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# The integrated green supply chain and human resource management for sustainability

**Abstract.** Small and medium companies can play a significant role in creating sustainable development, especially in the field of environment. However, one of the most important gaps in this area is the lack of strategic attention to the issue of green management among human resources and in the strategic and operational plans of the organization, which can play a significant role in the environmental performance and organizational sustainability of this organization. Therefore, the objective of this study is to evaluate the impact of integrated green supply chain and human resource managements for sustainable development of companies. This research is based on structural equation model and on the questionnaires' and statistical approach. The statistical community was made up of industrial companies (145 IT companies of Indonesia) and the statistical sample was considered based on Morgan's table. The main factors of the proposed method as the hypothesis are as Green transformational leadership, Green shopping, Customer environmental cooperation, Reverse Logistics, Internal environmental management, Environmental orientation, Green human resources, Green product, innovation, Green process innovation, environmental function, Green innovation, Green supply chain management. At the first stage their validity and reliability was tested based on confirmatory factor analysis in the SPSS software. The interaction of the variables were investigated and it was founded that the integrated green supply chain by human resources can be effective in sustainable development and Green shopping, Green human resources and Green process innovation demonstrated

most effective variables in the process. The outcomes of the current study can be employed to improve the sustainable performance of industrial companies regarding the environment and performance.

## 1. Introduction

Human resource management is the vital management task to guide the organization's most valuable asset, namely human resources. Recently, the issue of human resource management revolves around sustainable development (Zaid et al., 2018), In this regard, GHRM is considered the most main key of sustainable development. In the broad field of sustainable human resources, its environmental branch under the title of GHRM tries to investigate the relationship between human resources activities and environmental sustainability. Based on the literature review, the GSCM can be the solution from the industries from production to consumption chain to consider environmental concerns. Also, it considers the recycling system to minimize the damage to environment (Mousa & Othman, 2020).

In general, green human resource management seeks to describe how the organization's employees realize green and environmental goals. Taking various actions by organizations in order to preserve the environment, including paying attention to the issue of GHRM in order to fulfill the social responsibilities of organizations, for example, in the work by Danilwan et al. (2020) argued that all stages of environmental management systems need to be supported by human resource management methods. Jiang et al. (2024) 3 also stated that GHRM is one of the new management measures that can improve the organizational behavior of employees and create a positive effect on improving the attitude of customers.

Research shows that nowadays environmental orientation strategy with focus on environmental protection is an important issue for all stakeholders of the organization. Customers, shareholders, governments, employees and competitors attach great importance to the environment. Global pressures have required organizations to produce environmentally friendly products and services. Green supply chain is often assumed to be synonymous with reducing or eliminating the use of harmful chemicals.

Human resource management measures indicate programs, processes and approaches ultimately lead to reducing the negative effects or increasing the positive environmental effects of the organization, and the main objective of GHRM measures to enhance the sustainability and performance of the company. In fact, in this definition, it refers to the alignment of human resources processes and techniques with different dimensions of the organization, in order to achieve green goals in the direction of sustainable development. In order for a system to remain stable, that system must handle the unpredictable situation in any way it can in such a way as to prevent unwanted outcomes. Therefore, it can be argued from the findings of this section that when the processes and mechanisms of human resources management in the company are in such a way as to reduce the negative effects of the environment and the employees in doing the work related to the organization will ultimately reduce the environmental damage. It should be noted that the missions and goals of the organization are in line with improving the positive effects on the environment, in this case the organization can move to achieve a stable organizational situation and the capability to improve company performance in the long term and results in the continuous satisfaction of the company. Identifying and prioritizing GHRM measures can be effective. The results showed that the integration of the company's goals and environmental goals with the performance evaluation system is in the first rank

## 2. Method

The current research aims to determine the causal relationships between the variables of green transformative leadership, environmental orientation, GHRM, green innovation, GSCM and environmental performance; therefore, in terms of the practical purpose and in terms of the way of gathering information, it is descriptive and survey type. Research statistics consists of managers who are knowledgeable about the subject under investigation according to their position from production, distribution, marketing, and R&D of small and medium-sized Indonesian company's

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actives in IT. To determine the sample size of the present research, the sample size calculator for structural equations from the SPSS was used. The main variables are considered as Green transformational leadership, environmental orientation, GSCM, GHRM, green innovation, and environmental performance.

This software, with the power of writing different scenarios for the sample size of the research, helps the researcher in choosing the best scenario for the sample size of the research test. According to this method, the effect size for the research model test was 0.19, the second type of error, or the power of the test, was equal to 0.8%, and finally, the first type of error was considered to be 0.01 to achieve a 99% confidence interval, which resulted in a minimum sample size of 323. The person was determined. Finally, the questionnaire was randomly distributed among 323 operational, middle and senior managers as representatives of small and medium-sized enterprises in Indonesia, and 291 returned completed questionnaires are done by PLS (Inayat et al., 2023; Torre et al., 2023). The structure of the questionnaire used in terms of validity and reliability for the use of the confirmatory factor analysis method has been examined and its results reported. Structural equation modeling approach have also been used to answer the research hypotheses.

## 3. Results

In the current research, data analysis was done in two parts, descriptive and inferential. In the descriptive part of the results of the demographic variables, it was determined that 251 of the respondents were male and 82 were women. Regarding the age, the majority of the responding were in the age group of 40-50 years old with a frequency of 60% and the age group under 30 years old with 7% had the lowest frequency among this statistical sample. The frequency of education was also the highest percentage for the master's degree with 50 percent and the lowest frequency for the diploma level with 7 percent and after that the doctoral level with the frequency of 15 percent. Also, the results of the job position of the statistical sample showed that the frequency of operating managers of small and medium companies was 168 people, middle managers 27 people and senior managers 115 people.

The purpose of confirmatory factor analysis (CFA) is to evaluate the link of latent and manifest variables (questionnaire questions). In fact, it is indicative of the measurement model. The conditions for establishing reliability and validity according to Munawir et al. (2021), are based on Cronbach's alpha (CA) and combined reliability (CR), which were considered for CA reliability, CR < 0.7 and AVE < 0.5. Convergent validity is also considered based on factor loadings of 0.7 (Table 1).

Two indices of factor loadings and (AVE index of average variance extracted) are used to check the convergent validity. The factor load determines how much of the variance of the manifest variables the current variable explains, and since it is a correlation coefficient, it must be statistically significant in the confidence interval (t statistic) of 95%. The results of the factor loadings obtained except for the environmental orientation variable with a factor load of 0.541 and the green human resources variable with a factor load of 0.48, the rest of the indicators have a factor load greater than 0.7. The next index of convergent validity is the AVE index. With the help of this index, it was found that all the studied structures have the extracted average variance higher than 0.5, which shows that it has high convergence validity.

In the next step, the effect of the variables on each other's performance and considering the hypotheses of the research has been analyzed, and the results are presented in Table 2. If the

Table 1:
**Cronbach's alpha and AVE indices for composite reliability and convergent validity**

| Variable | CA | CR | AVE |
|---|---|---|---|
| Green transformational leadership | 0.88 | 0.91 | 0.68 |
| Green shopping | 0.85 | 0.90 | 0.70 |
| Customer environmental cooperation | 0.88 | 0.94 | 0.89 |
| Reverse Logistics | 0.82 | 0.88 | 0.65 |
| Internal environmental management | 0.89 | 0.92 | 0.69 |
| Environmental orientation | 0.79 | 0.87 | 0.68 |
| Green human resources | 0.87 | 0.90 | 0.65 |
| Green product innovation | 0.78 | 0.87 | 0.70 |
| Green process innovation | 0.70 | 0.84 | 0.71 |
| environmental function | 0.86 | 0.91 | 0.70 |
| Green innovation | 0.84 | 0.89 | 0.62 |
| Green supply chain management | 0.83 | 0.86 | 0.51 |

Source: Authors' own research

value of the beta coefficient is smaller than 0.2 and the value of the coefficient is less than 0.2 and the value of the p coefficient is less than 0.001, the hypothesis is rejected. As shown in Table 2, the hypotheses of the effect of environmental orientation on GHRM, and the impact of green innovation on environmental performance have been rejected and the rest of the hypotheses have been confirmed.

Table 2:
**Hypotheses testing results**

| Hypothesis | Beta-C | T-value | P-Value | Result |
|---|---|---|---|---|
| Green transformational leadership: Green human resources | 0.36 | 5.66 | 0.000 | Confirm |
| Environmental orientation: Green human resources | 0.02 | 0.22 | 0.022 | Reject |
| Green human resources: Green Innovation | 0.33 | 5.88 | 0.000 | Confirm |
| Green Innovation: Green Process | 0.96 | 6.98 | 0.000 | Confirm |
| Green Innovation: Environmental function | 0.11 | 1.43 | 0.019 | Reject |
| Green Supply Chain: Green Buy | 0.78 | 7.56 | 0.000 | Confirm |
| Green Supply Chain: Costumer performance | 0.75 | 9.45 | 0.000 | Confirm |
| Green Supply Chain: Logistic | 0.63 | 10.01 | 0.000 | Confirm |
| Green Supply Chain: Green Innovation | 0.52 | 3.65 | 0.001 | Confirm |
| Green Supply Chain: Environmental function | 0.35 | 3.99 | 0.000 | Confirm |

Source: Authors' own research

Firstly, in this study, the impact of two components of green transformational leadership and environmental orientation on GHRM practices was investigated. The results show that green transformational leadership has a direct impact on GHRM. This finding is consistent with the argument of Sahoo & Vijayvargy (2021). In fact, they emphasized that green transformational leadership, considering the individual requirements of employees, encourages them to create and apply GHRM practices. In this regard, it is suggested for small and medium-sized companies to design the implementation of GHRM to attract, train and motivate their employees in a way that is under the direct and stable supervision of the transformational leadership; but regarding the second component, we found that environmental orientation has no effect on GHRM. The result of this research is significantly different from the studies of Kalyar et al. (2020). In their research, they showed that environmental orientation by strengthening the effective environmental value system in the company helps employees understand the importance of implementing environmental mechanisms and improving it through GHRM practices, which ultimately leads to improved environmental performance. In fact, the main reason for not confirming the direct impact of environmental orientation on the management of GHRM of small and medium companies can be seen in the misunderstanding of employees about how to implement environmentally friendly methods.

Secondly, this study showed that GHRM has a positive impact on green innovation in terms of two types of green innovation methods, i.e. green product innovation and green process innovation. The findings of Jiang et al. (2024) are in agreement with the outcomes of this part of our research. If we found in this study, innovation Green under the influence of GHRM practices cannot affect the performance of the environment. Therefore, SMEs are advised to implement GHRM in their organization with green recruitment, green training, green performance-based rewards. And in this way, shift the employees towards green innovation in the recruitment process, maintain green products and services to finally achieve a competitive advantage by improving sustainable environmental performance.

Thirdly, the present article by examining the impact of GSCM on green innovation practices, reached the conclusion that the successful implementation of small and medium enterprises in GSCM can improve their green innovation. Some previous studies, for example, Tu & Wu (2021) argued that in green innovation there are sustainable methods for creating innovation at each stage of the supply chain in order to achieve competitive advantage and reduce environmental problems in the industry. Thus, it is suggested that small and medium companies facilitate the implementation of GSCM in order to take advantage of new ideas, approaches and/or technologies (green innovation) in the production of new products. We also found that GSCM has a positive impact on environmental performance. In this regard, Tu & Wu (2021) and Sudarmilah & Maelani (2021), also found that through the implementation of GSCM practices, organizations are encouraged to improve their relationships with suppliers and customers and increase the improvement of environmental performance. It can be founded that joint interactions between green supply chain members improve environmental performance. In this regard, our proposal

is to adopt a sustainable approach of GSCM by small and medium-sized companies, it can help them reduce waste, transaction and operational costs, and also help companies to behave in accordance with environmental regulations.

## 4. Conclusion

The outcomes of this research indicated how the ethical requirements of the organization towards the society and the environment can lead to the sustainable performance of the organization. The statistical analysis of the research indicates a significant and strong relationship between sustainable GHRM and GSCM. Positive long-term benefits for environmentally friendly companies have been repeatedly observed. It seems that moderator variables should be considered in the relationship of GSCM and social performance. Therefore, it is suggested to consider the role of mediating and moderating variables such as people's culture and beliefs and social conditions in future research. The results of this research show the effect of GSCM on environmental performance, operational performance and internal processes, and customer-oriented and social performance, but this effect on economic performance has been rejected; which is in line with the current research in the relationship between GSCM and environmental performance. However, regarding the two hypotheses of the effect of GSCM on social and financial performance, the results are inconsistent. It seems that the difference in the statistical population also makes the results different.

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