Building Sustainability Business Industry Palm Oil 4.0 Through A Green Human Resources Management, Green Innovation and Approach Green Commitment

Henny Hendarjanti¹*, Lenny Christina Nawangsari²
¹,²Faculty of Business and Economics, Mercubuana University, Jakarta Indonesia
Correspondence author:* henny.hendarjanti@gmail.com

Abstract

Indonesia is the largest producer and exporter of palm oil in the world. The demand for palm oil is increasing, partly because it is a source of biofuel. Oil palm plantations in Industrial 4.0 are required to increase productivity in an environmentally friendly and sustainable manner in the face of global competition. Various environmental issues have become a concern for world economic growth. There is a close correlation linking the environment with production and the economy. The point of global warming has become a central issue that poses a threat to the country's economic activities, production, and economic growth. The application of "Good Agricultural Practices" in the palm oil industry is accompanied by environmental policies, both mandatory and voluntary, as an effort toward business sustainability. One of which involves managing human resources in the business process of oil palm plantations to lower greenhouse gas emissions. The corporation's environmental policy is implemented to preserve nature through employee involvement in innovation and commitment to the environment. This writing aims to understand the structure that explains the correlation between Green HRM variables, Green Innovation, Green Commitment, and Sustainability Business. This paper presents the theory of Green HRM, especially the behavior of Green Commitment and Green Innovation in an organization. This paper is obtained through library research by analyzing the relationship between variables. Focuses on the correlation linking the variables of Green HRM, Green Innovation, Green Commitment, and Sustainability Business which is expected to complement literacy of similar research in the future

Keywords: green_HRM, green_innovation, green_commitment, sustainability business

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*Corresponding author
INTRODUCTION

Global warming is a serious environmental problem. Industry development causes a drastic increase in CO2 gas emissions as a greenhouse gas producer. The concept of decarbonization is a policy in several countries to reduce the effect of greenhouse gases. To achieve this goal, governments must rapidly reduce their greenhouse gas emissions, achieving carbon neutrality by 2030 and net zero emissions by 2050. The environment is an important issue in business practices worldwide (Weng, 2015). Oil palm plantations as agribusiness industries must address environmental issues by implementing good agricultural practices. The carbon emission trading scheme is a widely accepted policy to reduce carbon emissions (ICAP, 2019).

The phenomenon of carbon emissions also occurs in oil palm agribusiness. The development of industrial agribusiness affects the environment and ecosystem. This development causes forest areas to be lost, triggers deforestation, causes soil erosion, fragmentation, loss of habitat, loss of biodiversity, and changes in the ecological landscape. Land-use change, change the land cover and some serious environmental problems. There is an increase in greenhouse gas (GHG) emissions. Palm Oil Mill Effluent (POME) waste, application of fertilizers and pesticides, and fossil fuels in the palm oil industry are the causes of GHG emissions.

The palm oil industry has a significant advantage. Global demand for palm oil is increasing. Palm oil production is much higher than other vegetable oils such as soybean, sunflower seed, and rapeseed. Palm oil is a raw material for biofuel as renewable energy.

There is increasing anthropogenic pressure on the environment in the face of vulnerability to natural disasters. The European Union regulations in RED II (Renewable Energy Directive II), which are discriminatory against Indonesian palm oil production, are detrimental to palm oil producers in Indonesia. Therefore, sustainable palm oil agribusiness is a priority. The paper identifies and examines ways to build the sustainability of the palm oil industry. Green Human Resources Management (GHRM), Green Innovation, and Green Commitment are conceptual approaches to sustainability. Based on previous research as a reference material that the author will convey in the conceptual framework, it is known that several dominant factors or variables that affect Agribusiness Sustainability are GHRM, Green Innovation, and Green Commitment.

As presented at the International World Forum, the Indonesian government cares about and is committed to reducing greenhouse gas (GHG) emissions. In a speech by President Joko Widodo as the leader of the World Summit on 1 October 2021 on Climate Change or COP26 in Glasgow, Scotland, he stated that climate change is a significant threat to global prosperity and development. Togetherness, contribution, and participation globally are tactics for overcoming climate change (Dewi, 2021). The Indonesian government is concerned about this problem and is committed to reducing greenhouse gas (GHG) emissions. Its commitment is to start the rehabilitation of 600 thousand hectares of mangrove forest by 2024, the largest in the world. Indonesia has also completed the restoration of 3 million critical lands between 2010 and 2019. By 2030, commit to reducing GHG emissions by 29% and 41% with international assistance. By 2030, Indonesia will achieve a carbon net sink in the Forestry and Other Land Use (FoLU) sector or the so-called
"INDONESIA FoLU 2030 Agenda". Minister of Finance of the Republic of Indonesia, Sri Mulyani, on October 19, 2021, Sri stated that reducing carbon emissions by 29% requires the funding of US $ 365 billion. In addition, there is a target of reducing carbon emissions by up to 41% with financing from international support, which must achieve by 2030. The government issues green bonds and various financial instruments to attract multiple funding sources (Pratama, 2021). Green bond allocation for renewable energy shows a positive and 99% significant impact (Tolliver et al., 2020). The growing trend of green bond issuance with the distribution of funds to renewable energy infrastructure investments is reported to have rapidly increased beyond $26.7 billion in 2017 (Tolliver et al., 2019). Presidential Regulation of the Republic of Indonesia Number 61 of 2011 concerning National Action Plan for Reducing Greenhouse Gas Emissions and Regulation of the Republic of Indonesia Number 71 of 2011 concerning State Administration of greenhouse gas inventories are the basis for efforts to reduce GHG emissions.

In developing sustainable palm oil plantations in Indonesia, we must be aware of people, profit, and the planet. The balance of carbon emissions and sequestration depends on plantation management. Customer demands and environmental regulations related to palm products that are environmentally friendly and sustainable, with one of the indicators of low carbon emissions, are challenges that companies must face. Through GHRM, companies can implement environmentally friendly and sustainable business process activities. In the future, oil palm plantations must have a big vision to develop their industry.

Employees are the company's main asset that plays a role in successfully sustainably managing oil palm plantations. Based on previous research, it is known that the variables that can affect sustainable business include GHRM (Nawangsari & Sutawijaya, 2018; Obeidat et al., 2018; Roscoe et al., 2019), Green innovation (Liao, 2016; Grazzi et al., 2019) and Green Commitment (Jyoti, 2019; Cop et al., 2020). To find out the variables that affect business sustainability in oil palm plantations, researchers conducted interviews with Senior Managers and Managers of Agronomy Services, Plant Operations, Workshop & Infrastructure, Human Capital, Transport Management and Sustainability in the oil palm plantation industry. From the interview results obtained the following information:

1) Business orientation and innovation activities of oil palm plantations are still towards productivity, efficiency and digitalization,
2) Still low awareness of human resources towards sustainable environmental management, especially in carbon mitigation efforts that need to be improved,
3) Commitment to environmental activities and sustainable management of oil palm plantations needs to be increased.

Sustainable agriculture has become a topic that marks the industrial era 4.0. and become the main focus in implementing innovation through digital technology in agriculture. The implementation of Good Agriculture Practices encourages the achievement of the palm oil industry's agribusiness sustainability economically, environmentally, and socially. Implementing ISPO (Indonesia Sustainable Palm Oil) regulations is an obligation for the palm oil industry. Several voluntary global regulations, such as the RSPO (Roundtable on Sustainable Palm Oil) and ISCC (International Sustainability and Carbon Certification), are
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added values to competitive advantage. European Union policies related to the environment and transformational innovation in the digital field. Through GHRM, Green Innovation, and Green Commitment, it is hoped that the agribusiness industry can realize sustainability with a green concept. Some distinctive aspects include the government system, state administration system, organizational system, corporate culture, geographical conditions, and the impact of carbon emissions from the palm oil industry. Hence, companies need to see the extent to which the implementation of Sustainability policies in agribusiness. The problems in this research are formulated as follows:

1. Does Green Human Resources Management (HRM) impact Sustainability Business?
2. Does Green Innovation affect Sustainability Business?
3. Does Green Commitment affect Sustainability Business?
4. Does Green HRM, Green Innovation, and Green Commitment affect Sustainability Business?

On a macro level, this research has one big goal: to see the potential of Green HRM, Green Innovation and Green Commitment can contribute to achieving the goals of agribusiness sustainability. Compliance with environmental regulations and policies, both mandatory and voluntary, and the application of green in the palm oil industry is an alternative for companies to bolster the government of the Republic of Indonesia to help mitigate carbon emissions. In interpreting this research, the authors set the following objectives:

1. Find out and analyze the influence of Green HRM on Sustainability Business
2. Find out and analyze the effect of Green Innovation on Sustainability Business.
3. Find out and analyze the effect of Green Commitment on Sustainability Business.
4. Find out and analyze the influence of Green HRM, Green Innovation, and Green Commitment on Sustainability

The four objectives of this research are complementary where on the one hand, the study discusses the development of environmental policy implementation in the company. In contrast, on the other side, the study is the initiative and commitment of employees as human resources so that in the end, they can obtain utility for the sustainability of the oil palm agribusiness.

LITERATURE REVIEW

Sustainability Business Industry 4.0

Corporate sustainability management is influenced by business sustainability. Sustainability dimensions such as social, economic, and environmental are influenced by Green HRM activities (Singh et al., 2020). Sustainability Agribusiness is an activity in the agricultural sector that is expected to meet food needs and maintain sustainable economic characteristics. Provide good income while maintaining the vital role of the value chain that provides raw materials that can convert into other industrial products (Hrustek, 2020). The essential part of the value chain is that it allows for raw materials that can convert into other industrial products (Hrustek, 2020). In line with community values changes, should do agricultural practices in a social, economic, and environmentally sustainable manner (Meinke, 2019).
The focus in agricultural business operations is sustainable agriculture. Namely supply chain involvement in business sustainability management (Tsolakis et al., 2019). The supply chain aims to ensure efficiency and sustainability effectiveness in agribusiness processes. In the information segment, digital transformation aims to provide flexibility, efficiency, energy, and automation of agribusiness processes. Digital transformation helps ensure savings and faster decision-making, contributing to agribusiness sustainability.

Implementation of sustainable development is based on social, economic, and environmental. Palm oil is an essential and competitive agribusiness industry. The expansion of oil palm plantations is of great concern to environmentalists, ecologists, and policymakers. The sustainability of the palm oil industry is vital. Actions and activities towards a sustainable palm oil industry, according to Kathuna et al. (2017), include:
1. Immediate steps: a) monitoring and assessment of ecological integrity, b) good management practices, c) selection of productive plants, d) intensification of production, e) raising awareness;
2. Intermediate steps: a) long-term breeding program, b) environmentally friendly factory, c) agronomy for best production, d) zero waste technology; and
3. Final steps: a) mapping of ecosystem services (Ecosystem Service Mapping) for planning further land use expansion, b) alternative sources of oil. Implementing a sustainable palm oil industry requires the commitment and innovation of employees as human resources. Employees are company assets, so management of the employees themselves is needed. By doing so, Green Human Resources Management, Green Innovation, and Green Commitment are essential.

Green Human Resources Management

The Green HRM initiative can be seen as a radical change in an organization that requires considerable time and resources to be formulated into practice. Organizational enthusiasm can be seen in operational, financial, personnel, technical and knowledge readiness. Human Resources Managers need to attract and motivate employees towards green practices. Organizations that care about the environment and sustainability are active towards environmental sustainability and experience positive results, such as higher profitability, better financial performance, and higher share prices (Agrawal & Puri, 2021). Furthermore, it is said from the results of a survey conducted by the Society for Human Resources Management that only 22% of companies usually adopt environmentally friendly HRM initiatives, and 50% of companies have no plans to adopt HRM initiatives.

Green HRM practices within the company are the main tips in sustainable business that play an active role in exploring the green aspect of the business. The company's performance looks different and significant when the Green HRM technique is applied. Chakraborty & Biswas (2020) stated that the company's Green Management Perspective is prepared through Green Recruitment & Selection, Green Training, Environmentally Friendly Performance Management, Green Management Awards, and Employee Participation. The action is to promote the environment and significantly impact business sustainability. Green HRM practices have a substantial impact on company performance. Green HRM also enriches
employee competence and technical behavior in aligning tasks and targets in an environmentally friendly manner that will strengthen the company's core values.

Furthermore, this sustainable practice can instill a sense of commitment among employees to environmental issues and the company's mission to realize the company's green goals and improve green performance in the workplace. Obeidat et al. (2018) show that top management involvement and internal environmental orientation positively affect Green HRM, which has a significant impact on environmental performance. Indicates the effect of Green HRM in mediating the relationship between top management support, internal ecological orientation, and environmental performance. In addition, it found that environmental performance had a positive effect on organizational performance.

**Relationship of Green Human Resources Management with Sustainability Business**

Employing competent people, supported by performance appraisals and employee appreciation methods, can guide the mindset and behavior of employees towards sustainability according to company goals (Siti Nabiha, 2015). Yong et al. (2019) state that companies' social, financial, and environmental performance provides more benefits with Green HRM practices. The focus of the company is to implement sustainability. Management needs to implement green HRM practices for employees and pay attention to organizational culture. Through this, employees understand the importance of going green and the motivation to commit to the company's environmental and social mission and individually strive to achieve sustainability goals.

Chakraborty & Biswas (2020) said that Green HRM could promote the environment and significantly impact business sustainability. This sustainable practice can foster a motivated commitment among employees to environmental issues and the company's mission of realizing a green company and improving green performance in the workplace. Green HRM practices have a considerable influence on company performance, enriching employee competence and technical behavior in aligning tasks and targets in an environmentally friendly manner that will strengthen the company's core values. Green HRM is a company policy in sustainably managing human resources by including the environment side to protect natural sustainability in company management (Purnama & Nawangsari, 2019)

**Green Innovation**

Green innovation leads to the elaboration of environmentally friendly products and processes (Albort-Morant et al., 2016). According to Kunapatarawong and Martínez-Ros, (2016), Green Innovation is a contributive method to achieve a refined focus on high-quality economic development and protection of the environment.

Innovation is the main focus of climate change policies to reduce carbon emissions, especially green innovation. Green innovation can control resources and reduce environmental pollution by maximizing production efficiency (Sun et al., 2017). Furthermore, Wang et al. (2019) show that a region or neighboring country must collaborate in mitigating cross-border CO2 emissions. Several researchers have studied green
innovation in different countries and regions. Aldieri et al. (2019) conducted a study on green innovation in companies in Europe, Japan, and the United States, showing that environmental excellence has a significant positive effect on the company's workforce income. Ghisetti & Quatraro's research (2017) on the impact of environmental innovation on ecological performance in various regions of Italy shows that better environmental performance is found in areas with higher green technology innovation. Furthermore, Lambertini et al. (2017) stated that competition and innovation in controlling pollution have an inverse U-shaped relationship. R & D excellence drives innovation.

Technology can reduce the impact of climate change, such as transportation, water management, and the positive influence of their leadership on green growth. Research on green innovation has been carried out since 1990, especially regarding Green Technology Innovation. Current research describes green innovation as new or transformed products and processes that save the environment, including technological, managerial, and organizational innovations (Weng et al., 2015). Khurshid & Deng (2020) revealed that technology related to production and processing is an act that is harmful to green development. Energy consumption, generation, and transmission technologies damage the environment. However, renewable energy is a solution that contributes positively to green production and growth. Renewable energy positively contributes to reducing energy consumption in the agricultural sector, which adds to greenhouse gas emissions.

**Relationship of Green Innovation with Sustainability Business**

Several studies have shown a relationship between agricultural systems and increased emissions of pollutants such as carbon emissions (Balsalobre-Lorente et al., 2019). In this case, agriculture and food farming systems need to use natural resources and sustainable production. Currently, climate change and reduced natural resources are indicators of the need to apply and develop the concept of sustainability (Kurniawan & Managi, 2019). As environmental understanding increases, eco-innovation provides the best solution to saving the environment (Díaz-García et al., 2015; Osiepa-Kubicka & Pachura, 2017). Undoubtedly, ecological innovation practices are expected to reduce the use of energy and natural resources and create new processes, methods, and sustainable products (Veronica et al., 2019). Most importantly, environmental innovation transforms problem-solving and entrepreneurial opportunities to solve environmental problems and support business performance. Darmadji & Suwarta (2018) suggest that agricultural businesses need to develop to solve environmental problems

**Green Commitment**

The company is committed that employees are a reflection of performance. Employees are committed to the company to express more efforts to improve performance. The willingness of employees to care for and share the company's environmental problems is an employee's commitment to the environment (Paille & Valeau, 2020). Therefore, it can achieve the goal of a green company if employees are committed.
Environmentally friendly behavior and commitment from top management will affect employee behavior and commitment (Raineri & Paille, 2016). The top management's commitment is a performance appraisal of the company's environment.

Organizational commitment increases employees' ability to put in extra effort outside of their duties (Devece et al., 2016). A committed organization is a vital component of employee attitudes, as it leads to altruistic or pro-social behavior (Devece et al., 2016). Individuals in organizations who are solidly committed tend to increase efforts to involve employee behaviors in supporting the organization, such as task performance, work involvement, and proactive behavior (Pradhan & Pradhan, 2015).

**Relationship of Green Commitment with Sustainability Business**

Employee morale and satisfaction with the sustainable use of resources will increase through Green HRM. Employees will have a high commitment and feel satisfied with a more dynamic organization in supporting a green environment (Ahmad, 2015). Research Sharma et al. (2021) concluded that employee commitment is very important in green organizational culture to build green that will help companies to be innovative. Innovative products will have a positive effect on green performance.

Green HRM acts as a mediation toward HRM commitment and green creativity. According to Huo et al. (2020), committed Green HRM indirectly affects the company's green creativity. Environmentally related regulatory policies positively regulate the relationship between HRM commitments and Green HRM. Joshi & Dhar's (2020) research shows that green training directly affects the creativity of green organizations, and green dynamic capabilities indirectly affect green creativity through the mediating role of resources committed to creating superior creative outcomes. A committed organization will have an obligation to effective environmental management. Management of the internal environment moderates the effect of responsible leadership on employee performance and is pro-environment indirectly. Organizational commitment mediates this influence (Afsar et al., 2019).

**Conceptual Framework**

The constructs of this study i.e. Green HRM (GHRM), Green Innovation (GI), Green Commitment (GC) and Sustainability Business (SB) have been shown in Figure 1. On the basis Theory of Sustainability Business’s assumptions, the current study explained direct and indirect relationship among GHRM, GI, GC and SB.

![Conceptual Framework](Image processed by the author, Year 2021).
Green Human Resources Management (GHRM) affects Sustainability Business (Zientara & Zamojska, 2018; Dingra & Padmavathy, 2019; Yusoff, 2019; Purnama & Nawangsari, 2019; Chakraborty & Biswas, 2020; Mousa & Othman, 2020). Green Innovation leads to an escalation of environmentally friendly products and processes. At the same time, sustainability is a concept of “The Triple Bottom Line,” which facilitates the implementation of sustainability through three aspects: financial performance, environmental performance, and social performance. Steps Towards Sustainability Business by exploring and implementing green innovations (Albort-Morant et al., 2016; Albort-Morant et al., 2017; Kunapatarawong and Martínez-Ros, 2016; Nilashi et al., 2019a, b, c; Li et al., 2020; Singh et al., 2020). Organizations that are proactive in supporting the environment implement Green Commitment which will affect employee satisfaction, engagement, pro-activity, commitment, creativity, and performance (Devece et al., 2016; Raineri & Paille, 2016; Afsar et al., 2019; Huo et al., 2016). In this study, obtained several journals through google search, google scholar and research gate from several journal publishers, which include: Elsevier, Sustainability, Entreprenership and Sustainability Issues, Business Strategy and The Environment, Environmental Science and Pollution Research, Environmental Research and Publich Health, Business Strategy and Development, Environmental Management dan Cleaner Production. In the literature review search system using the keyword, namely “Sustainability Business, Green HRM, Green Innovation and Green Commitment”.

The literature review method is carried out to state various substantial theories with the problems being studied as reference material in the discussion of research results. The flow in this research method is as presented in the Concept Thinking Framework (Figure 1). The journals used as literature review material are limited to the 2015-2021 range.

RESULTS AND DISCUSSION

The application of Green HRM in an organization is one of the effective programs for green business because this method refers to the company’s efforts to transform typical employees into employees who participate in a proactive character towards the environment (Zientara & Zamojska, 2018). The success of
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the company's environmental management depends on the environmentally friendly behavior of employees because their behavior improves the company's environmental performance. In achieving a sustainable business, it is important to understand Green HRM in influencing employee behavior that is friendly to the environment. The environmental performance of a company is affected by individual employees. The principle of social identity provides a theoretical basis for the efforts of green companies through employee psychological processes and organizational commitment, which act as GHRM mediators on environmentally friendly behavior (Yusoff, 2019). GHRM is an HRM practice that applies ecologically friendly HR practices to campaign for sustainable HR implementation, resulting in more effectiveness, lower costs, increased employee performance, and better employee retention rates. Optimal use of resources to reduce carbon footprint will increase the company's competitive advantage, profit, and sustainability (Dingra & Padmavathy, 2019). The implementation of the Green HRM scheme has a positive effect on the sustainability of the company's performance. Identify and prioritize the most influential green implementation practices: green recruitment and green training and engagement (Mousa & Othman, 2020).

Green HRM practices will motivate superior employees to use green knowledge in carrying out green innovations. Companies with higher levels of green human resources will be successful and significant in green innovation (Singh et al., 2020). The expansion of environmentally friendly products and processes was spearheaded by Green innovation (Albort-Morant et al., 2016). Green innovation is implemented by adopting green organizational practices, namely the use of environmentally friendly materials and using concepts that minimize the impact of environmental damage. The concept aims to reduce GHG emissions through actions to save energy use, such as lowering electronics and water. Several previous studies have shown that companies implementing green innovations will be very successful (Albort-Morant et al., 2017). As described by Raut et al. (2019), environmentally friendly management in the agro-industrial sector can help a manager determine operational decisions sourced from human resources with environmentally friendly performance. Environmental management reveals an inverse U-shaped relationship between the extent of environmental management and economic performance. The depth of environmental management has a positive influence on financial performance. The relationship between the breadth of ecological management, the depth of environmental management, and economic performance. The relationship between the range of environmental management and the depth of environmental management impacts green innovation by mediating environmental leadership (Zhang & Ma, 2021).

Organizational green commitment is the relationship between responsible leadership and pro-environmental behavior by supporting the mediating mechanism of a shared green vision toward sustainability (Devece et al., 2016). This study follows the opinion of Afsar et al. (2019) that a company that has an idea and is committed to being environmentally friendly is a system of environmentally responsible employee behavior and leadership. Companies committed to being environmentally friendly have a direct relationship between responsible leadership and employee behavior that is proactive towards the environment. The company's commitment to responsible leadership has an indirect effect on the behavior of
employees who are aggressive towards the environment. Internal environmental controls mediate this indirect influence.

**CONCLUSIONS, MANAGERIAL IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH**

**Conclusions**

Following theoretical reviews and literature studies conducted above, the author can respond to and respond to the thoughts of the phenomena and questions raised, so from the concept of the framework, the author can conclude that the variables Green HRM, Green Innovation and Green Commitment affect Sustainability Business.

Based on the results of theoretical and literature studies, the authors can convey the following conclusions:

(a) Green Human Resources Management influences Sustainability Business;
(b) Green Innovation has an impact on Sustainability Business;
(c) Green Commitment influences Sustainability Business

The author suggests multiplying the literature sources when deepening the conceptual framework testing by comparing private organizations or companies with different industries and or organizations in government. Study scientifically and explore theory and broader literature, especially those related to best practices towards Sustainability Business.

**Managerial Implications**

This study has tremendous indication for policymakers and management as well. First, research findings show that the application of Green Management Practices in the agriculture sector can help managers manage authority and make decisions related to operations and human resources that focus on business operations and green performance (Raut et al., 2019; Mousa & Othman, 2020).

By doing so, Sustainability Business can be achieved when management pays more attention to GHRM management by implementing green innovation and green organizational commitment. Second, this study shows that green innovation is a fundamental and influential determinant of Sustainability Business. Therefore, it is necessary to generate Green organizational commitment and develop Green Innovation to help improve Sustainability Business (Kurniawan & Managi, 2019; Huo et al., 2020)

**Limitations and Future Research**

Even though this study suggests essential findings, it should note some minor limitations. First, the research conducted is a self-reported literature review-based study and cross-sectional interviews, thereby increasing the problem of social desirability bias. There are limitations to the collection of self-reported literature. To address this problem, could a mixed methodology be adopted in future research.

Further future research in this area can indulge by including other definite variables that can mediate the relationship between Green Human Resources Management (GHRM) and Sustainability Business (SB).
Lastly, retrieved the findings of this research from a literature review in which data was collected from agriculture industries. Therefore, the results of this research may be sector-specific. So, the results might not be generalized to other sectors of large organizations.

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