Sustainable Human Resources Management and Green Logistics in Manufacturing Firms in Ogun State Nigeria

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ABSTRACT

Green logistics integrates supply chain management with environmental requirements at every stage of the product design process, from raw material selection and supply to production, delivery to the customer, and distribution and transfer processes, to recycling management and reuse after consumption. This study aims at investigating the effect of green logistics and sustainable manpower management on fast moving consumer goods manufacturing companies in Ado/Odo Ota local government of Ogun State Nigeria.

On the organization sustainability, quantitative research approach was utilized with the aid of a well-structured questionnaire among fast moving consumer goods companies in the study area. The data obtained were analyzed using descriptive analysis and inferential statistics of partial least square structural equation model.

The findings shows that majority of the firms are aware and implemented green logistics and sustainable manpower in their respective organization. The model developed statistically support the null hypothesis which stated that there is a positive significant relationship between sustainable manpower management and green logistics likewise between sustainable manpower management and organization sustainability while the relationship between green logistics and organization is not statistically significant.

The study concluded that green logistics is based on functional activities related to logistics that encompass production and operations. It is therefore recommended that the government should expedite the adoption of green industry criteria standards that have a wide-ranging effect on the environment through a low carbon development (LCD) policy to minimize resource exploitation and sustain economic and social growth through development activities with low greenhouse gas emissions.

(Keywords: human resources, logistics, sustainability, green policies, environmental management)

INTRODUCTION

Green logistic services are continuously developing worldwide and are an important component of trading companies in their growth and competitiveness. The success of the effective logistic performance is based on the knowledge and expertise of employees to evaluate the entire system, which can satisfy customers' expectations. The effective green logistic performance provides a trading company with several competitive edges, such as the increased market value of products, optimizing cash flows, and reducing current and other expenses. Therefore, to enhance green logistic performance and gain a competitive advantage, companies should focus on the use of its tangible assets and strategically consider its intangible assets (Yingfei, Mengze, Zeyu, and Ki-Hyung, 2022).

Governments and society's increased concern over maintaining a sustainable environment is putting pressure on logistics companies to lessen the adverse effects of their activities on the environment. Similarly, the implementation of a sustainable environmental strategy in the supply chains of the manufacturing, transportation, and logistics sectors has been mandated by the increasingly strict environmental laws of the climate change agreement (Centobelli, Cerchione, and Esposito, 2017). This is done to lessen the effect supply chains have on the environment, from the distribution of finished items to the use of raw resources. Green logistics strategies help a

company become more recognizable as an environmentally conscious brand. Customers' loyalty, brand trust, and company profit all rise as a result.

Similarly, there are many different aspects to the impact of logistic operations on the environment, both in terms of the extent of their negative effects and their level of externalities. Distribution of products and services frequently resulted in noise and vibration, deterioration of the surrounding air quality, escalation of traffic issues, and ultimately contributed to global warming. Hence, the impact of logistics activities on climate change and environmental pollution has made policymakers and practitioners aware of the necessity of green logistics in recent years. The significance of this has increased due to recent research indicating that the threat posed by global warming, which is partially caused by logistics activities, is larger than before (Mukherji, 2022).

In order to stop environmental degradation brought on by current logistical operations from transportation, warehousing, goods forwarding, and other sources, it is imperative that the Ogun state create a sustainable environment. This study is also inspired by logistic value-adding. Despite being in its infancy, the state's logistics industry is one of Nigeria's fastest-growing industries. The state has seen an increase due to increased e-commerce and better connection with neighboring states.

Administrators of logistics are focusing more and more on inventive methods for the environment. Estimates stated that the energy utilized in the transportation industry to move goods consists of approximately 43% of all energy consumed worldwide (IPCC, 2014). Based on approximations according to the World Economic Forum, operations involving logistics are accountable for around 6% of the total emissions of greenhouse gases. This includes all emissions from logistics, freight, and supply chains actions.

Moreover, the goal of the majority of logistical operations is to guarantee the flow of commodities through the supply chain to meet consumer demands at the lowest feasible cost, with little regard for the environmental expenses (Mukherji, 2022). To ensure green logistics, the environmental cost of logistic activities, such as air pollution, noise and vibrations, and other traffic-related issues, must be considered. To practice green supply chain management, environmental costs must be taken into account at every stage of the supply chain, from product design and sourcing to manufacture and delivery to end users. An organization's efforts to quantify and lessen the logistical activities' environmental impact are known as "green logistics."

The likelihood of obtaining a competitive edge in the market that clients demand determines these kinds of actions (Larina, *et al.*, 2021). Traditionally, logistics' primary goal has been to arrange goods or materials in the proper quantity and location, primarily in a linear fashion. Nonetheless, a more modern idea known as the circular economy creates a closed-loop supply chain by integrating logistics into recycling, remanufacturing, reuse, and waste disposal. The greening of supply chains' forward and reverse segments is part of its growing approach to logistics, which takes the full breadth of the field into account.

Hazardous issues including global warming, rising greenhouse gas emissions, different forms of pollution, etc. are threatening the planet today. As a result, organizational innovation and strategy quickly prioritized environmental preservation and related tactics. The companies had to prioritize reducing or eliminating waste (energy, greenhouse gas, chemical, and hazardous waste) while maintaining a competitive edge and profitability.

All phases of raw material procurement, product design and manufacturing, sales and transportation, as well as usage and recycling, are included in green logistics. Businesses may reduce their impact on the environment and maximize their use of resources and energy by implementing green technology and logistics. A green revolution is emerging in conventional management concepts like human resources and operations management as the concerns of environmental sustainability and green organizations become more prevalent in management programs.

The subject of "sustainable Human Resource Management" (SHRM) has surfaced as a new area of study in the HR domain. Operations management's use of sustainability has gained a lot of traction and is becoming a more competitive field. The scientific community is

seeing a trend with topics like green logistics. Thus, the programs of scientists and professionals in HRM and operations management are influenced by SHRM and Green logistics, respectively. The practice of taking environmental standards or factors into account at every stage of the supply chain is known as logistic greening.

Green logistics literature and biocompatible production strategies expanded with the introduction of environmental management. One of the biggest developments of the past ten years has been the rise of the "green supply chain," which gives businesses the chance to customize their supply chains to meet environmental objectives. Green logistics is the collection of both internal and external initiatives taken by each company along the supply chain to reduce pollution and enhance the environment.

For individuals who are interested in environmentally friendly company operations and sustainable consumption issues, green logistics offers a fantastic opportunity. Reducing waste is the core concept of green logistics. Green logistics has grown in importance in traditional logistics and is now a proactive strategy to enhance environmental performance. In contrast to conventional environmental management, the idea of "green logistics" gives a business complete accountability for all aspects of its output, from raw material extraction and processing to the finished product and trash.

Extending laws to address environmental requirements and rising consumer. The new concept of "Green logistics" has emerged, encompassing the stages of the product life cycle from design to recycling. This is a result of the demand for the supply of green products to the supply chain, which enforces all activities related to the flow of goods from the raw material stage to the delivery of goods to final consumers, as well as information flow throughout the chain.

Adopting an investment strategy to enhance the supply chain's environmental performance has several advantages, including the ability to save energy resources, reduce pollutants, eliminate or reduce waste, add value for customers, and increase productivity for businesses and organizations. Growing worries about environmental warnings in the twenty-first century have increased the significance of environmental conservation in many communities and organizations (Rajabpour, 2017). An analysis of this field's specialized literature reveals that HRM is necessary for businesses to implement effective environmental management. A successful operations management strategy must include human resources, particularly those components of logistics that can help lower obstacles to success.

Green logistics will benefit from sustainable human resource management, which is crucial for logistical operations. As an advanced and proactive approach to environmental management in organizations, green logistics impacts the behavioral and human aspects and becomes crucial for sustainable human resource management. Human resource functions will play a crucial role in environmental management, as it is an increasing organizational aim. Thus, the overall goal of this research is to examine the impact of sustainable human resources management and green logistics on the sustainability of industrial organizations.

LITERATURE REVIEW

To adopt green supply chain management (SCM), Amrutha and Geetha (2020) contend that companies should embrace participatory management systems and use the ideas, inventions, and creativity of their workforce. The employment of green teams is advised by numerous experts. Reviewing the environment, creating an environmental plan, creating an environmental unit, forming working groups for environmental initiatives, determining the organization's environmental objectives, integrating environmental concerns with the monitoring framework of the organization, and evaluating the results of environmental programs are the steps involved in forming a green team.

Baah, Jin and Tang (2020), asserts that consumers are conscious of how their purchases impact the environment and are urged to take into account both the product's quality and the conditions under which it was produced. The European Union saw a peak in green consumption in the 1980s, with Germany seeing an even greater increase in this regard.

Customers have pushed producers to take the environment into account. Consequently, environmental consciousness has become a competitive advantage for producers as a result of green consumerism. Green consumerism places a strong emphasis on manufacturers making sure their goods meet environmental regulations.

Hair and Law (2018) offer a thorough method for assessing and simulating the performance of supply chains. Six criteria are taken into consideration for this purpose: efficiency, timely delivery, profitability expansion, employee and customer pleasure, and product reliability. In the retail industry, they find 34 green supply chain indicators, which they then classify into eight environmental management system categories: energy use, input attention, product, packaging, transportation, consumption, and waste.

Virkar and Mallya (2018), there are obstacles and restrictions when it comes to choosing suppliers who share environmental concerns. Government rules pertaining to the environment, the company's environmental purchasing goal, possible accountability for the disposal of hazardous items, and the expense of doing so are a few of these restrictions. They think that simply producing and supplying green products to markets is insufficient for producers. They require customers that desire eco-friendly goods. Green markets actually need green businesses.

According to Bose and Paul (2017), many large organizations with robust R&D departments can experience a significant reduction in costs by implementing such policies. This is because green SCM operations have a positive influence on costs. Under five components, they identify the indications of green supply chain management and showcase the capabilities of green purchasing, green supply management, environmental commitment, supplier environmental evaluation, and supplier collaboration.

Huang (2019) talks about green purchasing, where a lot of office supplies, raw materials, etc. are needed for the manufacture and delivery of goods. Businesses need to employ products and resources that meet environmental requirements in order to be able to generate green products. As a result, while negotiating with suppliers, businesses should take the environment into account (in order to preserve market share or sometimes merely for survival). Companies may adopt green purchasing strategies to address consumer demand for eco-friendly items, set themselves apart from competitors' offerings, or reduce expenses.

Most companies consider principles to be more environmentally friendly, some of which are, preparing the list of chemicals that should not be used, creating the approved product list, working with suppliers to improve environmental performance and considering a variety of environmental factors before making a purchase.

In order to investigate how a green supply chain affects an organization's performance, Kurbatova, Aisner and Mazurov (2020) surveyed 11,127 manufacturing firms in developing Asian nations between 1996 and 2015. These studies' findings support the idea that implementing green supply chain management (SCM) enhances an organization's performance from four angles: social, operational, environmental, and economic. This study also indicates that several operational relationships of green supply chain management (SCM) in a business are modulated by the industry type, organization size, ISO certification, and export orientation.

According to Rakhmangulov, Sladkowski, Osintsev and Muravev (2017), the new concept of "green supply chain management" encompasses all stages of the product life cycle, from design to recycling, and is the result of government regulations being expanded to meet environmental standards and consumer demand for the supply of green products to the supply chain. These regulations also enable all flow-related activities from the raw material stage to the delivery of goods to final consumers, as well as the flow of information throughout the chain. Several advantages come from implementing an investment strategy to enhance the supply chain's environmental performance, including the preservation of energy, the reduction of pollutants, the elimination or reduction of waste, the creation of value for customers, and, eventually, an increase in business and organizational efficiency.

Rajabpour (2016) also noted that increasing worries about environmental warnings in the twenty-first century have raised the significance of environmental preservation in a variety of

communities and organizations. An analysis of the expert literature in this area shows that HRM is necessary for effective environmental management in businesses. Human resource functions will be particularly helpful in this area, as environmental management is a growing organizational aim.

According to study by Seyed Javadin et al. (2016), the world is moving toward a green economy where human capital- a key component of economic growth displays a greater share than physical capital. Consumer expectations and upcoming employment shifts are critical considerations for businesses looking to thrive; sustainable development and environmental concerns should be given top priority. While enhancing the organization's environmental performance and paying attention to sustainable development policies, HRM with a focus on human capital and environmental management programs and their integration in their activities introduces green HRM and offers all activists and investors interesting facilities and conditions to participate in these programs. This fosters mutually beneficial relationships.

The relationship between GHRM and GSCM is examined by Ringle et al. (2020), taking into account the impact of employees' resistance to change in 161 Iranian manufacturing businesses. Their findings support the combination of HRM and green management as well as the positive and noteworthy influence of GHRM on GSCM. The three that have the biggest beneficial effects on GSCM are "Green Development and Training," "Green Employee Empowerment," and "Green Pay and Reward." Since it is the first stage in creating a sustainable corporate culture, they also discover that "Resistance to Change" has a moderating influence on the relationship between GHRM (especially green recruiting and selection) and GSCM.

The effects of employees' green behavior and green corporate culture in Qatar are examined by Leguina (2015), findings support the notion that green organizational culture is influenced by green leadership behavior, environmental care, and GHRM. Furthermore, they indicate a strong positive correlation between an organization's environmental performance, green behavior among employees, and green organizational culture.

Hair, *et al*. (2019) use Institutional Theory and the Natural Resource-Based View (NRBV) to examine the relationships between GSCM techniques and the performance of manufacturing enterprises. Mimetic, normative, and coercive forces have a good and significant impact on GSCM, according to their research. Furthermore, there is a favorable and significant correlation between the GSCM and the environmental, economic, and operational performance of the enterprises. Their moderation analysis indicates that the relationship between GSCM and economic and environmental performance is significantly moderated by collaborative capabilities.

Evangelista, Santoro and Thomas (2018), evaluate the effects of forward and backward GSCM and the variations by industry and home nation, and they determine the influence of GSCM on clean technology innovation (CTI) in Chinese enterprises. Their findings support GSCM's beneficial effects on CTI.

The relationship between environmental collaboration (EC), firm sustainable performance (FSP), and GSCM were examined by Bombiak and Marciniuk-Kluska (2018). They also look into how environmental cooperation may have acted as a mediator during this change. The outcomes confirmed the beneficial effects of GSCM on EC and FSP as well as the role that environmental cooperation plays as a mediator in the link between GSCM and FSP. Experiments and research confirm that when a GHRM system is implemented within a business, employees are motivated to actively think about environmental protection in all work-related operations.

METHODOLOGY, RESULTS AND DISCUSSION

In order to assess the validity and reliability of the constructs, Hair, *et al.* (2019) recommend using three measures: Cronbach's Alpha (with a recommendation of greater than 0.70), Composite Reliability (with a CR recommendation of greater than 0.70), and Average Variance Extracted (expected to be greater than 0.50).

Table 1: Construct Reliability and Validity.

Constructs	Cronbach Alpha (α)	Rho_A	CR	AVE
Green Logistic (GL)	0.939	0.951	0.956	0.846
Organization Sustainability (OS)	0.854	0.884	0.902	0.699
Sustainable Manpower Management (SMM)	0.925	0.943	0.946	0.815

Source: Author's field survey, (2024)

Table 2: Fornell-Lacker Criterion.

Constructs	GL	OS	SMM
GL	**0.928**		
OS	0.831	**0.933**	
SMM	0.864	0.957	**0.947**

Source: Author's field survey, (2024)

The fact that the composite reliability and Cronbach alpha values in Table 1 are higher than the suggested value suggests that they are reliable. Furthermore, Rho_A is an alternative internal consistency metric that has similarities to composite reliability and Cronbach alpha. A minimum Rho value of 0.7 is necessary. Table 1 illustrates that all values of rho_A are acceptable, further supporting internal dependability consistency. Convergent validity is verified for the whole sample using AVE. Therefore, it is also recommended that Average Variance Extracted (AVE) be more than or equal to 0.500 in order to demonstrate convergent validity (Latif et al, 2020). The suggested value of 0.500 is exceeded by the AVE values of the corresponding constructions, namely Green Logistics, Sustainable Manpower Management, and Organization Sustainability initiatives.

The results of the discriminant validity test performed on the constructs are displayed in Table 2. In the Fornell-Lacker validity test, discriminate validity is indicated when the diagonal elements/values in Table 2 are greater than the correlation coefficient's row. (For example, the correlation between organizational sustainability practices and green logistic initiatives is larger than the correlation between the two sets of data; similarly, the correlation between organization sustainability practices and other initiative indicators is higher than the correlation between the two sets of data.) So, it is for the management of sustainable manpower. With no construct's correlation with another construct being higher than its correlation with itself, this result suggests that discriminating among the constructs has been validated.

The cross loading of all the construct is as shown in Table 3. With GL1 - GL6 being item measuring its parental construct that is green logistics practices, OS1- OS8 are items measuring its parental construct refer to as Organization Sustainability Practices and SMM1 – SMM6 items measures its parental construct referred to as Sustainable Manpower Management Practiced. In comparison to the other parental construct, each of these individual indicators loads more favorably in its own parental construct. As seen in Table 3, GL1, GL2, GL3, GL4, GL5 and GL6 indicators measures Green logistic higher when compared to Organization Sustainability and Sustainable Manpower Management initiatives. This is applicable to the other constructs. In Table 3, it was observed that all the factor loadings are more significant than their cross-loadings, indicating a sign of discriminant validity which further validate the test of discriminate validity conducted by Fornell-Lacker Criterion.

The relationship between each measurement model and its corresponding parental construct such as green logistics initiatives, sustainable personnel management techniques, and sustainability practices of FMCG organizations is depicted in Figure 1.

Table 3: Cross Loading.

Constructs	GL	OS	SMM
GL1	0.872	0.810	0.832
GL2	0.952	0.747	0.778
GL3	0.947	0.875	0.889
GL4	0.913	0.730	0.784
GL5	0.951	0.744	0.762
GL6	0.933	0.698	0.744
OS1	0.780	0.919	0.907
OS2	0.825	0.942	0.939
OS3	0.752	0.926	0.902
OS4	0.856	0.960	0.932
OS5	0.814	0.936	0.897
OS6	0.731	0.936	0.893
OS7	0.704	0.912	0.820
OS8	0.723	0.927	0.840
SMM1	0.869	0.949	0.975
SMM2	0.764	0.896	0.955
SMM3	0.839	0.922	0.964
SMM4	0.813	0.887	0.930
SMM5	0.792	0.882	0.946
SMM6	0.823	0.897	0.959

Source: Author's field survey, (2024)

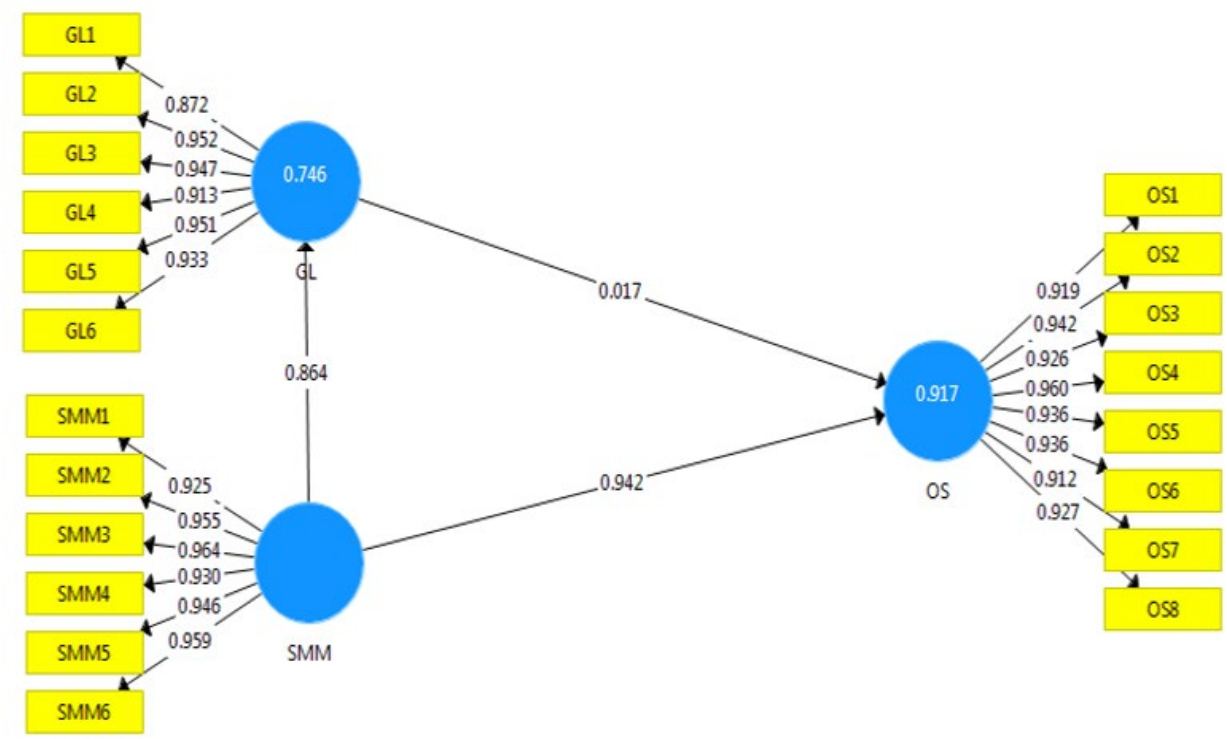

Figure 1: Relationship between Green Logistics, Sustainable Manpower Management and Organization Sustainability.

Table 4: Path Coefficient.

	Original Sample (O)	Sample Mean (M)	SD	T-Statistic	P-Value	
GL → OS	0.016	0.054	0.210	0.078	0.938	Rejected
SMM → GL	0.864	0.849	0.085	10.149	0.000	Accepted
SMM → OS	0.944	0.903	0.187	5.047	0.000	Accepted

Source: Author's field survey, (2024)

To measure their parental construct, each item of the corresponding latent or parental construct converges. It suggests how effectively each item represents its parental construct; the literature suggests that it should be over 0.500. The higher the better. Figure 1 illustrates how all the metrics assessing organizational sustainability, sustainable labor management methods, and green logistics activities converge over the suggested threshold of 0.500. This implies that the implementation of green logistics and sustainable manpower management by the FMCG companies in the study area as shown in the model of Figure 1 does predict a positive influence of approximately ninety two percent on the firm's organization sustainability.

Hypothesis Testing

Following a thorough and methodological examination of the participants' responses to the research questions, the SMART PLS Structural Equation Model was employed to assess the hypothesis. This was done with the aid of SMART PLS 3.0

From Table 4, it can be deduced that there is a positive and significant relationship between Sustainable Manpower Management and Green Logistics practice by the FMCG companies with a P-value less than 0.500 and an acceptable T statistic. Thus the null hypothesis that states that there is a positive relationship between Sustainable Manpower Management initiatives and Green Logistics practiced is accepted while the alternative is rejected.

Also, Sustainable Manpower Management initiatives and Organization Sustainability as seen in Table 4 have a positive relationship with P-value of less than 0.500. Thus the null hypothesis that states that there is a positive relationship between Sustainable Manpower Management initiatives and Organization sustainability practiced is accepted while the alternative is rejected. Lastly, it can be seen from Table 4 that Green Logistic does not have a significant effect on Organization Sustainability and as such the null hypothesis was rejected while the alternate hypothesis was accepted which states that there is no positive relationship between Green Logistic and Organization Sustainability.

CONCLUSION AND RECOMMENDATIONS

The implementation of Green Logistic practices according to literature can affect the performance of Organization sustainability development. Although research has demonstrated that industrial implementation of green logistics initiatives can achieve the economic, environmental, and social components of Sustainable Development goal of any Organization practice. Green Logistic is based on functional activities related to logistics that encompass production and operations. As a result, logistics may be used as a tool to help firms manage issues and strike a balance between environmental and economic factors.

The findings may possibly add to the body of knowledge in the Green Logistics, Sustainable Manpower Management, and Organization Sustainable Development goal. The findings provide statistical support for the claim that Green Logistic and Sustainable Manpower adoption has a significant impact on enhancing Sustainable Development of FMCG Organization practices. This study created a model for Green Logistics and Sustainable Manpower Management use in the management of supply chains to increase workers' environmental consciousness. The government can use these findings to expedite the adoption of green industry criteria standards that have a wide-ranging effect on the environment through a low carbon development (LCD) policy to minimize resource exploitation and sustain economic and social growth through development activities with low greenhouse gas emissions.

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