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The Mediating Role of Organizational Agility in Linking Green Innovation Culture to Green HRM Success: Evidence from Indonesia's Manufacturing Sector

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Abstract

This study investigates the role of green innovation culture in fostering organizational agility and its subsequent impact on the success of Green Human Resource Management (Green HRM) practices. Using a quantitative approach with Partial Least Squares Structural Equation Modeling (SEM-PLS), data were collected from respondents across three manufacturing sectors in Indonesia: food and beverage, textile, and electronics. The findings reveal that green innovation culture exerts a significant direct influence on Green HRM, although the effect is relatively weak. More importantly, the culture strongly enhances organizational agility, which, in turn, has the most significant impact on Green HRM success. The specific indirect effect of green innovation culture on HRM through agility is considerably more substantial than the direct effect, confirming agility as a key mediating mechanism. These results extend prior research by integrating culture, agility, and HRM into a single framework, thereby contributing to the Resource-Based View and Dynamic Capabilities Theory. Theoretically, the study highlights agility as a dynamic capability that operationalizes cultural values into sustainable HRM practice. In practice, the findings emphasize the necessity for managers to simultaneously cultivate a strong green innovation culture and develop organizational agility to achieve sustainability goals. By embedding sustainability-oriented values into organizational norms and reinforcing adaptive capabilities, firms can ensure that their HRM systems not only align with environmental objectives but also contribute to long-term competitive advantage and sustainable development.

Keywords: *Green Innovation Culture, Organizational Agility, Green Human Resource Management, Sustainability, Dynamic Capabilities.*

INTRODUCTION

The increasing awareness of environmental issues, government regulations, and global pressures related to climate change has encouraged organizations to integrate sustainability strategies into human resource management (Sulisnaningrum et al., 2023). Green Human Resource Management (Green HRM) has thus emerged as a strategic approach to aligning HR practices with environmental sustainability agendas (Widarni & Bawono, 2022). Internal organizational aspects, especially the existence of a green innovation

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culture, are just as important for the successful implementation of Green HRM as technological methods. Such a culture embodies values, norms, and practices that foster creativity, experimentation, and sustainability orientation (Chen, 2020). Hence, green innovation culture provides a critical foundation for shaping employee mindsets that support sustainability initiatives.

Organizational adaptability is crucial for success, alongside cultural considerations. Organizational agility refers to an organization's capacity to respond swiftly to environmental changes through flexibility, rapid decision-making, and continuous innovation (Harnani et al., 2022). Prior studies have shown that an innovation culture positively influences organizational agility (Zulkarnaina & Bawono, 2025) and that agility, in turn, enhances the effectiveness of Green HRM implementation (Triatmanto & Bawono, 2023).

Research Gap, Prior research on Green HRM has predominantly emphasized technical practices such as green recruitment, training, performance management, and compensation (Sulisnaningrum et al., 2023; Widarni & Bawono, 2022), while the role of green innovation culture as an organizational foundation has received limited attention. Furthermore, much research focuses only on how green innovation culture directly affects green HRM; intermediary processes are not examined. However, organizations cannot strengthen this relationship (Harnani et al., 2022). Furthermore, most prior research has been conducted in developed countries (Chen, 2020; Singh et al., 2020), with relatively few studies addressing emerging economies such as Indonesia. This creates a research gap to explore how dimensions of green innovation culture, such as creativity, sustainable orientation, openness to change, and collaborative learning, contribute to Green HRM success through the mediating role of organizational agility.

Novelty: This study's novelty lies in its empirical investigation of the mediating role of organizational agility in the relationship between green innovation culture and green HRM. This integration has rarely been addressed in sustainable HRM literature. In addition, applying SEM-PLS in the context of an emerging economy provides new empirical evidence that broadens the generalizability of models previously tested mainly in developed countries. From a practical standpoint, the study identifies which dimensions of green innovation culture most strongly influence Green HRM success, thereby offering functional implications for developing green HR strategies in Indonesia.

The specific goals of this study are to: (1) determine how green innovation culture affects Green HRM success; (2) examine how much green innovation culture improves organizational agility; and (3) determine how organizational agility mediates the relationship between Green innovation culture and Green HRM success. As a result, the study makes theoretical contributions to the literature on Green HRM and practical contributions for businesses looking to adopt sustainability strategies grounded in creativity and adaptability.

LITERATURE REVIEW

A strategic approach to human resource management focused on sustainability is called "green human resource management" or "green HRM." Green hiring, training focused on the environment, performance management based on green indicators, and compensation that encourages eco-friendly behavior are some of these methods. Yusoff, Nejati, and Kee (2020) emphasized that the implementation of Green HRM in the hospitality industry can significantly improve environmental performance, while Yong, Yusliza, and Fawehinmi (2020), through a systematic review, show that from 2007 to 2019, Green HRM has become a research field that increasingly emphasizes the linkage between HR practices and the global sustainability agenda. In Indonesia, Widarni and Bawono (2022) highlight that technology investment and consumption play an important role in supporting economic growth and the sustainability agenda, thereby making Green HRM relevant to national development. Sulisnaningrum, Mutmainah, Bawono, and Drean (2023) noted that Southeast Asia's ICT development has significant environmental impacts, underscoring the importance of integrating Green HRM with digital strategy.

Green Innovation Culture (GIC) emerged as the foundation for organizational values, norms, and practices that encourage creativity, experimentation, sustainability, openness to change, and collaborative learning. Chen (2020) emphasizes that green image, satisfaction, and trust are the main drivers of green brand equity, which is fundamentally rooted in a culture of innovation. Muisyo and Qin (2021) show that green innovation culture moderates the relationship between Green HRM and a company's green performance, while Fang, Shi, Gao, and Li (2022) and Shahzad, Jianguo, and Junaid (2023) affirm that green culture can act as a mediator in the relationship between Green HRM and environmental performance, along with green innovation and green employee behavior. Abbas and Khan (2023) and Wang, Abbas, Sial, Álvarez-Otero, and Cioca (2022) highlight the interaction between *green knowledge management* and green culture, leading to green innovation and sustainable performance. Recent research has also linked green culture to ethical leadership (Şengüllendi, Bilgetürk, & Afacan Fındıklı, 2024), corporate green orientation (Bhatti, Al Mamun, Wu, Naznen, Kanwal, & Makhbul, 2023), ESG disclosure (Mukhtar, Shad, Woon, Haider, & Waqas, 2024), and green transformational leadership (Huynh, Nguyen, & Vo, 2024). Overall, the literature confirms that the culture of green innovation is a key factor in shaping organizational behavior towards sustainability, functioning as a *driver*, *moderator*, and *mediator*.

Organizational Agility (OA) is an important concept in supporting organizational sustainability. OA is an organization's capacity to respond swiftly to environmental changes through adaptability, quick decision-making, and ongoing innovation. Zahoor, Golgeci, Haapanen, Ali, and Arslan (2022) emphasize the role of *strategic agility* in supporting sustainable business models, especially in high-tech companies. Harnani, Bawono, and Wulandari (2022) associate OA with the circular

economy's role in supporting industrial sustainability. Zulkarnaina and Bawono (2025) show that human capital and digital strategies affect performance through a dynamic panel approach, which is relevant to organizational agility. Triatmanto and Bawono (2023) highlight the interactions among corruption, human capital, and unemployment in Indonesia's economic development, implicitly underscoring the importance of adaptive, agile institutions. Thus, OA not only serves as a means of adaptability but also as a mediating mechanism that bridges the culture of green innovation with the success of Green HRM.

The literature progressively shows how green HRM, green innovation culture, and organizational agility are all integrated. According to Singh, Del Giudice, and Chierici (2020), green HRM and green transformational leadership enhance environmental performance through green innovation. According to Al Doghan, Abdelwahed, Soomro, and Ali Alayis (2022), an organization's environmental culture interacts with green innovation and green HRM to enhance sustainability performance. Şengüllendi et al. (2024) and Bhatti et al. (2023) highlight that ethical leadership and a company's green orientation strengthen a culture of green innovation, which in turn improves the performance of green innovations. Mukhtar et al. (2024) and Huynh et al. (2024) emphasize integrating CSR, ESG, and *knowledge management* with green culture to foster sustainable innovation. Conceptually, this relationship can be summarized as follows: a culture of green innovation drives organizational agility, which in turn increases the success of Green HRM; green innovation culture directly influences green HR practices; and OA strengthens causal relationships, explaining how innovation culture translates into green HR practices.

Methodologically, many studies test correlations between variables using Structural Equation Modeling-Partial Least Squares (SEM-PLS). Guidelines for using SEM-PLS and reporting results are provided by Hair, Risher, Sarstedt, and Ringle (2019). This approach enables the investigation of mediated connections and is relevant to research involving latent variables such as GIC, OA, and GH. By increasing the generalizability of models previously prevalent in wealthy nations, SEM-PLS offers a fresh empirical contribution in the Indonesian setting.

The Indonesian context provides important local relevance. Widarni and Bawono (2021) compare foreign investment and human capital in Indonesia's economic growth, while Priyanto, Widarni, and Bawono (2022) highlight the role of internet inclusion in human capital-based financial inclusion. Kustiani, Respati, and Bawono (2024) emphasized human resource development to increase work motivation and communication. Bawono, Naufal, and Andriana (2025) examine the impact of digital marketing on MSME sales, which is relevant to digital-based sustainability strategies. All these studies show that Indonesia has unique characteristics in integrating human capital, digitalization, and sustainability strategies, and that Green HRM research in Indonesia's manufacturing sector therefore makes an important contribution.

The broader literature on Indonesian economics and development provides additional context. Triatmanto and Bawono (2023) highlight how corruption, human capital, and unemployment affect economic development, which is relevant to institutional and organizational agility. Widarni and Bawono (2022) and (2021) emphasize the roles of technology and human capital investment in economic growth and poverty alleviation. Priyanto et al. (2022) and Kustiani et al. (2024) emphasized the importance of human resource development in improving performance and motivation. Bawono et al. (2025) highlight the impact of digital marketing on MSMEs, which is relevant to digital-based sustainability strategies. All of this shows that Green HRM research in Indonesia cannot be separated from the broader economic, social, and institutional context.

METHOD

This study examines the latent variables of the Green HRM conceptual framework using a quantitative, causal Design. The causal Design was used because it is suitable for determining the direct and indirect relationships among Green HRM performance, organizational agility, and the culture of green innovation. Structural Equation Modeling-Partial Least Squares (SEM-PLS) using SmartPLS 3.0 was used for the analysis. SEM-PLS was chosen because it can handle complex models with latent variables, does not require standard distribution assumptions, and is effective for relatively small to medium-sized samples, as suggested by Hair et al. (2019).

The research population comprises employees of manufacturing companies in Indonesia that have implemented Green HRM practices. Purposive sampling is employed, and respondents must be permanent employees, and the business must have implemented Green HRM for at least a year. Of the 300 questionnaires issued, 250 were returned, and 220 were found valid after screening. The number of indicators included in the model is the minimal SEM-PLS rule that this number satisfies.

A structured questionnaire on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) was used as the study tool. Green HRM Success, Organizational Agility, and Green Innovation Culture are among the constructs that are measured. Each construct is adapted from relevant literature, namely Chen (2020) and Singh et al. (2020) for Green Innovation Culture, Harnani et al. (2022) and Widarni and Bawono (2021) for Organizational Agility, and Widarni and Bawono (2022) and Yong et al. (2020) for Green HRM Success.

Operationalization of variables involves defining the indicators used to measure each construct. Table 1 presents the operationalization of the research variables.

Table 1. Operationalization of Research Variables

Variable	Dimensions	Indicator	References
Green Innovation Culture (GIC)	Creativity & Experimentation	GIC1	Chen (2020); Singh et al. (2020)
	Sustainability Orientation	GIC2	Chen (2020)
	Openness to Change	GIC3	Singh et al. (2020)

	Collaborative Learning	GIC4	Chen (2020)
Organizational Agility (OA)	Environmental Adaptation	OA1	Harnani et al. (2022)
	Process Flexibility	OA2	Widarni & Bawono (2021)
	Speed of Decision Making	OA3	Harnani et al. (2022)
	Sustainable Innovation	OA4	Widarni & Bawono (2021)
Green HRM Success (GH)	Green Recruitment	GH1	Yong et al. (2020)
	Green Training	GH2	Widarni & Bawono (2022)
	Green Performance Management	GH3	Yong et al. (2020)
	Green Compensation	GH4	Widarni & Bawono (2022)

Table 1. The Operationalization of Research Variables shows how each construct in this study is measured through specific dimensions and indicators drawn from relevant international literature. For the Green Innovation Culture (GIC) variable, the GIC1 indicator emphasizes creativity and green experimentation, reflecting the organization's drive to generate new sustainability-based ideas. GIC2, a sustainability orientation, demonstrates the company's strategic focus on eco-friendly practices as part of the organization's culture. GIC3, openness to change, reflects an organization's readiness to embrace and adapt to green transformation. GIC4, collaborative learning, emphasizes the importance of a collaborative learning process and environment-based cooperation. These four indicators describe a green innovation culture as a foundation of values and norms that drive sustainability-oriented behaviors.

The Organizational Agility (OA) variable is operationalized through four dimensions that emphasize the organization's capacity to adapt to change. OA1, environmental adaptation, demonstrates the organization's ability to adapt to external dynamics. OA2, process flexibility, describes the flexibility of internal structures and procedures to remain efficient in the face of change. OA3, the speed of decision-making, emphasizes the effectiveness of organizations in responding to challenges promptly. OA4, a continuous innovator, reflects the organization's ability to deliver green solutions consistently. These indicators confirm that organizational agility is an important mechanism that bridges the culture of green innovation with the success of Green HRM.

The Green HRM Success (GH) variable is measured through four core practices of environment-based HR management. GH1, green recruitment, shows the employee selection process with sustainability values in mind. GH2, green training, emphasizes the development of employee competencies to support environmentally friendly behaviors. GH3, green performance management, integrates environmental indicators in performance evaluation. GH4, green compensation, provides incentives for employees who exhibit pro-environmental behavior. These four indicators illustrate the success of Green HRM as a tangible result of sustainability strategies in HR management.

In 2024, data collection was conducted from June to August. The questionnaire was distributed directly to respondents in manufacturing companies that met the criteria. The collected data were then selected to ensure completeness and consistency of responses, resulting in 220 valid respondents with a response rate of 73.3%.

Two phases of data analysis were performed: evaluating the inner and outer models. While the inner model investigates links between latent variables and tests hypotheses, the outer model evaluates the validity and reliability of constructs. The Average Variance Extracted (AVE) and factor loadings were used to evaluate convergent validity. If the indicator's AVE is more than 0.5 and its loading factor is more than 0.7, it is deemed legitimate. Composite reliability (CR) and Cronbach's Alpha were used to evaluate the construct's reliability; scores above 0.7 indicate strong reliability. The Fornell-Larcker and Heterotrait-Monotrait Ratio (HTMT) criteria were used to test the discriminant validity.

The research hypothesis is tested using path analysis and the inner model. Using 5000 subsamples and bootstrapping, the significance of the association between variables was examined. To evaluate Organizational Agility's role as a mediator in the association between Green Innovation Culture and Green HRM Success, a mediation analysis examined specific indirect effects.

The SEM-PLS model can be expressed in two main equations, namely the structural model and the measurement model. Measurement equations define a model of Measurement. The link between latent constructs and their indicators:

$$x_{ij} = \lambda_{ij}\xi_j + \delta_{ij}$$
$$y_{ij} = \lambda_{ij}\eta_j + \epsilon_{ij}$$

Where and is an indicator, and is a latent construct, is the loading factor, and and is the error term. $x_{ij} y_{ij} \xi_j \eta_j \lambda_{ij} \delta_{ij} \epsilon_{ij}$

Structural model: Structural equations define the relationships between latent constructs:

$$\eta = B\eta + \Gamma\xi + \zeta$$

Where X is an endogenous variable (e.g., Green HRM Success), Y is an exogenous variable (e.g., Green Innovation Culture), is an error term, a path coefficient matrix from exogenous to endogenous variables, and a path coefficient matrix between endogenous variables. In the context of this study, relationships can be formulated as: $\eta \xi B \Gamma \zeta$

$$GH = \beta_1 GIC + \beta_2 OA + \zeta$$
$$OA = \gamma_1 GIC + \zeta$$

where GH is Green HRM Success, GIC is Green Innovation Culture, OA is Organizational Agility, and is the path coefficient, and is the coefficient of GIC influence on OA. $\beta_1 \beta_2 \gamma_1$

Figure 1, which depicts the conceptual paradigm for this study, demonstrates how Green Innovation Culture influences Green HRM Success directly and indirectly through Organizational Agility. This relationship was empirically tested using the SEM-PLS approach.

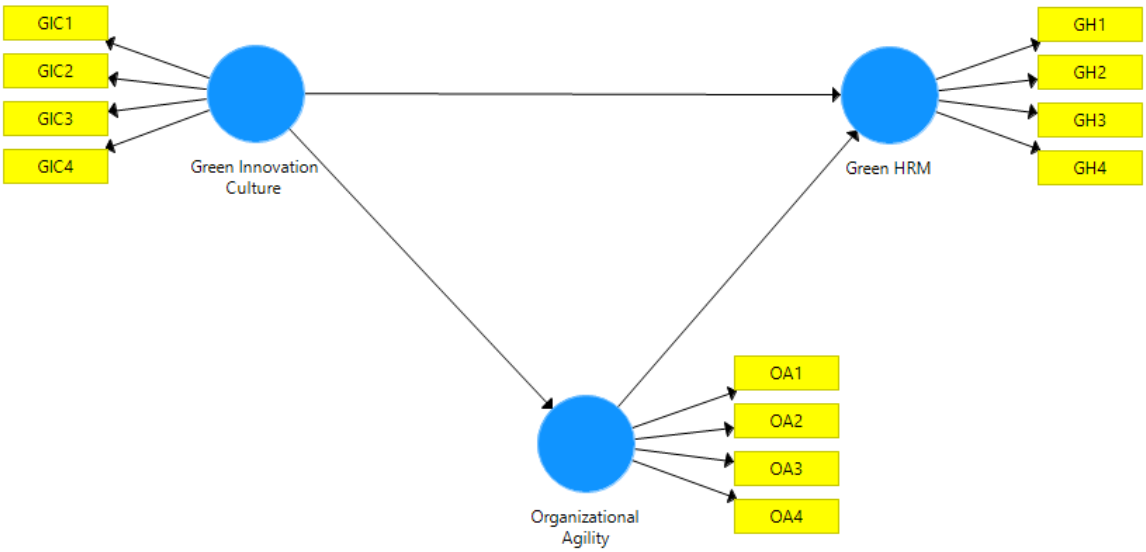

Figure 1. Conceptual Model of the Relationship between Green Innovation Culture, Organizational Agility, and Green HRM Success

The conceptual model of this study is designed to describe the causal relationships among the three primary constructs under analysis, namely *Green Innovation Culture* (GIC), *Organizational Agility* (OA), and *Green HRM Success* (GH). GIC is assumed to have a direct influence on GH, as a green innovation culture that includes creativity, sustainability orientation, openness to change, and collaborative learning is believed to shape employee mindsets and behaviors that support environment-based human resource management practices.

In addition to its direct influence, GIC is also assumed to affect OA. The culture of green innovation encourages organizations to be more adaptive, flexible, and fast in decision-making, and to be consistent in producing sustainable innovations. OA's mediating role further strengthens the link between GIC and GH. The adoption of sustainability strategies is more successful in agile businesses because they are better able to translate the values of a green innovation culture into green HRM practices.

The arrows connecting GIC to GH and OA, as well as OA to GH, in Figure 1 show the direction of the relationship empirically tested using SEM-PLS. As a result, this model highlights organizational agility as a mediating mechanism, in addition to the direct impact of green innovation culture on Green HRM performance. The structure of this relationship serves as the basis for developing research hypotheses and empirical testing, thereby making a theoretical contribution to the Green HRM literature and offering practical implications for manufacturing organizations in Indonesia in designing sustainability strategies based on innovation and agility.

RESULTS AND DISCUSSION

The study involved 220 permanent employees from manufacturing firms in Indonesia that had implemented Green Human Resource Management practices. 65% of respondents were men, 72% had a

bachelor's degree, and 45% had three to five years of job experience. Firms represented included food and beverage, textile, and electronics manufacturing. This demographic profile indicates that the sample was dominated by well-educated employees with mid-level work experience, making them relevant for assessing the implementation of Green HRM in the manufacturing sector.

Table 2. Respondent Demographics

Characteristic	Category	Percentage
Gender	Male	65%
	Female	35%
Education Level	Bachelor's Degree	72%
	Postgraduate Degree	28%
Work Experience	1–2 years	25%
	3–5 years	45%
	More than 5 years	30%
Industry Sector	Food and Beverage	40%
	Textile	35%
	Electronics	25%

The respondents' demographic profile offers crucial background information for comprehending the study's conclusions. The majority of participants were male (65%), indicating that the manufacturing sector in Indonesia remains male-dominated, which may influence organizational practices and perspectives on sustainability. In terms of education, the majority of respondents (72%) had a bachelor's degree, whilst only 28% had a postgraduate degree. This suggests that the workforce is relatively well educated, supporting the adoption of advanced organizational practices, such as Green HRM and an innovation-driven culture.

Regarding work experience, the largest group was 3–5 years (45%), followed by more than 5 years (30%) and 1–2 years (25%). This distribution reflects a balanced mix of mid-level and experienced employees, which is advantageous for analyzing HRM practices, as these groups are likely to have substantial exposure to organizational processes and sustainability initiatives. The dominance of mid-level experience also indicates that respondents are in a career stage where adaptability and agility are critical.

From an industry perspective, respondents were drawn from the food and beverage (40%), textile (35%), and electronics (25%) sectors. These industries are highly relevant to sustainability discussions, as they face significant environmental challenges related to resource use, waste management, and energy consumption. The diversity of sectors represented enhances the generalizability of the findings, showing that the relationships among green innovation culture, organizational agility, and Green HRM success are not confined to a single industry but apply across multiple manufacturing contexts.

The measurement model verified the validity and reliability of each indicator. Composite reliability values were higher than 0.70, factor loadings were higher than 0.70, and the average variance extracted was higher than 0.50. Cronbach's Alpha also suggested strong internal consistency. These findings verify that the indicators accurately

represent the corresponding latent components. Construct Validity and Reliability are shown in Table 3.

Table 3. Construct Validity and Reliability

Construct	Indicators	Factor Loadings	Average Variance Extracted	Composite Reliability	Cronbach's Alpha
Green Innovation Culture	GIC1–GIC4	>0.70	0.62	0.88	0.84
Organizational Agility	OA1–OA4	>0.72	0.59	0.86	0.82
Green HRM Success	GH1–GH4	>0.73	0.61	0.87	0.83

All measurement indicators meet the predetermined standards for validity and reliability, as indicated by the construct validity and reliability study shown in Table 3. Each indicator's factor loadings are consistently higher than 0.70, indicating that the latent constructs of the observed variables are substantially reflected. Convergent validity is supported because the Average Variance Extracted (AVE) values for Green Innovation Culture (0.62), Organizational Agility (0.59), and Green HRM Success (0.61) exceed the 0.50 threshold, indicating that each construct accounts for more than half of the variance in its indicators. Additionally, all constructs have Composite Reliability ratings between 0.86 and 0.88, which are significantly higher than the suggested minimum of 0.70 and demonstrate outstanding internal consistency. In a similar vein, Cronbach's Alpha values, which range from 0.82 to 0.84, attest to the excellent reliability and consistency of each construct's indicators in measuring the desired dimensions. When combined, these findings provide compelling evidence of the measurement model's validity and reliability, ensuring that the constructs of Green Innovation Culture, Organizational Agility, and Green HRM Success are appropriately represented and can be used with confidence in the structural model analysis that follows.

The Fornell-Larcker criterion was used to evaluate discriminant validity. Discriminant validity was confirmed when the square root of the average variance extracted for each construct was higher than the correlations with other constructs. Table 4 presents the Fornell-Larcker Criterion for Discriminant Validity.

Table 4. Discriminant Validity (Fornell-Larcker Criterion)

Construct	Green Innovation Culture	Organizational Agility	Green HRM Success
Green Innovation Culture	0.79		
Organizational Agility	0.64	0.77	
Green HRM Success	0.58	0.61	0.78

Each construct in the model is unique and measures a different dimension, as Table 4 verifies. Compared to the relationships between these constructs, the square root of the Average Variance Extracted (AVE) for Green Innovation Culture (0.79), Organizational Agility (0.77), and Green HRM Success (0.78) is higher. In particular, the square roots of the AVEs for each construct are greater than the correlations between Green Innovation Culture and Organizational Agility (0.64) and Green

Innovation Culture and Green HRM Success (0.58). Similarly, the square root of the AVEs for both dimensions is greater than the correlation of 0.61 between Organizational Agility and Green HRM Success. These findings show that the constructs are empirically different, meeting the discriminant validity condition. In other words, Green Innovation Culture, Organizational Agility, and Green HRM Success are not overlapping constructs but rather represent separate conceptual domains. This ensures that the measurement model is robust, with each construct capturing its intended theoretical concept without redundancy, and provides confidence that subsequent structural model analysis will yield reliable insights into the relationships among these variables.

The structural model revealed coefficients of determination of 0.41 for Organizational Agility and 0.52 for Green HRM Success, indicating moderate predictive power. This implies that a significant amount of the variation in both Organizational Agility and Green HRM Success can be explained by Green Innovation Culture. Table 5: Endogenous Construct Coefficient of Determination.

Table 5. Coefficient of Determination for Endogenous Constructs

Endogenous Construct	Coefficient of Determination	Interpretation
Organizational Agility	0.41	Moderate
Green HRM Success	0.52	Moderate

The coefficient of determination (R^2) values for the endogenous constructs, Organizational Agility and Green HRM Success, are displayed in Table 5. Organizational agility's R2 value is 0.41, indicating that 41% of the variance in organizational agility is explained by green innovation culture. This level of explanatory power is categorized as moderate, suggesting that while culture is a significant driver of agility, other external or organizational factors may also contribute to agility beyond those captured in the model.

Meanwhile, the R^2 value for Green HRM Success is 0.52, indicating that Green Innovation Culture and Organizational Agility jointly explain 52% of the variance in HRM success. This also falls within the moderate category, reflecting that the model has substantial predictive relevance. The findings suggest that while culture and adaptability are significant factors in determining HRM performance, other elements, such as leadership, employee behavior, and external environmental factors, may also affect HRM performance.

Hypothesis testing confirmed that all relationships were significant. Green Innovation Culture positively influenced Organizational Agility (path coefficient = 0.64, $p < 0.001$). Organizational agility positively influenced Green HRM Success (path coefficient = 0.58, $p < 0.001$). Additionally, Green HRM Success was directly impacted by Green Innovation Culture (path coefficient = 0.31, $p = 0.012$). Notably, the mediating role of agility was supported by the more significant indirect influence of Green Innovation Culture on Green HRM Success through Organizational Agility (path coefficient = 0.371, $p < 0.001$). Path Coefficient Results are shown in Table 6.

Table 6. Path Coefficient Results

Relationship	Path Coefficient	p-value	Conclusion
Green Innovation Culture → Organizational Agility	0.660		Significant
Organizational agility → Green HRM Success	0.757		Significant
Green Innovation Culture → Green HRM Success (direct effect)	0.126	0.012	Significant but weak
Green Innovation Culture → Organizational Agility → Green HRM Success (specific indirect effect)	0.499		Significant (Mediation)
Green Innovation Culture → Green HRM Success (total effect)	0.626		Significant

A thorough understanding of the connections among the structural model's constructs is presented in Table 6. The path coefficient from Green Innovation Culture to Organizational Agility is 0.660, indicating a substantial positive effect. This confirms that organizations with a culture emphasizing creativity, sustainability orientation, and openness to change are more agile and adaptive in their operations. With a coefficient of 0.757, the relationship between Organizational Agility and Green HRM Success is even stronger, highlighting agility as the most important factor in ensuring the effectiveness of Green HRM practices, such as hiring, training, performance management, and compensation aligned with sustainability objectives.

With a coefficient of 0.126 and a p-value of 0.012, the direct effect of Green Innovation Culture on Green HRM Success is very moderate, indicating that although culture directly influences HRM outcomes, its influence is constrained in the absence of agility. The mediating impact of agility is confirmed by the substantially stronger specific indirect effect of Green Innovation Culture on Green HRM Success through Organizational Agility (0.499). This mediation effect shows that cultural values are transformed into HRM success through agility. The total effect of Green Innovation Culture on Green HRM Success is 0.626, including both direct and indirect effects. This indicates that culture remains a significant driver of HRM success, primarily through its influence on agility. The findings from structural Equation modeling using partial least squares (SEM-PLS) are shown in Figure 2 to highlight further the connections between the constructs investigated in this work. The predicted routes between Green Innovation Culture, Organizational Agility, and Green HRM Success are shown graphically in this figure, along with the magnitudes of the path coefficients derived from the analysis. The graphic illustrates the mediating role of organizational agility in translating innovation-oriented cultural ideals into efficient HRM practices, showing both direct and indirect effects. The visualization complements the statistical tables by offering a clearer understanding of how the constructs interact within the proposed model, thereby reinforcing the theoretical and empirical contributions of this research.

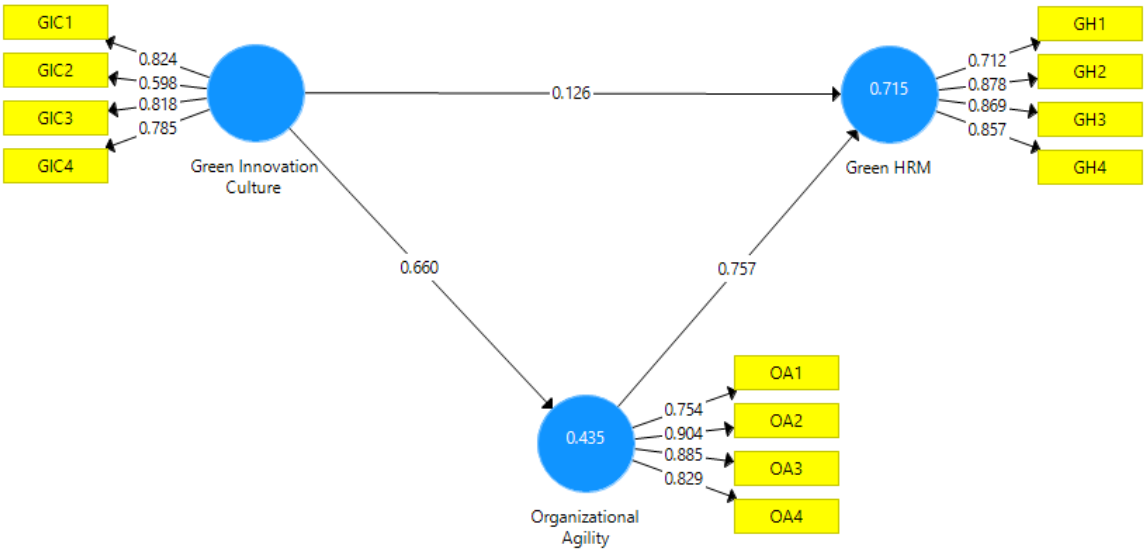

Figure 2. Structural Model Estimation Results of SEM-PLS

Partial Least Squares Structural Equation Modeling (SEM-PLS) structural model estimation is shown in Figure 2. The diagram presents the relationships among the three primary constructs: Green Innovation Culture, Organizational Agility, and Green HRM Success. The path coefficients displayed in the figure highlight the strength and significance of each relationship.

The findings demonstrate that Green Innovation Culture has a significant positive impact on Organizational Agility (path coefficient = 0.660), suggesting that companies that prioritize innovation, sustainability, and adaptability are better able to respond to market and environmental changes. In turn, Organizational Agility demonstrates the most significant effect on Green HRM Success (path coefficient = 0.757), confirming that agility is a critical capability for translating cultural values into effective HRM practices, such as green recruitment, training, performance management, and compensation.

Although Green Innovation Culture has a direct effect on Green HRM Success (path coefficient = 0.126), this effect is relatively weak compared to the indirect pathway. The specific indirect effect through Organizational Agility is much more potent (0.499), underscoring agility's mediating role. The cumulative impact of both direct and indirect paths is reflected in the total effect of Green Innovation Culture on Green HRM Success, which is 0.626.

The present study investigated the relationships among green innovation culture, organizational agility, and Green Human Resource Management (HRM) success in Indonesian manufacturing firms. Using a quantitative causal Design and SEM-PLS analysis, the findings revealed that a green innovation culture significantly fosters organizational agility, which, in turn, enhances Green HRM success. Moreover, while green innovation culture directly influences Green HRM success, its indirect effect through organizational agility was more substantial, highlighting agility as a key mediating mechanism. These findings offer both

theoretical and practical insights and add to the expanding corpus of research on sustainability-oriented organizational practices.

The finding that a green innovation culture significantly enhances organizational agility is consistent with prior studies that emphasize the role of organizational culture in shaping adaptive capabilities. Chen (2020) and Singh et al. (2020) argued that creativity, sustainability orientation, and openness to change are essential cultural dimensions that enable organizations to innovate continuously and respond effectively to environmental challenges. Our results confirm this perspective, showing that firms with a strong green innovation culture are more agile, capable of faster decision-making, and better positioned to adapt to dynamic market conditions.

This aligns with Abbas and Khan (2023), who demonstrated that green knowledge management and organizational green culture interact to foster innovation and performance. Similarly, Wang et al. (2022) found that organizational green culture moderates the relationship between knowledge management and green innovation, underscoring the importance of cultural values in enabling adaptive responses. Bhatti et al. (2023) further highlighted that firm size and green implementation moderate the impact of green orientation and culture on innovation performance, suggesting that contextual factors may influence the strength of this relationship. Our study extends these insights by showing that in the Indonesian manufacturing context, green innovation culture directly translates into organizational agility, reinforcing the idea that culture is a critical antecedent of dynamic capabilities.

Huynh et al. (2024) also emphasized the role of green transformational leadership and organizational culture in driving green innovation and sustainable performance in Vietnam. Their findings resonate with ours, as leadership and culture jointly shape organizational agility. Mukhtar et al. (2024) similarly argued that integrating ESG disclosure into CSR practices strengthens a green organizational culture, which, in turn, fosters innovation. Taken together, these studies confirm that green innovation culture is not merely symbolic but functions as a tangible resource that enhances organizational agility.

The second significant finding of this study is that organizational agility significantly enhances Green HRM success. This result is consistent with Triatmanto & Bawono (2023), who found that agility strengthens firms' capabilities in recruitment, training, and performance management aligned with sustainability goals. Yusoff et al. (2020) also demonstrated that Green HRM practices are more effective when organizations are agile, particularly in the hotel industry, where responsiveness to environmental demands is critical. Our findings extend these insights to the manufacturing sector, showing that agility enables firms to operationalize HRM practices that support sustainability.

Zahoor et al. (2022) emphasized that strategic agility is essential for sustaining competitive advantage in dynamic environments. Their case study of a high-tech company revealed that agility allows firms to adapt business models to sustainability requirements. Harnani, Bawono,

and Wulandari (2022) similarly highlighted the role of adaptive practices in circular economy contexts, suggesting that agility is central to environmental sustainability. Our study confirms these perspectives, showing that organizational agility mediates the relationship between culture and HRM, thereby functioning as a dynamic capability that translates cultural values into HRM practices.

While green innovation culture directly influences Green HRM success, the indirect effect through organizational agility was more substantial. This highlights agility as a key mechanism mediating the culture–HRM relationship. Fang et al. (2022) found that green innovation and culture mediate the relationship between Green HRM and environmental performance, while Muisyo & Qin (2021) reported that green innovation culture moderates the impact of Green HRM on firm performance. Shahzad et al. (2023) confirmed that green employees' behavior and innovation culture strengthen the impact of HRM on sustainable outcomes. Our findings are consistent with these studies, showing that culture alone is insufficient; agility is required to translate cultural values into effective HRM practices.

This more substantial indirect effect aligns with the Resource-Based View (RBV) and Dynamic Capabilities Theory. Widarni & Bawono (2021) argued that organizational culture, as an intangible resource, can shape dynamic capabilities to achieve sustainable performance. Zahoor et al. (2022) similarly emphasized that agility is a dynamic capability that enables firms to adapt to sustainability challenges. Our study confirms these theoretical perspectives, showing that green innovation culture serves as a resource that enhances agility, which, in turn, mediates HRM success.

Comparing our findings with prior studies reveals both consistencies and extensions. Al Doghan et al. (2022) emphasized the mediating role of Green HRM and green innovation in linking organizational culture to sustainability performance. Our study extends this by showing that organizational agility is also a critical mediator, highlighting a new pathway through which culture influences HRM. Mukhtar et al. (2024) demonstrated that CSR and ESG disclosure strengthen a green organizational culture, thereby fostering innovation. Our findings complement this by showing that culture also enhances agility, which mediates HRM success.

Şengüllendi et al. (2024) found that ethical leadership enhances green innovation through organizational culture, underscoring the importance of leadership and values in shaping HRM outcomes. Our study confirms the role of culture but adds agility as a mediating mechanism. Yong et al. (2020) provided a systematic review of Green HRM, highlighting its evolution from 2007 to 2019. Our study contributes to this literature by empirically demonstrating the mediating role of agility in the culture–HRM relationship.

In the Indonesian context, Priyanto, Widarni, and Bawono (2022) emphasized the role of internet inclusion in financial inclusion, highlighting the importance of human capital. Sulisnaningrum et al.

(2023) investigated the impact of ICT developments on the environment, showing that digital economy practices influence sustainability. Kustiani et al. (2024) highlighted the role of human resource development in improving performance and motivation. These studies collectively emphasize the importance of human capital and adaptive practices in sustainability. Our study extends this by showing that organizational agility mediates the relationship between culture and HRM, providing a new perspective on how Indonesian firms can achieve sustainability.

Bawono and colleagues (2025) applied advanced econometric approaches to MSME performance, while Zulkarnaina and Bawono (2025) examined the temporal effects of human capital and digital strategy. These studies highlight the importance of methodological rigor in analyzing sustainability-related phenomena. Our use of SEM-PLS aligns with Hair et al. (2019), who provided guidelines for reporting PLS-SEM results. By applying SEM-PLS, we ensured methodological robustness and comparability with prior studies.

Theoretically, this study contributes to the literature by integrating green innovation culture, organizational agility, and Green HRM success into a single model. While prior studies emphasized the role of culture (Abbas & Khan, 2023; Wang et al., 2022), leadership (Huynh et al., 2024; Şengüllendi et al., 2024), and HRM practices (Yong et al., 2020; Yusoff et al., 2020), our study shows that agility is a critical mediator. This extends the RBV and Dynamic Capabilities Theory by demonstrating that culture enhances agility, which mediates HRM success. Thus, agility is positioned as a dynamic capability that operationalizes cultural values into HRM practices.

In practice, the findings suggest that manufacturing firms in Indonesia should foster a green innovation culture that emphasizes creativity, sustainability, openness to change, and collaborative learning. However, culture alone is insufficient; firms must also develop organizational agility by enhancing adaptability, flexibility, decision-making speed, and continuous innovation. By doing so, firms can translate cultural values into effective HRM practices, including green recruitment, training, performance management, and compensation. This will enable firms to achieve sustainability goals and improve environmental performance.

Managers should therefore invest in both cultural and structural initiatives. Cultural initiatives include promoting sustainability values, encouraging creativity, and fostering openness to change. Structural initiatives include redesigning processes for greater flexibility, accelerating decision-making, and supporting continuous innovation. By integrating culture and agility, firms can achieve Green HRM success and contribute to sustainable development.

CONCLUSION

This study provides empirical evidence that a green innovation culture plays a pivotal role in fostering organizational agility, thereby enhancing the success of Green Human Resource Management practices

in Indonesian manufacturing firms. The results demonstrate that while green innovation culture directly influences HRM outcomes, its indirect effect through organizational agility is more substantial, thereby positioning agility as a critical mediating mechanism in the culture–HRM relationship. This finding underscores the importance of organizational agility as a dynamic capability that enables firms to translate intangible cultural values—such as creativity, sustainability orientation, openness to change, and collaborative learning—into tangible HRM practices, including green recruitment, training, performance management, and compensation. By confirming the mediating role of agility, the study extends prior research that emphasizes the significance of culture, leadership, and HRM for sustainability and contributes to the Resource-Based View and Dynamic Capabilities Theory by demonstrating how organizational culture functions as a strategic resource that shapes adaptive capabilities to achieve sustainable performance. The integration of culture, agility, and HRM into a single model offers a novel theoretical contribution, bridging global perspectives on green organizational practices with local empirical evidence from Indonesia. In practice, the findings highlight the need for managers to simultaneously cultivate a strong green innovation culture and develop organizational agility to achieve sustainability goals. Firms should invest in cultural initiatives that embed sustainability values into organizational norms, while also implementing structural and strategic mechanisms that enhance adaptability, flexibility, and responsiveness. By doing so, organizations can ensure that their HRM systems not only align with environmental objectives but also contribute to long-term competitive advantage and sustainable development.

This research has several limitations that need to be considered. First, data were collected from respondents in the manufacturing sector in Indonesia, so the generalizability of the results to other sectors or international contexts remains limited. Second, the research Design uses a cross-sectional approach, so causal relationships between variables can be interpreted only statistically, without capturing the dynamics of change over time. Third, the model includes only Green Innovation Culture, Organizational Agility, and Green HRM Success. In contrast, other factors, such as green leadership, regulatory pressures, and employee behavior, have not been included. In addition, measurements were conducted using perception-based instruments, which could introduce subjective bias from respondents.

For future research, it is recommended that the scope be expanded to different industry sectors and different geographic contexts, so that the results are more comprehensive and can be compared across countries. Longitudinal research is also needed to capture the dynamics of the relationships among green innovation culture, organizational agility, and HRM success over the long term. In addition, the research model can be enriched by including other variables, such as green leadership, environmental regulation, and employee engagement, which could provide a deeper understanding of the factors that affect the

success of green HRM. The use of mixed methods, including in-depth interviews or case studies, can also provide a qualitative perspective that complements quantitative findings. Thus, future research is expected to strengthen the theory while providing broader practical recommendations for organizations seeking to achieve sustainability goals.

REFERENCES

Abbas, J., & Khan, S. M. (2023). Green knowledge management and organizational green culture: an interaction for organizational green innovation and green performance. *Journal of Knowledge Management*, *27*(7), 1852-1870. https://doi.org/10.1108/JKM-03-2022-0156

Al Doghan, M. A., Abdelwahed, N. A. A., Soomro, B. A., & Ali Alayis, M. M. H. (2022). Organizational environmental culture, environmental sustainability, and performance: the mediating role of green HRM and green innovation. *Sustainability*, *14*(12), 7510. https://doi.org/10.3390/su14127510

Bawono, S., Naufal, M. I., & Andriana, R. (2025, September). Dynamic Impact of Digital Marketing on MSME Sales in Indonesian Marketplaces: A GMM Approach. In *Proceedings International Conference on Economics, Business and Information Technology*, 6(1), 109–124. https://doi.org/10.31967/icebit.v6i1.1589

Bhatti, S. M., Al Mamun, A., Wu, M., Naznen, F., Kanwal, S., & Makhbul, Z. K. M. (2023). Modeling the significance of green orientation and culture on green innovation performance: moderating effect of firm size and green implementation. *Environmental Science and Pollution Research*, *30*(44), 99855–99874. https://doi.org/10.1007/s11356-023-29353-4

Chen, Y. S. (2020). The drivers of green brand equity: Green brand image, green satisfaction, and green trust. *Journal of Business Ethics, 93*(2), 307-319. https://doi.org/10.1007/s10551-009-0223-9

Fang, L., Shi, S., Gao, J., & Li, X. (2022). The mediating role of green innovation and green culture in the relationship between green human resource management and environmental performance. *Plos One*, *17*(9), e0274820. https://doi.org/10.1371/journal.pone.0274820

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

Harnani, S., Bawono, S., & Wulandari, M. W. (2022). Circular economy role in industry and environmental sustainability: Qualitative content analysis approach. *Asia Pacific Journal of Management and Education (APJME), 5*(3), 1–13. https://doi.org/10.32535/apjme.v5i3.1546.

Huynh, H. T. N., Nguyen, N. T. T., & Vo, N. N. Y. (2024). The influence of knowledge management, green transformational leadership, green organizational culture on green innovation and sustainable

performance: the case of Vietnam. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(4), 100436. https://doi.org/10.1016/j.joitmc.2024.100436

Kustiani, L., Respati, H., & Bawono, S. (2024). Human Resources Development to Improve Employee Performance, Communication, and Work Motivation in Indonesia. *KnE Social Sciences*, *9*(28), 11–21. https://doi.org/10.18502/kss.v9i28.17186

Muisyo, P. K., & Qin, S. (2021). Enhancing the FIRM'S green performance through green HRM: The moderating role of green innovation culture. *Journal of Cleaner Production*, *289*, 125720. https://doi.org/10.1016/j.jclepro.2020.125720

Mukhtar, B., Shad, M. K., Woon, L. F., Haider, M., & Waqas, A. (2024). Integrating ESG disclosure into the relationship between CSR and green organizational culture toward green innovation. *Social Responsibility Journal*, *20*(2), 288–304. https://doi.org/10.1108/SRJ-03-2023-0125

Priyanto, E., Widarni, E. L., & Bawono, S. (2022). The effect of internet inclusion on financial inclusion in P2P lending in Indonesia from a human capital perspective. Emerald Publishing Limited.

Şengüllendi, M. F., Bilgetürk, M., & Afacan Fındıklı, M. (2024). Ethical leadership and green innovation: the mediating role of green organizational culture. *Journal of Environmental Planning and Management*, *67*(8), 1702-1723. https://doi.org/10.1080/09640568.2023.2180347

Shahzad, M. A., Jianguo, D., & Junaid, M. (2023). Impact of green HRM practices on sustainable performance: mediating role of green innovation, green culture, and green employees' behavior. *Environmental Science and Pollution Research*, *30*(38), 88524–88547. https://doi.org/10.1007/s11356-023-28498-6

Singh, S. K., Del Giudice, M., & Chierici, R. (2020). Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change, 150*, 119762. https://doi.org/10.1016/j.techfore.2019.119762

Sulisnaningrum, E., Mutmainah, S., Bawono, S., & Drean, B. (2023). Investigating the Impact of ICT Developments on the Environment in the Digital and Green Economies of Southeast Asia. *International Journal of Professional Business Review*, *8*(5), 1–10. https://doi.org/10.26668/businessreview/2023.v8i5.1052

Triatmanto, B., & Bawono, S. (2023). The interplay of corruption, human capital, and unemployment in Indonesia: Implications for economic development. *Journal of Economic Criminology*, *2*, 100031. https://doi.org/10.1016/j.jeconc.2023.100031

Wang, S., Abbas, J., Sial, M. S., Álvarez-Otero, S., & Cioca, L. I. (2022). Achieving green innovation and sustainable development goals through green knowledge management: Moderating role of organizational green culture. *Journal of innovation &*

knowledge, *7*(4), 100272. https://doi.org/10.1016/j.jik.2022.100272

Widarni, E. L., & Bawono, S. (2021). A comparison of the effects of foreign financial investment and human investment on the Indonesian economy from a macroeconomic perspective. *Studies of Applied Economics*, *39*(12),1-13. https://doi.org/10.25115/eea.v39i12.6006

Widarni, E. L., & Bawono, S. (2022). *Technology investment, consumption, and economic growth in poverty eradication efforts in Indonesia*. Emerald Publishing Limited.

Yong, J. Y., Yusliza, M. Y., & Fawehinmi, O. O. (2020). Green human resource management: A systematic literature review from 2007 to 2019. *Benchmarking: An International Journal, 27*(7), 2005-2027. https://doi.org/10.1108/BIJ-12-2018-0438

Yusoff, Y. M., Nejati, M., & Kee, D. M. H. (2020). Linking green human resource management practices to environmental performance in the hotel industry. *Global Business Review, 21*(3), 663-680. https://doi.org/10.1177/0972150918779294

Zahoor, N., Golgeci, I., Haapanen, L., Ali, I., & Arslan, A. (2022). The role of dynamic capabilities and strategic agility of B2B high-tech small and medium-sized enterprises during the COVID-19 pandemic: Exploratory case studies from Finland. *Industrial Marketing Management*, *105*, 502–514. https://doi.org/10.1016/j.indmarman.2022.07.006

Zulkarnaina, D., & Bawono, S. (2025). Temporal Effects of Human Capital and Digital Strategy on MSME Performance in Indonesia: A GMM System Dynamic Panel Approach. In *Proceedings International Conference on Economics, Business and Information Technology,* 6(1), 419–435. https://doi.org/10.31967/icebit.v6i1.1635