

# Uncertain Supply Chain Management

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## The mediating role of environmental sustainability between green human resources management, green supply chain, and green business: A conceptual model

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### ABSTRACT

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This study aims to assess the influence of green HR management and Green Supply Chain on practices for initiating green business and environmental sustainability. The research also incorporated the mediation role of environmental sustainability between green HR practices, Green Supply Chain, and green business. A structural study methodology was used with 220 samples drawn from manufacturing companies in the province of Central Java. A questionnaire was used to collect data. The PLS(SEM) was also utilized to assess the constructs' reliability and validity as well as investigate their hypothesized links. The finding of this study indicates that environmental sustainability significantly mediates the relationship between green HRM, green supply chain, and green business. The research also finds a positive relationship between green HRM, environmental sustainability, and green businesses. Similarly, findings also found a significant relationship between green supply chain, environmental sustainability, and green industries. The results of this study can be applied to strengthen the resource based theory and literature of HRM and supply chain management. There are several practical managerial implications for improving the performance of manufacturing companies in Central Java. They provide recommendations for practitioners and managers to improve the business performance of companies based on green HRM, green supply chain, and environmental sustainability.

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### 1. Introduction

The emergence of sustainable development occurred as a result of human use of natural resources and the environment, which needed to be safeguarded and is now a requirement of the modern period. Sustainable development is related to economic development and entails social and ecological interest to redefine strategies and functions to develop a sustainable business model that adds value and must be socially oriented (Pinzone et al., 2016). The phenomenon of sustainable development is equally important in developing or developed countries to respond to the global issues and challenges that potentially cause a threat to the environment. It is urgently required to reduce the negative impact of economic development and prevent the negative consequences of development that harm the ecological perspective. The organizations need to emphasize the modern directions of production, development, supply chain, and business functions at both national and economic level entities to adopt the latest technologies that must be environment friendly (Mulyani et al., 2021). It has been acknowledged that environmental sustainability and preservation of the environment satisfy the current generation's needs without negatively affecting the next generations. It is an intelligent, environment-friendly development that ensures the optimal utilization of all kinds of natural resources, innovation, and knowledge. The literature has highlighted three dimensions of sustainable development, including ecological, economic, and social. The ecological dimension protects the environment and natural

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resources (Chaudhary et al., 2018). The economic dimension of sustainable development is related to the economic development supported by technological development for effective utilization of resources, materials, supply chain, and workforce. The social dimension relates to improving all people's living conditions and safety (Bombiak & Marciniuk-Kluska, 2018).

Sustainable development entails three aspects of social, economic, and environmental concerns that must be reinforced. Strategy development should consider these aspects in a balanced manner to harvest the maximum benefits. The literature argues that economic solutions must be socially and environmentally responsible that create value. It is stated that only long-term businesses that give social, economic, and environmental benefits can encourage environmental preservation and long-term growth. The phenomenon of sustainability of the environment and its emergence evolved over many years, with controversies having a narrow approach in terms of environmental protection the poor recognition on a microeconomic level. However, it has been recognized as a much more complex interaction among environmental, economic, and social factors and perceived differently according to the interest (Gollagher & Hartz-Karp, 2013). Previously, sustainability was reported in difficult manners based on the different models, approaches, and concepts in the literature; another aspect is to look at organizational interest the way they ensure business sustainability based on a multidimensional perspective. The studies have incorporated sustainability management that focuses on the relationship development between diverse interested parties or stakeholders that produces various benefits through the positive influence of socially responsible activities for the efficiency of the firms (Kim & Kim, 2018).

Sustainable development has become the necessity of today's world due to the impact on the environment by human activities to nature that caused a significant change in climate and natural appearance. It has been recorded that the earth's temperature has increased in recent years due to large-scale human activities, degradation of environmental concerns, and negative impact on the environment (Chaudhary et al., 2018). This condition has been observed to have damaged the coastal areas due to heavy rainfalls, floods, and drought, which affects the higher level of demand and supply. Similarly, various countries have reported the same phenomenon, including Yemeni Peninsula, Maldives, and Malaysia (Bombiak & Marciniuk-Kluska, 2018). The number of business activities has changed the appearance of nature and contributed to climate change. Therefore, the green concept has been proposed to reduce the negative outcomes and mitigate natural damages (Yuniati, 2021). The academic imagination devised various strategies to address the issues that have harmed the cosmos. Green supply chain and green HRM is a concept that has arisen to address and bring answers to environmental degradation and climate change (Stojanoska, 2016; Ahmad & Ahmad, 2021; Din et al., 2021).

The researchers stressed organizational resources to be sustainable and witnessed that green HR practices provide the footprint and contribution in reducing negative impact to the universe and reducing greenhouse effects (Bombiak & Marciniuk-Kluska, 2018). Green HR practices play an important role in environmental concerns by creating awareness at work among employees and gaining sustainability (Yuniati, 2021). Previous research has shown that green HR practices positively influence the environment (Bombiak & Marciniuk-Kluska, 2018). Similarly, the literature emphasized the importance of green supply chain strategies playing a significant part in environmental issues by raising employee awareness at work and gaining sustainability (Azevedo, Carvalho, & Machado, 2011). Adopting green HR practices and supply chain in all aspects of the company provides a competitive advantage, such as recruiting to full-business operations. The greening component contributes to achieving environmentally friendly outcomes and reducing the negative imprint of business activities (AlKhidir & Zailani, 2009). The notion of the green concept adds to organizational performance, which allows enterprises to acquire a competitive edge. Therefore, implementing the green concept decreases environmental harm and positively influences the organization's environment (Mathiyazhagan, Govindan, & Noorul Haq, 2014; Aguenane, 2020). The findings show that their implementation in Indonesia is still low.

Green business practices contribute to maintaining the environmental quality that prevents damage to the earth caused by various business activities (Husnaini & Tjahjadi, 2021). Implementing greening practices can result in inappropriate actions, incorporating activities that do not hurt the surrounding environment and protect the planet from harmful and dangerous impacts (EFFENDI et al., 2021). Scholars have highlighted various practices that have created environmental and physical challenges for the company entity and have established green and supportive practices to lessen the negative footprints of business activities. Furthermore, green environmental resources influence future generations by strengthening the greening element and its favorable environmentally friendly results (Agustini et al., 2021). Because business operations are directly tied to humans, and the environment and earth must be safeguarded from bad results that harm the environment, green business strategies, green supply chain, and green HR practices increase corporate sustainability from a performance standpoint (Aykan, 2017). However, the current study work aims to address the challenges and issues associated with environmental damages caused by various business activities and implement practices to reduce the environment's negative imprint. Furthermore, implementing environmentally friendly and greening practices promotes sustainability and strengthens the link between green practices and favorable outcomes. Therefore, the study is to construct a conceptual model that highlights the function of HR practices and the role of the green supply chain in a sustainable environment in order to boost Indonesia's green business in the manufacturing sector.

## 2. Literature review and hypothesis development

### 2.1. Green Human Resources Management and Environmental Sustainability

In today's dynamic competitive business environment, the protection and preservation of natural resources have become important for business operators and decision-makers. The competition has increased in recent years, requiring identifying new ways for optimal utilization of organizational resources, including human resources management that is considered important for implementing the policies and practices for green business for sustainable performance (Sheehan, 2014; Celinmar, 2021). The literature has embarked on HR practices that contribute to organizational performance. Effective HR practices are considered a competitive advantage for organizational success, leading to innovation and sustainable performance. The effective and efficient utilization of organizational resources reduces the threat and obstacles and contributes to gaining and retaining the competitive advantage (Singh et al., 2021). The literature argued that it's a challenge for organizations to utilize economic development resources while adapting and implementing environmental-friendly business practices that improve economic, social, and environmental performance. The industrial revolution around the globe has increased rapidly; hence, pollution has increased and caused a negative impact on the environment. The government agencies and stakeholders, including competitors, customers, employees, and society as a whole, encouraged firms to adopt green HR practices that lead toward the development, economic gain, and improvements in organizational performance (El-Kassar & Singh, 2019; Illangakoon et al., 2021).

Organizational environment and culture already have a culture as one of the main artists in improving Green Human Resource Management. Specifically, the customer relationship management practices have turned programs into different processes that may assist organizations in reduction of environmental effects and increasing the positive influence on the environment, in short, the practices that contribute to environmental sustainability (Arulrajah et al., 2016). This study aims to initiate continuous recruitment, training and development, management, and the provision of rewards and salaries that can improve aspects of human resources in the organization (Y. M. Yusoff et al., 2020). Various previous studies have provided empirical evidence that leadership, organizational structure, and culture strategies are important predictors in implementing Green Human Resource Management (Brockner et al., 2006). It has been identified and considered a proximate conceptual sign capable of providing value needs and the absence of Green Human Resource Management in organizations. In addition, the organization's condition is a very important motivator in practicing activities that are more pro-environment orientated, such as Green Human Resource Management by an organization (Ren et al., 2018). The organizations focus on adopting green activities in their business operations that generate profit for the long-term and maximize the positive consequences for the environment. Therefore an environmental culture by building an environment where green activities can encourage a Green Human Resource Management system which includes organizational training and incentives that are Green which is the main dimension of Green Human Resource Management (Amini et al., 2018; Travaillé & Naro, 2017). So it can be believed that organizations should proactively adapt and apply various environmental performance principles and improve environmental performance because it will bring benefits to the organization holistically for competitive advantage and increase in corporate value (O'Donohue & Torugsa, 2016; Paillet et al., 2015; Tariq et al., 2016). Based on this description, the following hypothesis is derived:

*H<sub>1</sub>: Green Human Resource Management has a positive effect on environmental sustainability.*

### 2.2. Green Supply chain and Environmental Sustainability

It was establishing operational parameters that are needed by the organizational environment because the concept of greening the business requires organizational commitment (Azevedo et al., 2011; Paillet et al., 2015; Roscoe et al., 2019). So, it can be argued that the concept of greening supply chain is an activity in environmentally green supply chain management whose orientation is to produce lower-cost efficiency and increase supply by protecting the environment. It will impact organizational benefits because it can reduce supply costs in a futuristic way. In addition, it is also able to provide a form of authentic evidence because it will have a cognitive understanding that the firms will be able to participate in a healthy environment. In the same concept, the best way for organizations to achieve environmental performance improvement is through a green supply chain (AlKhidir & Zailani, 2009). Because green supply chain practices can provide a foundation for a green environment, this foundation will help to reduce the cost and improve the performance of the green businesses. Organizations with their pro-environmental behavior lead to a holistic improvement of environmental performance by adopting green practices to pursue business activities (Daily et al., 2009; Kim et al., 2019). The adoption and implementation of green practices provide various green initiatives that empower the greening aspect and contribute to positive performance-related outcomes that further encourage and enhance the green supply chain management (Nejati et al., 2017; Teixeira et al., 2016). The research scholars have verified that the adoption and implementation of green supply chain (GSC) practices bring positive change to the organizations and are observed as a significant contributor to the green environment (Jabbour & Santos, 2008). They implement GSC practices that are involved in different levels of distribution to successfully supply the goods that contribute to organizational environment performance (Paillet et al., 2015; Yusoff et al., 2018). The strategy that contributes to improving organizational human resources is expected to significantly contribute to environmental performance through effective implementation of green practices (Álvarez Jaramillo et al., 2019; Roscoe et al., 2019). The research studies have established a strong relationship between GSC practices relevant to environmental sustainability (Arda

et al., 2019; Paillet et al., 2015). The research scholars have argued to improve environmental performance through effective practices and organizational learning (Vidal-Salazar et al., 2012). Based on this description, the following hypothesis is derived:

**H<sub>2</sub>:** *Green supply chain has a positive effect on environmental sustainability*

### 2.3. *Green Human Resource Management and green business*

Prior literature has addressed the role of green hiring in sustainable performance. Previous research reveals that green HRM has positively impacted the strategic business environments and has provided empirical evidence in the analysis of this relationship which gives a controversial difference in their research results related to Green HRM with environmental strategies (Gill et al., 2021). Further green training and development influence environmental sustainability, such as social performance, environmental performance, and economic performance. The study also incorporated the green performance management that influences environmental sustainability, which is explained based on social performance (Mousa & Othman, 2020). The policy development related to green HRM promotes the sustainable utilization of resources to prevent environmental concerns within business organizations (Gill et al., 2021; Aguenane, 2020). Human resource management practices directly relate to corporate environmental management, which has been investigated by several experts (Jabbour et al., 2013). The results of these considerations are academically related to the relationship between green human resource management and environmental strategies, both direct and indirect effects. Research has also tried to explain the contribution drivers of various antecedent variables in improving environmental performance, among others, which can be shown through company size, diversity of interlocks, common vision, commitment to learning, and sharing knowledge (Ortiz-de-Mandojana et al., 2012; Martínez-del-Río et al., 2012). Green Human Resource Management is also included in various concepts of mediator variables such as interpersonal contact and training has succeeded in providing the concept of mediation in increasing the influence between Green Human Resource Management performance and environmental sustainability. It also shows the effect of the implementation of a construct on the company's performance has succeeded in examining whether the integration between employees succeeded in providing a strengthening effect on the relationship between the Green Human Resource Management and environmental performance (Wolf & Gan, 2013).

Environmental practices are positively related to employees' job satisfaction in manufacturing companies. When they are recruited with the concept of green recruitment (Wagner, 2011). Environmental signs that voluntarily have improved the economy of professional and non-professional employees in the company indicate that a company has been able to provide a significant form of analysis contribution to improving environmental performance. Several papers at the individual level of analysis have succeeded in finding the personal values of leaders in non-profit organizations and services products from the eco-centric side that have been open to change and become transcendent from the managers of an organization (Egri & Herman, 2000). This researcher also continued in their next research they found a relationship that Green Human Resource Management was significantly able to have a positive relationship with environmental management (Yu, 2005). In particular, they tested whether human resource management in a strategic environment and having practiced in their environment improved perceptions of organizational performance. This study provides a form of positive analysis of the significance of greening practices of HR in business strategies developed for environmental concerns. The following hypothesis is formed as literature depicts the phenomenon of green human resources.

**H<sub>3</sub>:** *Green Human Resource Management has a positive effect on green businesses*

### 2.4. *Green Supply Chain and Green Business*

The phenomenon of the green supply chain has attracted a large number of scholars due to its importance for environmental sustainability and green business performance. The research studies have adopted the role of GSC practices and considered it an essential element for achieving green goals and necessary for survival in achieving high performance. So, there is a need to conduct studies on integrating environmental management into supply chain management that utilizes greening aspects and develop the policies that support GSC. GSC policies promote the sustainable utilization of resources within a business and generally promote the cause of green business. The studies have incorporated social responsibility under the GSC practices by widening the program for being green and involvement of essential elements, including environmentally friendly practices and preservation of knowledge capital. The literature has incorporated the green practices from the entry-to-exit process in the supply chain perspective by translating the green policies and practices (AlKhidir & Zailani, 2009). The GSC has gained the attention of research scholars in the perspective of accepting challenges and accepting the issues in adopting green practices for business initiatives. The literature stressed the adoption of green practices, specifically developing the green supply and distribution management function under the greening umbrella by integrating green practices. In short, the study argued against adopting the GSC culture to create the sense of being a green distribution process and support organizational sustainability (Mehta & Chugan, 2015). The organizations strive to increase awareness about GSC policies and practices that contribute to the sustainability of the environment (AlKhidir & Zailani, 2009). The research study was also found to be influential towards increased saving, improved social image, and focus on corporate social responsibilities (Azevedo et al., 2011). The green practices have been identified as green printing, green payroll, green distribution process, green manufacturing, video recruitment, video conference, greening transportation, ensuring recycling, e-filing, and energy-

efficient workplaces (Rani & Mishra, 2014). The green supply chain is considered a key business strategy for a significant organizational performance that must be focused on greening the activities in the future by altering the normal distribution process to the green distribution process (Ahmad, 2015; Jabłoński, 2016).

**H4:** *Green supply chain has a positive effect on green businesses.*

### 2.5. Environmental Sustainability and Green Business

The current section addresses the relationship between environmental sustainability and green business in the context of the Indonesian consumer market. Environmental sustainability has become one of the hot issues due to increased global warming and pollution. Therefore, various countries' governments have focused on developing practices and policies to support green practices. The current study incorporated the green HR practices that ensure environmental sustainability by increasing the awareness among employees to be green in their behavior. A significant positive relationship has been reported between environmental training and environmental management development carried out by employees (de Sousa Jabbour et al., 2015). Employee recruitment and implementation of Green Human Resource Management and supply practices influence environmental performance checks (Mustafa, 2012). Several articles have considered this relationship, directly and indirectly, related to Green Human Resource Management and strategies in mediation and moderation environments. Various events have shown that variables such as industry practice, organizational climate, culture, and country-level factors have contributed to improving the relationship between Green Human Resource Management and the strategic environment. However, it has also succeeded in mediating the improvement of proactive environmental management on the financial performance of companies (O'Donohue & Torugsa, 2016).

A green environmentally green attitude in this effort can also determine the success of an environmental performance improvement strategy (Aiman-Smith, 1996). The research findings have shown that an environmentally green attitude and perceived attractiveness of the company have a specific relationship. This relationship is shown in a job search, particularly in the company and the job offer. The concept of sustainable development has been widely debated. It has become quite an interesting topic and factual enough to reduce the concept of climate change. Sustainable development does not appear as a scientific conception that has been studied like climate change. In research related to corporate sustainability, which is currently still developing, it has been explained that the concept of sustainable development has an essential form of articulation that contributes to the implementation of business strategy (Bansal & Hoffman, 2012; Whitman et al., 2013). The concept of sustainable development so far has been articulated in increasing understanding in the world of entrepreneurship. Concepts that occur socially, politically, and by the business have become a reflection of interests between business stakeholders and the government. For example, It can be shown that in the 90s, business strategy became an issue. It was fundamental about how to measure an existence when evaluation in a business or product was the criteria that must be used. This became a major consideration for companies (Jones & Spadafora, 2017; Robinson, 2004). The company's practice in responding to these matters related to climate change, which has become a central issue so far, has become a holistic and comprehensive understanding for the development of corporate strategies to improve business performance that is integrated with improving environmental performance. The present research aims to determine the relationships between environmental sustainability and green business, and the following hypothesis is derived as literature depicts the relationship:

**H5:** *Environmental sustainability has a positive effect on green business*

### 2.6. Mediating Role of Environmental Sustainability between Green HRM, GSC, and Green Business

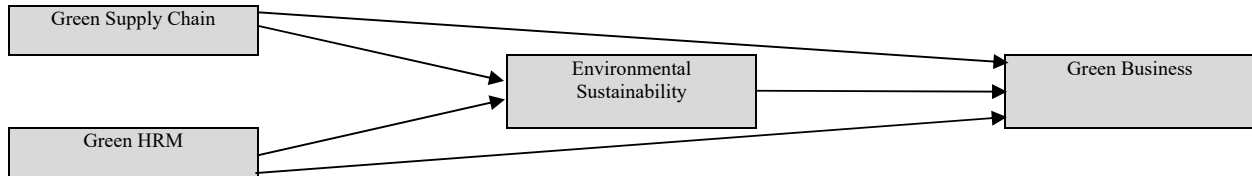
The study intends to determine the mediation effect of environmental sustainability between the relationship of green HR, green supply chain, and green businesses among Indonesian firms. The literature established the association between green HR management and business initiatives, green HR and environmental sustainability, and green business. The study argues that environmental sustainability plays a mediation role between independent and dependent variables (Azevedo et al., 2011). Environmental sustainability and business concepts have a comprehensive understanding seen from a long-term perspective; the reaction to environmental damage causes a form of industrial growth that is quite progressive. The first industrial revolution shaped how the industry began to grow, followed by the second revolution in the nineteenth century, which demonstrated the existence of a product in the form of laws related to pollution and anti-metal pollution that was agreed upon by countries in America and Europe to provide long-term nature conservation. (Guha, 1999; Jones & Spadafora, 2017; Weber & Soderstrom, 2012). Development that can trigger the formation of National Parks These initiatives were initially quite isolated sporadically. Still, they had quite basic power when at the end of the 19th century, environmental damage was fatal enough to cause a fundamental change in mindset, which provoked cognitively business people to consider a sustainable environment. In the 1960s, in Europe and the United States, there was a second wave of protests about changes in the environment, another characteristic of a different form of understanding related to the concept of strategies for improving performance previously. In addition to turning into a mass movement, this movement was based on the expansion of knowledge about nature, triggering the emergence of anti-establishment criticism of capitalism after the second world war was over (Weber & Soderstrom, 2012). The community considers that businesses will achieve a form of optimization when they provide a cognitive understanding of environmental damage with their business activities. This awareness will encourage industrialization in several cities such as in America and Europe, where entrepreneurs have committed to reducing pollution

and supporting programs related to environmental sustainability. It will become a concept of organizational resistance and control of environmental damage. The importance of awareness and response in business aspects among entrepreneurs' industrial managers provides arguments about environmental sustainability awareness in their business aspects. So, it can ensure that the understanding of green practices is able to provide existence in sustainable performance, which will ultimately improve the concept of corporate strategy in improving its business performance. The current study argues and intends to determine the mediating role of environmental sustainability, and the following hypothesis is formed for the purpose:

**H<sub>6</sub>:** *Environmental sustainability mediates between green human resource management and green business.*

**H<sub>7</sub>:** *Environmental sustainability mediates between green supply chain and green business.*

**3. Research Model and research methodology**



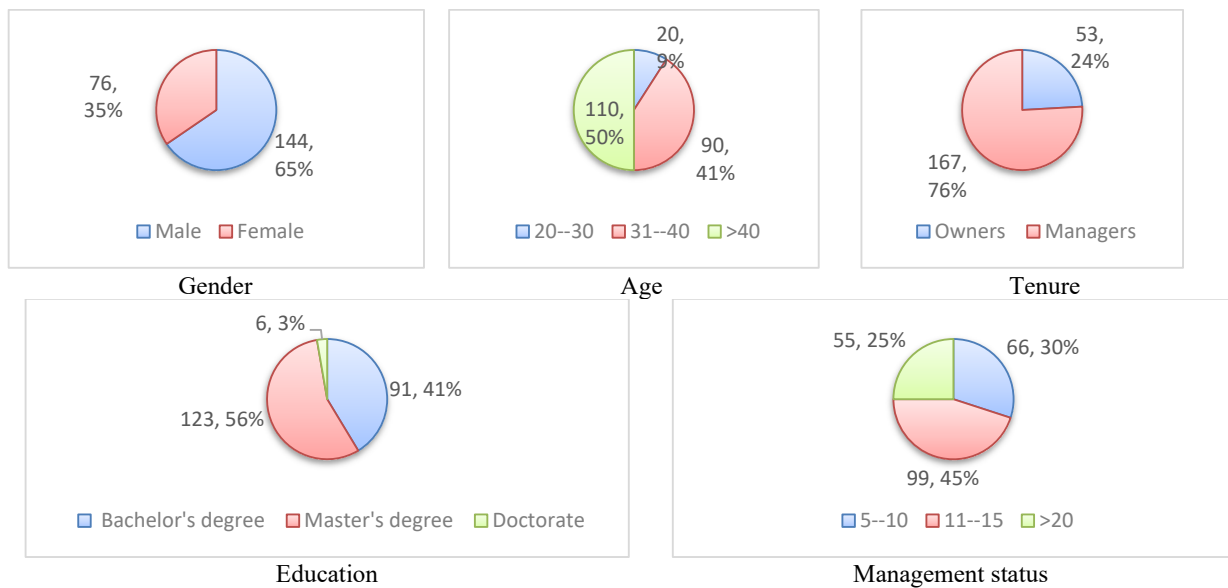
**Fig. 1.** Conceptual framework and the related hypothesis of the research

**3.1. Population and sample**

The current study is cross-sectional quantitative in nature, as data were collected from respondents at once and was analyzed on Smart-PLS. The research was conducted in Central Java, Indonesia, to assess the green business influenced by green HR practices and the role of environmental sustainability. The questionnaire was designed based on different items, the green HRM was determined based on 4 items, 4 items for green supply chain, environmental sustainability was determined based on 5 items, and 4 items for green business. The unit of analysis in the present study was the firm to ensure the adoption and implementation of green practices from each firm's management. The owner/managers were key respondents who could provide the better and required information. In any research, the sample calculation is crucial; for appropriate sample collection, the determination of efficient sample size must be confirmed to represent the population (Morgan & Strong, 2003). For appropriate sample calculation, the Krejcie & Morgan, (1970) table was used as 354 was a sample size deemed to be sufficient. So, the oversampling method was also incorporated, increasing the sample size by 40 to 50% to a low response rate as per suggested criteria (Salkind, 1997). So, the questionnaire was distributed for data collection, and 220 respondents were received as fully usable after discarding the incomplete questionnaires.

**3.2. Demographic profile**

The population of the study was manufacturing firms in East Java and Central Java. Fig. 2 shows the demographic profile of the respondents.



**Fig. 2.** Respondent's demographic Profile

### 3.3. Results and analysis

The analysis of collected data is conducted and presented in this phase of the research paper. The Smart-PLS was utilized for data analysis; the first section determined the construct validity and reliability through the PLS algorithm. The validity and reliability were determined on the values of Cronbach alpha ( $\alpha$ ), composite reliability (CR), and average variance extracted (AVE). The second phase investigated the relationship between the study constructs through the utilization of bootstrapping methods.

## 4. Measurement model

### 4.1. Validity and Reliability Test

This phase demonstrates the value of construct validity and reliability by assessing the Cronbach alpha ( $\alpha$ ), Composite reliability (CR), and average variance extracted (AVE). Cronbach alpha of 0.70 is deemed acceptable for minimal acceptability, 0.80 is considered fair reliability, and 0.90 is considered exceptional reliability. The CR is also assessed, and the cut-off point is suggested as 0.70 for acceptable composite reliability. The value for AVE must remain higher than 0.50 for acceptability, as suggested by (Hair et al., 2012). The reliability and validity must be reviewed due to the reflective model of the indicators closely related and interchangeable. The reliability and validity of constructs are assessed in conformity factor analysis as the internal consistency is determined based on composite reliability values. The convergent validity is determined based on AVE values, and discriminant validity is derived through factor loading. For assessment of the internal consistency reliability of the construct, the composite reliability was determined by assessing the loading of items, and the cutoff value for cross-loading is 0.5 as recommended by (Leguina, 2015). The convergent validity is assessed based on the average variance extracted, and the values for all constructs must remain higher than 0.5 for acceptability. Table 1 presents the values of Cronbach alpha, composite reliability, and average variance extract.

**Table 1**  
Cronbach alpha, CR, and AVE

Variables	Items	Loading Factor	Alpha	CR	AVE
Environmental sustainability	ES1	0.812	0.876	0.915	0.729
	ES2	0.895			
	ES3	0.913			
	ES4	0.859			
Green Business	GB1	0.800	0.903	0.928	0.721
	GB2	0.851			
	GB3	0.901			
	GB4	0.861			
Green HRM	GHRM1	0.828	0.899	0.930	0.768
	GHRM2	0.836			
	GHRM3	0.833			
	GHRM4	0.895			
	GHRM5	0.852			
Green Supply Chain	GSC1	0.837	0.893	0.926	0.758
	GSC2	0.911			
	GSC3	0.881			
	GSC4	0.875			

Table 1 shows that the first item of environmental sustainability is loaded on the value 0.812, the second item was loaded on 0.895, the third item was loaded on 0.913, and the fourth item was loaded on the value of 0.859 all are above the cutoff point and accepted. Similarly, the factor loading for all items of green business was found to be higher than the cutoff point; the first items of green business were loaded at the value of 0.800, the second item of green business was loaded at the value of 0.851, the third item of green business was loaded at the value of 0.901, and the fourth item of green business was loaded at the value of 0.861; additionally, the items of green HR were loaded at the values of 0.828, 0.836, and 0.833. Similarly. Items of the green supply chain were a load at 0.837, 0.911, 0.881, and 0.875; hence all items of each construct were loaded at acceptable value and remained higher than the cutoff value. The Cronbach alpha for environmental sustainability was observed to be 0.876, the green business was determined for Cronbach alpha as 0.903, green HR management was determined for Cronbach alpha as 0.899, and for the green supply chain is 0.893, which are acceptable for further analysis. The CR for environmental sustainability, green HRM, green supply chain, and green business was observed as 0.915, 0.928, 0.930, and 0.926. Moreover, the AVE for environment sustainability, green HRM, green supply chain, and green business was observed as 0.729, 0.721, 0.768, and 0.758 respectively.

### 4.2. Discriminant Validity

This section entails the discriminant validity; the discriminant validity is determined based on the comparison of square root of AVE and correlation value with other constructs. The square root of AVE must remain higher than the correlation value,

as the intersection value must remain higher as per the given criteria of Hair et al, (2012). Table 2 demonstrates the discriminant validity.

**Table 2**  
Discriminant Validity

	GB	GHRM	GSC	SE
GB	<b>0.854</b>			
GHRM	0.466	<b>0.849</b>		
GSC	0.339	0.395	<b>0.877</b>	
SE	0.425	0.447	0.487	<b>0.871</b>

Measurement Model

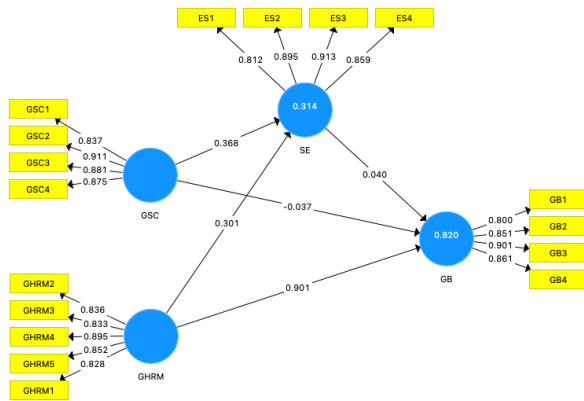


Fig. 3. Measurement Model

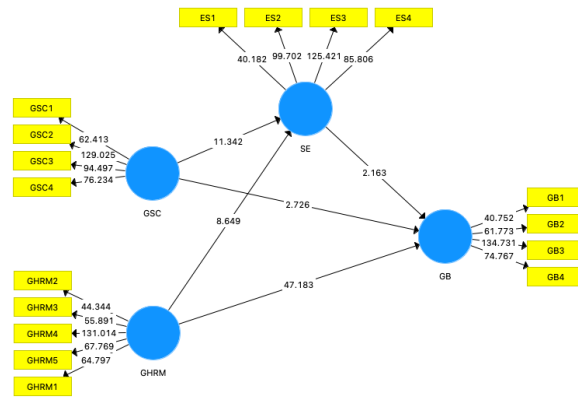


Fig. 4. Structural Equation Model

4.3. Structural Equation Model (SEM)

This section includes the structural equation model for investigating the relationship between constructs, and it contains seven hypotheses: the first hypothesis, H1, determines the investigation between green HRM and environmental sustainability, the second hypothesis, H2, determines the investigation between green Supply chain and environmental sustainability, the third hypothesis, H3, determines the investigation between green HRM and green business, and the fourth hypothesis, H4, determines the investigation between green Supply chain and environmental sustainability. The mediating role of environmental sustainability was also determined as H6, H7 investigates the mediation role between green HRM. Green Supply chain and green business. The relationship is determined on the basis of t-statistics and p-value, the cutoff point for t-value is 1.96 for the acceptable significance of the relationship, and p-value must remain lower as the cutoff point is 0.05 as confidence interval in social sciences is suggested at 95% (Hair et al., 2012). Therefore, Fig. 4 demonstrates the SEM model.

4.4. Hypothesis Testing

In this study, the testing of direct hypotheses occurred before considering mediation analysis.

**Table 3**  
Hypothesis Relationship and testing

No	Hypotheses	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-values	P- Values	Results
H1	GHRM → SE	0.301	0.302	0.035	8.649	0.000*	Supported
H2	GSC → SE	0.368	0.370	0.032	11.342	0.000*	Supported
H3	GHRM → GB	0.901	0.902	0.019	47.183	0.000*	Supported
H4	GSC → GB	-0.037	-0.036	0.013	2.726	0.007*	Supported
H5	SE → GB	0.040	0.040	0.018	2.163	0.031*	Supported
H6	GHRM → SE → GB	0.012	0.012	0.006	2.070	0.039*	Supported
H7	GSC → SE → GB	0.015	0.015	0.007	2.080	0.038*	Supported

Note: \* Statistically a significant at 5% levels respectively



Using the Smart PLS, hypothesis testing was performed, with a bootstrapping approach of 5000 and 95% confidence interval (CI). Table 4 shows the results of the direct three hypotheses. The hypothesis H1 is found to be significant at ( $\beta = 0.002$ ,  $t$ -value = 8.649,  $p$ -value = 0.000). So, H1 is confirmed. The GSC is also significant with SE at the ( $\beta = 0.370$ ,  $t = 11.342$ ,  $p = 0.000$ ). Here H2 is also accepted. The GHRM has a significant effect on GB (H3) with coefficient value ( $\beta = 0.902$  and significant at ( $t$ -value = 47.183,  $p$ -value = 0.000), which shows that the H3 is supported. Similarly, the GSC has a positive relation with GB at ( $\beta = -0.036$ ,  $t = 2.726$ ,  $p = 0.007$ ). hence the h4 is also confirmed. As regards with  $ES \rightarrow GB$ , the hypothesis H5 is performed on the coefficient value ( $\beta = 0.040$ ) and its also a significant at ( $t$ -value = 2.163,  $p$ -value = 0.031). Which shows that the H3 is also confirmed. Therefore, based on the above statistics, the hypotheses H1, H2, H3, H4, and H5 were statistically significant results.

#### 4.5. Mediating Hypothesis

The final stage of our investigation focuses on the mediating effects of the variable's environmental sustainability between green HRM, GSC, and green business, with the purpose of testing Hypotheses 6 and 7. Table 3 summarizes the mediation analysis findings. However, the H6 (GHRM  $\rightarrow$  ES  $\rightarrow$  GB) shows that the  $t$ -value is higher than the cutoff point and observed as 2.070. Therefore, the mediation role is significant at ( $p=0.039$ ). Which allows us to accept that the H6 is supported. Similarly, SE also positively mediates the relationship between GSC and GB and is significant at ( $\beta = 0.015$ ,  $t = 2.080$ ,  $p = 0.038$ ). Therefore, the H7 is also supported. Moreover, Table 4 shows that GB has 82% and SE has 31% variance on all other independent variables such as GHRM and GSC. Thus, the value of R square should be considered as strong and moderate, which is significantly acceptable according to the criteria of Chin (1998).

**Table 4**

Prediction of R-Square

	R Square	R Square Adjusted
GB	0.820	0.820
SE	0.314	0.312

## 5. Discussion and implementations

The current study results show that green HRM has the tendency to influence performance-related outcomes; green HRM influences environmental sustainability. That means the green HR practices influence the practices that preserve the environment. The result of hypothesis H1 also depicted the same thing. It has been established that green HR management positively significantly influences environmental sustainability. The hypothesis H2 investigated the relationship between the green supply chain and environmental sustainability. This relationship found a positive relationship and followed the results of AlKhidir and Zailani (2009). Similarly, hypothesis H3 investigated the relationship between green HR and green business; green HR practices have the tendency to influence the businesses to adopt greening practices to become environment friendly and support the findings of (Azevedo et al., 2011). Moreover, hypothesis H4 also examined the relationship between the green supply chain and green business. The findings suggested that the green supply chain practices have a significant effect on the performance of the green business and also support the finding of (Mathiyazhagan et al., 2014). The hypothesis H5 also investigated the relationship between environmental sustainability and green business; environmental sustainability capacity influences the green business practices to adopt green activities that business functions adopt green practices and become environment friendly. The mediating hypotheses H6 and H7 were also found to be significant statistically and reported that environment sustainability mediates the relationship between green HRM, green supply chain, and green business. These support the finding of (Gilal et al., 2019; Jabbar & Abid, 2015; Jerónimo et al., 2020). Furthermore, these findings contribute to the resource base review and literature of human resource management and supply chain management.

There are several factors in implementing green practices to influence the business activities that become environmentally friendly. First, you must have a concept that can help in formulating a green business. This sustainable organization must be able to compensate for appropriate green business functions and green human resource management practices when deviations occur in their implementation. This will provide feedback solutions to each other and can be a way to produce a sustainable growth strategy. This research also succeeded in providing a form of manifestation of the assumption that the concept of practice in a theoretical framework has been able to provide empirical evidence in solving concrete problems in the field related to green improvement. It was considering the approach taken methodologically after getting the findings that some of the existing literature has provided evidence that the development of green practices focuses on the environment (H. J. Kim et al., 2019; Jerónimo et al., 2020). Scholars have also created various studies in their academic obligations to link the concept of green human resource management, green supply chain management, and environmental management. The concept of green human resource management in modern organizations can be considered as a good supplement for organizations. There is a controversy that has been proven in one of the scholars that what they have done has obtained various pieces of evidence of inconsistency regarding the alignment between green human resource management and organizational environmental management that has been running so far (Daily et al., 2009; H. J. Kim et al., 2019). Thus, it can be shown that the practice of green human resource management can trigger an organizational environment if it is effectively and efficiently integrated into the organization's policies, plans, and strategies.

Likewise, Green Human Resource management can uphold organizational performance because it can provide a form of competitive advantage for the organization. Basically, in the broad application of the organization. Thus, the contribution of green has an important meaning in improving the implementation of green management by employees in an organization. Human resource management contributes to implementing HR Management in the organizational environment carried out by employees and their organizations. The selection component of green Human Resources management, such as recruitment, selection, training, performance, and development of compensation awards and pensions that are carried out in a green manner, will positively impact the organization's environment and sustainability. Several studies have provided empirical evidence about recruitment and green selection that new employees understand the organizational environmental culture and have the concept of environmental values in their minds. Thus, recruitment practices can support optimal organizational environmental management practices. Organizations that have chosen to use shields against them will immediately give green work in their business processes. They will be more effective in attracting new talent by seeing the high-quality potential and the ability to green work. They are effective in the same place and will be able to show the concept of their current work better. In the same place, the findings successfully show that Green Human Resource Management has a significant impact on environmental sustainability when organizations enter environmental indicators in their performance management systems. Organizations must survive as a reputation for a dual role for their business processes and environmental performance long-term orientation to gain competitive advantage Wolf (2013). Integrating environmental performance indicators in a work management system that has become a fairly optimal plan will provide the optimal implementation of long-term environmental sustainability.

## 6. Conclusion and discussion

The present research paper was an effort to assess the role of green HR practices, green supply chain, and management in the manufacturing industry of Indonesia to initiate the green business functions to become environmentally friendly and responsive towards preservation of the environment to reduce the negative impact. The study stressed the green activities, including green recruitment, green selection, green supply chain, green distribution, green training and development, and green business performance. The study was conducted on manufacturing firms of Java, Indonesia, as data was collected through questionnaires and was analyzed on Smart-PLS. The study reported that green HR practices and the green supply chain influence green business activities and environmental sustainability. The results depicted that environmental sustainability influences the green business; furthermore, environmental sustainability mediates the relationship between green HR management, green supply chain, and green business.

The study suggested to the manufacturing industry to ensure green practices. From the HR perspective, the recruitment and selection procedure must be green. Organizations should adopt the green R&S process to attract potential candidates and selection criteria. The study also argues for adopting green training and development programs to increase the awareness of greening aspects and train the employees to adopt green practices. Performance management is considered one of the important factors; the performance evaluation must be made based on green initiatives. The compensation and benefits activity must be carried out through the greening aspect, and the rewards must be given to employees to adopt and maintain the green practices. The organizations are suggested to adopt the green programs to influence environmental sustainability that further influence the business to adopt the green practices and functions to preserve the environment and reduce the carbon emission during the business operations.

## 7. Limitation and future studies

This research has limitations; among others, this research has not been able to describe the green human resource management aspects for environmental performance, specifically in increasing the green business. In addition, this study also uses a smaller sample around the province of Central Java. Still, this study has succeeded in showing evidence that the concept of green HRM and green supply chain simultaneously affects the sustainability of the environment and business directly when tested on a small sample scope only in the manufacturing industry in the province of Central Java. The provision of a pension system reward that is given in consideration of the green aspect. In addition, to improve the business and environmental sustainability, further research can also add variables in innovation, institutional pressure, and green investment. Future studies may be undertaken to analyze the different firms that have implemented green practices; pre-and post-analysis must be recorded in order to assess the function of green practices. Future research should focus on the best green practices in manufacturing, production, transportation, and service centers to ensure environmental sustainability.

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