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How Green Human Resource Management Enhances Sustainable Performance: Organizational Green Culture and Top Management Support

Bagaimana Manajemen Sumber Daya Manusia Hijau Meningkatkan Kinerja Berkelanjutan: Budaya Hijau Organisasi dan Dukungan Manajemen Puncak

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Abstract

This study examines the effect of green human resource management (GHRM) on environmental and social performance, with organizational green culture (OGC) as a mediator and top management support (TMS) as a moderator. Data from 197 respondents at a manufacturing company in East Kalimantan were analyzed via PLS-SEM in SmartPLS. Results show GHRM significantly affects OGC, environmental performance, and social performance, though negatively for the latter. OGC significantly influences environmental but not social performance, and does not mediate the GHRM-performance relationship. TMS does not moderate the OGC-performance relationships. These findings indicate that strengthening GHRM practices directly, rather than through organizational culture or top management support, is the more critical driver of corporate sustainability.

Keywords: Environmental Performance, Green Human Resource Management, Organizational Green Culture, Social Performance, Top Management Support.

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Abstrak

Penelitian ini menguji pengaruh green human resource management *(GHRM) terhadap kinerja lingkungan dan kinerja sosial, dengan budaya hijau organisasi (OGC) sebagai mediator dan dukungan manajemen puncak (TMS) sebagai moderator. Data dari 197 responden pada sebuah perusahaan manufaktur di Kalimantan Timur dianalisis menggunakan PLS-SEM melalui SmartPLS. Hasil penelitian menunjukkan bahwa GHRM berpengaruh signifikan terhadap OGC, kinerja lingkungan, dan kinerja sosial, meskipun berpengaruh negatif pada kinerja sosial. OGC berpengaruh signifikan terhadap kinerja lingkungan tetapi tidak terhadap kinerja sosial, dan tidak memediasi hubungan GHRM dengan kinerja. TMS tidak memoderasi hubungan antara OGC dan kinerja. Temuan ini menunjukkan penguatan praktik GHRM secara langsung, dan bukan melalui budaya organisasi atau dukungan manajemen puncak, merupakan pendorong yang lebih penting bagi keberlanjutan perusahaan.*

Kata kunci: *Budaya Hijau Organisasi; Dukungan Manajemen Puncak; Kinerja Lingkungan; Kinerja Sosial; Manajemen Sumber Daya Manusia Hijau*.

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INTRODUCTION

Controlling industrial emissions is central to global climate mitigation. The Paris Agreement requires global greenhouse gas emissions to peak before 2025 and fall by roughly 43 percent by 2030 (United Nations Framework Convention on Climate Change, 2016). Yet energy-related CO2 emissions still rose 0.8 percent in 2024 to about 37.8 gigatonnes, with manufacturing alone responsible for roughly 25 percent of direct carbon emissions (International Energy Agency, 2025; State of Green, 2025).

As a developing country where manufacturing underpins the economy, Indonesia faces 31,795 medium- and large-scale manufacturing companies (Badan Pusat Statistik, 2024), a production index that only recently rebounded after falling in 2021–2023 (BPS Produksi Indonesia, 2025), and the largest share of national final energy consumption at 46 percent (Ministry of Energy and Mineral Resources Republic of Indonesia, 2024), pushing green industry policy toward energy efficiency and low-carbon technology (Moosmann *et al*., 2025). Green Human Resource Management (GHRM) integrates sustainability into HR functions such as recruitment, training, evaluation, and compensation (Renwick *et al*., 2013), fostering pro-environmental behavior (Fathurohman *et al*., 2025) and strengthening environmental performance (Jabbour & Santos, 2008; Ribeiro *et al*., 2022), while Akbar *et al*. (2024) reporting that about 68 percent of adopting firms saw measurable environmental gains.

However, the GHRM and Sustainable Performance link is not always direct, pointing to a need for mediating and moderating mechanisms. Organizational Green Culture (OGC) the shared values and norms that encourage environmentally friendly behavior (Wahyu *et al*., 2025) is thought to bridge GHRM policy and employee behavior (Ali *et al*., 2024). Top Management Support (TMS) acts as a boundary condition determining whether green practices are implemented substantively or only symbolically (Ahmad *et al*., 2022; Nugroho *et al*., 2021).

Empirical studies also reveal inconsistent results regarding the relationships between the core variables of this research, as summarized in Table 1. This inconsistency underscores the need for re-examination in a new context. This study therefore examines the effect of GHRM on Environmental and Social Performance, with OGC as mediator and TMS as moderator, in a manufacturing company in East Kalimantan is enriching empirical evidence from Indonesia's manufacturing sector, an area still underexplored relative to Europe, the United States, China, and India. Thus, this topic is considered still interesting to explore further.

Table 1. Summary of Research Gap

Relationship	**Researcher**	**Result**
GHRM → Environmental Performance	Gazi *et al*. (2024)	Negative
	Elshaer *et al*. (2021)	Positive
	Aggarwal & Agarwala (2023)	Positive
GHRM → Social Performance	Gazi *et al*. (2024)	Negative
	Montalvo-Falcón *et al*. (2023)	Positive
	Tessema (2025)	Positive

Sumber: Literature review (compiled), 2026.

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LITERATURE REVIEW

This study draws on the natural resource-based view (NRBV) (Hart, 1995), an extension of the resource-based view (Barney, 1991), and dynamic capabilities theory (Teece, 2025). NRBV holds that sustainable advantage rests on pollution prevention, product stewardship, and sustainable development, explaining how GHRM builds sustainability performance through OGC and top management support; dynamic capabilities theory explains how organizations sense, seize, and transform in response to environmental demands, with GHRM supporting each stage through training, green recruitment/compensation, and performance appraisal (Al-Shammari *et al*., 2022).

Green Human Resource Management

Green human resource management (GHRM) is the systematic integration of environmental sustainability into HR practices (Mustafa *et al*., 2023), typically covering green recruitment, training, performance management, pay, and employee involvement (AlKetbi & Rice, 2024). Grounded in NRBV, GHRM builds internal environmental capabilities that are valuable and hard to imitate (Hart, 1995) and consistently strengthens sustainability outcomes across both SME and cross-industry settings (Al-Shammari *et al*., 2022; Mustafa *et al*., 2023).

Organizational green culture (OGC) is the shared values, beliefs, and norms that orient members toward environmental preservation (Huynh *et al*., 2024), commonly assessed by degree, diffusion, and depth (Aggarwal & Agarwala, 2023; Villar & Guevara, 2025). As an NRBV resource, OGC both directly drives sustainability outcomes and transmits GHRM's effect on environmental performance (Altassan, 2023; Huynh *et al*., 2024).

Top management support (TMS) reflects senior leaders' commitment to sustainability through resource allocation, targets, and direct involvement (Hasan *et al*., 2024; Memon *et al*., 2022), positioned in NRBV and dynamic capabilities theory as a boundary condition for organizational response to environmental demands (Faisal, 2023). Prior studies show TMS both strengthens environmental performance directly (Memon *et al*., 2022) and reinforces the GHRM and sustainability link (Gazi *et al*., 2024).

Sustainable Performance

Sustainable performance reflects an organization's long-term capacity across economic, environmental, and social dimensions (Kumar & Choubey, 2023; Nugrahani & Artanto, 2022). This study focuses on the environmental and social dimensions, following Tanveer *et al*. (2023) and Aftab *et al*. (2023), since GHRM's effect on economic performance is often constrained by the cost of green technology in developing countries.

Environmental performance is the extent to which organizational activity yields positive environmental outcomes through resource efficiency, waste reduction, and green technology (Arsawan *et al*., 2025). Its link with GHRM is rarely direct, and is consistently strengthened by factors such as environmental strategy (Arsawan *et al*., 2025) or green culture (Hutabarat & Sulistyaningsih, 2025).

Social performance captures an organization's contribution to stakeholder welfare employees, communities, suppliers, and consumers is through fair and inclusive practice (Alshebami *et al*., 2023). Sustainability practices including GHRM and green leadership are generally linked positively to social performance, with TMS strengthening that link (Gazi *et al*., 2025; Singh *et al*., 2022).

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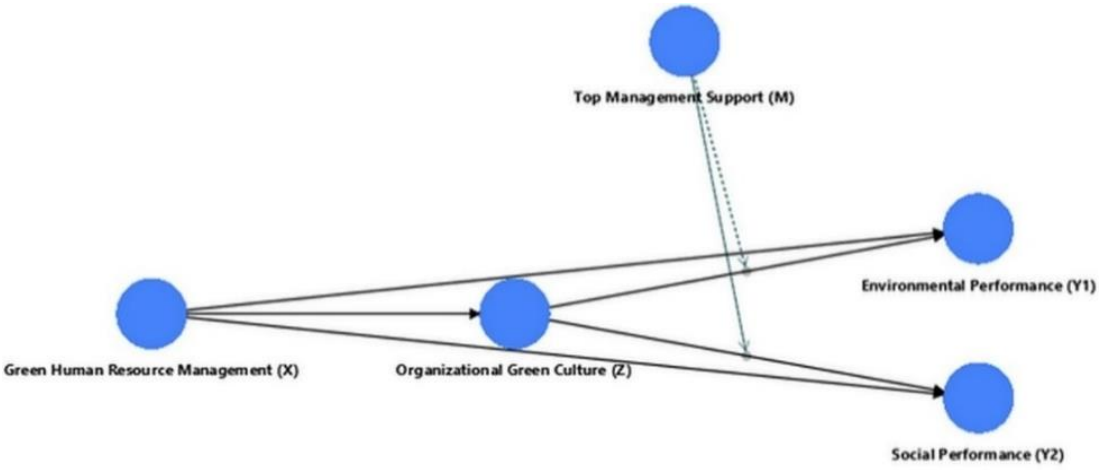


Figure 1. Research Framework
Sumber: Developed by the Researcher, 2026.

Hypothesis Development

Based on this review, the relationships among variables are illustrated below and formulated into nine hypotheses. Hypothesized relationship patterns are shown in Figure 1. Therefore, the following hypothesis is proposed:

H1: GHRM has a positive and significant effect on OGC.

H2: GHRM has a positive and significant effect on environmental performance.

H3: GHRM has a negative and significant effect on social performance.

H4: OGC has a positive and significant effect on environmental performance.

H5: OGC has a negative but not significant effect on social performance.

H6: GHRM does not have a significant effect on environmental performance through OGC.

H7: GHRM does not have a significant effect on social performance through OGC.

H8: TMS does not does not significantly strengthen the relationship between OGC and environmental performance.

H9: TMS does not does not significantly strengthen the relationship between OGC and social performance.

METHOD

This study uses a quantitative, explanatory design to test the effect of GHRM on environmental and social performance, with OGC as mediator and TMS as moderator, at a manufacturing company in East Kalimantan (anonymized). All 197 employees were surveyed via census sampling given the limited population, using a 1–5 Likert questionnaire. GHRM as environmentally oriented HR practice (AlKetbi & Rice, 2024; Chowdhury *et al*., 2025); OGC as sustainability-supporting organizational values (Aggarwal & Agarwala, 2023, 2025; Shetty & Koodamara, 2026); environmental/social performance as organizational achievement in those domains (Ferehoun *et al*., 2024; Xue *et al*., 2022); and, TMS as management backing for sustainability strategy (Fareed *et al*., 2023; Patu *et al*., 2023; Syafitri *et al*., 2024).

Data were analyzed with partial least squares structural equation modeling (PLS-SEM) in SmartPLS. The outer model was assessed via convergent validity (loading ≥ 0.70; AVE > 0.50),

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discriminant validity (Fornell-Larcker, HTMT), and reliability (Cronbach's Alpha, Composite Reliability > 0.70) (Ghozali & Latan, 2014). The inner model was assessed via R^2, F^2, SRMR, VIF, and direct/indirect/moderation effects, with hypotheses tested by bootstrapping at 5 percent significance level.

RESULTS

Respondent characteristics are summarized by age, gender, education and tenure in Table 2. Most respondents fall in the 43-46 age range (20.30 percent) and are predominantly male (91.88 percent), reflecting the workforce structure at the research site. The majority hold a high school/vocational education (64.47 percent) is sufficient to understand company policy and have 10-12 years of tenure (31.47 percent), indicating broad familiarity with company dynamics and culture.

Measurement Model Evaluation (Outer Model)

Measurement model testing assessed outer loadings, construct reliability, and convergent validity (AVE), shown in Tables 3 and 4. Results showed all outer loadings exceed 0.70, and the Fornell-Larcker and HTMT criteria confirm discriminant validity (Ghozali & Latan, 2014). Cronbach's alpha (0.865–0.914), composite reliability (0.901–0.936), and rho_a (0.871–0.924) all exceed 0.70, and AVE (0.647–0.788) exceeds 0.50, confirming reliability and convergent validity; the model therefore proceeds to structural evaluation.

Structural Model Evaluation (Inner Model)

The structural model was evaluated via R^2 (Table 5), effect size F^2 (Table 6), model fit SRMR (Table 7), and collinearity VIF (Table 8). Results showed environmental performance shows the highest R^2 (0.561), indicating GHRM and OGC jointly explain a substantial share of environmental outcomes, while the low R^2 for social performance (0.122) suggests other unmodeled factors are also at work. Consistently, exogenous variables contribute moderately to environmental performance but only marginally to social performance (Table 9) plausibly because most respondents are operational-level staff whose views on the firm's social dimension are less shaped by strategic factors like green HR policy, culture, or top management support.

Table 2. Results of Descriptive Statistics

	Range	Frequency	Percentage
Age (years)	27–30	15	7.61
	31–34	22	11.17
	35–38	28	14.21
	39–42	35	17.77
	43–46	40	20.30
	47–50	30	15.23
	51–54	18	9.14
	55–58	9	4.57
Education	High School/Vocational School/Equivalent	127	64.47
	Diploma (D1/D2/D3)	41	20.81
	Bachelor (S1)	21	10.66
	Master (S2)	8	4.06
	Doctoral (S3)	0	0.0
Gender	Male	181	91.88
	Female	16	8.12
Length of Service (years)	1–3	8	4.06
	4–6	20	10.15
	7–9	29	14.72
	10–12	62	31.47
	13–15	45	22.84
	16–18	25	12.69
	19–20	8	4.06

Source: Primary Data (processed), 2026.

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Table 3. Summary of Second-Order Construct Outer Loadings

Constructs	Outer Loadings
M1.1 ← *Top Management Support* (M)	.866
M1.2 ← *Top Management Support* (M)	.901
M1.3 ← *Top Management Support* (M)	.803
M1.4 ← *Top Management Support* (M)	.880
M1.5 ← *Top Management Support* (M)	.865
X.1.1 ← *Green Human Resource Management* (X)	.879
X1.2 ← *Green Human Resource Management* (X)	.889
X1.3 ← *Green Human Resource Management* (X)	.808
X1.4 ← *Green Human Resource Management* (X)	.751
Y1.1 ← *Environmental Performance* (Y1)	.857
Y1.2 ← *Environmental Performance* (Y1)	.773
Y1.3 ← *Environmental Performance* (Y1)	.804
Y1.4 ← *Environmental Performance* (Y1)	.910
Y2.1 ← *Social Performance* (Y2)	.844
Y2.2 ← *Social Performance* (Y2)	.790
Y2.3 ← *Social Performance* (Y2)	.816
Y2.4 ← *Social Performance* (Y2)	.824
Y2.5 ← *Social Performance* (Y2)	.891
Z1.1 ← *Organizational Green Culture* (Z)	.893
Z1.2 ← *Organizational Green Culture* (Z)	.853
Z1.3 ← *Organizational Green Culture* (Z)	.915

Source: Primary Data (processed), 2026.

Table 4. Reliability and Convergent Validity (Construct Reliability & Validity)

Construct	Cronbach's Alpha	rho_a	rho_c (CR)	AVE
Environmental Performance	.865	.871	.903	.651
Green Human Resource Management	.865	.899	.901	.647
Organizational Green Culture	.866	.888	.917	.788
Social Performance	.891	.923	.919	.695
Top Management Support	.914	0,924	.936	.745

Criteria: Cronbach's Alpha and Composite Reliability (rho_c) > 0.70; AVE > 0.50.
Source: Primary Data (processed), 2026.

Table 5. R-Square Values

Endogenous Variable	R^2
Organizational Green Culture	.282
Environmental Performance	.561
Social Performance	.122

Source: Primary Data (processed), 2026.

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Table 6. Effect Size (F-Square)

Variable Relationship	F^2	Category
GHRM → Environmental Performance	.254	Moderate
OGC → Environmental Performance	.239	Moderate
TMS → Environmental Performance	.248	Moderate
TMS × OGC → Environmental Performance	.076	Small
GHRM → Social Performance	.057	Small
OGC → Social Performance	.000	None
TMS → Social Performance	.018	Small
TMS × OGC → Social Performance	.059	Small

Cohen's (1988) criteria: $f^2 \geq 0.02$ small; ≥ 0.15 moderate; ≥ 0.35 large.
Source: Primary Data (processed), 2026.

Table 7. Model Fit (Saturated Model and Estimated Model)

Indicator	Saturated Model	Estimated Model
d_ULS	1.946	2.671
d_G	1.194	1.240
SRMR	.092	0.108
NFI	.677	0.675
Chi-Square	262.168	264.072

Criteria: SRMR < 0.08 indicates good fit; SRMR ≤ 0.10 is still considered acceptable fit for conventional CB-SEM models (Hu & Bentler, 1999).
Source: Primary Data (processed), 2026.

Table 8. Results of Collinearity Test (Variance Inflation Factor)

Variable Relationship	VIF	Criteria
GRHM → OGC	1.038	No collinearity issue
GRHM → Environmental Performance	1.171	No collinearity issue
OGC → Environmental Performance	1.171	No collinearity issue
GRHM → Social Performance	1.193	No collinearity issue
OGC → Social Performance	1.193	No collinearity issue

Criteria: VIF < 3.3 indicates no collinearity issues or common method bias (ideal); VIF < 5 is still acceptable; VIF ≥ 5 indicates serious multicollinearity among predictor variables (Hair *et al.*, 2019).
Source: Primary Data (processed), 2026.

The estimated model's SRMR (0.108) slightly exceeds the 0.08 threshold proposed for CB-SEM by Hu & Bentler (1999), which is methodologically expected given the model's second-order constructs, mediation, and moderation on a moderate sample (n = 197); this threshold's application to PLS-SEM, a method designed for prediction rather than covariance reproduction is itself considered tentative (Hair *et al*., 2019; Henseler *et al*., 2016). Supporting this reading, R^2 values are adequate and predictive relevance is strong ($Q^2 = 1 - (1-0.561)(1-0.282)(1-0.122) = 0.723$) (Ghozali & Latan, 2014; Hair *et al*., 2017), and the collinearity results (Table 8) show no multicollinearity or common method bias, together indicating the 0.108 SRMR reflects an acceptable, not a flawed, model. All VIF values fall well below 3.3 (Table 8), confirming no collinearity or common method bias, so the analysis proceeds to hypothesis testing.

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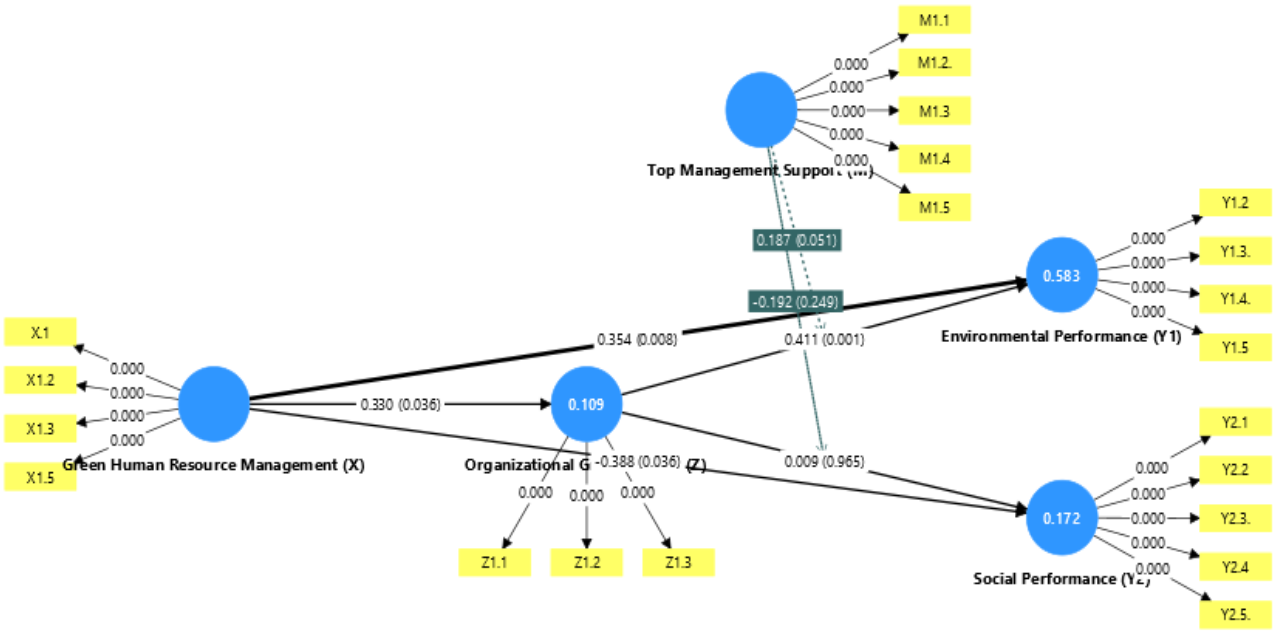


Figure 2. Structural Model Results of PLS-SEM (Path Coefficients)

Sumber: Primary Data (processed), 2026.

Table 9. Results of Hypothesis Testing (Direct and Moderation Effects)

Hypothesis	Inter-Variable Relationship	Coefficient	T-statistic	P-value	Decision
H1	GHRM → OGC	0,330	2,125	0,036	Accepted
H2	GHRM → Environmental Performance	0,354	2,726	0,008	Accepted
H3	GHRM → Social Performance	-0,388	2,120	0,036	Accepted
H4	OGC → Environmental Performance	0,411	3,490	0,001	Accepted
H5	OGC → Social Performance	0,009	0,044	0,965	Rejected
H8	TMS × OGC → Environmental Performance	-0,311	1,974	0,051	Rejected
H9	TMS × OGC → Social Performance	-0,130	1,160	0,249	Rejected

Source: Primary Data (processed), 2026.

Table 10. Results of Indirect Effect Testing

Hypothesis	Mediation Relationship	Coefficient	T-statistic	P-value	Decision
H6	GHRM → OGC → Environmental Performance	0,136	1,540	0,127	Not Significant
H7	GHRM → OGC → Social Performance	0,003	0,034	0,973	Not Significant

Source: Primary Data (processed), 2026.

Hypothesis Testing

Hypothesis testing used bootstrapping on path coefficients, t-statistics, and p-values at 5 percent (Figure 2, Table 9). GHRM proved significantly affects OGC and environmental performance (H1, H2 accepted) and social performance negatively (H3 accepted). OGC also found significantly affects environmental performance (H4 accepted) but not social performance (H5 rejected).

Mediation and Moderation Testing

Mediation analysis tested whether OGC links GHRM to environmental and social performance. Table 10 tests whether OGC mediates GHRM's effect on environmental and social performance; neither indirect effect is significant, so H6 and H7 are rejected.

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As shown in Table 9, TMS does not significantly strengthen either the OGC–environmental performance link (H8 rejected, p = 0.051) or the OGC–social performance link (H9 rejected, p = 0.249).

Discussion

The results of the first analysis obtained that GHRM significantly strengthens OGC (β = 0.330, t = 2.125, p = 0.036). These results prove that green recruitment, training, performance management, rewards, and employee involvement embed sustainability values into daily work, consistent with NRBV's view of GHRM as building internal environmental capability (Hart, 1995) and with prior evidence that GHRM is a key antecedent of OGC (Altassan, 2023; Huynh *et al*., 2024; Mustafa *et al*., 2023).

The results of the second analysis obtained GHRM also significantly strengthens environmental performance (β = 0.354, t = 2.726, p = 0.008), as green selection, training, evaluation, and rewards translate into concrete resource efficiency and waste reduction, consistent with NRBV (Hart, 1995; Zihan & Makhbul, 2024) and prior GHRM to environmental performance evidence (Arsawan *et al*., 2025; Elshaer *et al*., 2021). In contrast, GHRM significantly weakens social performance (β = -0.388, t = 2.120, p = 0.036), suggesting environmental prioritization may trade off against employee well-being, qualifying NRBV, since environmental capability does not automatically extend to social benefit (Hart, 1995), and contrasting studies reporting positive GHRM to social performance links (Al-Shammari *et al*., 2022; Alshebami *et al*., 2023).

The third analysis showed OGC significantly strengthens environmental performance (β = 0.411, t = 3.490, p = 0.001), as internalized green values turn sustainability into collective habit, consistent with NRBV (Hart, 1995) and prior evidence (Hutabarat & Sulistyaningsih, 2025; Huynh *et al*., 2024). However, OGC has no significant effect on social performance (β = 0.009, t = 0.044, p = 0.965), indicating green culture remains ecologically oriented and has not yet extended to social aspects such as employee well-being, again qualifying NRBV (Hart, 1995) and contrasting the Altassan (2023).

The fourth analysis showed OGC does not significantly mediate GHRM's effect on either environmental (0.136, t = 1.540, p = 0.127) or social performance (0.003, t = 0.034, p = 0.973), suggesting GHRM has not yet been fully institutionalized into culture and instead operates through more direct pathways (Arsawan *et al*., 2025; Hutabarat & Sulistyaningsih, 2025). Similarly, TMS does not significantly moderate the OGC to environmental (β = -0.311, t = 1.974, p = 0.051) or OGC to social relationship (β = -0.130, t = 1.160, p = 0.249), suggesting TMS contributes to performance more directly, through policy and resources, than as a moderator (Gazi *et al*., 2024; Hasan *et al*., 2024; Memon *et al*., 2022).

In light of these findings, the author is of the view that sustained performance improvement in the studied company requires integrating GHRM, OGC, and TMS as one reinforcing system rather than separate initiatives. Since GHRM and OGC strengthen environmental outcomes without improving, and in GHRM's case even weakening, social performance, and since TMS does not significantly moderate any tested relationship, top-down endorsement alone is unlikely to sustain the company's performance gains; a policy announced from the top but not embedded in routine HR practice risks remaining symbolic. Sustained improvement instead requires embedding environmental and social objectives jointly into everyday HR mechanisms: green recruitment paired with well-being indicators, training that builds ecological and social competencies together, appraisal

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systems that weigh social contribution alongside environmental achievement, and reward structures that reinforce both dimensions at once, reviewed periodically by HR, sustainability, and line management together so that environmental gains are never pursued at the expense of social ones.

CONCLUSION

GHRM significantly improves OGC and environmental performance, but significantly reduces social performance. OGC also improves environmental performance, with no significant effect on social performance, its influence remains ecological rather than social. Neither OGC (mediation) nor TMS (moderation) was significant, suggesting GHRM operates directly rather than through cultural or managerial reinforcement, and that green culture or management support alone is insufficient without more integrated mechanisms.

Theoretically, the results showed environmentally oriented HR practice operates more through direct influence than cultural mediation in this manufacturing context. Practically, companies need to embed environmental considerations throughout HR processes and translate green culture and management support into consistent programs, since top-down endorsement alone won't sustain performance gains. This requires concrete HR mechanisms: green recruitment paired with well-being indicators, training addressing both ecological and social competencies, appraisal systems weighing social alongside environmental contribution, and reward structures reinforcing both dimensions jointly.

This study is limited by its single-company, East Kalimantan sample and cross-sectional design, which cannot capture long-term behavioral change, and by variables outside the model that may also shape environmental and social performance. Future research should broaden the industrial scope, incorporate variables such as Green Innovation, Environmental Commitment, Employee Green Behavior, or Corporate Sustainability Strategy, and adopt a longitudinal design.

Practically, these results help manufacturing HR practitioners in East Kalimantan and similar developing-region contexts design GHRM policies that strengthen environmental performance while anticipating trade-offs with social outcomes. Policymakers can draw on them for green industry incentives, academics for studying how OGC and TMS shape sustainability outcomes, and employees and communities stand to benefit indirectly through improved environmental practice—though more deliberate attention to social performance is still needed.

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