

Green innovation, transformational leadership and human resource management: Inputs to green sustainability model of logistics company

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ISSN: 2243-7770
Online ISSN: 2243-7789

OPEN ACCESS

Received: 18 June 2023

Revised: 20 July 2023

Accepted: 24 July 2023

Available Online: 15 August 2023

DOI: 10.5861/ijrsm.2023.1061

Abstract

This study aimed to develop a model that can be used by logistics companies to reinforce green innovation, transformational leadership, and human resource management for green sustainability. Specifically, this research determined the green innovation practices in terms of green managerial innovation and green technology innovation; described the green transformational leadership in terms of inspirational motivation, idealized influence, intellectual stimulation, and individualized consideration; and described the green human resource management practices in terms of recruitment and selection, training and development, performance and management appraisal, rewards and compensation, and employee empowerment and participation. The study revealed also the significant difference in responses when grouped according to profile and the significant relationship among green transformational leadership and green human resource management to green innovation

Keywords: green innovation, transformational leadership, human resource management, sustainability, innovation

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1. Introduction

The need to adopt the idea of "green," sustainable development is driven by the ongoing, successful growth of organizations within a healthier environment. (Sadiq, et al., 2023). The logistics industry is expanding and becoming more difficult as the global economy expands. Companies can no longer exclusively concentrate on one economic aspect that affects their financial performance. The logistics industry's market, consumers, and other stakeholders demand that environmental sustainability be taken into account. And since it is highly in demand, a logistics company should have a competitive advantage and edge against its competitors to be able to fully take advantage of the demand for the operations of logistics firms and add to the profitability and positive company performance.

Green innovation has been examined in a number of empirical studies as a factor that enhances overall firm performance. Companies may boost productivity and concentrate on developing environmentally friendly goods and processes through the use of a green innovation strategy, which will enable them to alter their current operating procedures and drastically lessen their negative environmental impact. Furthermore, green innovation results in the development of new products and processes that can help restore the environment, which has implications for competitive advantage. Companies that have a proactive green innovation strategy aim to improve environmental performance, which is very important for companies nowadays because different stakeholders are interested in the company's sustainability by going green and operating with the environment and the community in mind.

Green transformational leadership (GTFL) is a leadership style in which the primary goal of the leader is to provide a clear vision, inspiration, and motivation to employees while also supporting their developmental needs in order to achieve the organization's environmental goals (Mittal & Dhar, 2016). To achieve green sustainability and very good environmental performance that has a positive impact on the overall performance of the company, it is stated in the study of Singh et al. (2020) that transformational leadership is one of the key variables in promoting higher firm performance. Such interest in the relationship between transformational leadership and firm performance becomes relevant, particularly when firms must be innovative in their processes and products to gain a competitive advantage and superior firm performance.

Green human resource management (GHRM) practices at the firm, on the other hand, refer to green HRM practices aimed at assisting enterprises in acquiring, developing, motivating, and maintaining green employee job behaviors at the workplace (Dumont et al., 2017). GTFL personifies the beliefs and values of top management and has a significant impact on the firm's GHRM. As a result, Singh et al. (2020) proposed that, in order to achieve firm green innovation and green performance, GTFL in organizations plays a critical role in the development of green human resource management (GHRM) policies and in assisting firms in carrying out their goals and visions to achieve green performance.

The logistics industry carries out green innovation for sustainable development, but not all efforts are successful. Businesses all across the world are struggling to strike a balance between profitable consumption and ecological preservation. Political instability, a lack of regulations and authorities supporting biofuel, and improper environmental management are all signs of a lack of environmental leadership in the direction of environmental sustainability (Awosusi, et al., 2023). The term "green HRM" now refers to not only an awareness of environmental issues, but also to the firm's and its employees' overall social and economic well-being (Ahmad, 2015). Green human resource management may become a key business strategy for an organization due to the problem of a lack of training and awareness in the human resource department. It can be used to cut costs,

improve efficiencies, and lower carbon footprints. (Ziyadeh, et al., 2023) it emphasizes the importance of integrating Green HRM principles into existing HR practices for long-term development.

While it is true that the logistics industry in the Philippines has been cautious about their involvement in environmental protection, there are still many businesses that are unaware of and non-compliant. In their report titled "Green Freight and Logistics Policy Development in the Philippines: Assessing Freight Transportation in Support of a National Green Freight Program," ASEAN German Technical Cooperation Energy Efficiency and Climate Change Mitigation in the Land Transport Sector Wenlong, et al., (2023) found that 48 percent of the respondents were aware of any private or public initiatives in the logistics sector that address environmental issues. This was verified by an interview conducted by the researcher with four of the top 3PL managers in the company. According to them, their constant activities merely focused on product delivery rather than conducting different trainings pertaining to environmental management.

This was the reason why the researcher wanted to pursue this study to fill the gap on the extent of practices in green innovation, transformational leadership, and human resource management in the realization of having a green sustainability in the logistics company. It is also highly relevant for the researcher to conduct this study since it is in line with her field of specialization, logistics, which is part of supply chain management. It is deemed important to address these issues with the operations of logistics companies and how companies manage their human resources for the overall progress of the company while securing a very sustainable and environmentally friendly approach to business. As the researcher is also an entrepreneur and educator, insights gained in the conduct of this can make her competent enough to incorporate the output developed into her business. She can likewise share ideas with her students, who are more likely to be working for logistics companies in the near future, about the necessity of working both on green strategy and sustainability.

Objectives of the Study - This study aimed to determine the level of green innovation, green transformational leadership, and green human resource management in logistics companies as input to the development of a green sustainability model. Specifically, it aimed to determine the green innovation practices in terms of: green managerial innovation and green technology innovation; describe the green transformational leadership in terms of: Inspirational motivation, idealized Influence, intellectual stimulation, individualized consideration; describe the green human resource management practices in terms of: recruitment and selection, training and development, performance and management appraisal, rewards and compensation, employee empowerment and participation; test the significant difference on responses when grouped according to profile variables; test the significant relationship among green leadership and green human resource management to green innovation and to develop a model that can be used by logistics company to reinforce the green human resource management and leadership for green sustainability.

2. Methods

Research Design - In this study, a descriptive research strategy was adopted to ensure an accurate and clear interpretation of the findings. According to Rahi (2017), a descriptive technique of research is a type of research that collects relevant facts, data, and information in their current state, offering a precise overview of situations, individuals, or events. Polit and Beck (2014) further stated that descriptive research aims to explore and track an emerging feeling that cannot be identified by an impartial element. The researcher acquired information from the respondents by giving survey questionnaires to them. This descriptive research method proved useful in effectively gathering data from respondents.

Participants of the Study - The study's respondents were the top 15 3PL high revenue generating companies in the Philippines, with a total population of 1985 originating from each company's operation, warehouse, and human resource departments. A sample size of 322 employees was determined using the Raosoft sample size calculator with a 95% degree of confidence and a 5% margin of error. These companies have high management performance in terms of GI, GTL, and GRHM. In administering the questionnaire, the researcher used

convenience sampling. The frequency distribution of the respondents' profile in terms of age, gender, number of years working in the firm, and educational attainment is shown in Table 1. In terms of age, 151 out of 322 respondents, or 46.40 percent, are between the ages of 26 and 40. This suggests that the vast majority of responses are adults. The majority of responders are mature and knowledgeable enough to evaluate the performance of senior management.

In terms of gender, 182 people, or 56.50 percent, are female. This could imply that the majority of top 3PL personnel are female. According to studies, women have the ability to multitask as well as sympathetic qualities, making them ideal for the logistics business. As to number of years in work, 173 or 53.70% of the respondents are working between 1-5 years followed by 58 or 18% who are working between 6-10 years. Majority of the workforce is in this bracket. Most of the respondents are college graduate with a number of 304 or 94.40%. Only 1 respondent is high school graduate, 14 out of 304 are post graduate. This can be said that having a bachelor's degree is the common and popular level of higher education where an individual learns a specific career to pursue and the beginning of professional opportunities in the corporate setting. According Roulin, et al., (2013), having a bachelor's degree can be used to excel in the competitive job market. It can enable to make a person qualified for additional opportunities and has more options in choosing a field of specialization. This also offers economic stability and can provide security for the future. Also, earning a bachelor's degree is the start of the chosen career path especially if it requires a higher level of education such as earning a Master's degree or Doctorate.

Table 1*Respondents Profile*

Age	Frequency	Percentage (%)
20-25 (young adults)	127	39.40
26-40 (adults)	151	46.90
41-59 (middle aged person)	44	13.70
Gender		
Male	140	43.50
Female	182	56.50
Number of years working in the firm		
less than a year	42	13.00
1-5 years	173	53.70
6-10 years	58	18.00
11-15 years	25	7.80
16-20 years	11	3.40
21 years and above	13	4.00
Educational Attainment		
High School Graduate	1	.30
College Graduate	304	94.40
Post Graduate	14	4.30
Others		.90

Data Gathering Instrument - To collect the information required to achieve the study's aims, a modified survey instrument was used. This was divided into four sections. The first section created a profile of respondents based on their age, gender, number of years working for the company, and educational attainment. The second section of the surveys was about green innovation. This was classified as having several major components, including green managerial innovation and technological innovation (Qi et al., 2010; Rennings, 2000). The determinants of green innovation studied by Rennings (2000), Kemp and Foxon (2007), Horbach (2008), and Weng et al. (2015) were reviewed. Following an analysis, it was concluded that the factors employed by (Rennings, 2000; Chen et al, 2014) were relevant in the study area. The questions used in the studies of Qi et al, Chen et al and Rennings (2015) and Huelgas et al (2021) et al on these determinants were incorporated with minimal modifications to reflect the logistical character of the study locations. The determinants in question were divided into two categories: green managerial innovation and green technological innovation. There was a total of ten (10) questions for the evaluation of these categories.

While the third section of the questionnaire was for Green Transformational Leadership, which combined

and modified the questions used by Awan, wet al., (2023). These questions were intended to determine the levels of the four transformational leadership dimensions as exhibited by the respective top management of Logistics Company in terms of their individualized consideration, intellectual stimulation, inspirational motivation and idealized influence. There was a total of 20 questions for this purpose. Whereas the fourth award was given to Green Human Resource Management.

Several academics investigated firms' Green Human Resource Management methods. The variables utilized in the research of Arulrajah et al. (2016); Hosain and Rahman (2016) were evaluated, and common variables were identified. Those relevant to the study areas were adapted. The survey instrument have incorporated, with slight modifications in the questions used in the research of Arulrajah, et al (2016). These included training and development management, management performance and appraisal, reward and remuneration, and employee empowerment and participation. There were a total of 25 questions for the evaluation of the five (5) green HRM practices. The measurements that were used for Green Innovation, Green Transformational Leadership and Green Human Resource management is the four-point scale from 1-4 rating to correspond to a very great extent to a light extent. The modified questionnaire was validated by experts and subjected to reliability test, as shown in table 2.

Table 2

Reliability Test Report of a Pre-Test of the Questionnaire

Indicators	Cronbach Alpha	VI
Green Innovation	0.931	Excellent
Green Managerial Innovation	0.914	Excellent
Green Technology Innovation	0.888	Good
Transformational Leadership	0.954	Excellent
Inspirational	0.945	Excellent
Idealized Influence	0.841	Good
Intellectual Stimulation	0.916	Excellent
Individual Consideration	0.935	Excellent
Green Human Resource Management	0.965	Excellent
Recruitment and Selection	0.854	Excellent
Training and Development	0.930	Excellent
Performance Management and Appraisal	0.900	Excellent
Rewards and Compensation	0.910	Excellent
Overall Instrument Reliability	0.979	Excellent

George and Mallery (2003) provide the following rules of thumb: "> .9 -Excellent. > .8-Good,>.7-Acceptable,>.6- Questionable,> .5-Poor, and <.5- Unacceptable"

Data Gathering Procedure - A letter of Permission addressed to the managers of 3PL companies was sent via e-mail to seek permission to conduct a study. Approval was obtained in order for the researcher to push through with the study. Thereafter, the selected respondents were given enough time to answer the questions. The allocated time for distribution and collection of the survey questionnaire has taken weeks, which was sufficient for the researcher to gather the data needed for the study. The data were treated for data tabulation

Data Analysis - To perform data analysis, the following statistical tools were used. The Frequency count was used to describe the profile of the respondents. Weighted means and ranking were used to assess green innovation, green transformational leadership, and green human resource management. The result of the Shapiro-Wilk test revealed that the p-values of the major variables are less than 0.05, which means that the data set is not normally distributed. Therefore, the Mann-Whitney U test and Kruskal-Wallis test were used to test for two and three groups as part of the non-parametric tests to determine the significant differences. Likewise, Spearman's rho was used to test the significant relationship. In addition, all data were treated using a statistical program known as PASW version 26 to further interpret the results of the study using an alpha level of 0.05.

3. Results and Discussion

As reflected in Table 3, the generated value of the composite mean for green innovation was 3.05, which

indicates that the respondents observed green innovation to a great extent. The result implies that green innovation is considerably associated with modifying an organization's managerial and technological processes that contribute to the improvement of its operations and sustainability of the environment. According to Rennings (2000), Green Managerial Innovation and Green Technology Innovation improve organizational performance (OP) and environmental performance (EP) while also providing enterprises with a competitive advantage. It is a proactive attempt that lowers negative environmental effects or generates good environmental benefits while also increasing market value and customer delight. Green technology innovation is typically found in corporate operations as a proactive approach to environmental management. The comprehensive approach not only decreases pollution but also boosts corporate competitiveness. The success of environmentally friendly technologies utilizing various technologies is required for innovation, which is a component of the managerial goal. As a result of rising public concern about environmental protection, green management innovation has become an essential component of numerous organizations' operational plans and practices (Ma et.al., 2018).

Table 1*Summary Table on Green Innovation*

Indicators	Weighted Mean	Verbal Interpretation	Rank
1.Green Managerial Innovation	3.12	Great Extent	1
2.Green Technology Innovation	2.98	Great Extent	2
Composite Mean	3.05	Great Extent	

Legend: 3.50 – 4.00 = Very Great Extent ; 2.50 – 3.49 = Great Extent ; 1.50 – 2.49 = Moderate Extent ; 1.00 – 1.49 = Light Extent

As seen in the result, green managerial innovation received a higher mean of 3.12 and was widely perceived. This means that green managerial innovation is a critical component of green innovation. Green managerial innovation improves a company's success, creating a high demand for innovation in all facets of its operation. According to Khan, et al. (2023), a company's management will not ignore the negative environmental impact of its operations if it has a strong environmental commitment. Companies that care about the environment understand the importance of environmental protection and exhibit their commitment through their actions. A green managerial innovation practice will encourage upper, middle, and lower management, as well as internal stakeholders, to integrate organizational resources and influence employee behavior in order to offset the negative environmental implications of industrial processes and outputs. As a result, such behavior will build the organization's identity and eventually lead to numerous process improvements.

The results showed that green technological innovation received a weighted mean of 2.98, which was widely understood. This means that, of the two green innovation practices, green technological innovation was less observed. This could be because the corporation was more focused on management than technology. However, in today's corporate environment, it is critical to adopt new and enhanced technologies. The researcher discovered the significance of R&D. This should be prioritized in order to improve innovation in technology and ensure the long-term viability of its operations. This was supported by a study by Wang et al. in 2018, which found that environmental pollution and sustainable asset management had become

Table 3*Summary Table on Green Transformational Leadership*

Indicators	Weighted Mean	Verbal Interpretation	Rank
1.Inspirational Motivation	3.14	Great Extent	1
2. Idealized Influence	3.12	Great Extent	2
3.Intellectual Stimulation	3.05	Great Extent	3
4.Individualized Consideration	2.97	Great Extent	4
Composite Mean	3.07	Great Extent	

Legend: 3.50 – 4.00 = Very Great Extent ; 2.50 – 3.49 = Great Extent ; 1.50 – 2.49 = Moderate Extent ; 1.00 – 1.49 = Light Extent

The overall assessment of the summary of the response of 3PL companies with regards to transformational leadership attained a composite mean of 3.07 and was interpreted to a great extent. It is clear that the top management of the top 15 3PL firms places a high value on transformational green leadership, which can

promote industry sustainability and expansion. In today's fiercely competitive market, businesses must ensure that consumers and the general public are protected from environmental and social risks through their products and services. Customers today demand goods and services that not only satisfy their needs but also take into account the environmental and social effects of goods and customer services. They also favor businesses that do not negatively impact the environment or the well-being of society. This could only happen if there is adequate support and encouragement coming from the top leaders of the company, as it can push the employees to act towards the green goals of the organization through the consistent work and action of the top management while at the same time achieving the economic growth of the organization.

According to Zhang (2019), due to increased public awareness of businesses' environmental and social obligations as a result of globalization and the development of social media, firms must achieve higher sustainable performance to maintain their position in the market on both a national and international scale. When businesses conduct their operations without degrading society's or the environment's quality, they are said to be performing sustainably. Even on a worldwide scale, a green firm conducts its operations with the welfare of the general public and the quality of natural resources in mind. When a company's management are aware of the social and environmental expectations of present and potential consumers, as well as the government, they can achieve highly sustainable business performance without jeopardizing society's or the environment's welfare for a little gain in profit. Such a business accurately monitors the environmental problems caused by its operations and modifies its procedures to meet the demands of environmental regulatory bodies. If a firm safeguards the quality of the environment and the welfare of the local populace in the area where it operates, it can achieve sustainable business performance. As a result, the corporation cultivates an atmosphere that will allow it to grow.

Among the indicators in transformational leadership, inspirational motivation had the highest mean of 3.14 and was interpreted to a great extent. For transformational leadership to be effective, it must inspire and motivate the people of the company. Starting from the top management to the rank and file, it is not enough to say the plans and the green goals of the organization; it is also significant that the top management will continuously inspire and motivate their subordinates to integrate these green movements into their daily activities. In that way, green sustainability can be achieved.

According to Awan, (2023), transformational leadership has a significant impact on employees' green intrinsic motivation and green creativity, which are necessary for them to generate green products and services. Green intrinsic motivation also plays a role in mediating the connection between green transformational leadership and green innovation. On the other hand, the green intrinsic incentive for green creative action is slightly undermined by the green extrinsic motivation as a moderator. So that they can develop innovative, environmentally friendly, and sustainable goods and services, the leadership in firms should increase employee motivation for going green.

Meanwhile, the indicator Individualized Consideration obtained the lowest mean of 2,94 but was still interpreted to a great extent. This supports the idea that transformational leadership has a broad scope and also deals with analyzing the individual needs and cooperation of every person. Individual consideration allows employees to create a feeling of belonging and concern for each other, which opens the door for the leaders to effectively communicate the message and provide help. The ability to assist others is a crucial component of transformative leadership. Leaders recognize each follower's capacity to enhance the firm's environmental performance and acknowledge and encourage it. When a firm runs its company by recruiting individuals who are environmentally conscious, it achieves exceptional environmental performance while simultaneously garnering the trust of clients and the general public.

As stated by Priyadarshini et al., (2023) individualized consideration has a favorable influence on helping. As a result, helping behaviors are an essential component of transformational leadership. Leaders acknowledge and promote each follower's ability to improve the firm's environmental performance and value their particular contributions. When an organization conducts its business operations by hiring people who have environmental

awareness, it achieves excellent company ecological performance while also gaining the trust of clients and the public. Thus, individualized consideration and organizational support, such as green integration in HRM, boost transformational leaders' contributions to long-term company success.

Table 4*Green Human Resource Management*

Indicators	Weighted Mean	Verbal Interpretation	Rank
Recruitment and Selection	2.80	Great Extent	5
Trainings and Development	2.98	Great Extent	1.5
Performance management and appraisal	2.98	Great Extent	1.5
Reward and compensation	2.87	Great Extent	4
Employee Empowerment and Participation	2.88	Great Extent	3
Composite Mean	2.90	Great Extent	

The overall assessment of green human resource management has a weighted mean of 2.90, which was interpreted to a great extent. The results show that the top 15 3PL companies use green HRM by developing a workforce that is aware of, supportive of, and engaged in green initiatives. These companies also maintain their green goals throughout the HRM process, which includes hiring, training, evaluating, rewarding, and enabling employee participation to achieve the green sustainability of logistics companies. Competitive advantages including superior human capital, employee engagement, and skill set. Training and development ranked first with a weighted mean of 2.98. Though the result shows that top management practices this to a great extent, it does not necessarily mean that they are doing well in the implementation. The researcher believes that extensive employee training on environmental issues has a significant effect on overall environmental sustainability (Aftab, 2023). According to the study of Usman (2023), employees' understanding of the environmental impact of their employers' actions is increased by green education and training programs. Employees that attend training are exposed intellectually and emotionally to environmental challenges and informed of potential solutions to the existing green human resource management system. Additionally, managers need to implement environmental plans and initiatives with better awareness.

Same in rank are performance management and appraisal, which were verbally interpreted to a great extent. This implies that the top managers' objective is to compare goals and results in order to study and evaluate how well employees performed in relation to their tasks and responsibilities. According to Ivancevich, 1995 employees receive insightful feedback on their contributions to environmental sustainability when PM is used for environmental issues. Feedback can be helpful in stopping negative attitudes and promoting admirable behavior. Furthermore, Tang, (2023) argued that rather than remaining static and focusing just on the same green behaviors and skills, green appraisal must be dynamic and incorporate new goals and challenges.

Among those indicators, least in rank is recruitment and selection, which has a weighted mean of 2.80. A result of such great extent implies that the top management still enforces green practices among their employees among a pool of applicants as part of their human resource management. This could be prompted by the companies' urge to hire applicants who are well-equipped with environmental management skills, as they aim to achieve long-term positive results through green management.

The environmental management not only protects the environment, but it can also benefit businesses through: a) cost savings by a decrease in spending on water and waste management, energy, and raw materials; b) business reputation, such that consumers may be more enticed to support a business that shows genuine care for the environment; c) resource recovery by reusing and recycling profitable resources; d) work health and safety by diminishing chemical use and waste materials; and e) legal compliance since countries now impose environmental protection statutes.

Figure 1 presents the model developed by the researcher for the reinforcement of green sustainability of a Logistics company. In business, successful and sustainable practices rest on an internal foundation. The problem of how to sustain the green performance of logistics companies is perennial and persistent and needs to be

addressed immediately. According to Mutingi et al. (2014), managers view improvements in environmental, or "green," performance as a fundamental competitive aim. Environmental challenges are increasingly becoming one of the most important themes in logistics management. Decision-makers are now required to manage their organizational performance from an ecological or environmental perspective due to the market's constantly expanding green concerns and the consequent green movements.

One of the purposes of the study is to provide a basis for the inputs needed to achieve the green sustainability of logistic companies through green innovation, green transformational leadership, and green human resource management. Taken singly, there are literature bases, theories, and models that lead to the sustainability of each of the given variables, but no prior literature explores the influence of green innovation, green transformational leadership, or green human resource management on the green performance and sustainability of a logistics company (Chen, Chang & Lin, 2014). Thus, the researcher was able to come up with a novel research model to fill the mentioned research gap and at the same time came up with an output that can support the desired basis for input. As mentioned, there are theories and models that lead to the sustainability of each of the identified variables. That is why the researcher was of the opinion that the new model is just a reinforcement of the independent individual models for the purpose of ensuring the sustainability of logistic companies.

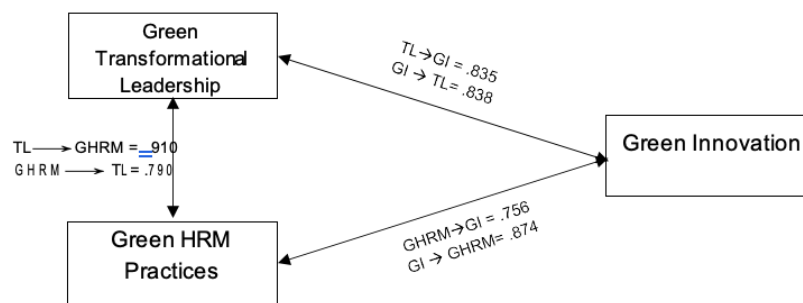


Figure 1
Green Human Resource Management and Leadership for Green Sustainability Reinforcement Model

The researcher simplifies the model because the previous data revealed substantial correlations between the three variables and their specific variables. It is crucial to maintain a basic model, according to Darvak, Diel, and Vos (2021), because it contains abstraction. There is a need to limit the model's displayed variables as much as is feasible so that it can be improved further by dealing with and constructing with new parameters. The researcher used simple regression analysis to show the relationship between the variables. The data reveal a causal relationship between the three variables. This implies that one variable can explain the behavior of another variable and vice versa. All of the values in the model are the regression model's beta () values, or coefficients. This clarifies the magnitude of the dependent variable's effect on the independent variable.

The influence of transformational leadership on green innovation was discovered to have a beta () value of .835; this means that for every one (1) point increase in the transformational leadership assessment, green innovation practice will increase by .835 points. The beta () value of .835 is equal to .836 in terms of the impact of green innovation on transformational leadership. This suggests that for every one (1) unit rise in the assessment of green innovation, transformational leadership improves by .835 points. It was discovered that the effect of green human resource practices on green innovation has a beta () value of .756, implying that for every one (1) point increase in the assessment of transformational leadership, green innovation practice will increase by .756 points. The beta () value of .835 is equal to .874 in terms of the effect of green innovation on green human resource practices. This suggests that for every one (1) unit increase in green innovation, green human resource practices improve by .874.

Finally, the effect of green human resource practices on transformational leadership was discovered to have a beta (β) value of .790, implying that for every one (1) point rise in transformational leadership evaluation, green innovation practice will increase by .790 points. The beta (β) value for the impact of green human resource practices on transformational leadership is .910. This suggests that for every one (1) unit rise in the assessment of transformational leadership, green human resource practices increase by \$910. As an input to the problem at hand, given these circumstances, it is critical to reinforce all three parts, as green innovation, green human resource management techniques, and transformational leadership practices are all intertwined. whereas the model suggests that developing and implementing plans and policies to improve one variable may lead to improvements in the other. Likewise, if a problem or issue arises in one variable, it must be resolved right away because it will affect the other variables, which goes without saying that it will affect the entire system.

4. Conclusions and Recommendations

In terms of green innovation practices, employees of the top 3PL companies assessed those practices in terms of green managerial innovation and green technological innovation to a great extent. This revealed that top management observed the sustainability of the company by continuing to innovate in green management. In terms of green transformational practices, employees of the top 3PL companies assessed those practices on inspirational motivation, idealized influence, intellectual stimulation, and individualized consideration to a great extent, which means that top management of the top 15 3PL companies gives importance to green transformational leadership as it can lead to sustainability and growth of the industry. In terms of green human resource managements, employees of the top 3PL companies assessed those practices under recruitment and selection, training and development, performance management and appraisal, rewards and compensation and employee empowerment to a great extent which indicates that the top 15 3PL companies implements green HRM by creating a green workforce that understands, appreciates, and practices green initiatives and maintains its green objectives all throughout the HRM process of recruiting, training, appraising, giving of rewards and empowering employees participation to achieve the green sustainability of logistics company.

There was a significant difference in green innovation in terms of green technology innovation when grouped according to age and gender, as well as green managerial innovation in terms of educational attainment. Other variables were not significant. Moreover, there was a significant difference in green transformational leadership when grouped according to age, gender, and number of years working in the firm in terms of inspirational motivation, idealized influence, intellectual stimulation, and individualized consideration while in educational attainment. Other profile variables for transformational green leadership were not significant. In addition, there was a significant difference in green human resource management when grouped according to age in terms of recruitment and selection, training and development, performance management and appraisal, rewards, and compensation. Meanwhile, there was also a significant difference in the number of years spent working in the firms in terms of the five variables of green HRM.

Other profile variables, such as gender and educational attainment, were not significant. There was a significant relationship between green innovation and transformational leadership. This means that logistics companies that practice green transformational leadership have a greater impact on green innovation to achieve the sustainability of the company. Moreover, there is a significant relationship between GI and GHRM. This implies that green HRM is increasingly being treated as an essential tool for implementing green strategies and environmental management practices. Result shows that there was a significant relationship between GTL and GHRM, which means that the logistics green transformational leadership influenced the formulation of HRM policies as well as the implementation of HRM practices for the attainment of its environmental objectives. Based on the results of the study, the researcher develops a model that can be used by logistics companies to reinforce green human resource management and leadership for green sustainability.

Environmental research and development in logistics management may be prioritized to encourage innovations that can aid in achieving the logistics businesses' goal of environmental sustainability. The coaching

and mentoring of staff members who are concerned about the environment may be improved since doing so fosters a sense of community that fosters compassion for one another. A sustainable reward system may be developed to encourage staff members to participate in any environmental initiatives. Sustainable workshops or forums for personnel can be created to share their hidden expertise and enhance their environmental behavior. Environmental performance of Logistics employees could be recognized publicly as a way of motivation. Staff may be encouraged to consider eco-friendly business practices. Future researchers may conduct related study focusing on the enhancement of the Green Human Resource Management practices of other Logistics companies aside from 3PL companies.

5. References

- Ahbdullail, M. A. (2017). *Transformational leadership behaviors: A literature review*.
- Arularajah, A., & Shen, J. (2017). Effects of green human resource management practices on employee workplace green behavior: The role of psychological green climate and employee green values.
- Arulrajah, A. A., Opatha, H. H. D. N. P., & Nawaratne, N. N. J. (2016). *Green human resource management practices: a review*. Sri Lankan Journal of Human Resource Management, 5(1), 1. Retrieved from <https://doi.org/10.4038/sljhrm.v5i1.5624>
- Arulrajah, A. A., Opatha, H. H. D. N. P., & Nawaratne, N. N. J. (2016). *Employee green performance of job: a systematic attempt towards measurement*. Sri Lankan Journal of Human Resource Management, 6(1), 37. Retrieved from <https://doi.org/10.4038/sljhrm.v6i1.5631>
- Chen, Y. S., Chang, C. H., & Lin, Y. H. (2014). *Green Transformational Leadership and Green Performance: The Mediation Effects of Green Mindfulness and Green Self-Efficacy*. Sustainability, 6(10), 6604–6621. Retrieved from <https://doi.org/10.3390/su6106604>
- Chen, Y. S., Chang, C. H. (2013). *The Determinants of Green Product Development Performance: Green Dynamic Capabilities, Green Transformational Leadership, and Green Creativity*. J Bus Ethics 116, 107–119 (2013). Retrieved from <https://doi.org/10.1007/s10551-012-1452-x>
- Dumont, J., Shen, J., & Deng, X. (2016). Effects of Green Human Resources Management Practices on Employee Workplace Green Behavior: The Role of Psychological Green Climate and Employee Green Values. *Human Resources Management*, 56(4), 1-15.
- Fernandez, S. (2019). The role of human resource management in sustainability: A review and research agenda. |
- Hosain, S., & Rahman, S. (2016). *Green Human Resource Management: A Theoretical Overview*. IOSR Journal of Business and Management, 18(6) 3 (Jun. 2016), PP 54-59. Retrieved from <https://ssrn.com/abstract=2799537>
- Huelgas, A. P., & Arrellano, V. A. (2021). Green transformation leadership, green human resource management and green innovation: Key to environmental performance of selected port management offices in the Philippines. *International Multidisciplinary Research Journal*, 5(2), 48-64.**
- Jonker, J. (2015). Sustainable development: A contested concept. In P. J. Simmons & I. B. Weidner (Eds.), *Handbook of global environmental politics* (2nd ed., pp. 51-66). Sage Publications.**
- Joubert, M. (2022). The communication behaviour of publicly visible scientists in South Africa: The role of higher level of education. *Science and Public Policy*.
- Masri, H. A., & Jaaron, A. A. (2017). Assessing green human resources management practices in Palestinian manufacturing context: An empirical study.
- Mittal, S., & Dhar, R. L. (2016). *Effect of green transformational leadership on green creativity: A study of tourist hotels*. Tourism Management, 57, 118–127. Retrieved from <https://doi.org/10.1016/j.tourman.2016.05.007>
- Mutingi, B., & Muchira, P. (2019). Green human resource management practices and organizational environmental performance: Evidence from the manufacturing sector in Kenya. *Corporate Social Responsibility and Environmental Management*.
- Rennings, K. (2000). *Redefining innovation — eco-innovation research and the contribution from ecological economics*. Ecological Economics, 32(2), 319– 332. Retrieved from

[https://doi.org/10.1016/s0921-8009\(99\)00112-3](https://doi.org/10.1016/s0921-8009(99)00112-3)

- Singh, S. K., Giudice, M. D., Chierici, R., & Graziano, D. (2020). *Green innovation and environmental performance: The role of green transformational leadership and green human resource management*. *Technological Forecasting and Social Change*, 150, 119762. Retrieved from <https://doi.org/10.1016/j.techfore.2019.119762>
- Wang, X., Zhou, K., & Liu, W. (2018). *Value Congruence: A Study of Green Transformational Leadership and Employee Green Behavior*. *Frontiers in Psychology*, 9. Retrieved from <https://doi.org/10.3389/fpsyg.2018.01946>
- Weng, H. H., Chen, J. S., & Chen, P. C. (2015). *Effects of Green Innovation on Environmental and Corporate Performance: A Stakeholder Perspective*. *Sustainability*, 7(5), 4997–5026
- Wenjing, Z. (2018). Transformational leadership, employee green behavior, and environmental performance: The mediating role of psychological empowerment.
- Wenjing, Z., & Wu, Z. (2020). Green transformational leadership, green intrinsic motivation, and green creativity: The mediating role of psychological green climate.
- Zhang, Y., Luo, Y., Zhang, X., & Zhao, J. (2019). *How Green Human Resource Management Can Promote Green Employee Behavior in China: A Technology Acceptance Model Perspective*. *Sustainability*