THE IMPACT OF GREEN HUMAN RESOURCE MANAGEMENT ON ENVIRONMENTAL PERFORMANCE AMONG EMPLOYEES OF ENVIRONMENTALLY FRIENDLY COMPANIES IN BATAM

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ABSTRACT

Efforts by companies to achieve long-term sustainability by emphasizing the importance of Environmental Performance (EP) align with the goals of the SDGs, where environmental preservation is crucial for maintaining sustainability. The manufacturing sector has implemented Green Human Resource Management (GHRM) practices to address this issue. This study aims to demonstrate that the GHRM variable affects Environmental Performance through Organizational Citizenship Behavior (OCB) as a mediating variable. The research sample consists of 363 respondents from seven environmentally friendly companies in Batam. Data analysis was conducted using SEM Partial Least Squares (PLS) by distributing questionnaires to the employees of these companies. The results indicate a significant effect of GHRM and OCB on EP, both directly and indirectly, in environmentally friendly companies in Batam. This study novelty examines how organizational citizenship behavior (OCB) mediates the relationship between green human resource management (GHRM) and environmental performance (EP) in Batam's manufacturing sector, addressing a research gap regarding the impact of OCB-supported GHRM on EP in highly industrialized regions.

Keywords: *green human resource management, environmental performance, organizational citizenship behavior*

INTRODUCTION

The decline in export performance has resulted in a decline in the economy in Indonesia. However, it is stable again from inflation in 2022 (Kinski et al., 2023). In addition, in 2024 there are several risks that arise, such as geopolitical rigidity and climate change. This creates an increase in food prices so that inflation soars and affects Indonesia's achievement in GDP by 3.45% (Sarazola et al., 2022). SDGs aim for international development to improve social, economic, and environmental sustainability (Suh et al., 2021; Dasaraju & Tambunan, 2023). Environmental degradation caused by untreated industrial waste and high levels of air pollution in industry must be addressed by implementing environmentally friendly practices such as human resource management (GHRM) (Urbano et al., 2018; Nassar et al., 2023). Early studies have shown that the use of green human resource management (GHRM) influences workers in achieving their goals (Jan et al., 2021). However, research on social HR practices shows that the GHRM process does not have a direct impact on employee opinions and views (Ababneh, 2021). In recent years, businesses in Indonesia, particularly in the manufacturing sector, have begun to adopt GHRM practices such as green recruitment, green training, and sustainable compensation systems (Sabokro et al., 2021). Many stakeholders are concerned about the environment because manufacturing activities have an impact on the environment (Danilwan et al., 2020). This program also serves to improve environmental performance. According to previous studies, green human resource management (GHRM) has a significant effect on organizational citizenship behavior (OCB) (Elmagrhi et al., 2019; Moktadir et al., 2018; Meng et al., 2023). Green recruitment attracts

potential talent to the company (Khatoon et al., 2021). Instilling environmentally (Najid et al., 2016) friendly concepts and habits is a key component of green training for future company development (Singh et al., 2020). These practices are expected to contribute to better environmental performance through the cultivation of environmental awareness and behavior among employees (Gilal et al., 2019; Yusoff et al., 2020). Based on previous studies, the success of the Green Human Resource Management (GHRM) program has a significant impact on employee, company, and environmental performance (Moktadir et al., 2020; Ren et al., 2018).

Research on the role of organizational citizenship behavior (OCB) as a mediator between GHRM and environmental performance (EP) is still limited (Japir Bataineh et al., 2023; Anwar et al., 2020; Moch Yusuf Fathussalam et al., 2021; Perez et al., 2023).

On average, research only discusses the effects of GHRM on EP and does not discuss OCB, so there is a gap in the writing. The author aims to conduct this study to test the mediation role of OCB explicitly (Mishra & Rath, 2024). Generally, research raises GHRM can soar employee self-reflection about the environment in achieving environmental performance. However, the study predominantly does not explain the psychological side of employees (Asri, 2021). Based on previous research, it shows that there are still few who show employee behavior due to GHRM to achieve company goals (Nazir & Islam, 2023). This study has a novelty, namely OCB as a mediation between GHRM and EP, and focuses on manufacturing in Batam because it is densely industrialized. (Satrianto et al., 2023; Matejun et al., 2024; Rizvi & Garg, 2021) Previous researchers also said that the lack of

research on GHRM results when supported by OCB to achieve environmental performance (EP) (Hadjri et al., 2019).

In addition, this study is also in accordance with the emphasis of Batam regulations for environmentally friendly industries. The Batam government has also introduced appropriate programs for industries capable of recycling waste, reducing emissions as a framework for increasing responsibility. This study provides theoretical assistance on how OCB can help GHRM improve environmental performance (EP) for more tangible and intangible impacts so that employees are also more pro-environment and help manufacturing or industry operate in the long term.

Batam, with environmental regulations as an industrial area, requires serious waste sorting policies and imposes fines on industries that do not comply. The introduction of subsidized recycling facilities by the Batam Free Trade Zone authority and the Environmental Agency encourages cleaner operations (Fatimah, Simamora, & Silitonga, 2022). This guideline can produce a basis for the desire for GHRM and OCB. This study can help readers to assess the influence of policies set on GHRM, OCB, and EP from a rarely used perspective.

LITERATURE REVIEW

Green Human Resource Management Affects Organizational Citizenship Behavior

Green Human Resource Management (GHRM) refers to company practices and procedures that help recruit, assess work, train, and reward employees to be dedicated to sustainability (Saputro & Nawangsari, 2021; Pham et al., 2018). Previous research suggests that GHRM

influences employee initiatives to behave in an environmentally friendly manner (OCB), for example, spreading knowledge about environmentally friendly ways and reducing air pollution (Sinaga & Nawangsari, 2020; Mohammad et al., 2020). In Batam, there is still little attention directed at employees who have environmentally friendly initiatives.

H1: Green Human Resource Management (GHRM) has a positive influence on Organizational Citizenship Behavior (OCB)

Organizational Citizenship Behavior Affects Environmental Performance

OCB includes willingness to the welfare of the company towards the environment, for example, reducing paper use and waste of resources (Afsar et al., 2020). OCB increases the commitment of determination towards the company's environmentally friendly goals (Nazir et al., 2018; Sentoso & Sang Putra, 2021; Tian & Robertson, 2019; Latan et al., 2018; Sentoso & Muchsinati, 2024). The results of the observation stated that OCB has a major influence on environmental performance (EP); the evidence is the efficient use of resources and reduced emissions (Elshaer et al., 2021; Umrani et al., 2020). Lack of research discussing waste management in Batam and OCB that strengthens EP. By discussing that, I will explain the reasons why companies can be more environmentally superior.

H2: OCB has a positive effect on Environmental Performance (EP)

Green Human Resource Management Affects Environmental Performance with OCB as mediation

Starting in 2020, research has increased, stating that OCB directly or indirectly increases the influence of GHRM on EP (Aboramadan, 2022; Fawehinmi et al., 2020; Japir Bataineh et

al., 2023). Employees who receive environmentally friendly training, recruitment, and appreciation can support EP (Kim et al., 2019; Luu, 2019; Ojo et al., 2022; Pusparini et al., 2018). Several lecturers say that GHRM, OCB, and EP also depend on the Environmental Management System (EMS) to be sustainable (Piwowar-Sulej et al., 2023).

The gap between this research and the previous one is that in previous research, especially in Batam manufacturing, very few have discussed the influence of GHRM on EP with the help of OCB. While this study explains that OCB can help GHRM improve EP as a critical filler of theoretical gaps, especially in Batam manufacturing.

H3: Green Human Resource Management has positive effect on Environmental Performance with OCB as mediation

METHODS

This study uses cross-sectional and quantitative surveys with the intention of analyzing green human resource management, organizational citizenship behavior (OCB), and environmental performance (EP) in several ISO-certified manufacturers in Batam, Indonesia, under highly controlled environmental supervision.

Green Human Resource Management (GHRM) is the practice of training, recruiting, evaluating, and developing employees as human resource management. This application is useful for reducing the negative effects of company operations on the environment (Devi et al., 2024). Organizational Citizenship Behavior (OCB) is an employee initiative behavior that is indirectly influenced by the company to support the success of achieving the company's vision. Green OCB will support companies to be more environmentally conscious, such as minimizing waste from production, reducing resource inefficiencies, and others (Kim & Kim, 2024). EP is a criterion for a company's success in managing the negative impacts of its operations on the environment. EP is an important indicator of a company's sustainability. EP includes compliance with environmental policies and carbon emission reduction (Abdelwahed & Ramish, 2025).

The population of the study consisted of employees from six manufacturers in Batam, namely PT Batamindo Investment Cakrawala (1000 employees), PT Telkom Indonesia (23,800 employees), PT Apollo Solar Indonesia (1000 employees), PT Schneider Electric (4,500 employees), and PT Wiraja Yunan Internasional (200 employees). The researcher used data from 363 respondents because of the choice of purposive sampling who understand environmental or HR activities.

Data were collected using a Likert scale of 1-5, with 1 meaning strongly disagree" and 5 meaning strongly agree. The data was collected using a questionnaire distributed to employees of the research company with a total of 8 questions for the environmental performance variable, 8 questions for organizational citizenship behavior, and 6 questions for green human resource management. The questionnaire came from an instrument that had been validated by the lecturer (Dong et al., 2023; Liu et al., 2023).

This study analyzed the data using SmartPLS 3 to analyze complex relationships. The analysis consists of the inner model test (indirect and direct effects) and F and R-square tests to determine the magnitude of the impact and analyze its mediation (Nuzula Agustin, 2021).
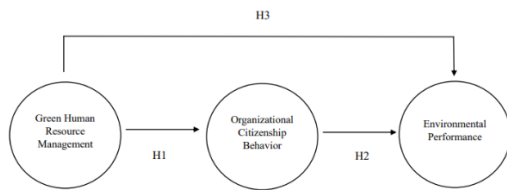
Figure 1. Research Model
Source: Developed by the Researcher for this Research (2024)

RESULTS

Table 1 shows the respondent's demographic profile, showing that woman comprised the majority of respondents (60 per cent, or n of 218) compared to man (40 per cent, or n of 145). Most respondents were under 27 (39.9 per cent, or n of 145), while only 35 per cent were under 37 (n of 133). Similarly, 58.7 per cent (n of 213) of employees have a bachelor's degree.

Table 1. Demography

No	Factors		Frequency	Percents
1	Gender	Woman	218	60.000
		Man	145	40.000
		Total		100.000
2	Age	17-27 years	145	39.900
		28-37 years	133	36.900
		38-47 years	59	16.300
		Greater than 47 years	25	6.900
		Total		100.000
3	Education	High School	54	14.900
		Diploma	48	13.200
		Bachelor	213	58.700
		Master	48	13.200
	Total			100.000

Source: Primary Data (2024)

The PLS algorithm method in Smart PLS 3 produces validity and reliability analyses as above. Based on the data above, all variables have passed as the numbers are above 0.6, as per the results of the Cronbach's alpha parameters, that are based on the validity and reliability tests done on the questionnaire data.

Table 2. Measurement of Validity and Reliability

	Cronbach's Alpha	Rho A	Composite Reliability	Average Variance Extracted (AVE)
EP	0.973	0.975	0.977	0.841
OCB	0.969	0.970	0.974	0.822
GHRM	0.956	0.959	0.965	0.820

Table 2 shows the test results show that it passed as it was over 0.6 based on the composite reliability parameter. For a result, it's decides that the research data test results are good reliability. The test data has been considered good validity since the Average Variance Extracted (AVE) parameter results are over 0.5.

Table 3 shows the correlation between the OCB and EP variables does not meet the criteria, based on the results of the discriminant validity test (Fornell Larcker Criterion), as it is still larger at 0.963 than the correlation between the variables and the variable itself (0.907 and 0.917). Also, the OCB variable's correlation to GHRM fails to meet the criteria because it is greater at 0.927 than the correlation between this variable and the variable itself (0.907 and 0.906). However, because it is below the correlation between variables and the variable itself (0.906 and 0.917), the correlation between variables that meet the Fornell Larcker test criteria, GHRM and EP, is just 0.81. The uniqueness in terms of the related environment suggests that further research needs to demonstrate the control variance method for discriminant validity (Smith & Doe, 2025). The authors review that OCB strongly influences EP.

Table 3. Fornell Larcker Table

	EP	GHRM	OCB
EP	0.917		
GHRM	0.813	0.906	
OCB	0.963	0.927	0.907

Source: Primary Data (2024)

The table 4 shows the cross loadings value shows that each indicator has converged with its respective variable with a minimum of more than 0.7. The data is highly correlated because the requirement to pass the cross-loadings test is a minimum value of 0.7. The results of

discriminant validity with the cross-loading test show that all variables and constructs are have high discriminant validity.

Table 4. Cross Loadings Table

	Environmental Performance	Green Human Resource Management	Organizational Citizenship Behavior
EP_1	0.860	0.704	0.779
EP_2	0.959	0.844	0.907
EP_3	0.905	0.765	0.837
EP_4	0.954	0.872	0.941
EP_5	0.927	0.830	0.901
EP_6	0.864	0.827	0.862
EP_7	0.920	0.835	0.905
EP_8	0.943	0.848	0.920
GHRM_1	0.857	0.927	0.901
GHRM_2	0.890	0.963	0.923
GHRM_3	0.793	0.888	0.809
GHRM_4	0.781	0.905	0.811
GHRM_5	0.742	0.871	0.775
GHRM_6	0.768	0.876	0.804
OCB_1	0.851	0.835	0.896
OCB_2	0.944	0.922	0.971
OCB_3	0.855	0.778	0.849
OCB_4	0.886	0.828	0.924
OCB_5	0.881	0.901	0.930
OCB_6	0.856	0.787	0.871
OCB_7	0.810	0.835	0.882
OCB_8	0.897	0.829	0.924

Source: Primary data (2024)

The table 5 shows the outer loadings analysis results that all research indicators are greater than 0.6, thus fitting the convergent validity criteria. The findings show that the variable utilized in this study's indicators have high discriminant validity.

Table 5. Outer Loadings

	Environmental Performance	Green Human Resource Management	Organizational Citizenship Behavior
EP_1	0.860	0.704	0.779
EP_2	0.959	0.844	0.907
EP_3	0.905	0.765	0.837
EP_4	0.954	0.872	0.941
EP_5	0.927	0.830	0.901
EP_6	0.864	0.827	0.862
EP_7	0.920	0.835	0.905
EP_8	0.943	0.848	0.920
GHRM_1	0.857	0.927	0.901
GHRM_2	0.890	0.963	0.923
GHRM_3	0.793	0.888	0.809
GHRM_4	0.781	0.905	0.811
GHRM_5	0.742	0.871	0.775
GHRM_6	0.768	0.876	0.804
OCB_1	0.851	0.835	0.896
OCB_2	0.944	0.922	0.971
OCB_3	0.855	0.778	0.849
OCB_4	0.886	0.828	0.924
OCB_5	0.881	0.901	0.930
OCB_6	0.856	0.787	0.871
OCB_7	0.810	0.835	0.882
OCB_8	0.897	0.829	0.924

Source: Processed Primary Data (2024)

The EP and OCB models are strong, as proved by the R Square EP analysis results, which are ≥ 0.75. Based on the results of the R square test using SmartPLS 3 above, it shows that the dependent variables, namely environmental performance and organizational citizenship behavior, vary greatly and cannot be explained by the independent variables.

Table 6. R Square

	R Square	Summary
Environmental Performance	0.927	Strong
Organizational Citizenship Behavior	0.859	Strong

Source: Primary Data (2024)

The goal of direct effect analysis is to verify the hypothesis that endogenous variables have a direct effect on exogenous ones.

Based on tables 7 and 8 demonstrate how the outcomes of the hypothesis study were calculated, both directly and indirectly, to produce a structural research model, as shown in Figure 2.

Table 7. Direct Effect

	T Statistic	P Values	Information
GHRM → OCB	66.756	0.000	Accepted
OCB → EP	16.609	0.000	Accepted

Source: Primary Data (2024)

The objective of testing the indirect effect hypothesis is to demonstrate that a variable may have an indirect (through an intermediary) effect on other variables.

Table 8. Indirect Effect

	Original Sample	Sample Mean	Standard Deviation	T Statistic	P Values	Information
GHRM → OCB → EP	0.901	0.902	0.047	19.031	0.000	Accepted

Source: Primary Data (2024)

DISCUSSIONS AND CONCLUSIONS

Some conclusions from the results of this study using SEM Partial Least Squares (PLS) are as follows:

The Effect of Green Human Resource Management on Organizational Citizenship Behavior

The result is that environmentally friendly human resource management affects organizational citizenship behavior positively and significantly. With the existence of green human resource management, company employees realize that environmentally friendly practices are very necessary, especially in company operations, so that the company continues to operate optimally and does not damage the environment so that it gets a long-term operating permit. Socialization and implementation of environmentally friendly behavior directs all employees to take the initiative to behave environmentally friendly after knowing the benefits of implementing this positive behavior. Conversely, when the implementation of environmentally friendly human resource management is reduced, the implementation of

organizational citizenship behavior by employees also decreases.

The results of this study are the same as previous studies which show that the independent variable positively influences the mediating variable (Freire & Pieta, 2022; Amalia Anggraeni Nurhakim & Puspa, 2023).

Effect of Organizational Citizenship Behavior on Environmental Performance.

The results of hypothesis testing indicate that there is a positive relationship between organizational citizenship behavior and environmental performance. This means that the higher the organizational citizenship behavior, the higher the environmental performance (Permadi & Agustina, 2025).

Several studies have shown that the relationship between organizational citizenship behavior and environmental performance is positive (Satriawan et al., 2023; Jankelová et al., 2024). However, previous research has stated that the effect of OCB on EP is small in manufacturing in Vietnam (Nguyen et al., 2024). The development of OCB can motivate environmental improvement in a stable manner. Companies that implement environmental priorities in their company's human resources encourage employees to carry out green OCB (Susita & Murdiono, 2024). Company leadership and management also influence OCB results on environmental performance (Abbas et al., 2022). This study confirms that OCB must be strengthened systemically and ethically for significant results (Fan, Wider, & Chan, 2023). The researcher proposes to strengthen OCB as a regulation in Batam manufacturing to compare with the results of in-depth research.

The Effect of Green Human Resource Management on Environmental

Performance is Mediated by Organizational Citizenship Behavior

Based on the results of the hypothesis testing study, organizational citizenship behavior mediates green human resource management with environmental performance. Thus, environmentally friendly manufacturing employees in Batam, Indonesia, and green human resources affect environmental performance through organizational citizenship behavior. This finding supports previous research, which shows that the evidence of green human resource management that stimulates behavior, development, and training so that employees behave in an environmentally friendly manner significantly contributes to the growth of organizational citizenship behavior in their work (Gill et al., 2021; Sheikh et al., 2024). This study contradicts previous studies that underestimate the influence of OCB on the influence of GHRM on EP (Aji & Riani, 2025) because with the presence of OCB, GHRM is able to increase EP significantly because it influences employees to work according to pro-environmental policies.

The recommendations offered by the author based on the results of this study are developing green standards in management because it is recorded to influence employee environmental OCB by 30% (Raymond & Bhiwajee, 2025), strengthening behaviors such as OCB-based team competition increasing OCB by 18% in the industry (Rismanto et al. 2025), using the Batam free trade zone environmental program with internal GHRM practices to reduce resource waste, and monitoring and reporting the level of team contribution in green initiatives to motivate company employees to improve the company culture to be more environmentally friendly and sustainable (Alherimi et al., 2024).

LIMITATIONS

This sample has limitations, such as only being in Batam, so that samples from several other geographies were not studied. The survey that reported the measurement was not too detailed, so the insight was not too rich and caused bias. However, this study provides an empirical basis for testing the effects of the relationship between green human resource management, organizational citizenship behavior, and environmental performance on green manufacturing in Batam. It is recommended that future research already cover a wider geography and add other variables that may influence and are still related.

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