

GREEN HUMAN RESOURCE MANAGEMENT AND SUSTAINABLE EMPLOYEE PERFORMANCE IN HIGHER EDUCATION: THE MEDIATING ROLE OF EMPLOYEE GREEN BEHAVIOR AND THE MODERATING ROLE OF GREEN ORGANIZATIONAL CULTURE

GREEN HUMAN RESOURCE MANAGEMENT DAN SUSTAINABLE EMPLOYEE PERFORMANCE PADA PERGURUAN TINGGI DI KOTA MAKASSAR: PERAN MEDIASI EMPLOYEE GREEN BEHAVIOR DAN MODERASI GREEN ORGANIZATIONAL CULTURE

Dhimas Tribuana^{1*}, Endang Halimah², Andi Masniah³, Jahara⁴, Isiswenty⁵, Koas Dianah⁶

Akademi Sekretari Manajemen Indonesia Publik, Makassar^{1,2,3,4,5,6}

d.tribuana@gmail.com^{1*}, endanghalimah2810@gmail.com², andinia7@gmail.com³, jaharajhara93@gmail.com⁴,
isisskarda2306@gmail.com⁵, koasdianah1964@gmail.com⁶

ABSTRACT

This study examines how Green Human Resource Management (GHRM) contributes to Sustainable Employee Performance (SEP) in higher education by positioning Employee Green Behavior (EGB) as a mediating mechanism and Green Organizational Culture (GOC) as a moderating condition. A quantitative cross-sectional survey was conducted among 200 lecturers and educational staff working at higher education institutions in Makassar City, Indonesia, from 1 to 14 April 2026. Data were analyzed using partial least squares structural equation modeling (PLS-SEM) with SmartPLS 4 and 5,000 bootstrap subsamples. The measurement model demonstrated satisfactory reliability and validity. The structural results show that GHRM positively affects EGB ($\beta = 0.487$; $p < 0.001$) and SEP ($\beta = 0.193$; $p = 0.001$), while EGB positively affects SEP ($\beta = 0.408$; $p < 0.001$). GOC positively affects EGB ($\beta = 0.235$; $p < 0.001$) and SEP ($\beta = 0.274$; $p < 0.001$). EGB significantly mediates the GHRM-SEP relationship ($\beta = 0.199$; $p < 0.001$), and GOC significantly strengthens the GHRM-EGB relationship ($\beta = 0.354$; $p < 0.001$). The model explains 41.4% of EGB and 47.2% of SEP variance. The findings extend GHRM research by integrating behavioral mediation and cultural moderation with employee-level sustainable performance, and offer practical directions for embedding sustainability into higher education HR systems and organizational culture.

Keywords: Green Human Resource Management; Employee Green Behavior; Sustainable Employee Performance; Green Organizational Culture; Higher Education.

ABSTRAK

Penelitian ini menganalisis bagaimana *Green Human Resource Management* (GHRM) berkontribusi terhadap *Sustainable Employee Performance* (SEP) pada perguruan tinggi dengan menempatkan *Employee Green Behavior* (EGB) sebagai mekanisme mediasi dan *Green Organizational Culture* (GOC) sebagai kondisi moderasi. Penelitian menggunakan pendekatan kuantitatif dengan desain survei potong lintang terhadap 200 dosen dan tenaga kependidikan pada perguruan tinggi di Kota Makassar, Indonesia, yang dikumpulkan pada 1-14 April 2026. Data dianalisis menggunakan *partial least squares structural equation modeling* (PLS-SEM) melalui SmartPLS 4 dengan 5.000 subsampel *bootstrap*. Model pengukuran menunjukkan reliabilitas dan validitas yang memadai. Hasil model struktural menunjukkan GHRM berpengaruh positif terhadap EGB ($\beta = 0,487$; $p < 0,001$) dan SEP ($\beta = 0,193$; $p = 0,001$), sedangkan EGB berpengaruh positif terhadap SEP ($\beta = 0,408$; $p < 0,001$). GOC berpengaruh positif terhadap EGB ($\beta = 0,235$; $p < 0,001$) dan SEP ($\beta = 0,274$; $p < 0,001$). EGB memediasi secara signifikan pengaruh GHRM terhadap SEP ($\beta = 0,199$; $p < 0,001$), sedangkan GOC memperkuat secara signifikan pengaruh GHRM terhadap EGB ($\beta = 0,354$; $p < 0,001$). Model menjelaskan 41,4% variasi EGB dan 47,2% variasi SEP. Temuan memperluas literatur GHRM melalui integrasi mediasi perilaku dan moderasi budaya dengan kinerja berkelanjutan pada tingkat pegawai serta memberikan arahan praktis bagi perguruan tinggi untuk mengintegrasikan keberlanjutan ke dalam sistem SDM dan budaya organisasi.

Kata Kunci: Green Human Resource Management; Employee Green Behavior; Sustainable Employee Performance; Green Organizational Culture; Perguruan Tinggi.

This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0).

Artikel ini adalah artikel akses terbuka yang didistribusikan di bawah ketentuan Lisensi Creative Commons Attribution 4.0 International (CC BY 4.0).



INTRODUCTION

The sustainable development agenda has changed the way organizations view the human resource function. Sustainability is no longer positioned solely as the responsibility of environmental or facilities units; it also requires employee involvement through organizational policies, competencies, behaviors, and workplace culture. The 2030 Agenda places productivity and decent work within SDG 8, resource efficiency and responsible production and consumption patterns within SDG 12, and the strengthening of human and institutional capacities related to climate change within SDG 13 (United Nations, 2015). In higher education, the integration of these agendas is particularly important because higher education institutions play a dual role: they are organizations that consume and manage resources, while simultaneously shaping knowledge, values, and societal behavior.

Within the human resource management literature, the integration of environmental objectives has developed through Green Human Resource Management (GHRM). Renwick et al. (2013) describe this field as the integration of people-management practices with environmental management objectives and organize GHRM practices through the Ability-Motivation-Opportunity (AMO) framework. Practices such as environmentally oriented recruitment, green training, performance appraisal based on environmental targets, green rewards, and employee involvement can strengthen employees' ability, motivation, and opportunity to contribute to sustainability goals. Ahmad (2015), Benevene and Buonomo (2020), Pham et al. (2020), and Joshi et al. (2023) further demonstrate that GHRM has evolved into a strategic domain that links HR policies, employee behavior, and organizational sustainability.

At the micro level, one of the most immediate outcomes of GHRM is Employee Green Behavior (EGB), referring to employee actions that help reduce negative environmental impacts and support organizational environmental goals. Bissing-Olson et al. (2013) distinguish workplace pro-environmental behavior into in-role behavior, which forms part of formal job requirements, and extra-role behavior, which is performed voluntarily. Dumont et al. (2017) demonstrate that employees' perceptions of GHRM influence workplace green behavior through social and psychological processes. Similar evidence has emerged across different contexts, including Ansari et al. (2021), Al-Swidi et al. (2021), Farrukh et al. (2022), Fawehinmi et al. (2024), and Yadate (2025), although the strength of the relationship may vary according to context, psychological mechanisms, and the type of green behavior examined.

Higher education has increasingly become an important context for testing GHRM because the transformation toward a sustainable campus cannot be achieved through formal policies alone. Anwar et al. (2020) show that GHRM promotes organizational citizenship behavior toward the environment, which in turn improves environmental performance on university campuses. Abbas et al. (2022) demonstrate the contribution of GHRM to higher education sustainability, while Aboramadan (2022) finds that GHRM enhances in-role and extra-role green behavior through green work engagement. More recent studies reveal increasingly complex mechanisms. Noor Faezah et al. (2024) examine green culture and green satisfaction as mediators in higher education, whereas Fawehinmi et al. (2024) show that perceived behavioral control and attitudes toward corporate environmental policy can explain the relationship between GHRM and EGB. Among university staff, Yadate (2025) further indicates that the effect of GHRM may differ across dimensions of green behavior. These variations highlight the need to investigate more specific mechanisms and contextual conditions.

Most GHRM studies in higher education continue to position environmental performance, green behavior, green engagement, green satisfaction, or organizational-level sustainability as their main outcomes. However, organizational sustainability also requires employees who are able to maintain effective performance over the long term. Ji et al. (2021) developed the concept of Employee Sustainable Performance (E-SuPer) as a regulatory process in which individuals continuously and efficiently attain desired work goals while maintaining an adequate level of well-being. This concept differs from organizational environmental performance because its unit of analysis is the sustainability of individual performance. Therefore, linking GHRM with Sustainable Employee Performance (SEP) offers a micro-level extension of the sustainable HRM literature.

The relationship between GHRM and SEP can theoretically be explained through the AMO framework. GHRM practices enhance ability through environmental training and knowledge, motivation through goals, appraisal, rewards, and recognition, and opportunity through employee involvement in environmental initiatives (Renwick et al., 2013; Anwar et al., 2020). These three mechanisms not only facilitate environmental compliance but may also encourage more focused, resource-efficient, adaptive, and consistent ways of working. The broader literature indicates that GHRM can support sustainable performance through innovation, commitment, behavior, and organizational capabilities (Zihan & Makhbul, 2024; Zhao et al., 2024; Ali et al., 2024). Nevertheless, direct evidence concerning SEP at the individual level remains relatively limited.

This study positions EGB as a mediating mechanism between GHRM and SEP. The underlying logic is that HR systems and policies do not generate sustainable performance merely because they are formally available. The effects of GHRM need to be translated into concrete employee actions, such as conserving energy

and materials, avoiding waste, completing tasks in environmentally responsible ways, proposing improvements, and helping colleagues adopt green practices. When such behaviors become embedded in work routines, resources can be used more efficiently and employees may be better able to sustain their work achievements over time. This behavioral mechanism is consistent with Anwar et al. (2020), who demonstrate the mediating role of environmental citizenship behavior, and with Dumont et al. (2017) and Aboramadan (2022), who show that employees' behavioral responses constitute an important link in the effectiveness of GHRM.

Beyond the behavioral mechanism, the effectiveness of GHRM is also expected to depend substantially on Green Organizational Culture (GOC). Roscoe et al. (2019) identify leadership emphasis, message credibility, peer involvement, and employee empowerment as important enablers of green organizational culture. GOC signals that sustainability is not merely an administrative program but a value supported by leaders, aligned with organizational practices, reinforced through peer norms, and translated into opportunities for employees to act. Al-Swidi et al. (2021) demonstrate that GOC is positively associated with green behavior and environmental performance. These findings suggest that green culture may operate both as a direct source of influence and as a contextual condition determining how strongly GHRM policies are translated into employee behavior.

Previous studies have predominantly positioned GOC as a mediator or an outcome of GHRM (Roscoe et al., 2019; Al-Swidi et al., 2021; Noor Faezah et al., 2024). This study takes a different position by treating GOC as a moderator of the GHRM-EGB relationship. Theoretically, consistency between the HR system and organizational culture should strengthen employees' interpretation of environmental messages. If GHRM provides green training, targets, and rewards while everyday workplace culture fails to support those practices, the behavioral effect may weaken. Conversely, when leaders, organizational messages, peers, and empowerment practices consistently reflect green values, GHRM becomes more credible and is more likely to be translated into EGB.

Based on the preceding review, three research gaps provide the foundation for this study. First, higher education research has extensively demonstrated the relationship between GHRM and green behavior or environmental sustainability, but considerably fewer studies have connected GHRM with sustainable performance at the individual level. Second, EGB as a mechanism linking GHRM and SEP has received less attention than mediators such as green work engagement, green satisfaction, perceived behavioral control, or green commitment. Third, GOC has more often been tested as a mediator than as a boundary condition that strengthens the GHRM-EGB relationship. This study integrates these three elements among higher education employees in Makassar City, thereby providing contextual evidence from Indonesia and extending the application of AMO theory to employee-level sustainability.

Accordingly, this study aims to examine the effects of GHRM on EGB and SEP, the effect of EGB on SEP, the mediating role of EGB in the GHRM-SEP relationship, the effects of GOC on EGB and SEP, and the moderating role of GOC in the GHRM-EGB relationship. Its scientific contribution lies in integrating behavioral mediation and cultural moderation within a model of sustainable employee performance. Practically, the findings are expected to provide a basis for higher education institutions to align HR policies, organizational culture, and employee behavior in support of the sustainability agenda.

Hypothesis Development

Based on the AMO framework, GHRM practices provide employees with the ability, motivation, and opportunity required to act in accordance with environmental objectives. When organizations incorporate green goals into training, appraisal, rewards, and participation, employees receive clearer signals regarding expected behavior. Evidence from Dumont et al. (2017), Anwar et al. (2020), Aboramadan (2022), and Yadate (2025) strengthens the argument that GHRM can promote EGB.

H1: Green Human Resource Management has a positive effect on Employee Green Behavior.

GHRM may also help employees develop competencies, resource-use discipline, a long-term orientation, and organizational support needed to sustain work achievement. Research on GHRM and sustainability indicates that green HR systems can contribute to sustainable performance through behavioral and capability-based mechanisms (Zihan & Makhbul, 2024; Zhao et al., 2024; Ali et al., 2024). By shifting the outcome to the individual level, this study predicts a positive effect of GHRM on SEP.

H2: Green Human Resource Management has a positive effect on Sustainable Employee Performance.

EGB reflects the translation of sustainability values into everyday work actions. Behaviors such as reducing waste, using resources efficiently, performing tasks in environmentally responsible ways, and taking green initiatives may improve the consistency and efficiency of work processes. Because SEP emphasizes the efficient and sustainable attainment of work goals over the long term (Ji et al., 2021), EGB is expected to constitute an important antecedent.

H3: Employee Green Behavior has a positive effect on Sustainable Employee Performance.

If GHRM promotes EGB and EGB subsequently improves SEP, then EGB functions as an explanatory

mechanism through which GHRM influences SEP. This pattern is consistent with studies showing that behavioral outcomes can transmit the effects of GHRM to environmental performance or sustainability outcomes (Anwar et al., 2020; Ansari et al., 2021).

H4: Employee Green Behavior mediates the effect of Green Human Resource Management on Sustainable Employee Performance.

A green organizational culture creates norms, symbols, leadership support, message credibility, peer involvement, and empowerment that guide employee behavior. Roscoe et al. (2019) and Al-Swidi et al. (2021) demonstrate the importance of green culture as a social context for environmental behavior and performance. Therefore, the stronger the GOC, the greater the likelihood that employees will display EGB.

H5: Green Organizational Culture has a positive effect on Employee Green Behavior.

GOC is also expected to have a direct effect on SEP because a culture that consistently supports efficiency, learning, collaboration, and proactive action can sustain employee performance over time. Thus, culture not only shapes green behavior but also creates organizational conditions that enable employees to maintain performance sustainably.

H6: Green Organizational Culture has a positive effect on Sustainable Employee Performance.

Finally, green organizational culture is positioned as a strengthening condition. GHRM becomes more effective when formal HR messages are consistent with the organization's informal values and practices. Under high GOC, green training, appraisal, rewards, and goals become more credible and receive stronger social support, thereby increasing the expected effect of GHRM on EGB.

H7: Green Organizational Culture strengthens the positive effect of Green Human Resource Management on Employee Green Behavior.

RESEARCH METHOD

This study employed an explanatory quantitative approach using a cross-sectional survey design. The unit of analysis was individual higher education employees, including lecturers and educational staff working at higher education institutions in Makassar City. Data were collected from 1 to 14 April 2026. A total of 200 questionnaires with complete responses were used in the analysis. Because the study aimed to simultaneously test predictive relationships involving direct, mediating, and moderating effects, the data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM).

GHRM was measured using six items adapted from Dumont et al. (2017), representing employees' perceptions of environmental objectives, green training and development, performance appraisal, rewards, and career-development support related to environmental behavior. EGB was measured using six items representing in-role and extra-role green behavior, drawing on Bissing-Olson et al. (2013) and its application in higher education by Aboramadan (2022). In the SmartPLS model, all six indicators were specified as reflective indicators of the EGB construct.

GOC was measured using ten items representing the four enablers of green organizational culture developed by Roscoe et al. (2019): leadership emphasis, message credibility, peer involvement, and employee empowerment. SEP was measured using the ten-item E-SuPer scale developed by Ji et al. (2021), which emphasizes employees' ability to meet work goals and job demands efficiently and sustainably. All study items were assessed using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

The analysis was conducted using SmartPLS 4 (Ringle et al., 2024). Measurement model assessment included outer loadings, Cronbach's alpha, rho_A, composite reliability (CR), average variance extracted (AVE), and the heterotrait-monotrait ratio (HTMT). In general, construct reliability was considered satisfactory when alpha and CR exceeded 0.70, while convergent validity was supported by AVE values above 0.50 (Hair et al., 2019; Hair et al., 2022). Discriminant validity was primarily evaluated using HTMT with a conservative threshold of 0.85 (Henseler et al., 2015).

The structural model was subsequently evaluated using inner VIF, path coefficients, R-squared, f-squared, and Q-squared. The significance of direct, indirect, and moderating effects was assessed through bootstrapping with 5,000 subsamples, two-tailed testing, and a 5% significance level. Mediation was interpreted based on the significance of the indirect effect together with the presence of the direct effect, whereas moderation was determined from the GOC x GHRM interaction coefficient predicting EGB. Predictive relevance was assessed through the blindfolding procedure, with Q-squared values above zero indicating predictive relevance for the endogenous constructs.

RESULTS AND DISCUSSION

Respondent Characteristics

The study involved 200 employees from higher education institutions in Makassar City. The respondent distribution represented both public and private institutions as well as the two main employee groups, namely lecturers and educational staff. Detailed respondent characteristics are presented in Table 1.

Table 1. Respondent Characteristics

Characteristic	Category	Frequency	Percentage
Type of Higher Education Institution	Private	108	54.0%
	Public	92	46.0%
Gender	Male	105	52.5%
	Female	95	47.5%
Employment Category	Lecturer	108	54.0%
	Educational Staff	92	46.0%
Education	High School/Diploma	12	6.0%
	Bachelor's Degree	67	33.5%
	Master's Degree	95	47.5%
	Doctoral Degree	26	13.0%
Age	20-30 years	39	19.5%
	31-45 years	113	56.5%
	46-55 years	45	22.5%
	>55 years	3	1.5%
Tenure	1-5 years	37	18.5%
	6-10 years	39	19.5%
	11-20 years	80	40.0%
	>20 years	44	22.0%
Total		200	100.0%

Source: survey data processed by the authors, 2026

A total of 108 respondents (54.0%) worked at private higher education institutions and 92 (46.0%) at public institutions. The gender composition was relatively balanced, with 105 male respondents (52.5%) and 95 female respondents (47.5%). In terms of employment status, 108 respondents (54.0%) were lecturers and 92 (46.0%) were educational staff. Educational attainment was dominated by master's degree holders, totaling 95 respondents (47.5%), followed by bachelor's degree holders with 67 respondents (33.5%), doctoral degree holders with 26 respondents (13.0%), and high school/diploma graduates with 12 respondents (6.0%). The 31-45-year age group was the largest (56.5%), with a mean age of 38.98 years and a range of 22-62 years. Tenure was dominated by the 11-20-year group (40.0%); mean tenure was 13.4 years, ranging from 1 to 35 years. This profile indicates that most respondents had sufficient experience to evaluate HR practices, organizational culture, and workplace behavior within their institutions.

Measurement Model Evaluation

The measurement model evaluation indicates that all constructs demonstrate satisfactory internal consistency and convergent validity. The outer loading range was 0.770-0.817 for EGB, 0.776-0.879 for GHRM, 0.763-0.876 for GOC, and 0.680-0.822 for SEP. Two SEP indicators had loadings of approximately 0.680; however, they were retained because the construct's composite reliability and AVE remained satisfactory and the indicators retained substantive relevance to the E-SuPer scale. A summary of reliability and convergent validity is presented in Table 2.

Table 2. Reliability and Convergent Validity

Construct	Number of Items	Loading	Cronbach Alpha	rho_A	CR	AVE
EGB	6	0.770-0.817	0.878	0.880	0.907	0.620
GHRM	6	0.776-0.879	0.898	0.902	0.922	0.663
GOC	10	0.763-0.876	0.942	0.947	0.950	0.656
SEP	10	0.680-0.822	0.915	0.919	0.929	0.569

Source: SmartPLS 4 PLS Algorithm output processed by the authors, 2026

Cronbach's alpha ranged from 0.878 to 0.942, while composite reliability ranged from 0.907 to 0.950. All values exceeded 0.70, indicating satisfactory internal consistency reliability. AVE values ranged from 0.569 to 0.663

and were all above 0.50, thereby supporting convergent validity. The rho_A values ranged from 0.880 to 0.947 and were consistent with the overall reliability pattern.

Table 3. Heterotrait-Monotrait Ratio (HTMT)

Construct	EGB	GHRM	GOC	SEP
EGB	-			
GHRM	0.545	-		
GOC	0.400	0.335	-	
SEP	0.668	0.527	0.511	-

Source: SmartPLS 4 PLS Algorithm output processed by the authors, 2026

HTMT values across constructs ranged from 0.335 to 0.668, all below the conservative threshold of 0.85 recommended by Henseler et al. (2015). Therefore, EGB, GHRM, GOC, and SEP demonstrate satisfactory discriminant validity. The Fornell-Larcker criterion also supports this conclusion because the square root of AVE on the diagonal for each construct (EGB = 0.788; GHRM = 0.814; GOC = 0.810; SEP = 0.754) exceeded the corresponding inter-construct correlations.

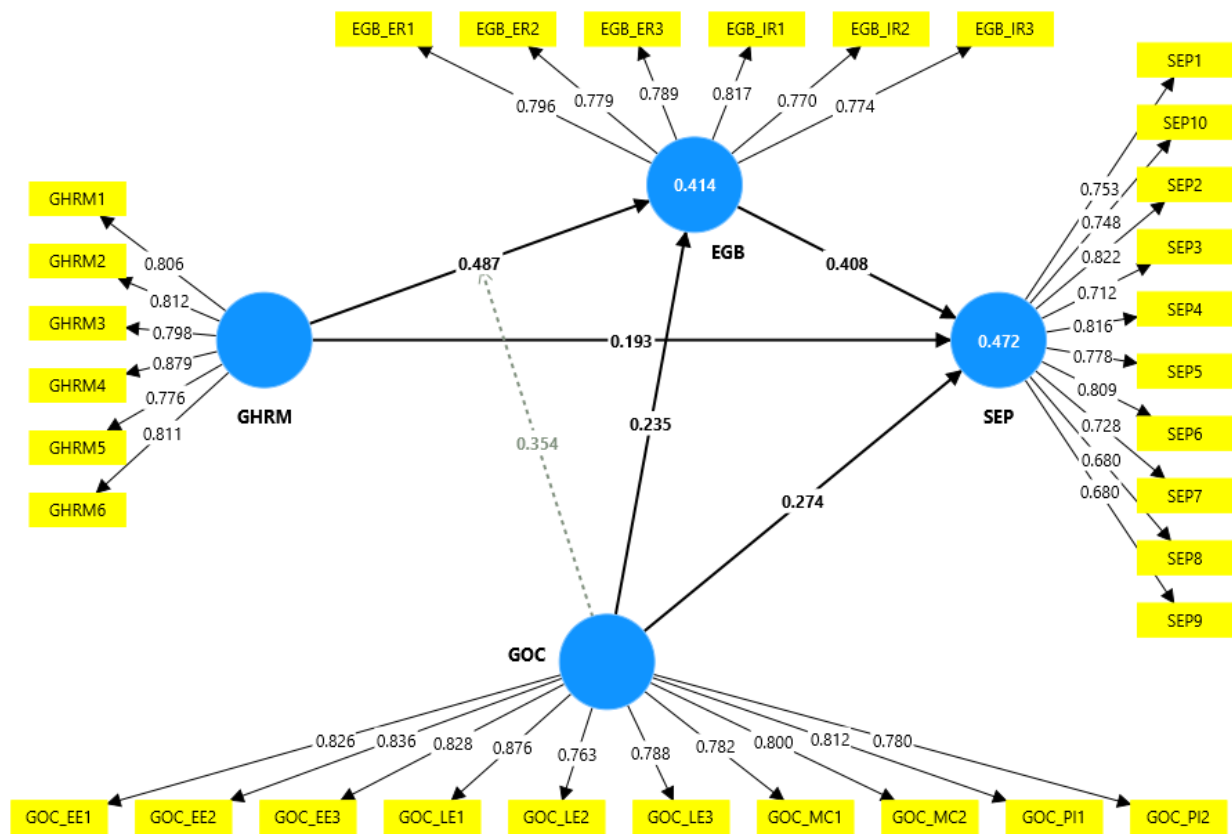


Figure 1. PLS Algorithm Model

Source: SmartPLS 4 output processed by the authors, 2026

Structural Model Evaluation

Before hypothesis testing, structural model collinearity was evaluated using inner VIF. VIF values for all structural paths ranged from 1.041 to 1.416, far below levels that would indicate serious collinearity problems. Therefore, the path coefficient estimates do not appear to be meaningfully distorted by multicollinearity among the predictors.

Table 4. Explanatory Power and Predictive Relevance of the Model

Endogenous Construct	R-squared	Adjusted R-squared	Q-squared
Employee Green Behavior (EGB)	0.414	0.405	0.243
Sustainable Employee Performance (SEP)	0.472	0.464	0.260

Source: SmartPLS 4 and blindfolding outputs processed by the authors, 2026

The R-squared value of 0.414 for EGB indicates that GHRM, GOC, and the GOC x GHRM interaction jointly explain 41.4% of the variance in EGB. The R-squared value of 0.472 for SEP indicates that GHRM, GOC, and EGB explain 47.2% of the variance in SEP. Q-squared values for EGB (0.243) and SEP (0.260) were above zero, demonstrating predictive relevance for both endogenous constructs. The model produced an SRMR value of 0.053 and an NFI value of 0.869. In this PLS-SEM study, these fit indices are treated as supplementary information, while the primary evaluation focuses on measurement model quality, explanatory power, predictive relevance, and the significance of structural relationships.

Table 5. Effect Size (f-squared)

Relationship	f-squared
GHRM -> EGB	0.351
GOC -> EGB	0.085
GOC x GHRM -> EGB	0.204
GHRM -> SEP	0.052
EGB -> SEP	0.223
GOC -> SEP	0.119

Source: SmartPLS 4 PLS Algorithm output processed by the authors, 2026

The effect-size results show that the contribution of GHRM to EGB was the most pronounced (f-squared = 0.351), followed by EGB to SEP (0.223) and the GOC x GHRM interaction effect on EGB (0.204). The effect of GOC on SEP was 0.119 and that of GOC on EGB was 0.085, whereas the direct effect of GHRM on SEP was 0.052. This pattern suggests that the effect of GHRM on sustainable performance is stronger when transmitted through the behavioral mechanism than when operating only through the direct path.

Table 6. Direct Effect and Moderation Testing

Hyp.	Relationship	Beta	STDEV	t	p	95% CI	Decision
H1	GHRM -> EGB	0.487	0.053	9.133	<0.001	0.383-0.593	Supported
H2	GHRM -> SEP	0.193	0.059	3.285	0.001	0.078-0.308	Supported
H3	EGB -> SEP	0.408	0.060	6.850	<0.001	0.292-0.523	Supported
H5	GOC -> EGB	0.235	0.056	4.202	<0.001	0.128-0.346	Supported
H6	GOC -> SEP	0.274	0.058	4.711	<0.001	0.160-0.387	Supported
H7	GOC x GHRM -> EGB	0.354	0.060	5.881	<0.001	0.228-0.461	Supported

Source: SmartPLS 4 bootstrapping results with 5,000 subsamples, processed by the authors, 2026

The bootstrapping results indicate that all direct effects in the model were significant at the 5% level. GHRM had the strongest positive direct effect on EGB (beta = 0.487; $t = 9.133$; $p < 0.001$). EGB subsequently had a positive effect on SEP (beta = 0.408; $t = 6.850$; $p < 0.001$). GHRM also had a positive direct effect on SEP (beta = 0.193; $t = 3.285$; $p = 0.001$). GOC positively affected EGB (beta = 0.235; $p < 0.001$) and SEP (beta = 0.274; $p < 0.001$). The GOC x GHRM interaction effect on EGB was positive and significant (beta = 0.354; $t = 5.881$; $p < 0.001$), indicating that GOC strengthens the effect of GHRM on EGB.

Table 7. Indirect Effect Testing

Hyp./Effect	Indirect Path	Beta	STDEV	t	p	95% CI	Interpretation
H4	GHRM -> EGB -> SEP	0.199	0.035	5.694	<0.001	0.135-0.271	Significant mediation
Add.	GOC -> EGB -> SEP	0.096	0.027	3.510	<0.001	0.047-0.154	Indirect effect
Add.	GOC x GHRM -> EGB -> SEP	0.144	0.032	4.457	<0.001	0.082-0.209	Conditional indirect effect

Source: SmartPLS 4 bootstrapping results with 5,000 subsamples, processed by the authors, 2026

The indirect effect of GHRM on SEP through EGB was 0.199 and statistically significant ($t = 5.694$; $p < 0.001$; 95% CI = 0.135-0.271). Because the direct GHRM -> SEP path remained significant and had the same direction, EGB indicates partial mediation. The total effect of GHRM on SEP was 0.392, comprising a direct effect of 0.193 and an indirect effect of 0.199. Thus, slightly more than half of the total effect of GHRM on SEP operates through changes in employees' green behavior, supporting H4. Additional results show that GOC also had an indirect effect on SEP through EGB of 0.096, while the GOC x GHRM interaction had a conditional indirect effect on SEP through EGB of 0.144. These additional findings indicate that green culture operates not only directly and as a moderator, but that its strengthening effect is ultimately transmitted to sustainable performance through EGB.

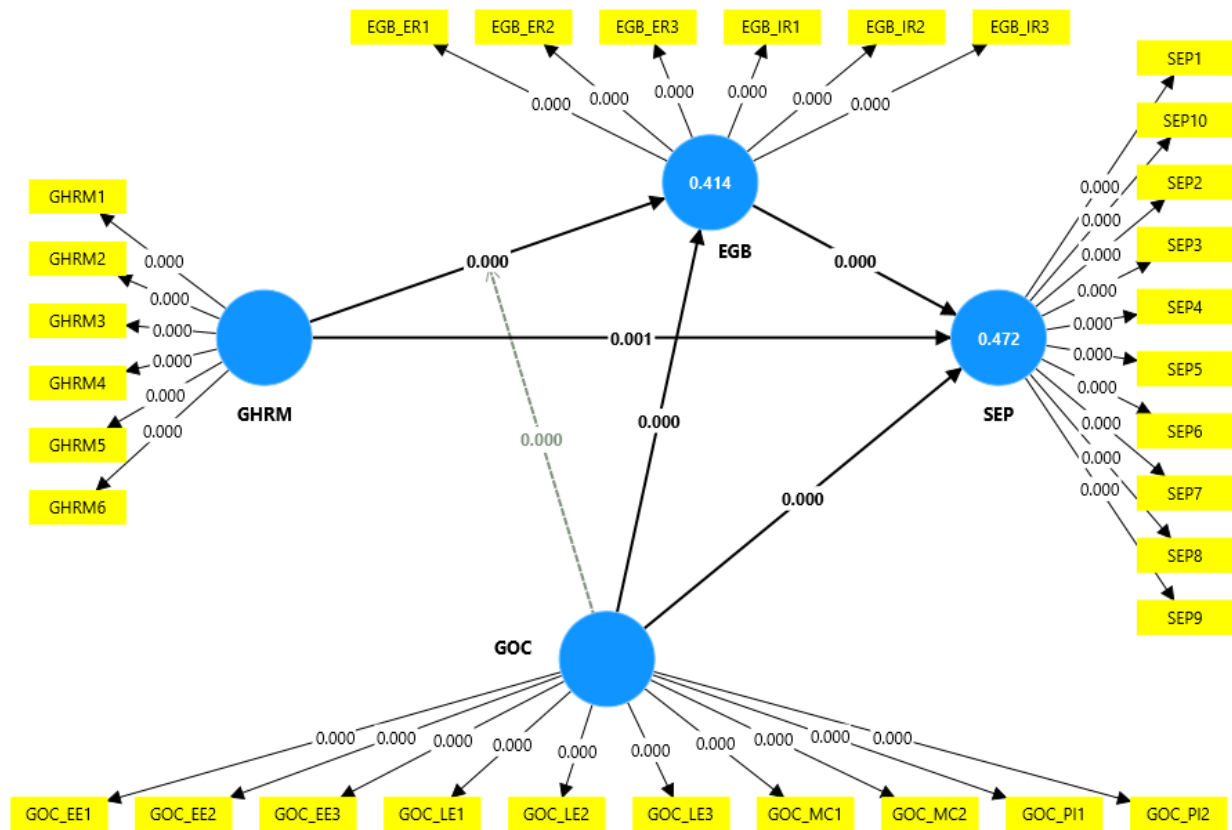


Figure 2. Structural Model Bootstrapping Results

Source: SmartPLS 4 bootstrapping output processed by the authors, 2026

Effect of GHRM on Employee Green Behavior (H1)

The results show that GHRM has a positive and significant effect on EGB ($\beta = 0.487$; $p < 0.001$), thereby supporting H1. This coefficient is among the largest direct effects in the model and is accompanied by an f -squared value of 0.351. The finding reinforces the AMO explanation that HR practices can build the ability, motivation, and opportunity employees need to act in accordance with environmental objectives. In higher education, training that incorporates environmental competencies, performance appraisal that considers green behavior, rewards for environmental contributions, and opportunities for employee involvement signal that sustainability forms part of the work role rather than merely an additional activity.

This finding is consistent with Dumont et al. (2017), who demonstrate the effect of GHRM on workplace green behavior, and Anwar et al. (2020), who identify a relationship between GHRM and environmental citizenship behavior in a university context. Aboramadan (2022) also shows that GHRM can promote in-role and extra-role green behavior among higher education employees. The present result differs from Fawehinmi et al. (2024), who did not find a direct GHRM-EGB path among academics at Malaysian public universities and instead emphasized the roles of perceived behavioral control and attitude. This difference suggests that the GHRM-EGB relationship is context-sensitive; among higher education employees in Makassar, perceptions of GHRM practices appear sufficiently strong to generate a direct behavioral effect.

Effect of GHRM on Sustainable Employee Performance (H2)

GHRM has a positive effect on SEP ($\beta = 0.193$; $p = 0.001$), thereby supporting H2. Although the direct coefficient is smaller than the effect of GHRM on EGB, the result is important because it shows that environmentally oriented HR systems need not conflict with performance requirements. When sustainability is embedded in competencies, targets, evaluation, rewards, and employee involvement, these practices can help develop work discipline and resource-use efficiency that support performance over the long term.

This finding extends research that has predominantly examined sustainability performance at the organizational level. Zihan and Makhbul (2024) identify GHRM as a catalyst for sustainable performance through green innovation, while Zhao et al. (2024) link GHRM to sustainable development performance through organizational ambidexterity and responsible leadership. Ali et al. (2024) likewise demonstrate the relevance of GHRM practices to corporate sustainability performance. The present study shifts this focus to the individual level by using the SEP construct developed by Ji et al. (2021), showing that the benefits of GHRM are also reflected in employees' capacity to sustain their work performance.

Effect of Employee Green Behavior on Sustainable Employee Performance (H3)

EGB has a positive and significant effect on SEP ($\beta = 0.408$; $p < 0.001$), thereby supporting H3. This coefficient indicates that green behavior is one of the principal direct predictors of SEP. Substantively, EGB can help employees reduce waste, manage resources more carefully, organize work processes more efficiently, and initiate improvements that lower both environmental and operational costs. Such behavioral patterns align with the core of SEP, which concerns the achievement of work goals in ways that are not limited to short-term results but can be maintained efficiently over time (Ji et al., 2021).

This finding is also consistent with literature showing that pro-environmental behavior can serve as a bridge to performance outcomes. Anwar et al. (2020) show that environmental citizenship behavior mediates the effect of GHRM on environmental performance, Al-Swidi et al. (2021) identify a relationship between employee green behavior and organizational environmental performance, and Elshaer et al. (2021) position pro-environmental behavior as an important mechanism in the GHRM-environmental performance relationship. The present study extends this line of research by showing that behavioral outcomes are relevant not only to organizational environmental performance but also to the sustainability of individual performance.

Mediating Role of Employee Green Behavior (H4)

H4 is supported because the indirect GHRM $\rightarrow$ EGB $\rightarrow$ SEP effect is significant ($\beta = 0.199$; $p < 0.001$) and its confidence interval does not include zero. The direct GHRM $\rightarrow$ SEP path remains significant ($\beta = 0.193$), indicating partial mediation. This finding shows that the presence of GHRM practices alone does not fully explain sustainable performance; a substantial portion of their benefits must be realized through changes in employee behavior. With a total effect of 0.392, the indirect effect of 0.199 is even slightly larger than the direct effect of 0.193.

This finding reinforces the behavioral mechanism perspective in the GHRM literature. Dumont et al. (2017) explain that GHRM operates through social-psychological processes that shape green behavior. Anwar et al. (2020) identify a mediating role for organizational citizenship behavior toward the environment, whereas Ansari et al. (2021) demonstrate an environmental commitment mechanism in the development of pro-environmental behavior. In higher education, Aboramadan (2022) and Noor Faezah et al. (2024) show that mediators such as green work engagement, green culture, and green satisfaction help translate GHRM into employee outcomes. The main distinction of the present study is that EGB is positioned as a mediator leading to SEP; thus, green behavior is treated not as an endpoint but as a process through which individual performance becomes more sustainable.

Effects of Green Organizational Culture on EGB and SEP (H5-H6)

GOC has a positive effect on EGB ($\beta = 0.235$; $p < 0.001$) and SEP ($\beta = 0.274$; $p < 0.001$), supporting H5 and H6. Green organizational culture provides a social context in which sustainability becomes an observable everyday work norm. Leadership emphasis provides legitimacy; message credibility ensures alignment between communication and practice; peer involvement generates social support; and employee empowerment provides room for action (Roscoe et al., 2019). When these four elements are strong, employees are more likely to engage in green behavior and work with a long-term orientation.

This result is consistent with Al-Swidi et al. (2021), who find a positive relationship between green organizational culture, employee green behavior, and environmental performance. Noor Faezah et al. (2024) also demonstrate the importance of green culture within the GHRM ecosystem in higher education. The effect of GOC on SEP extends these studies because the outcome in the present research is sustainable performance at the individual level. Practically, culture functions as social infrastructure: GHRM policies may change, but internalized norms can help maintain consistency in employee behavior and performance over time.

Moderating Role of Green Organizational Culture (H7)

The GOC $\times$ GHRM interaction effect on EGB is positive and significant ($\beta = 0.354$; $p < 0.001$), thereby supporting H7. This means that the stronger the green organizational culture, the stronger the effect of GHRM on EGB. The result represents a major contribution of this study because it positions GOC not merely as a mediator or outcome, but as a boundary condition for the effectiveness of the green HR system. When formal GHRM practices are consistent with organizational culture, employees receive stronger and more credible signals regarding what the institution considers important.

This finding complements Roscoe et al. (2019) and Al-Swidi et al. (2021), who emphasize the role of culture as a linking mechanism, as well as Noor Faezah et al. (2024), who examine green culture as a mediator in higher education. In the present study, GOC functions as an amplifier. The interaction effect is also indirectly transmitted to SEP through EGB ($\beta = 0.144$; $p < 0.001$). Thus, a strong green culture increases the effectiveness of GHRM in shaping behavior, and that behavior subsequently contributes to sustainable performance. This pattern underscores the importance of alignment between HR architecture and cultural context.

Theoretical and Practical Implications

Theoretically, this study offers four implications. First, AMO remains relevant for explaining GHRM in higher education, but the findings show that the effect of the HR system does not stop at EGB; it extends to sustainable individual performance. Second, SEP broadens GHRM outcomes from organizational environmental performance to the sustainability of employee performance. Third, EGB is empirically supported as a behavioral mechanism linking GHRM policies with SEP. Fourth, GOC operates as a boundary condition that strengthens the effectiveness of GHRM, indicating that GHRM theory should account for alignment between formal systems and the cultural context.

For higher education managers in Makassar City, the results indicate the need to integrate sustainability throughout the HR cycle. Work objectives can include resource-efficient behavior; training can develop environmental literacy and green work skills; appraisal systems can evaluate environmental contributions; and rewards can recognize ideas or practices that reduce waste. Higher education institutions must also ensure that such policies are not merely symbolic. Leaders should model the expected behavior, environmental messages should be consistent with operational practices, colleagues should be involved in reinforcing green norms, and employees should be empowered to propose or implement improvements.

Another implication is the need to connect GHRM with everyday campus operations, such as document digitalization to reduce paper use, energy efficiency, waste management, efficient use of spaces and facilities, green procurement, and the involvement of lecturers and educational staff in sustainability programs. These actions are relevant to SDG 8, SDG 12, and SDG 13; however, this study does not measure SDG achievement as an empirical construct. Therefore, the link to the SDGs is treated as a contextual and policy implication of the findings.

CONCLUSION

The study of 200 higher education employees in Makassar City shows that Green Human Resource Management has a positive effect on both Employee Green Behavior and Sustainable Employee Performance. Employee Green Behavior also positively affects Sustainable Employee Performance and significantly mediates the GHRM-SEP relationship. Green Organizational Culture positively affects EGB and SEP while also strengthening the effect of GHRM on EGB. Thus, all seven research hypotheses are supported.

The central finding is that sustainable employee performance is shaped not only by the presence of GHRM practices but also by the organization's ability to translate those practices into green behavior within a supportive cultural context. The indirect effect of GHRM through EGB is slightly larger than the direct effect of GHRM on SEP, indicating that employee behavior constitutes a central mechanism. At the same time, the GOC moderation effect shows that the effectiveness of green HR policies increases when environmental values are consistently reinforced through leadership, message credibility, peer involvement, and employee empowerment. Practically, higher education institutions should integrate sustainability into training, performance appraisal, rewards, participation, and career development while simultaneously building an authentic green culture. Formal policies without cultural support may produce weak behavioral responses, while culture without a consistent HR system may be difficult to sustain. Combining both provides a stronger foundation for developing sustainable employee behavior and performance.

This study is limited by its cross-sectional design and its geographic focus on Makassar City; therefore, causal interpretation and generalization should be approached cautiously. Future research may employ longitudinal or multi-source designs, compare public and private higher education institutions, examine differences between lecturers and educational staff, expand the geographic scope, and integrate other constructs such as green leadership, psychological green climate, green work engagement, or employee well-being. Future models may also test the conditional indirect effect more explicitly to clarify how culture and behavior jointly produce sustainable employee performance.

ACKNOWLEDGMENTS

The authors would like to thank all higher education employees in Makassar City who participated in the data collection process, as well as all parties who supported the implementation of this study.

REFERENCES

- Abbas, Z., Sarwar, S., Rehman, M. A., Zamecnik, R., & Shoaib, M. (2022). Green HRM promotes higher education sustainability: A mediated-moderated analysis. *International Journal of Manpower*, 43(3), 827-843. <https://doi.org/10.1108/IJM-04-2020-0171>
- 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>

- Ahmad, S. (2015). Green human resource management: Policies and practices. *Cogent Business & Management*, 2(1), 1030817. <https://doi.org/10.1080/23311975.2015.1030817>
- Al-Swidi, A. K., Gelaidan, H. M., & Saleh, R. M. (2021). The joint impact of green human resource management, leadership and organizational culture on employees' green behaviour and organisational environmental performance. *Journal of Cleaner Production*, 316, 128112. <https://doi.org/10.1016/j.jclepro.2021.128112>
- Ali, M., Shujahat, M., Fatima, N., Lopes de Sousa Jabbour, A. B., Vo-Thanh, T., Salam, M. A., & Latan, H. (2024). Green HRM practices and corporate sustainability performance. *Management Decision*, 62(11), 3681-3703. <https://doi.org/10.1108/MD-05-2023-0787>
- Amrutha, V. N., & Geetha, S. N. (2021). Linking organizational green training and voluntary workplace green behavior: Mediating role of green supporting climate and employees' green satisfaction. *Journal of Cleaner Production*, 290, 125876. <https://doi.org/10.1016/j.jclepro.2021.125876>
- Ansari, N. Y., Farrukh, M., & Raza, A. (2021). Green human resource management and employees pro-environmental behaviours: Examining the underlying mechanism. *Corporate Social Responsibility and Environmental Management*, 28(1), 229-238. <https://doi.org/10.1002/csr.2044>
- Anwar, N., Nik Mahmood, N. H., Yusliza, M. Y., Ramayah, T., Noor Faezah, J., & Khalid, W. (2020). Green Human Resource Management for organisational citizenship behaviour towards the environment and environmental performance on a university campus. *Journal of Cleaner Production*, 256, 120401. <https://doi.org/10.1016/j.jclepro.2020.120401>
- Appelbaum, E., Bailey, T., Berg, P., & Kalleberg, A. L. (2000). *Manufacturing Advantage: Why High-Performance Work Systems Pay Off*. Cornell University Press.
- Benevene, P., & Buonomo, I. (2020). Green Human Resource Management: An evidence-based systematic literature review. *Sustainability*, 12(15), 5974. <https://doi.org/10.3390/su12155974>
- 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>
- 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/10.1016/j.tourman.2021.104401>
- Dumont, J., Shen, J., & Deng, X. (2017). Effects of Green HRM Practices on Employee Workplace Green Behavior: The role of psychological green climate and employee green values. *Human Resource Management*, 56(4), 613-627. <https://doi.org/10.1002/hrm.21792>
- Elshaer, I. A., Sobaih, A. E. E., Aliedan, M., & Azazz, A. M. S. (2021). The effect of green human resource management on environmental performance in small tourism enterprises: Mediating role of pro-environmental behaviors. *Sustainability*, 13(4), 1956. <https://doi.org/10.3390/su13041956>
- Farrukh, M., Ansari, N., Raza, A., Wu, Y., & Wang, H. (2022). Fostering employee's pro-environmental behavior through green transformational leadership, green human resource management and environmental knowledge. *Technological Forecasting and Social Change*, 179, 121643. <https://doi.org/10.1016/j.techfore.2022.121643>
- Fawehinmi, O., Yusliza, M. Y., Tanveer, M. I., & Abdullahi, M. S. (2024). Influence of green human resource management on employee green behavior: The sequential mediating effect of perceived behavioral control and attitude toward corporate environmental policy. *Corporate Social Responsibility and Environmental Management*, 31(3), 2514-2536. <https://doi.org/10.1002/csr.2707>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (3rd ed.). Sage.
- 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>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43, 115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Ji, T., de Jonge, J., Peeters, M. C. W., & Taris, T. W. (2021). Employee Sustainable Performance (E-SuPer): Theoretical conceptualization, scale development, and psychometric properties. *International Journal of Environmental Research and Public Health*, 18(19), 10497. <https://doi.org/10.3390/ijerph181910497>
- Joshi, A., Kataria, A., Rastogi, M., Beutell, N. J., Ahmad, S., & Yusliza, M. Y. (2023). Green human resource management in the context of organizational sustainability: A systematic review and research agenda. *Journal of Cleaner Production*, 430, 139713. <https://doi.org/10.1016/j.jclepro.2023.139713>
- 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>
- Li, Z., Yu, H., & Xing, L. (2023). The impact of green culture on employees' green behavior: The mediation role of environmental awareness. *Corporate Social Responsibility and Environmental Management*, 30(3), 1325-1335. <https://doi.org/10.1002/csr.2422>
- Noor Faezah, J., Yusliza, M. Y., Ramayah, T., Jabbour, C. J. C., & Kot, S. (2024). Green human resource management and employee ecological behaviour: Testing green culture and green satisfaction as parallel mediators in Malaysian higher education. *Corporate Social Responsibility and Environmental Management*, 31(5), 4280-4297. <https://doi.org/10.1002/csr.2800>
- Pham, N. T., Hoang, H. T., & Phan, Q. P. T. (2020). *Green human resource management: A comprehensive review and*

- future research agenda. *International Journal of Manpower*, 41(7), 845-878. <https://doi.org/10.1108/IJM-07-2019-0350>
- Renwick, D. W. S., Redman, T., & Maguire, S. (2013). Green Human Resource Management: A review and research agenda. *International Journal of Management Reviews*, 15(1), 1-14. <https://doi.org/10.1111/j.1468-2370.2011.00328.x>
- Ringle, C. M., Wende, S., & Becker, J.-M. (2024). SmartPLS 4. SmartPLS GmbH.
- Roscoe, S., Subramanian, N., Jabbour, C. J. C., & Chong, T. (2019). Green human resource management and the enablers of green organisational culture: Enhancing a firm's environmental performance for sustainable development. *Business Strategy and the Environment*, 28(5), 737-749. <https://doi.org/10.1002/bse.2277>
- United Nations. (2015). Transforming our world: The 2030 Agenda for Sustainable Development. United Nations General Assembly, A/RES/70/1.
- Yadate, D. A. (2025). The effect of green human resource management on employee green behavior. *Corporate Social Responsibility and Environmental Management*, 32(1), 404-418. <https://doi.org/10.1002/csr.2956>
- Zhao, F., Wang, L., Chen, Y., Hu, W., & Zhu, H. (2024). Green human resource management and sustainable development performance: Organizational ambidexterity and the role of responsible leadership. *Asia Pacific Journal of Human Resources*, 62(1), e12391. <https://doi.org/10.1111/1744-7941.12391>
- Zihan, W., & Makhbul, Z. K. M. (2024). Green Human Resource Management as a catalyst for sustainable performance: Unveiling the role of green innovations. *Sustainability*, 16(4), 1453. <https://doi.org/10.3390/su16041453>