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Green human resource management and business performance of MSMEs in Indonesia

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Abstract

This study aims to examine the effect of the practice of green human resource management strategies on the performance of business entities, mediated by green product innovation, green employee behavior, and green process innovation. This research is important because the issue of environmental impact caused by the business processes of business entities is increasingly being discussed. The existence of this issue eventually led to several regulations from the government to implement green principles in the economy and business, such as Law No. 32 of 2009, Government Regulation No. 46 of 2017, Law No. 11 of 2020, Circular Letter of the Head of LKPP No. 16 of 2020, and Presidential Regulation No. 98 of 2021. In addition, the issue of environmental protection is also a major concern in the Sustainable Development Goals, namely points 6, 7, 13, 14, and 15. Therefore, this research needs to be conducted to capture the impact of implementing green concepts in MSME businesses on performance. This research employs a quantitative approach by conducting a causal step test. The data for this study were obtained from the results of questionnaires distributed to approximately 400 MSMEs in Indonesia using the accidental sampling method. Data analysis was carried out with the help of the Eviews application. The results of this study are expected to provide information, references, and recommendations for academics, practitioners, and policymakers related to green human resource management practices in Indonesia.

Keywords: Business performance, Green employee behavior, Green human resource management, Green process innovation, Green product innovation.

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1. Introduction

Today, the term 'green' has become an important issue and a common practice to denote the image of environmentally friendly products, processes, systems, technologies, and business practices being conducted [1]. Green business practices

have generally been recognized to help organizations gain better financial efficiency and effectiveness, along with other benefits. Green business also impacts natural systems and creates a better and healthier environment [2].

The green business process is included in the concept of environmentally sustainable development implemented by business entities. The concept of environmentally sustainable development is defined as the need for a balance between industrial growth to create prosperity and the preservation of the natural environment for the welfare of future generations [3]. Environmental sustainability is an important factor for the survival and competitiveness of organizations [4]. In addition, environmental sustainability is also in line with the goals to be achieved by the Sustainable Development Goals (SDGs). The issue of environmental protection is a major goal in the Sustainable Development Goals, namely goals 6, 7, 13, 14, and 15. As a result, the implementation of effective environmental management is very important for the survival of the company and to improve sustainable performance [5].

The implementation of green business practices in business entities in Indonesia needs to be prioritized and become a special concern and focus. This is because business entities in Indonesia currently still lack awareness of the environmental impacts resulting from their activities. The issues of climate change and environmental damage have significant repercussions on the Indonesian economy. Data from the National Development Planning Agency (Bappenas), processed by CSIS, indicates that the impact of natural disaster losses in Indonesia reaches an average of IDR 1.06 trillion per year. The total cost of climate change mitigation amounts to Rp 4 trillion per year. Indonesia's gross domestic product (GDP) also has the potential to decline by 19 percent if the earth's temperature rises to 4 degrees Celsius [6]. Additionally, there have been several cases of environmental pollution in Indonesia, such as five cases of environmental pollution that occurred in Pasuruan Regency by medium industries during 2020 [7] and the pollution case involving PT KSA in 2022 in West Cikarang District, Bekasi Regency [8]. Therefore, based on the various cases of environmental pollution that have occurred, the implementation of green business practices through environmental management needs to be a special topic.

One of the implementations of environmental management is to conduct green human resource management strategies. Jabbour [9] defines GHRM as 'the systematic and planned alignment of typical human resource management practices, such as recruitment, training, and motivation, with organizational or corporate sustainability goals'. The ability, motivation, opportunity (AMO) framework in HRM or GHRM literature categorizes HRM practices into three distinct dimensions: ability (i.e., recruitment and selection, training); motivation (i.e., performance management, pay, and reward); and opportunity (i.e., engagement, environmentally friendly ways of working, responsibility, and rules). The increasing use of the AMO framework in GHRM research in recent years corroborates the idea that these three GHRM dimensions, when combined, enable, motivate, and provide opportunities for employees to adopt green behaviors, which in turn will improve corporate sustainability performance [10, 11].

The adoption of green human resource management strategies by business organizations also fits the explanation of signaling theory. Signaling theory has the central idea of communication by and within organizations [12] and proposes that organizations can use GHRM practices to signal their importance. Signaling theory focuses on the receiver or employee when it comes to GHRM practices. The theory assumes that employees are active receivers and will provide their own interpretations regarding the implementation of GHRM practices [13]. In fact, signaling theory highlights the need to focus on socio-cognitive factors and their relevance in explaining RMA to HR signals [14].

Based on the explanation above, research on the implementation of green human resource management strategies is important to be carried out in Indonesia. This is because the issue of environmental impacts caused by the business processes of business entities is increasingly being discussed. This issue is also an important issue in Indonesia, where there are several regulations from the government to implement green principles in the economy and business such as [15]; [16]; [17]; Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah (LKPP RI) [18] and Peraturan Presiden [19]. Therefore, this study will focus on highlighting the effect of human resource management strategies on business performance.

Research related to the topic of green human resource management has been carried out by several previous studies. Research by Ahmed et al. [20] tested the effect of GRHM by involving employees and environmental sustainability in manufacturing companies in Bahrain. This study found that environmentally friendly human resource practices have a positive relationship with environmental sustainability, and employee engagement mediates the relationship between environmentally friendly human resource practices and environmental sustainability.

Research Andjarwati et al. [21] tested the role of Green HRM, training, development, and green policies on environmental sustainability. The study also examined the mediating role of employee green behavior and the moderating role of individual green values. Data were collected from employees associated with the mining sector in Indonesia. The results of this study found that green training and development are not important predictors of environmental sustainability.

Research from Ali et al. [22] also conducted research related to GRHM on corporate environmental innovativeness. This study identified the moderating role of organizational innovative culture on the relationship between green HRM and corporate environmental innovativeness. This study was conducted on 212 furniture manufacturing companies in Malaysia and analyzed using structural equation modeling. The results of the data analysis show that green HRM practices are positively related to corporate environmental innovation. This study also found a moderating role of organizational innovative culture on the effect of green training and green compensation on corporate environmental innovation.

Research Huo et al. [23] aimed to investigate the impact of green human resource management (GHRM) practices on green performance through the mediation of green work climate, green work engagement, and green employee behavior. To fulfill the objective, a cross-sectional quantitative study was conducted using simple random sampling, and data were collected using a structured questionnaire from 390 employees of manufacturing SMEs in Pakistan. The findings of this study support all direct and indirect relationships and reveal that the incorporation of GHRM practices in SMEs has a performance-supportive effect in terms of achieving green performance.

Based on the results of previous studies, it shows that there is a research gap, namely inconsistencies in the results of previous studies. Research from Ahmed et al. [20], Ali et al. [22], and Huo et al. [23] states that GRHM affects business performance, while Andjarwati et al. [21] found that GRHM is not a predictor of environmental performance. Therefore, research related to green HRM needs to be conducted again.

The purpose of this study is to examine the effect of green human resource management on business performance through green product innovation, green employee behavior, and green process innovation. Therefore, this research is classified as basic research that employs a quantitative approach. Basic research, also referred to as fundamental research or pure research, contributes to the development of certain sciences and enhances the knowledge structure [24]. The problem-solving approach utilized in this study is conducted using a quantitative method. The quantitative approach is employed in this study to test the influence between the variables. Quantitative testing in this study was conducted on research hypotheses developed from grand theory, namely AMO theory, legitimacy theory, and the results of several previous studies.

Research on green human resource management (GHRM) has previously been conducted by several researchers in various countries with different types of samples. This research was based on studies conducted by Mustafa et al. [25] and Ali et al. [26]. Mustafa et al. [25] conducted a study to understand green competitive advantage through the application of the Ability-Motivation-Opportunity theory and the Natural Resource-Based View. In a timed longitudinal online survey related to small and medium-sized manufacturing companies, 223 professionals participated. The results support the model and verify the influence of green human resource management practices on green competitive advantage, with partial mediation of green knowledge sharing and green innovation (green product innovation and green process innovation). The analysis revealed a highly significant positive moderation of green human capital, which is novel to this study.

Research conducted by (26) used the ability, motivation, and opportunity (AMO) framework to examine how corporate GHRM practices indirectly shape employees' green behavior for sustainable corporate performance by fostering and strengthening green organizational culture under the boundary conditions of high employee pro-environmental behavior. Data were collected from Green DAY managers and employees in 242 ISO-14001 certified green companies in the Kingdom of Saudi Arabia. The findings support the proposition that GHRM practices, both directly and indirectly, shape employees' green behaviors for sustainable performance. GHRM practices indirectly enhance employees' green behavior for sustainable performance by fostering and developing a green organizational culture in the presence of high pro-environmental behavior.

Based on the explanation of the two research results, the state of the art of this research tries to develop a model of the effect of green human resource management on business performance by including green product innovation, green employee behavior, and green process innovation variables as mediating variables. This is based on the argument that the green human resource management strategy is a trigger for the emergence of green product innovation, green employee behavior, and green process innovation, which, in turn, if applied to a business entity, will be able to improve business performance. Some previous studies that conducted research on the topic of green human resource management still have not found a research model using these three mediating variables. Therefore, this research model can be the state of the art of this research when compared to previous studies. Based on the explanation of the background that has been conveyed previously, this research has a problem formulation that will be answered in this study as follows.

1. Does green human resource management have a positive effect on green product innovation, green employee behavior, and green process innovation?
2. Do green human resource management, green product innovation, green employee behavior, and green process innovation have a positive effect on business performance?
3. Does green human resource management have a positive effect on business performance through green product innovation, green employee behavior, and green process innovation?

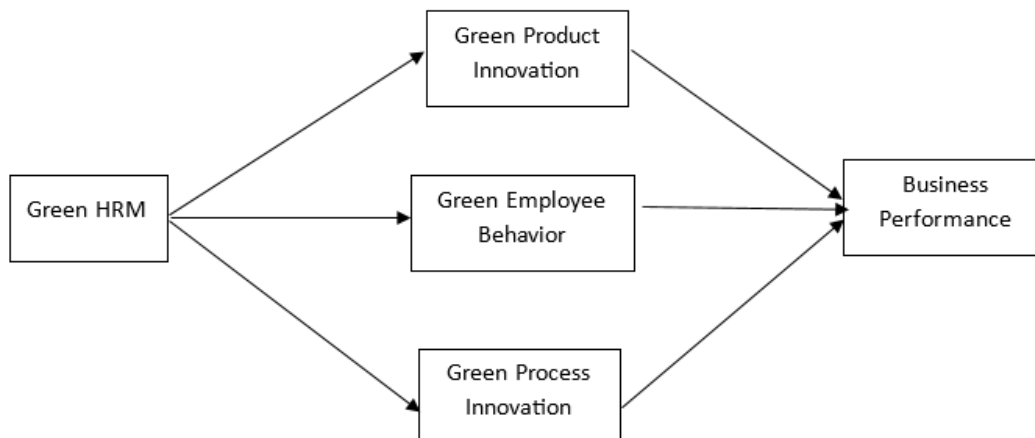


Figure 1.
Research Model.

2. Method

2.1. Data Type and Source

The data in this study is research that uses primary data. The type of primary data used in this study is a questionnaire. This research questionnaire will be distributed to Micro, Small, and Medium Enterprises in Malang Regency. This is because

Malang Regency is the district with the largest number of MSMEs in East Java Province. Based on data from the Office of Cooperatives and MSMEs of East Java Province, it shows that the number of MSMEs in Malang Regency is 100,627 [27]. The determination of the number of research samples is based on the Slovin formula as follows:

$$n = \frac{N}{1 + Ne^2}$$

where: n = sample size; N = population size; e = margin of error.

The results of calculations using the Slovin formula with a population of 100,627 and an error rate of 5% found that the minimum sample size was 398.42, which was rounded up to 400 samples. The process of selecting MSMEs as respondents in this study was carried out using the accidental sampling method.

2.2. Data Collection Technique

The data collection method used involves several techniques, namely literature study, documentation, and questionnaires. The literature study method aims to collect data sourced from literature such as books, scientific articles, and other materials that are used to prepare research instruments. Furthermore, documentation is a data collection technique in the form of records of past events. Finally, the distribution of questionnaires is intended to obtain research data from respondents, which will be processed to draw conclusions.

2.3. Operational Definition of Variables

The variables in this study were measured using the references as presented in the following Table 1.

Table 1.
Operational definition and measurement of variables.

Variables	Operational Definition	Measurement Indicators	Scale	Reference
Green Human Resource Management (X ₁)	Green HRM is a term that describes aspects of sustainable HRM that relate to environmental sustainability issues. In addition, Green HRM practices consider environmentally friendly behavior in performance appraisals, rewards, compensation, and promotions to motivate employees regarding environmentally friendly activities.	1. Selection & Recruitment 2. Training & Development 3. Compensation & Rewards	Ordinal (Scale 1-5)	Wagner [28] and Zihan and Makhbul [29]
Green Products Innovation (I ₁)	Green product innovation aims to modify or adapt product design to reduce its negative effects on the environment. In addition, this type of innovation is used as a weapon to achieve GCA in the market. For example, organizations can choose raw materials that produce less pollution and eliminate hazardous substances from products.	1. Products produce less pollution. 2. Products consume the least energy and resources. 3. Using the least material method to assemble the product. 4. Products are easy to recycle, reuse, and decompose.	Ordinal (Scale 1-5)	Lin, et al. [30]; Kivimaa and Kautto [31]; Xie, et al. [32] and Chen, et al. [33]
Green Process Innovation (I ₂)	Green process innovation is an effort to reduce emissions, waste, or make it a valuable resource during the production process.	1. The manufacturing process effectively reduces emissions of hazardous materials or waste. 2. The company's manufacturing processes recycle waste and emissions, allowing them to be processed and reused. 3. The manufacturing process reduces the consumption of	Ordinal (Scale 1-5)	Xie, et al. [32]; Chen, et al. [33] and Hart and Ahuja [34]

Variables	Operational Definition	Measurement Indicators	Scale	Reference
		water, electricity, coal, or oil. 4. The production process reduces the use of raw materials.		
Green Employee Behavior (I ₃)	Employee green behavior refers to actions demonstrated by employees that have a positive impact on the environment.	1. Preserving category 2. Working sustainably 3. Avoid danger 4. Influencing others 5. Taking the initiative	Ordinal (Scale 1-5)	Algarni, et al. [35] and Iqbal, et al. [36]
Business Performance (Y)	Business performance here is interpreted as a green competitive advantage, which is a situation where competitors cannot imitate a particular position of an organization regarding environmental protection.	1. Have the competitive advantage of low cost. 2. The quality of the product or service offered is better than competitors. 3. Able to do R&D and innovation better than its competitors. 4. Have better management skills than their competitors. 5. The company's profitability is getting better. 6. Business growth exceeds its competitors. 7. Becoming a pioneer in several important fields and occupying important positions. 8. The entity's image is better than other competitors.	Ordinal (Scale 1-5)	Chen, et al. [33] and Chen and Chang [37]

2.4. Data Analysis Technique

This research, when viewed from the analytical approach, can be classified as quantitative research. Quantitative research emphasizes testing theories by measuring research variables with numbers and analyzing data using statistical procedures. This study employs causal relationship analysis, specifically examining how one variable affects changes in other variables. This study utilizes a sample of all non-financial companies listed on the IDX from 2018 to 2023.

The data analysis that will be carried out in this study will use a statistical approach consisting of descriptive statistics, classical assumption tests, model feasibility tests, and research hypothesis testing. Data analysis using descriptive statistics is intended to provide an overview of the distribution of research variable data in general. Descriptive statistics that will be discussed include analysis of the average data (mean), maximum value, minimum value, and standard deviation [38].

The second test after descriptive statistics is to conduct a classic assumption test. These assumptions include tests of normality, heteroscedasticity, multicollinearity, and autocorrelation [38]. The use of structural equation modelling requires the fulfilment of several basic assumptions to produce the best estimate (Best Linear Unbiased Estimator- BLUE).

Testing the suitability of the model aims to test the accuracy of the regression function from the sample in estimating the actual value [39]. Model suitability can be seen from the coefficient of determination (adjusted R²) and ANOVA test output. The coefficient of determination (R²) measures the statistical explanatory power of the independent variable in explaining a proportion of the variance of the dependent variable [40]. When compared to the coefficient of determination (R²), the use of adjusted R² is more advisable in interpreting the statistical power of the independent variables to explain variation in the dependent variable.

This study involves causal step mediation testing, which involves four interrelated models. The analytical technique used for testing causal step mediation is Ordinary Least Square [41] multiple regression. The tool used to process and analyse the data is EViews software version 10. Testing the ten hypotheses (H1 to H10) will use a 95% confidence level and a one-tail test.

3. Results and Discussion

3.1. Overview of the Research Questionnaire

The first stage in the research implementation process is to compile a research questionnaire. The research questionnaire was prepared based on the indicators of each research variable obtained from previous studies. The questionnaire was distributed online using Google Forms. The following is a link to the online questionnaire that has been distributed in this study: <https://forms.gle/1CEwHFZ5VBUVch6B8>.

3.2. Description of Research Respondents

The questionnaires distributed in this study were distributed to approximately 500 Micro, Small, and Medium Enterprises (MSMEs) in Malang Regency. However, of the number of questionnaires that have been distributed to these MSMEs, only 401 MSMEs have filled out and after reviewing the returned questionnaires, only around 345 questionnaires were filled in completely and can be processed to the data analysis stage. Table 2 presents a description of the research respondents who have filled out the questionnaires that have been distributed.

Table 2.

Description of Research Respondents.

Respondent	Total	%
Gender:		
Man	134	33.33
Woman	268	66.67
Education Level		
Elementary School	4	0.99
Junior High School	21	5.22
Senior High School	130	32.34
Diploma (D3)	63	15.67
Bachelor (S1)	179	44.53
Master's Degree (S2)	5	1.24
Doctoral (S3)	0	0
Ages		
Less than 17 years	10	2.49
17 years – 20 years	121	30.1
21 years – 30 years	179	44.53
31 years – 40 years	44	10.95
More than 40 years	48	11.94
Length of Business		
Less than 1 year	48	11.94
1 year – 3 years	79	19.65
3 years – 5 years	88	21.89
5 years – 10 years	129	32.09
More than 10 years	58	14.42
Amount of Turnover Per Month		
Less than Rp 10.000.000	66	16.42
Rp 10.000.000 – Rp 20.000.000	102	25.37
More than Rp 20.000.000 – Rp 40.000.000	74	18.41
More than Rp 40.000.000 – Rp 80.000.000	111	27.61
More than Rp 80.000.000	49	12.19

Table 2 above shows a description of the respondents who filled out the research questionnaire. The number of respondents who completed the questionnaire was 402 individuals who were owners of MSMEs in Malang Regency. Most of the respondents are female, with the majority age range being from 17 years to 30 years, and the highest education level attained is high school graduation and Strata I (S1). The majority of MSMEs represented in this study have been operating their businesses for 5 to 10 years, with monthly turnover ranging from Rp 40,000,000 to Rp 80,000,000.

4. Data Analysis

4.1. Reliability and Validity Test Results

The first data analysis process is the reliability test and validity test of the research instrument. The reliability test in this study is intended to measure the level of consistency of the questionnaire, which is an indicator of the variable or construct. A questionnaire is said to be reliable if a person's answer to a question is consistent or stable over time. The level of reliability is determined from the Cronbach's alpha value, which is compared to the r table value. The r table value for the number of respondents in this study is 0.1150. Table 3 presents the results of the reliability test that has been carried out in this study.

Table 3.
Reliability Test Results.

Variable	Cronbach Alpha	Indicators
Green Human Resource Management	0.57	11
Green Product Innovation	0.531	10
Green Process Innovation	0.579	9
Green Employee Behavior	0.637	12
Business Performance	0.588	11

Table 3 shows that the value of Cronbach's alpha for each variable is greater than the r table value, namely 0.1150. Thus, all variables in this study have met the criteria for the reliability test.

The next process is the validity test, where this validity test is carried out to show the extent to which the measuring instrument used in a measurement measures what is intended to be measured. The validity test in this study is determined from the Pearson correlation value and the resulting significance. If the Pearson correlation value is positive and the significance is less than 0.05, it can be concluded that the variable is valid. Table 4 presents the results of the validity test that has been carried out in this study.

Table 4.
Validity Test Results (Nilai Pearson Correlation).

GHRM	Green Product Innovation	Green Process Innovation	Green Employee Behavior	Business Performance
0.182	0.334	0.519	0.370	0.410
0.285	0.386	0.356	0.398	0.375
0.237	0.302	0.274	0.320	0.315
0.299	0.344	0.287	0.337	0.453
0.253	0.303	0.257	0.337	0.274
0.296	0.296	0.414	0.399	0.139
0.312	0.458	0.401	0.327	0.478
0.408	0.210	0.462	0.474	0.368
0.432	0.234		0.357	0.316
0.530			0.363	0.264
			0.398	

Table 4 presents the Pearson correlation values of the validity test that has been conducted for each variable, while the significance value for each item is 0.000. Thus, the positive Pearson correlation values and a significance value of less than 0.05 indicate that all items of this research variable have met the validity test criteria.

4.2. Classical Assumption Test Results

The classical assumption test in this study was conducted to ensure that the regression model met the BLUE (Best Linear Unbiased Estimators) criteria. The classical assumption test was performed by conducting a normality test, a multicollinearity test, and a heteroscedasticity test. The first test conducted was the normality test, which aims to determine whether the data distribution in this study is normal. The normality test was carried out by conducting the Kolmogorov-Smirnov test (K-S test) and analyzing the shape of the histogram and P-plot. Table 5 and Figure 2, and Figure 3 present the results of the normality test that has been conducted in this study.

Table 5.
Normality Test Result.

		Unstandardized Residual
N		379
Normal Parameters ^{a,b}	Mean	0.00
	Std. Deviation	02.32
Most Extreme Differences	Absolute	0.053
	Positive	0.048
	Negative	-0.053
Kolmogorov-Smirnov Z		1.036
Asymp. Sig. (2-tailed)		0.234
a. Test distribution is Normal.		
b. Calculated from data.		

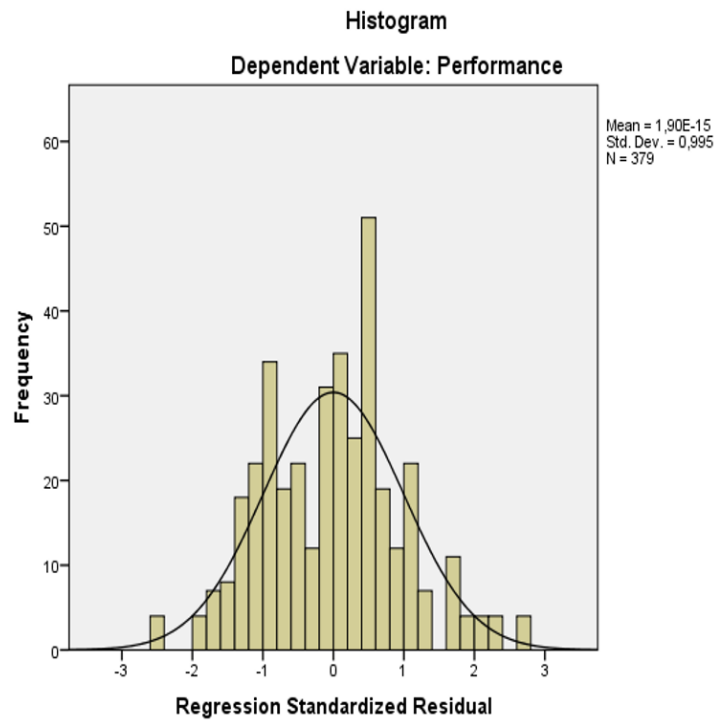


Figure 2.
Histogram.

Normal P-P Plot of Regression Standardized Residual

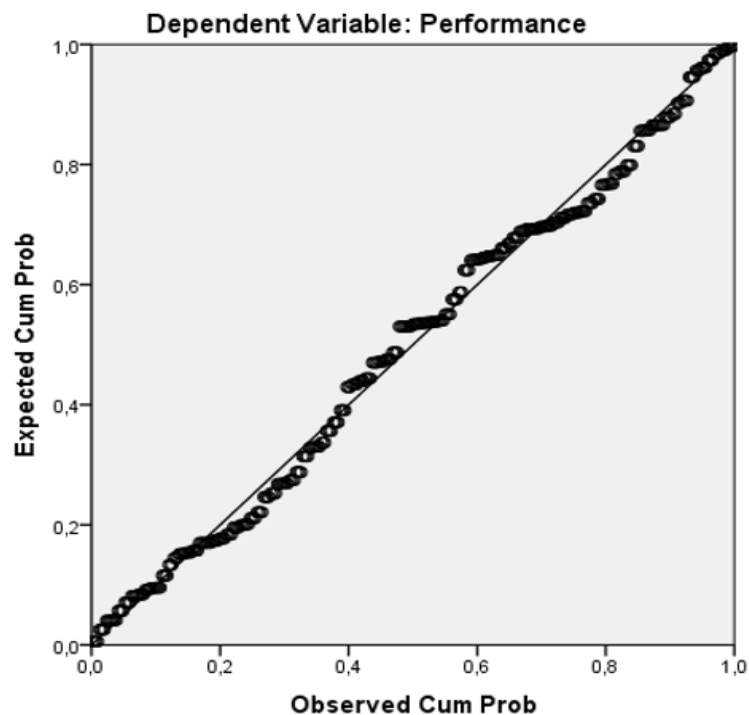


Figure 3.
P-Plot.

Table 5 shows the Kolmogorov Smirnov results that have been carried out in this study. The significance value shows a value of 0.234 so that this value shows that it is greater than 0.05. Thus, the K-S test results show that this research data has a normal data distribution. The results of this normality test are also supported by Figure 2 and Figure 3, where the histogram shows that the curve formed forms an arch in the middle and the points on the P-Plot approach the diagonal line in the middle.

The second classical assumption test conducted in this study is the multicollinearity test. The multicollinearity test is conducted to see the relationship or correlation that occurs between each variable. A good regression model should not have a correlation between independent variables. This test is conducted by looking at the Tolerance value and the Variance Inflation Factor (VIF) value of each independent variable. The regression model is said to be good if it has a tolerance value

of more than 0.1 and a VIF of less than 10. Table 6 shows the results of the multicollinearity test that has been conducted in this study.

Table 6.
Multicollinearity Test Result.

Variable	Tolerance	VIF
Green Human Resource Management	0.743	1.347
Green Product Innovation	0.819	1.221
Green Process Innovation	0.739	1.353
Green Employee Behavior	0.830	1.204

Source: Output SPSS.

The last classical assumption test is to conduct a heteroscedasticity test. This test aims to determine whether there is inequality in the variance of the residuals from one observation to another in the regression model. In this study, the heteroscedasticity test was conducted based on the scatterplot. A good regression model does not experience heteroscedasticity, as indicated by a scatterplot pattern that is spread out and does not form a particular pattern. Figure 4 below shows the results of the heteroscedasticity test that has been conducted in this study.

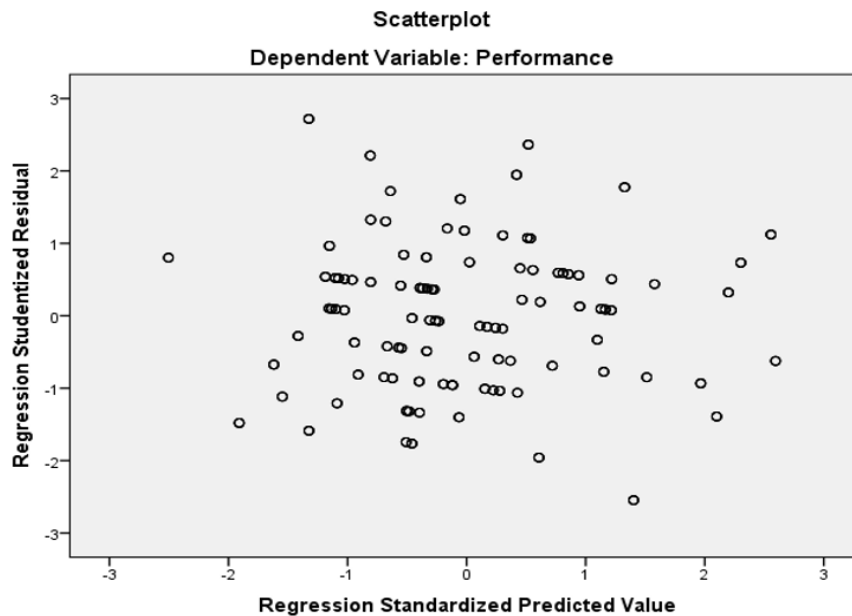


Figure 4.
Scatter Plot.

4.3. Hypothesis Test Result

The last stage in data analysis is to conduct a research hypothesis test. This stage consists of several testing processes, namely the determination coefficient test (R^2), simultaneous test (F test), direct effect test, and Sobel test. Table 7 presents the results of the hypothesis test that has been carried out in this study.

Table 7.
Hypothesis Test Result.

Relationship	Coefficient	t-value	Sig.	Decision
GHRM → Green Product Innovation	0.158	-	0.000	Significant
GHRM → Green Process Innovation	0.207	-	0.000	Significant
GHRM → Green Employee Behavior	0.441	-	0.000	Significant
GHRM → Performance	0.011	-	0.854	Not Significant
Green Product Innovation → Performance	0.172	-	0.040	Significant
Green Process Innovation → Performance	0.05	-	0.120	Not Significant
Green Employee Behavior → Performance	0.072	-	0.000	Significant
GHRM → Green Product Innovation → Performance	-	3.197	0.000	Significant
GHRM → Green Process Innovation → Performance	-	0.771	0.220	Not Significant
GHRM → Green Employee Behavior → Performance	-	0.673	0.250	Not Significant
Sig. Value of F Test				0.009
Coefficient of Determination				0.253

Table 7 shows some important research results. First, Green Human Resource Management (GRHM) has a positive effect on green product innovation, green process innovation, and green employee behavior. Furthermore, green product innovation, green process innovation, and green employee behavior have a positive effect on business performance while GHRM has no direct effect on business performance. Finally, green product innovation is proven to have a mediating effect on the indirect effect of GHRM on business performance. However, green process innovation and green employee behavior are not proven to have a mediating effect on the indirect effect of GHRM on business performance.

The Effect of Green Human Resource Management on Green Product Innovation, Green Employee Behavior, and Green Process Innovation.

The first results of this study indicate that the green human management variable has a positive effect on green product innovation in MSMEs. This is indicated by the coefficient value and significance resulting from the regression test that has been carried out. The regression test results show a coefficient value of 0.158 and a significance value of 0.000. Thus, the first hypothesis of this study (H_1), which states that green human management has a positive effect on green product innovation, is accepted.

The next results of this study indicate that the green human management variable has a positive effect on green employee behavior in MSMEs. This is indicated by the coefficient value and significance resulting from the regression test that has been carried out. The regression test results show a coefficient value of 0.441 and a significance value of 0.000. Thus, the second hypothesis of this study (H_2), which states that green human management has a positive effect on green employee behavior, is accepted.

The last results of this study indicate that the green human management variable has a positive effect on green process innovation in MSMEs. This is indicated by the coefficient value and significance resulting from the regression test that has been carried out. The regression test results show a coefficient value of 0.207 and a significance value of 0.000. Thus, the third hypothesis of this study (H_3), which states that green human management has a positive effect on green process innovation in this study, is accepted.

The Effect of Green Human Resource Management, Green Product Innovation, Green Employee Behavior, and Green Process Innovation on Business Performance.

The results of this study indicate that the green human management variable has a positive effect on business performance in MSMEs. This is indicated by the coefficient value and significance resulting from the regression test that has been carried out. The regression test results show a coefficient value of 0.011 and a significance value of 0.854. Thus, the fourth hypothesis of this study (H_4), which states that green human management has a positive effect on business performance in this study, is rejected.

The next results of this study indicate that the green product innovation variable has a positive effect on green process innovation in MSMEs. This is indicated by the coefficient value and significance resulting from the regression test that has been carried out. The regression test results show a coefficient value of 0.172 and a significance value of 0.04. Thus, the fifth hypothesis of this study (H_5), which states that green product innovation has a positive effect on green process innovation in this study, is accepted.

The other results of this study indicate that the green employee behavior variable has a positive effect on green process innovation in MSMEs. This is indicated by the coefficient value and significance resulting from the regression test that has been carried out. The regression test results show a coefficient value of 0.072 and a significance value of 0.000. Thus, the sixth hypothesis of this study (H_6), which states that green employee behavior has a positive effect on green process innovation in this study, is accepted.

The last results of this study indicate that the green process innovation variable has a positive effect on green process innovation in MSMEs. This is indicated by the coefficient value and significance resulting from the regression test that has been carried out. The regression test results show a coefficient value of 0.05 and a significance value of 0.120. Thus, the seventh hypothesis of this study (H_7), which states that green process innovation has a positive effect on green process innovation in this study, is rejected.

The Mediating Effect of Green Product Innovation, Green Employee Behavior, and Green Process Innovation on The Effect of Green Human Resource Management on Business Performance.

The results of this study indicate that the green product innovation variable is able to mediate the influence of green human management on business performance. This is indicated by the t value and significance of the Sobel test results shown, which have a t value of 3.197 and a significance of 0.000. Thus, the eighth hypothesis of this study (H_8), which states that the green product innovation variable has a mediating effect on the effect of green human management on business performance in this study, is accepted.

The next results of this study indicate that the green employee behavior variable is able to mediate the influence of green human management on business performance. This is indicated by the t value and significance of the Sobel test results shown, which have a t value of 0.673 and a significance of 0.250. Thus, the ninth hypothesis of this study (H_9), which states that the green employee behavior variable has a mediating effect on the effect of green human management on business performance in this study, is rejected.

The last results of this study indicate that the green process innovation variable is able to mediate the influence of green human management on business performance. This is indicated by the t value and significance of the Sobel test results shown, which have a t value of 0.771 and a significance of 0.220. Thus, the tenth hypothesis of this study (H_{10}), which states that the green process innovation variable has a mediating effect on the effect of green human management on business performance in this study, is rejected.

5. Conclusion

This study aims to find empirical evidence regarding the effect of green human resource management, green product innovation, green employee behavior, and green process innovation on MSME business performance. In addition, this study also seeks to prove the mediating effect of green product innovation, green employee behavior, and green process innovation on the effect of green human resource management on MSME business performance. The results showed that Green Human Resource Management (GHRM) positively affects green product innovation, green process innovation, and green employee behavior. Furthermore, green product innovation, green process innovation, and green employee behavior have a positive effect on business performance, while GHRM has no direct effect on business performance. Finally, green product innovation is shown to have a mediating effect on the indirect effect of GHRM on business performance. However, green process innovation and green employee behavior are not proven to have a mediating effect on the indirect effect of GHRM on business performance.

The results of this study have implications, namely that micro, small, and medium enterprises in Indonesia need to apply good green human resource management. This is because the maximum application of GHRM can support a business entity in running and creating green product innovation, green employee behavior, and green process innovation. In addition, GHRM that is maximally implemented will be able to create good business performance through the implementation of green product innovation. MSME products that are environmentally friendly through green innovation are able to provide a special attraction for consumers because they are considered not damaging and polluting the environment. Therefore, consumers will prefer to buy products that implement green innovation and are able to increase the company's sales revenue.

The results of this study can be used as a source of reference and material for consideration while still considering the limitations of existing research. The limitation of this research is that the respondents in this study were limited to MSMEs in one region of Indonesia. Thus, further research needs to expand the scope of research respondents by including respondents from MSMEs in several regions of Indonesia or companies. The second limitation of this research is that there are still few studies on similar topics using the variables as in this study, especially in Indonesia, making the use of a grand theory that is suitable for developing hypotheses and/or research questionnaires more difficult. Based on this, further research is expected to be able to search for references to previous research more broadly.

References

- [1] S. Vachon and R. D. Klassen, "Environmental management and manufacturing performance: The role of collaboration in the supply chain," *International Journal of Production Economics*, vol. 111, no. 2, pp. 299-315, 2008. <https://doi.org/10.1016/j.ijpe.2006.11.030>
- [2] A. T. Bon, A. A. Zaid, and A. Jaaron, "Green human resource management, green supply chain management practices and sustainable performance," in *8th International Conference on Industrial Engineering and Operations Management (IEOM), (Bandung, Indonesia) March*, 2018, pp. 6-8.
- [3] B. F. Daily and S. c. Huang, "Achieving sustainability through attention to human resource factors in environmental management," *International Journal of Operations & Production Management*, vol. 21, no. 12, pp. 1539-1552, 2001. <https://doi.org/10.1002/bse.277>
- [4] K. H. Lee, "Why and how to adopt green management into business organizations? The case study of Korean SMEs in manufacturing industry," *Management Decision*, vol. 47, no. 7, pp. 1101-1121, 2009. <https://doi.org/10.1108/00251740910978322>
- [5] L. Preston, "Sustainability at Hewlett-Packard," *California Management Review Reprint Series*, vol. 43, no. 3, pp. 122-141, 2001.
- [6] B. K. Yogatama, "Economic losses due to environmental damage hinder Indonesia's progress. Kompas," Retrieved: <https://www.kompas.id/baca/ekonomi/2023/11/02/kerugian-ekonomi-akibat-kerusakan-lingkungan-hambat-indonesia-maju>, 2023.
- [7] Pasuruan Regency Government, "Cases of environmental pollution due to company waste in Pasuruan Regency are decreasing," Retrieved: <https://www.pasuruankab.go.id/isiberita/kasus-pencemaran-lingkungan-akibat-limbah-perusahaan-di-kabupaten-pasuruan-semakin-menurun>, 2020.
- [8] Bekasi Regency Government, "This is an environmental pollution violation by PT KSA in West Cikarang," Retrieved: <https://www.bekasikab.go.id/ini-pelanggaran-pencemaran-lingkungan-oleh-pt-ksa-di-cikarang-barat>, 2022.
- [9] C. J. C. Jabbour, "Environmental training and environmental management maturity of Brazilian companies with ISO14001: Empirical evidence," *Journal of Cleaner Production*, vol. 96, pp. 331-338, 2015. <http://dx.doi.org/10.1016/j.jclepro.2013.10.039>
- [10] A. K. Al-Swidi, H. M. Gelaidan, and R. M. Saleh, "The joint impact of green human resource management, leadership and organizational culture on employees' green behaviour and organisational environmental performance," *Journal of Cleaner Production*, vol. 316, p. 128112, 2021. <https://doi.org/10.1016/j.jclepro.2021.128112>
- [11] S. Maheshwari, A. Kaur, and D. W. Renwick, "Green human resource management and green culture: An integrative sustainable competing values framework and future research directions," *Organization & Environment*, vol. 37, no. 1, pp. 32-56, 2024. <https://doi.org/10.1177/10860266231217280>
- [12] B. L. Connelly, S. T. Certo, R. D. Ireland, and C. R. Reutzel, "Signaling theory: A review and assessment," *Journal of Management*, vol. 37, no. 1, pp. 39-67, 2011. <https://doi.org/10.1177/0149206310388419>
- [13] M. Spence, "Job market signaling," *The Quarterly Journal of Economics*, vol. 87, no. 3, pp. 355-374, 1973. <https://doi.org/10.2307/1882010>
- [14] D. E. Guest, K. Sanders, R. Rodrigues, and T. Oliveira, "Signalling theory as a framework for analysing human resource management processes and integrating human resource attribution theories: A conceptual analysis and empirical exploration," *Human Resource Management Journal*, vol. 31, no. 3, pp. 796-818, 2021. <https://doi.org/10.1111/1748-8583.12326>
- [15] President of the Republic of Indonesia, "Law of the Republic of Indonesia Number 32 of 2009 concerning Environmental Protection and Management," Retrieved: <https://jdih.setneg.go.id/>. [Accessed 2009.
- [16] Government of the Republic of Indonesia, "Government regulation Number 46 of 2017 concerning environmental economic instruments," Retrieved: <https://peraturan.bpk.go.id/Home/Details/64701>. [Accessed 2017.

- [17] Badan Pemeriksa Keuangan (BPK), "Law of the Republic of Indonesia Number 11 of 2020 concerning job creation," Retrieved: <https://peraturan.bpk.go.id/Home/Details/135059>, 2020.
- [18] Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah (LKPP RI), "Surat Edaran Kepala LKPP Nomor 16 Tahun 2020," Retrieved: <https://jdih.lkpp.go.id/regulation/surat-edaran-kepala-lkpp-nomor-16-tahun-2020>, 2020.
- [19] Peraturan Presiden, "Presidential regulation Number 98 of 2021 concerning the implementation of carbon economic value for the achievement of Nationally Determined Contribution Targets and Control of Greenhouse Gas Emissions in National Development. BPK Regulation Database," Retrieved: <https://peraturan.bpk.go.id/Home/Details/184282/perpres-no-98-tahun-2021>, 2021.
- [20] U. Ahmed, M. R. H. AlZgool, and S. M. M. Shah, "The impact of green human resource practices on environmental sustainability," *Polish Journal of Management Studies*, vol. 20, no. 1, pp. 9–18, 2019.
- [21] T. Andjarwati, E. Budiarti, A. K. Audah, S. Khouri, and R. Rebilas, "The impact of green human resource management to gain enterprise sustainability," *Polish Journal of Management Studies*, vol. 20, no. 2, pp. 93-103, 2019.
- [22] S. Ali, A. J. Ali, K. Ashfaq, and J. Khalid, "Green human resource management and environmental innovativeness," *International Journal of Sustainable Development & Planning*, vol. 16, no. 6, pp. 1-14, 2021.
- [23] X. Huo, A. Azhar, N. Rehman, and N. Majeed, "The role of green human resource management practices in driving green performance in the context of manufacturing SMEs," *Sustainability*, vol. 14, no. 24, p. 16776, 2022. <https://doi.org/10.3390/su142416966>
- [24] A. Ferdinand, *Research methods of BP management*, Diponegoro University. Semarang: BP Universitas Diponegoro, 2014.
- [25] K. Mustafa, M. B. Hossain, F. Ahmad, F. Ejaz, H. G. A. Khan, and A. Dunay, "Green human resource management practices to accomplish green competitive advantage: A moderated mediation model," *Heliyon*, vol. 9, no. 11, p. e21830, 2023. <https://doi.org/10.1016/j.heliyon.2023.e21830>
- [26] M. Ali *et al.*, "Green HRM practices and corporate sustainability performance," *Management Decision*, vol. 62, no. 11, pp. 3681-3703, 2024. <https://doi.org/10.1108/MD-05-2023-0787>
- [27] Timur DK & UPJ, "National MSME data statistics," Retrieved: https://data.diskopukm.jatimprov.go.id/satu_data/statistik, 2024.
- [28] M. Wagner, "'Green' human resource benefits: Do they matter as determinants of environmental management system implementation?," *Journal of Business Ethics*, vol. 114, pp. 443-456, 2013. <https://doi.org/10.1007/s10551-012-1356-9>
- [29] W. Zihan and Z. K. M. Makhbul, "Green human resource management as a catalyst for sustainable performance: Unveiling the role of green innovations," *Sustainability*, vol. 16, no. 4, p. 1453, 2024. <https://doi.org/10.3390/su16041453>
- [30] R.-J. Lin, K.-H. Tan, and Y. Geng, "Market demand, green product innovation, and firm performance: Evidence from Vietnam motorcycle industry," *Journal of Cleaner Production*, vol. 40, pp. 101-107, 2013. <https://doi.org/10.1016/j.jclepro.2012.01.001>
- [31] P. Kivimaa and P. Kautto, "Making or breaking environmental innovation? Technological change and innovation markets in the pulp and paper industry," *Management Research Review*, vol. 33, no. 4, pp. 289-305, 2010. <https://doi.org/10.1108/01409171011030468>
- [32] X. Xie, J. Huo, and H. Zou, "Green process innovation, green product innovation, and corporate financial performance: A content analysis method," *Journal of Business Research*, vol. 101, pp. 697-706, 2019. <https://doi.org/10.1016/j.jbusres.2019.01.010>
- [33] Y.-S. Chen, S.-B. Lai, and C.-T. Wen, "The influence of green innovation performance on corporate advantage in Taiwan," *Journal of Business Ethics*, vol. 67, pp. 331-339, 2006. <https://doi.org/10.1007/s10551-006-9025-5>
- [34] S. L. Hart and G. Ahuja, "Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance," *Business Strategy and the Environment*, vol. 5, no. 1, pp. 30–37, 1996. [https://doi.org/10.1002/\(SICI\)1099-0836\(199603\)5:1<30::AID-BSE38>3.0.CO;2-Q](https://doi.org/10.1002/(SICI)1099-0836(199603)5:1<30::AID-BSE38>3.0.CO;2-Q)
- [35] M. A. Algarni *et al.*, "Make green, live clean! Linking adaptive capability and environmental behavior with financial performance through corporate sustainability performance," *Journal of Cleaner Production*, vol. 346, p. 131156, 2022. <https://doi.org/10.1016/j.jclepro.2022.131156>
- [36] Q. Iqbal, S. H. Hassan, S. Akhtar, and S. Khan, "Employee's green behavior for environmental sustainability: A case of banking sector in Pakistan," *World Journal of Science, Technology and Sustainable Development*, vol. 15, no. 2, pp. 118-130, 2018.
- [37] Y.-S. Chen and C.-H. Chang, "Enhance environmental commitments and green intangible assets toward green competitive advantages: An analysis of structural equation modeling (SEM)," *Quality & Quantity*, vol. 47, pp. 529-543, 2013. <https://doi.org/10.1007/s11135-011-9548-3>
- [38] W. Winarno, *Econometric and statistical analysis with eviews*, 4th ed. Yogyakarta: UPP STIM YKPN, 2015.
- [39] I. Ghozali, *Multivariate analysis application with SPSS program*, 7th ed. Semarang: Faculty of Economics Publishing Agency, UNDIP, 2013.
- [40] J. F. Hair, W. C. Black, B. Babin, and R. E. Anderson, *Multivariate data analysis*, 7th ed. USA: Pearson, 2010.
- [41] R. M. Baron and D. A. Kenny, "The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations," *Journal of Personality and Social Psychology*, vol. 51, no. 6, pp. 1173–1182, 1986. <https://doi.org/10.1037/0022-3514.51.6.1173>