion was applied to further evaluate discriminant validity among the latent constructs. According to this criterion, discriminant validity is established when the square root of the Average Variance Extracted (AVE) for each construct (diagonal values) exceeds its correlations with other constructs (off-diagonal values).

As shown in Table 5.29, the diagonal values range approximately from 0.73 to 0.84, consistently higher than the corresponding inter-construct correlations.

This indicates that each construct shares more variance with its own indicators than with any other construct in the model. Consequently, the constructs—CSRG, GHRM, PEB, PEPC, and SFP—demonstrate strong discriminant validity and conceptual distinctiveness.

These results confirm that the measurement model is both empirically sound and theoretically coherent, thereby validating its suitability for subsequent structural model analysis and hypothesis testing within the research framework.

Table 6: Fornell-Larcker Criterion.

	CSRG	GHRM	FEB	PEPC	SFP
CSRG					
GHRM	0,858				
FEB	0,852	0,731			
SFP	0,829	0,701	0,696	0,701	

3.7. Construct Reliability

The results of the construct reliability analysis, as presented in Table 5.29, demonstrate that all constructs exhibit excellent internal consistency and reliability. Cronbach's Alpha values range from 0.877 to 0.976, and Composite Reliability (CR) values range from 0.878 to 0.976, both exceeding the recommended threshold of 0.70, indicating strong internal reliability (Hair et al., 2019). Additionally, all Average Variance Extracted (AVE) values are above 0.50, confirming satisfactory convergent validity, as each construct explains more than half of the variance of its indicators. Green Human Resource Management (GHRM) records the highest reliability (α = 0.976; CR = 0.976), while Sustainable Firm Performance (SFP) shows the lowest but still acceptable reliability (α = 0.877; CR = 0.878). Overall, these results confirm that the measurement model demonstrates robust reliability and validity, providing a solid foundation for further structural model evaluation and hypothesis testing.

Table 7: Internal Consistency Reliability.

Yes	Variable	*Cronbach's Alpha* (N=275)	*Composite Reliability* (N=275)	AVE (N=275)	Information
1	*Green Human Resource Management (GHRM)*	0,976	0,976	0,598	Reliable
2	Pro-Environmental Behavior (PEB)	0,910	0,911	0,643	Reliable
3	Green Corporate Social Responsibility (Green CSR)	0,967	0,967	0,539	Reliable
4	Sustainable Firm Performance (SFP)	0,877	0,878	0,537	Reliable

Source: Primary Data Processed, 2025

The results of the structural model fit assessment presented in Table 5.32 indicate that the model demonstrates strong explanatory and predictive capability. The R-squared values for Pro-Environmental Behavior (PEB) at 0.701 and Green Corporate Social Responsibility (GCSR) at 0.807 exceed the threshold of 0.67, signifying a high level of explanatory power, while Sustainable Firm Performance (SFP) records a moderate yet acceptable R-squared value of 0.582, suggesting that over half of its variance is explained by the model's exogenous variables. Meanwhile, Green Human Resource Management (GHRM), as an exogenous construct, does not possess an R-squared value. The Q^2 values derived from the PLSpredict procedure—0.911 for PEB, 0.963 for GCSR, and 0.825 for SFP—are all well above the 0.35 benchmark, indicating strong predictive relevance based on Stone–Geisser's criteria. These findings confirm that the model not only explains substantial variance (R^2) but also demonstrates excellent predictive validity for new data, supported by low predictive error measures. Overall, the model exhibits robust goodness of fit, affirming its adequacy for testing causal relationships among the studied variables.

Table 8: Measure Of Fit Structural Model Test Results.

Yes	**Variable**	**R-squared**	**Q^2**
2	*Green Human Resource Management (GHRM)*	-	-

3	Pro-Environmental Behavior (PEB)	0,701	0,911
4	Green Corporate Social Responsibility (Green CSR)	0,807	0,963
5	Sustainable Firm Performance (SFP)	0,582	0,825

Source: Primary Data Processed, 2025.

The results of the Goodness of Fit (GoF) analysis using the SmartPLS approach, which provides indices and measures of the quality of relationships among latent variables, are presented in Table 5.33. The analysis shows that the Standardized Root Mean Square Residual (SRMR) value is 0.053. Following the principle of parsimony, if at least one model fit criterion is satisfied, the model can be considered acceptable. Since the SRMR value is below the recommended cutoff of 0.10 (Hu & Bentler, 1999), the model can be regarded as having a good fit.

Furthermore, the calculated Goodness of Fit (GoF) value is 0.644, which, according to the criteria proposed by Wetzels et al. (2009), falls within the large category (GoF > 0.36). This indicates that the structural model demonstrates a high degree of consistency between the measurement model (outer model) and the structural model (inner model). In other words, the model exhibits strong explanatory power for the variance of endogenous constructs and demonstrates satisfactory convergent validity, confirming that the model is both statistically sound and theoretically well-constructed.

Table 9: Model Fit and Quality Indices.

Model Fit* and *Quality indices	**Fit Criteria**	**Result**	**Information**
Standardized Root Mean Square Residual (SRMR)	Cut off < 0.10 (Hu and Betler, 1999)	0.053	Good
Gof Index	> 0.36	$\sqrt{\square\square\square^2\square\square^2} = (0{,}570)(0{,}729) = 0{,}644$	Good

Source: Primary Data Processed, 2025.

3.8. Testing Research Models

The results of the inner model analysis presented in Table 5.34 indicate that all Variance Inflation Factor (VIF) values are below the threshold of 5.0, suggesting the absence of multicollinearity among the variables in the structural model. The VIF values, ranging from 1.013 to 1.719 for the relationships between Green Human Resource Management (GHRM), Pro-Environmental Behavior (PEB), Green Corporate Social Responsibility (GCSR), and Sustainable Firm Performance (SFP), fall within acceptable limits. This implies that each construct contributes uniquely to the model without redundancy among predictors. Therefore, the model satisfies the collinearity assumption, ensuring that the estimated path coefficients are reliable, unbiased, and statistically valid in representing the causal relationships among the variables.

Table 10: Inner Model.

	VIVID
GHRM -> PEB	1,013
PEB -> CSRG	1,719
CSRG -> SFP	1,000

3.9. Hypothesized Structural Equation Model (SEM) By PLS-Bootstrapping

The results of the PLS-bootstrapping analysis presented demonstrate that both hypothesized direct relationships are positive and statistically significant ($p < 0.001$), indicating strong and meaningful associations among the examined constructs.

Table 11: Results Of Testing the Relationship Between Direct Influence Variables.

Hypothesis	**Relationships Between Variables**	***Path Coefficients***	***T statistics***	***ρ-value***	**Information**	***F Square***
H1	GHRM → PEB	0,736	24,286	<0.001**	Significant	1,786
H2	H3	PEB → GCSR	0,452	12,961	<0.001**	0,617
H3	GCSR → SFP	0,763	30,595	<0.001**	Significant	1,394

****) = Significant At the Level Of 0.05 (5%).**

Source: Primary Data Processed, 2025.

The results of the PLS-bootstrapping analysis presented in Table 5.35 demonstrate that both hypothesized direct relationships are positive and statistically significant ($p < 0.001$), indicating strong and meaningful associations among the examined constructs. The first hypothesis (H1) shows that

Green Human Resource Management (GHRM) has a substantial and significant positive effect on Pro-Environmental Behavior (PEB), as reflected by a path coefficient of 0.736, a t-value of 24.286, and a 95% confidence interval ranging from 0.669 to 0.792. These results imply that effective implementation of GHRM practices substantially enhances employees' pro-environmental actions within the organization. The large effect size ($f^2 = 1.786$) further confirms that GHRM is a critical determinant in fostering pro-environmental behavior. Meanwhile, the second hypothesis (H2) indicates that Green Corporate Social Responsibility (GCSR) exerts a significant positive influence on Sustainable Firm Performance (SFP), with a path coefficient of 0.763, a t-value of 30.595, and a confidence interval between 0.710 and 0.809. This strong and stable relationship suggests that the higher the implementation of green CSR initiatives, the greater the firm's overall sustainable performance across economic, social, and environmental dimensions. The large effect size ($f^2 = 1.394$) reinforces the importance of GCSR as a major driver of long-term corporate sustainability. Collectively, these findings confirm that both GHRM and GCSR play pivotal roles in advancing environmentally responsible behavior and achieving superior sustainable performance outcomes within organizations.

Table 11: Results of Testing the Relationship Between Direct Influence Variables.

Hypothesis	Relationships Between Variables	*Path Coefficients*	*T statistics*	*ρ-value*	Information	*F Square*
H1	GHRM → PEB	0,736	24,286	<0.001**	Significant	1,786
H2	PEB → GCSR	0,452	12,961	<0.001**	Significant	0,617
H3	GCSR → SFP	0,763	30,595	<0.001**	Significant	1,394

****) = Significant At the Level Of 0.05 (5%).**
Source: Primary Data Processed, 2025.

The results of the indirect relationship testing presented in Table 7, reveal that several mediation effects significantly strengthen the structural model. Specifically, Pro-Environmental Behavior (PEB) is found to partially mediate the relationship between Green Human Resource Management (GHRM) and Green Corporate Social Responsibility (GCSR), with an indirect path coefficient of 0.333, t = 11.495, and $p < 0.001$. This finding indicates that GHRM influences GCSR both directly and indirectly through employees' environmentally responsible behaviors, emphasizing the critical behavioral pathway through which green HR practices enhance corporate environmental responsibility. Furthermore, a significant three-path mediation is observed in the relationship between GHRM and Sustainable Firm Performance (SFP) through PEB and GCSR, with an indirect path coefficient of 0.254, t = 10.902, and $p < 0.001$, confirming partial mediation. This suggests that green-oriented HR practices not only directly contribute to improved sustainable performance but also indirectly enhance it by fostering pro-environmental behaviors that lead to stronger CSR engagement. Overall, these findings highlight the central mediating role of PEB in translating GHRM initiatives into greater environmental and sustainability outcomes, demonstrating that employee behavioral change is a crucial mechanism linking human resource management practices to corporate sustainability performance.

3.10. Testing The Relationship Between Indirect Influence Variables

Table 12: Results Of Testing the Relationship Between Indirect Influence Variables.

Yes	Relationships between variables	Path coefficient	*T statistics*	P-Value
H4	GHRM→PEB→GCSR	0,333	11,495	< 0.001**
H5	GHRM→PEB→CSR→SFP	0,254	10,902	< 0.001**

****) = Significant At the Level Of 0.05 (5%).**
Source: Primary Data Processed, 2025.

4. DISCUSSION

The empirical results of this study strongly support the proposed structural model, confirming the significant relationships among Green Human Resource Management (GHRM), Pro-Environmental Behavior (PEB), Green Corporate Social Responsibility (GCSR), and Sustainable Firm Performance (SFP). The PLS-bootstrapping analysis revealed that GHRM exerts a substantial positive influence on employees' pro-environmental behavior ($\beta = 0.736$, $p < 0.001$). This result highlights the central role of green-oriented HR practices in developing environmental consciousness and behavioral commitment within organizations. Consistent with the Ability–Motivation–Opportunity (AMO) theory, effective implementation of GHRM policies enhances employees' competencies, motivation, and

opportunities to engage in environmentally responsible behaviors (Bos-Nehles et al., 2017; Renwick et al., 2013). These findings are also aligned with the observations of Amrutha and Geetha (2020) and Ahmad et al. (2023), who demonstrated that green HR practices, when integrated into recruitment, training, and reward systems, significantly improve employees' environmental engagement.

The finding that GHRM positively affects PEB is supported by several empirical studies showing that when employees perceive strong environmental values embedded in HRM systems, they are more likely to exhibit voluntary ecological behaviors (Afsar & Umrani, 2020; Naz et al., 2023; Nguyen et al., 2025). According to the Theory of Planned Behavior (Ajzen, 1991), such behaviors emerge when individuals have favorable attitudes toward environmental actions, perceive social support for such actions, and believe they possess control over their behavior. In PT Hutan Sawit Lestari, this mechanism is evident in the cultivation of eco-friendly practices such as waste reduction, energy efficiency, and sustainable farming methods. These outcomes mirror the findings of Malik et al. (2021), who emphasized that the success of green HRM depends on employees perceived behavioral control and organizational support. Thus, the current results reaffirm that HR policies represent not just administrative systems but strategic levers shaping employees' environmental identity.

The results of the hypothesis testing reveal that Pro-Environmental Behavior (PEB) exerts a significant and positive effect on Green Corporate Social Responsibility (GCSR) ($\beta = 0.452$, $t = 12.961$, $p < 0.001$), indicating that employees' environmentally responsible actions play a pivotal role in strengthening corporate sustainability initiatives. This finding suggests that CSR success is not only dependent on top-down policies but also on the extent to which employees internalize and enact pro-environmental values in their daily work routines. Afsar and Umrani (2020) emphasized that employees' voluntary eco-friendly behaviors form the behavioral infrastructure that drives corporate environmental strategies. Similarly, Ahmad et al. (2023) demonstrated that organizations fostering green behaviors through supportive HR practices experience greater alignment between individual motivation and collective CSR objectives. Within the context of PT Hutan Sawit Lestari, where sustainable operations depend on employee discipline in resource use and waste management, such individual ecological consciousness directly enhances the firm's ability to meet environmental and social obligations embedded within GCSR frameworks.

This empirical relationship further validates the theoretical premise that CSR performance emerges as an extension of employees' psychological commitment to environmental values. As Hameed et al. (2024) argued, employees' green attitudes and practices create an internal climate that amplifies CSR implementation and improves public legitimacy. Naz et al. (2023) also found that when workers perceive their organization as environmentally responsible, they are more likely to engage in green citizenship behaviors, reinforcing CSR credibility and continuity. In line with Ziyadeh et al. (2024), this study confirms that employee-level environmental engagement serves as a critical micro-foundation linking organizational behavior to sustainable social performance. For PT Hutan Sawit Lestari, the implication is that empowering employees through environmental education, participatory programs, and reward systems not only fosters pro-environmental conduct but also ensures that CSR initiatives are authentically embedded in everyday operations, ultimately enhancing the company's long-term sustainability and stakeholder trust.

The analysis further revealed that GCSR has a strong and positive effect on Sustainable Firm Performance ($\beta = 0.763$, $p < 0.001$). This suggests that corporate social responsibility initiatives focused on environmental sustainability substantially enhance organizational outcomes across social, ecological, and economic dimensions. This finding aligns with Carroll's (2021) conceptualization of CSR as a multidimensional construct that creates shared value by integrating ethical, social, and environmental imperatives into business strategy. Empirical studies by Ali et al. (2023), Luo and Qu (2023), and Úbeda-García et al. (2021) have likewise shown that environmentally oriented CSR initiatives enhance firms' legitimacy, stakeholder trust, and financial performance. In the Indonesian context, Nawangsari and Wardhani (2022) also found that GCSR in palm oil companies directly contributes to employee engagement and long-term competitiveness. For PT Hutan Sawit Lestari, the implementation of CSR programs related to environmental conservation, local community empowerment, and transparent reporting has strengthened its reputation and sustained its operational performance amid global environmental scrutiny.

The partial mediation effect of PEB in the relationship between GHRM and GCSR provides

new insight into the behavioral mechanisms underlying corporate sustainability. The significant indirect path (β = 0.333, p < 0.001) indicates that employees act as behavioral transmitters linking HR practices to CSR outcomes. This confirms earlier research suggesting that GHRM influences CSR indirectly by fostering employees' environmental attitudes, commitment, and voluntary participation in sustainability programs (Hameed et al., 2024; Zafar & Suseno, 2024). Afsar and Umrani (2020) and Paillé and Boiral (2013) also emphasized that employees who internalize environmental values through HRM systems are more likely to support organizational sustainability initiatives. In PT Hutan Sawit Lestari, such behaviors manifest in field-level environmental protection activities, such as reforestation efforts and biodiversity monitoring. These findings support the argument of Jabbour and Renwick (2018) that environmental behavior at work serves as the micro-foundation for successful CSR implementation.

The results also confirm the sequential mediation of PEB and GCSR between GHRM and SFP (β = 0.254, p < 0.001), demonstrating that the impact of green HR practices extends beyond individual behaviors to organizational performance. This sequential relationship highlights that sustainability-oriented HRM practices initially influence employee attitudes and behaviors, which subsequently enhance CSR engagement and drive firm-level outcomes. The present finding extends the work of Danish et al. (2025) and Ziyadeh et al. (2024), who established that CSR and PEB function together as mediators linking GHRM with sustainable performance. Similarly, Alam et al. (2023) found that employees' pro-environmental engagement strengthens the relationship between HR practices and environmental performance in developing economies. This study's results affirm that behavioral transformation among employees serves as a catalyst for achieving collective environmental and social objectives that improve firm competitiveness.

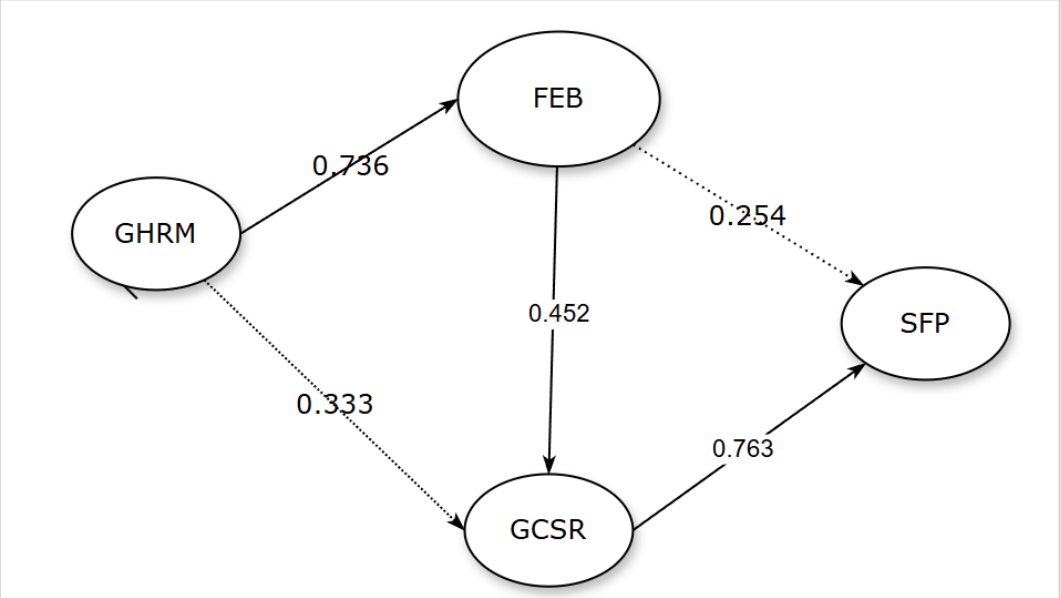

Fig 2: Path Coefficient.

From a theoretical perspective, these findings advance the integration of the AMO framework (Bos-Nehles et al., 2017) and the Theory of Planned Behavior (Ajzen, 1991) in explaining sustainability-oriented human resource systems. Together, these frameworks elucidate how individual capabilities, motivations, and opportunities interact with psychological determinants—attitudes, norms, and perceived control—to shape pro-environmental action. Empirical support for this theoretical integration can be found in the studies of Hameed, Khan, and Islam (2022) and Chouhan (2025), who demonstrated that green HRM initiatives foster green self-efficacy and environmental concern that subsequently led to measurable sustainability outcomes. Thus, the present research contributes to the literature by offering an empirically validated model that bridges micro-level behavioral processes and macro-level performance outcomes through HR-driven sustainability mechanisms.

The contextual implications of these findings are especially relevant to Indonesia's palm oil sector. Prior studies have identified this industry as environmentally sensitive, facing pressures from deforestation, biodiversity loss, and international sustainability standards (Musofa et al., 2021;

Murshed et al., 2021). The present study provides evidence that human-centered approaches—through HR systems and behavioral engagement—can mitigate these challenges. Consistent with the work of Nawangsari and Wardhani (2022), embedding environmental awareness into HR practices promotes stronger employee compliance with sustainability regulations and voluntary participation in environmental programs. Moreover, this supports the argument of Bombiak and Marciniuk-Kluska (2018) that GHRM represents a critical organizational capability for aligning economic productivity with ecological responsibility in emerging markets.

The managerial implications of these results are equally significant. Organizations seeking to improve sustainable performance should institutionalize GHRM as a strategic function that shapes environmental values and behavioral norms. Managers must design HR systems that incorporate environmental criteria in recruitment, appraisals, and rewards while ensuring continuous green training to enhance employee skills (Jackson et al., 2011; Renwick et al., 2013). Linking GHRM with CSR strategies also ensures that sustainability initiatives are both internally motivated and externally visible. This integrated approach echoes the recommendations of El-Kassar and Singh (2018) and Dao et al. (2011), who argue that organizational sustainability depends on aligning human, technological, and strategic resources. For PT Hutan Sawit Lestari, this implies that HR practices should not only focus on compliance but on cultivating an enduring culture of environmental stewardship throughout all levels of operation.

Finally, the evidence from this research underscores that sustainable firm performance in resource-intensive sectors is a multifaceted construct emerging from the synergy of individual, organizational, and strategic factors. The sequential mediation effect found in this study demonstrates that the path from GHRM to sustainability outcomes is not linear but behavioral and systemic. These findings corroborate the perspectives of Malik et al. (2021) and Úbeda-García et al. (2021), who contend that achieving sustainability requires embedding environmental values into both corporate systems and human mindsets. Overall, this study contributes to the growing body of literature affirming that sustainability in industries like palm oil is attainable when organizations integrate green HRM, encourage pro-environmental behavior, and implement genuine CSR practices that translate ecological responsibility into long-term competitive advantage.

5. THEORETICAL AND MANAGERIAL IMPLICATIONS

From a theoretical standpoint, this study enriches the growing body of knowledge on Green Human Resource Management (GHRM) by empirically validating its role as a driver of sustainability through behavioral and organizational mechanisms. The integration of the Ability–Motivation–Opportunity (AMO) framework (Bos-Nehles et al., 2017) and the Theory of Planned Behavior (Ajzen, 1991) provides a multi-level explanation of how organizational systems and individual cognition interact to produce pro-environmental outcomes. The findings demonstrate that GHRM not only enhances employee capability and motivation but also shapes the psychological conditions necessary for sustainable action. This hybrid theoretical approach confirms earlier assertions by Amrutha and Geetha (2020) and Ahmad et al. (2023) that human resource systems are central to embedding sustainability into organizational routines. It extends these frameworks by demonstrating that the effect of GHRM on sustainable firm performance is transmitted through a dual mediation process—first through employees' pro-environmental behavior and subsequently through the strengthening of corporate social responsibility.

In addition, the study contributes to sustainability theory by illustrating that corporate environmental performance emerges from an alignment between micro-level behavioral factors and macro-level institutional practices. The sequential mediation mechanism empirically validates the behavioral-to-organizational pathway proposed by Afsar and Umrani (2020) and Danish et al. (2025), providing evidence that employees' voluntary environmental actions are critical for translating HR strategies into firm-level sustainability outcomes. The findings also corroborate Malik et al. (2021) and Ziyadeh et al. (2024), who emphasized that corporate social responsibility acts as a bridge between internal human capital practices and external sustainability performance. By focusing on PT Hutan Sawit Lestari—a resource-intensive palm oil company—this research expands the empirical boundaries of GHRM theory to developing economies, where the human element of sustainability remains underexplored. Hence, the study advances theory by confirming that behavioral engagement, when fostered through green HR systems, becomes the foundation of environmental and social value creation.

From a managerial perspective, the results highlight that human resource departments must be

repositioned as strategic partners in achieving corporate sustainability rather than as administrative units. Managers should design HRM policies that embed environmental objectives into all core functions—recruitment, training, performance appraisal, and compensation (Renwick et al., 2013; Jackson et al., 2011). For instance, green recruitment ensures the selection of employees with pro-environmental values, while continuous green training builds their capacity for sustainable innovation. Moreover, incorporating environmental performance metrics into appraisal and reward systems strengthens the behavioral reinforcement process identified in this study. These managerial practices ensure that sustainability is institutionalized not only at the strategic level but also within daily operations. For PT Hutan Sawit Lestari, aligning HR functions with environmental goals can enhance productivity while meeting international sustainability certification standards such as RSPO.

Another key managerial implication lies in recognizing the mediating role of employee behavior in the success of sustainability programs. The results indicate that even the most comprehensive CSR strategies can fail if employees are not actively engaged in implementing them (Hameed et al., 2024; Zafar & Suseno, 2024). Managers must therefore cultivate a workplace climate that supports environmental commitment and psychological ownership of sustainability initiatives. This includes fostering participatory decision-making, providing recognition for green contributions, and enabling opportunities for collaboration in CSR activities. Studies by Naz et al. (2023) and Nguyen et al. (2025) confirm that such green psychological climates significantly enhance employees' willingness to engage in sustainable practices. For PT Hutan Sawit Lestari, empowering employees to participate in community-based environmental projects can not only strengthen CSR credibility but also promote long-term employee satisfaction and retention.

Finally, the findings have significant implications for policymakers and industry leaders in the broader context of sustainable development in emerging economies. The palm oil industry, often criticized for deforestation and carbon emissions, can greatly benefit from institutional frameworks that mandate green HR policies as part of environmental governance. Government agencies and sustainability regulators should promote GHRM adoption through incentives, training programs, and policy integration. Aligning public sustainability goals with organizational HR practices would reinforce the behavioral transformation necessary for achieving national environmental targets. As emphasized by Alam et al. (2023) and Nawangsari and Wardhani (2022), environmental sustainability in developing economies depends not only on technology or policy but also on human engagement. Therefore, this study's insights underscore that sustainable competitiveness requires organizations to develop a workforce that embodies environmental stewardship, ensuring that human resources become the catalyst for long-term sustainability and ethical corporate conduct.

6. CONCLUSIONS AND RECOMMENDATIONS

The main objective of this study was to develop and empirically validate a sequential mediation model that explains how Green Human Resource Management (GHRM) contributes to Sustainable Firm Performance (SFP) through the mediating effects of Pro-Environmental Behavior (PEB) and Green Corporate Social Responsibility (GCSR). Based on data collected from 275 employees of PT Hutan Sawit Lestari, a palm oil company in Indonesia, and analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS), the study confirms that GHRM plays a pivotal role in enhancing both individual and organizational sustainability outcomes. The empirical results demonstrate that green-oriented HR practices—such as recruitment and selection based on environmental values, green training and development, and performance-based environmental incentives—significantly promote employees' environmental awareness, commitment, and behavioral engagement. These findings affirm that human resource systems are central to developing an environmentally responsible organizational culture.

Furthermore, the results validate the sequential mediating mechanism proposed in the conceptual model. Employees' pro-environmental behaviors serve as an essential behavioral pathway through which GHRM practices influence GCSR initiatives, which subsequently improve sustainable firm performance. This pattern confirms that sustainability in organizations operates through both micro-level and macro-level processes: the behavioral engagement of employees (PEB) strengthens the institutionalization of corporate environmental responsibility (GCSR), and together, these mechanisms lead to improved financial, social, and environmental outcomes. Therefore, GHRM acts as a strategic enabler that transforms organizational sustainability goals into measurable performance through the alignment of individual values,

behavior, and corporate responsibility.

From a theoretical perspective, the study contributes to the integration of the Ability–Motivation–Opportunity (AMO) framework and the Theory of Planned Behavior (TPB) in the sustainability context. The results demonstrate that employees are more likely to exhibit environmentally responsible behavior when organizations provide them with the necessary skills (ability), motivation (incentives and recognition), and opportunities (participation in environmental programs). This theoretical integration enriches existing GHRM literature by extending its applicability to developing economies and resource-based industries, particularly the palm oil sector, where sustainability challenges are complex and multifaceted.

From a practical standpoint, the findings emphasize the need for companies such as PT Hutan Sawit Lestari to **institutionalize GHRM as a strategic management function** rather than an administrative practice. HR policies should integrate sustainability indicators into recruitment, training, and performance evaluation systems to ensure environmental objectives are embedded at all organizational levels. Aligning employee-level pro-environmental behavior with corporate-level CSR programs will strengthen the firm's environmental reputation and long-term competitiveness. Managers should also cultivate continuous learning environments that reinforce environmental responsibility through participatory initiatives and transparent reporting mechanisms.

For future research, longitudinal and multi-sectoral studies are recommended to capture the dynamic evolution of GHRM's effects on sustainability outcomes over time. Including external stakeholders, such as suppliers and local communities, could further clarify how HR-driven environmental behavior extends beyond organizational boundaries. Overall, the study concludes that fostering a green organizational culture through effective HRM systems is a crucial pathway to achieving **sustainable firm performance**, particularly in environmentally sensitive and resource-intensive industries such as palm oil.

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