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Assessing The Impact of Green Supply Chain Practices on Change Management of Selected Logistics Companies in Nigeria

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***Abstract*:-**This study addresses the crucial problem of sustainability in the logistics industry by evaluating the influence of green supply chain techniques on change management within a subset of Nigerian logistics enterprises. The goal is to comprehend how operational change management is impacted by environmentally friendly tactics such as reverse logistics, sustainable transportation, and green buying. Using their vast knowledge and experience, managers and owners of logistics enterprises in Southwest Nigeria were purposefully sampled. A structured questionnaire based on established scales from the literature was used to gather the data, and 129 out of 160 distributed questionnaires were returned, yielding a high response rate of 81%. SMART_Partial Least Squares (PLS) version 4, which is skilled at managing tiny sample numbers and complex models, was used for the analysis. Results show that sustainable change management is much improved by green supply chain techniques, highlighting the necessity of making wise investments in green projects. The study's conclusions include recommendations for targeted incentives, strong regulatory frameworks, and cooperative efforts to support sustainable development in the logistics sector for industry players and government.

Keywords: Green Supply chain, Practices, Sustainability, Change management, Logistics

1. Introduction

Green supply chain management (GSCM) techniques are essential, as evidenced by the growing global awareness of sustainability and environmental challenges. The term "green supply chain management" (GSCM) describes how environmental factors are included into supply chain management operations, including product design, procurement of raw materials, manufacturing procedures, final product delivery, and end-of-life management. This strategy is essential for reducing the negative environmental effects of supply chain management and logistics, which are major contributors to carbon emissions and environmental deterioration. Because these practices can result in enhanced sustainability performance and competitive advantage, it is imperative to investigate how GSCM affects change management in logistics organisations (Ahmad et al., 2022; Agi & Nishant, 2017).

Because of strict environmental laws, consumer awareness, and corporate social responsibility programmes, developed nations have been at the forefront of implementing GSCM methods. For example, in the United States, companies such as Walmart have used green logistics strategies, leading to notable decreases in greenhouse gas emissions. BMW has adopted sustainable supply chain methods in Germany, emphasising waste reduction and resource efficiency. Similar to this, Toyota of Japan has improved operational and environmental performance by combining lean and green supply chain methods (Cherrafi et al., 2018; Green et al., 2019). Other instances include Sweden, where IKEA's supply chain places a strong emphasis on energy efficiency and sustainable procurement, and the UK, where Marks & Spencer's "Plan A" intends to fulfil 100 sustainability targets. Carrefour, a French retailer, has also adopted green logistics, emphasising the reduction of carbon emissions via effective packaging and shipping strategies (Micheli et al., 2020; Tundys & Wiśniewski, 2018).

On the other hand, because of their weak infrastructure, lack of understanding, and limited resources, developing nations have a difficult time putting GSCM practices into effect. Due to high prices and a lack of legislative assistance, the Indian industrial sector finds it difficult to implement green practices (Kalpande & Toke, 2021). Similar problems, exacerbated by a lack of technical innovation, plague Pakistan's logistics industry (Khan &

Qianli, 2017). Economic and regulatory obstacles impede Ghana's mining industry's efforts to implement environmentally friendly practices (Kusi-Sarpong et al., 2016). Similar to this, insufficient government policies and financial limitations hinder the textile industry's efforts to be environmentally sustainable in Bangladesh (Rahman et al., 2020). Due to its poor technology skills, Sri Lanka's industrial industry also struggles to integrate GSCM methods (Priyashani & Gunarathne, 2021).

Furthermore, although Brazil's home appliance sector has made progress in green supply chain management, there are still implementation and cost-related obstacles to overcome (Scur & Barbosa, 2017). Due to market forces and corporate policy, South Africa's construction companies have adopted GSCM to differing degrees (Ojo, 2016). With regard to implementing GSCM techniques, Nigeria's supply chain and logistics industries are still in their infancy. High operational expenses, inadequate infrastructure, and ineffective regulations are the hallmarks of Nigeria's logistics sector, which make it difficult to adopt green practices there (Ososanmi et al., 2022). However, due to mounting environmental concerns and pressure from throughout the world, there is a rising acknowledgment of the necessity of sustainable practices. According to research, GSCM techniques boost operational efficiency and sustainability performance for Nigerian logistics companies (Onwuka et al., 2024; Orji et al., 2019).

It is evidently necessary for Nigerian logistics companies to adopt GSCM methods in spite of these obstacles. Implementing green supply chain activities can yield substantial advantages, such as reduced costs via energy efficiency, improved brand recognition for the company, and adherence to global environmental regulations, which may present new business prospects. Companies that employ GSCM techniques, for example, can enhance supply chain resilience overall, minimise waste, and maximise resource utilisation (Agyabeng-Mensah et al., 2021; Balasubramanian & Shukla, 2017). International environmental standards are also necessary for Nigerian companies to be competitive as global supply networks get increasingly interwoven.

This will boost Nigerian logistics companies' overall competitiveness in the international market in addition to improving environmental sustainability (Ferreira et al., 2023; Jermsittiparsert et al., 2019). Nigeria has a great chance to address its environmental issues while promoting sustainable development and economic progress through the shift to green supply chains.

2. Objective

The imperative to tackle environmental degradation and improve operational efficiency in the logistics sector has led to the need to evaluate the influence of green supply chain techniques on change management in Nigerian organisations. Nigerian logistics companies fall behind in adopting green practices despite the global push towards sustainability because of issues such high operational expenses, poor infrastructure, and ineffective regulations (Ososanmi et al., 2022). For example, the logistics industry is a major source of carbon emissions, and transportation alone is responsible for a large amount of pollution in the environment. These companies can cut waste, maximise resource use, and lessen their environmental impact by implementing green supply chain management (GSCM) techniques (Onwuka et al., 2024).

According to Orji et al. (2019), Nigerian companies can get a competitive edge in the global market by adopting Green Supply Chain Management (GSCM) to comply with international environmental requirements. Sustainability is fast becoming a crucial factor in commercial relationships and customer preferences. The significance of this research is in its investigation of the particular aspects or applications of GSCM in Nigeria, offering perspectives and tactics for efficient change management and cultivating a more sustainable logistics industry.

2.1 Literature Review

2.1.1 Green Supply Chain

A variety of academics have defined green supply chain management (GSCM), with each highlighting distinct facets of its reach and significance. According to Ahmad et al. (2022), green supply chain management (GSCM) involves integrating environmental factors into every phase of the supply chain, from product design to end-of-

life disposal, with the goal of minimising environmental impact and enhancing sustainability performance. GSCM is a strategic strategy that incorporates environmental thinking into supply chain management, encompassing green sourcing, environmentally friendly manufacturing methods, and effective waste management, as highlighted by Agi and Nishant (2017). Similarly, GSCM is defined by Cherrafi et al. (2018) as the application of lean and green approaches to improve operational and environmental performance. Notwithstanding these divergent viewpoints, integrating environmental considerations into the supply chain to achieve sustainability is a recurring subject. The emphasis on particular components—strategic integration vs operational efficiency, for example—differs throughout definitions, but they all aim to reduce the negative environmental effects of supply chain operations. Together, these definitions highlight how all-encompassing GSCM is and how important it is for promoting sustainable business practices (Green et al., 2019; Micheli et al., 2020).

2.1.2 Green Supply Chain Practices

Implementing environmentally sustainable practices within supply chain operations with the goal of minimising ecological effect while preserving economic viability is known as "green supply chain practices" (GSCP) (Onwuka et al., 2024; Ferreira et al., 2023; Jermsittiparsert et al., 2019). Green procurement, reverse logistics and sustainable transportation are just a few of the many activities that fall under this category. Throughout the supply chain, from the procurement of raw materials to the management of end-of-life products, GSCPs are intended to minimise waste, reduce emissions, and conserve resources (Agyabeng-Mensah et al., 2021).

Green procurement, which entails locating goods and resources with the least possible negative environmental impact, is one common technique. For instance, companies like BMW in Germany place a strong emphasis on obtaining recycled materials for their manufacturing procedures. Eco-friendly manufacturing is another approach, where companies use greener production methods to cut down on pollution. Toyota is a prime example of this strategy in Japan, where it has integrated green practices and lean manufacturing (Cherrafi et al., 2018). Another important strategy is sustainable transportation, which aims to lower emissions by using fuel-efficient cars and well-designed logistics networks. For example, Tesco in the UK has made investments in an electric delivery vehicle fleet in an effort to reduce carbon emissions. For waste management, reverse logistics—which includes product return, recycling, and disposal—is essential (Ferreira et al., 2023; Jermsittiparsert et al., 2019). Companies in the electronics industry in Brazil have put in place reliable methods for gathering and recycling electronic trash.

These methods are not without difficulties, though. The broad use of GSCPs is hampered in developing nations like Nigeria and India by problems like high implementation costs, poor infrastructure, and a lack of regulatory backing (Kalpande & Toke, 2021; Ososanmi et al., 2022). Due to logistical and technological limitations, integrating green practices seamlessly can be difficult even in wealthy countries. For example, the USA's extensive geographic distribution and ongoing reliance on fossil fuels frequently pose obstacles to the country's efforts towards sustainable transportation. These instances highlight the heterogeneous adoption landscape of GSCP and the complex issues that exist in various geographical areas.

2.1.3 Change Management

According to a number of academics, change management is the methodical process of handling an organization's objectives, procedures, or technological advancements. According to Kotter (1996), leading change involves eight steps, including the necessity of creating a sense of urgency, building a guiding coalition, developing a vision and strategy, communication the change vision, empowering broad based action, generating short term wins, consolidating gains and produce more change and anchoring the change. To help with organisational transition, Lewin (1951) provides a three-step paradigm that involves unfreezing, altering, and refreezing. Change management, according to Prosci (2006), is the practice of guiding the people side of change to attain a desired result by using a collection of tools and an organised procedure. Lewin's model is more conceptual and offers a high-level framework for comprehending the dynamics of change, whereas Kotter's model is more thorough and directive, concentrating on the actions that leaders should do. In order to close the gap between theory and practice, Prosci's definition emphasises the useful use of instruments and procedures. Notwithstanding these variations, the objective shared by all definitions is to successfully manage change in order to enhance organisational performance and guarantee the introduction of new projects (Kotter, 1996; Prosci, 2006).

2.1.4 Logistics Companies in Nigeria: Issues and Prospects

Nigerian logistics firms are crucial to the country's economy and a major contributor to GDP. They do, however, confront a number of obstacles that limit their effectiveness and potential benefits. Ososanmi et al. (2022) state that the Nigerian logistics industry faces challenges related to insufficient infrastructure, ineffective regulations, and elevated operational expenses, all of which obstruct its productivity and expansion. For example, inadequate transport infrastructure and traffic in cities lead to longer travel times and higher fuel consumption, which reduces the efficiency of logistics processes. In contrast, affluent nations like the US and Germany have sophisticated regulatory structures and infrastructure that enable effective logistics operations, raising their GDP shares from this industry. Similar issues are present in developing nations like Brazil and India, however initiatives to enhance logistics through legislative changes and infrastructure improvements are underway (Kalpande & Toke, 2021; Scur & Barbosa, 2017). Nigeria's logistics industry makes up about 3% of its GDP, which is far less than the developed world average of about 6% (Ososanmi et al., 2022). This discrepancy highlights how urgently study into how green supply chain strategies affect change management in Nigerian logistics firms is needed. Nigeria may boost the productivity and competitiveness of its logistics industry, which will raise GDP contributions and overall economic growth, by tackling these issues through sustainable practices (Onwuka et al., 2024; Orji et al., 2019).

2.1.5 Theoretical Synthesis

The Institutional Theory and the Resource-Based View (RBV) are two important theories that are pertinent to the study of green supply chain practices and change management in logistics organisations. According to institutional theory, which was put forth in 1977 by sociologists like Meyer and Rowan, organisational structures and practices are shaped by the social and institutional context in which they function. According to the notion, companies follow specific procedures in order to become legitimate, fit in with society norms, and meet legal obligations. This hypothesis is especially relevant to Nigerian logistics organisations, as the adoption of green supply chain methods is driven by external factors such as environmental restrictions and pressure from international trade partners (Ahmed et al., 2019). For instance, Nigerian logistics companies may use green practices despite the related costs and infrastructure problems in order to comply with international environmental requirements and improve market competitiveness (Ososanmi et al., 2022).

According to Barney's 1991 Resource-Based View (RBV), a firm's competitive advantage comes from its special resources and competencies. A corporation can attain a lasting competitive advantage if its resources are uncommon, valuable, unique, and non-replaceable, as per Resource-Based Viewpoints. Using this theory to logistics organisations in Nigeria, the implementation of green supply chain methods may be viewed as a strategic asset that boosts environmental performance, lowers costs, and increases operational efficiency (Khan et al., 2022). For example, logistics firms in Nigeria can save a lot of money and obtain a competitive advantage in the market by investing in environmentally friendly technologies and effective transportation methods.

This is consistent with research from industrialised nations such as Germany, where companies such as BMW use green supply chain strategies to improve their market standing and sustainability performance (Cherrafi et al., 2018). On the other hand, due to financial and infrastructural limitations, developing nations like India find it difficult to utilise these resources; nonetheless, effective implementation of green practices has demonstrated the potential to improve business performance (Kalpande & Toke, 2021). Therefore, RBV and Institutional Theory offer useful frameworks for comprehending the motivations for and advantages of green supply chain strategies in the Nigerian logistics industry.

3. Methods

Purposive sampling, which is in line with the goals of the study and the characteristics of the target population, was used to choose business owners and managers of logistics enterprises in Southwest Nigeria as the sample population. Purposive sampling is useful when the researcher wants to include particular people who have relevant information and experiences connected to the research issue, as Saunders et al. (2020) point out. Business owners and managers are selected in this situation because they have important knowledge of the problems, opportunities,

and decision-making processes in the logistics sector. Because of their jobs, they have a thorough awareness of sustainable change management techniques and green supply chain management, which makes them ideal responders to give insightful information for this study.

It is also justifiable to concentrate on the logistics sector in Southwest Nigeria because of its substantial economic impact, ability to create jobs, and capacity to promote sustainable development. An essential part of the Nigerian economy, the logistics industry makes trade and commerce easier by guaranteeing the smooth flow of goods and services. With a large concentration of logistic enterprises and a broad economic landscape, southwest Nigeria offers a thorough understanding of the contextual elements and regional dynamics driving sustainable change management and general social and cultural management. Through an analysis of this market, the research seeks to identify the particular tactics and methods that can improve the industry's operational effectiveness and sustainability. Given the increased emphasis on green supply chain management (GSCM) methods worldwide and the requirement that developing nations like Nigeria align with these sustainable practices, this focus is especially pertinent (Ososanmi et al., 2022).

In order to guarantee firsthand knowledge of business practices, the **inclusion criteria** for choosing owners and managers of logistics companies in Southwest Nigeria are made sure that the participants actively participate in the day-to-day operations and decision-making processes of their enterprises. The requirements also include companies that are members of respected organisations like the Logistics and Supply Chain Practitioners Association of Nigeria (LOGSPAN), the Chartered Institute of Logistics and Transport Nigeria (CILT Nigeria), and the Nigerian Logistics and Supply Chain Association (NLSCA). These organisations, who are important players in the logistics industry, offer a reliable framework for selecting eligible and pertinent study participants.

The research instruments for this study include validated scales from prior studies on change management and green supply chain management, such as those used by Agyabeng-Mensah et al. (2021) and Ahmed et al. (2019), as well as a **structured questionnaire** built based on current literature. It makes sense to use a Google Forms-administered questionnaire because of its practicability, effectiveness, and capacity to connect with a large number of respondents who are spread out around the area. This approach ensures strong involvement by facilitating data gathering in a time- and money-efficient manner.

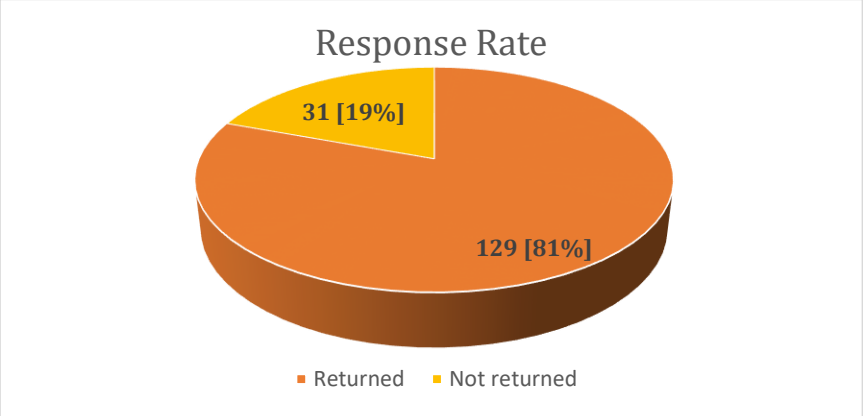
As suggested by Saunders et al. (2020) for quantitative research approaches, descriptive and inferential statistics are used for data analysis to offer both a thorough overview and deeper insights into the relationships and patterns within the dataset. This methodology makes it possible for the study to produce insightful findings that can influence logistics industry policy and practice.

4. Results

The Nigerian Logistics and Supply Chain Association (NLSCA), the Chartered Institute of Logistics and Transport Nigeria (CILT Nigeria), and the Logistics and Supply Chain Practitioners Association of Nigeria (LOGSPAN) are three important industry associations that registered members of business owners and managers of logistics companies provided the data for this study. These people were chosen because they actively and directly participate in the daily operations and decision-making processes of their companies, guaranteeing that they have in-depth knowledge of the logistics industry's business practices. Their membership in these professional associations also suggests adherence to industry norms and best practices, which makes them important sources of accurate and pertinent information for evaluating how green supply chain methods affect change management. Table 1 provides a summary of the survey response rate and an indication of the sample population's representativeness for this study.

Table 1: Analysis of Overall Response Rate of Shared/Retrieved Questionnaire

Questionnaire	Number of Respondents	Percentage [%]
Returned	129	81
Not returned	31	19
Total	160	100



An analysis of the overall questionnaire response rate is given in Table 1. A high 81% of business owners and managers of logistics companies returned 129 of the 160 questionnaires that were distributed to them. This suggests a high degree of participation and engagement from the respondents, which improves the validity and dependability of the information gathered. On the other hand, thirty-one surveys (19% of the total) were not returned. With a strong 81% return rate, the study's results are likely to be representative and reflective of the region's logistics industry as a whole, offering solid insights into how green supply chain strategies affect change management as shown in Table 1 shows.

4.1 Data Analysis and Interpretation

The information gathered for this study is split into two categories. The initial segment includes demographic data, such as the respondents' location, highest educational attainment, years of experience, and professional associations (refer to Table 1). By giving a basic grasp of the sample population, this demographic data guarantees that the histories and credentials of the respondents are taken into consideration throughout the research. Inferential statistics are used in the second portion, namely SEM-Partial Least Square (SEM-PLS) analysis (refer to Table 2). The selection of SEM-PLS, version 4, is warranted due to its sturdy nature, making it appropriate for intricate models and limited sample sizes. It provides exceptional precision and dependability when examining the correlations between latent and observed variables.

Table 2: Demographic Characteristics of Managers and Owners of Logistic Companies

SN	Demographic Characteristics		Percentage
1	Gender	Male	62
		Female	38
		Total	100%
2	Highest Academic Qualification	Diploma	33
		College/Bachelors' degree	42
		Masters	18
		PHD	7
		Total	**100%**
3	Working Experience	1-5years	21
		6 – 10years	59
		11- 15years	16
		16 years and above	4
		Total	**100**%
4	Professional Affiliations	None	0
		1-2	61
		3-4	39
		Total	**100**%

[n= 129]

The study's participant managers and owners of logistics enterprises are shown in Table 2 by means of their demographic features. According to the gender distribution, 38% of respondents are women and 62% of respondents are men. In terms of education, the sample is well-educated: 33% of respondents have a diploma, 42% have a bachelor's or college degree, 18% have a master's degree, and 7% have a Ph.D. The participants' varying levels of working experience—21% had 1–5 years of experience, 59% had 6–10 years, 16% had 11–15 years, and 4% had more than 16 years—indicate that most of them had moderate levels of experience. In conclusion, all of the respondents have professional affiliations; 61% belong to 1-2 professional bodies, and 39% to 3–4 bodies, indicating a high degree of professional participation in the field.

4.2 Test of Hypothesis

This study looked at how sustainable change management in logistics organisations is affected by green supply chain techniques. A combination of structural and measurement models were used to accomplish this. For this analysis, SMART_Partial Least Squares (PLS) version 4 was the novel methodology used. The reason this method was chosen is that it can manage multivariate, complicated models, which is crucial considering the complex relationship between sustainable change management and green supply chain practices. PLS guarantees accurate results even with sparse data, which is very helpful in situations with small sample sizes (Arejiogbe, Moses, Salau, Onayemi, Agada, Dada, & Obisesan, 2023). This is particularly important for a study like this one that is company-specific because it could be difficult to get a sizable dataset.

PLS is ideally suited for comprehending how different green supply chain strategies and methodologies forecast sustainable change management results in logistics organisations because of its emphasis on predictive capacity. Table 3 and Figure 2 provide examples of the techniques for green supply chain activities and how they affect sustainable change management. Table 3 and Figures 2, 3, and 4 present the path coefficients, the structural model, and the total effects histogram, respectively.

SEM Path Diagram (Version 4)

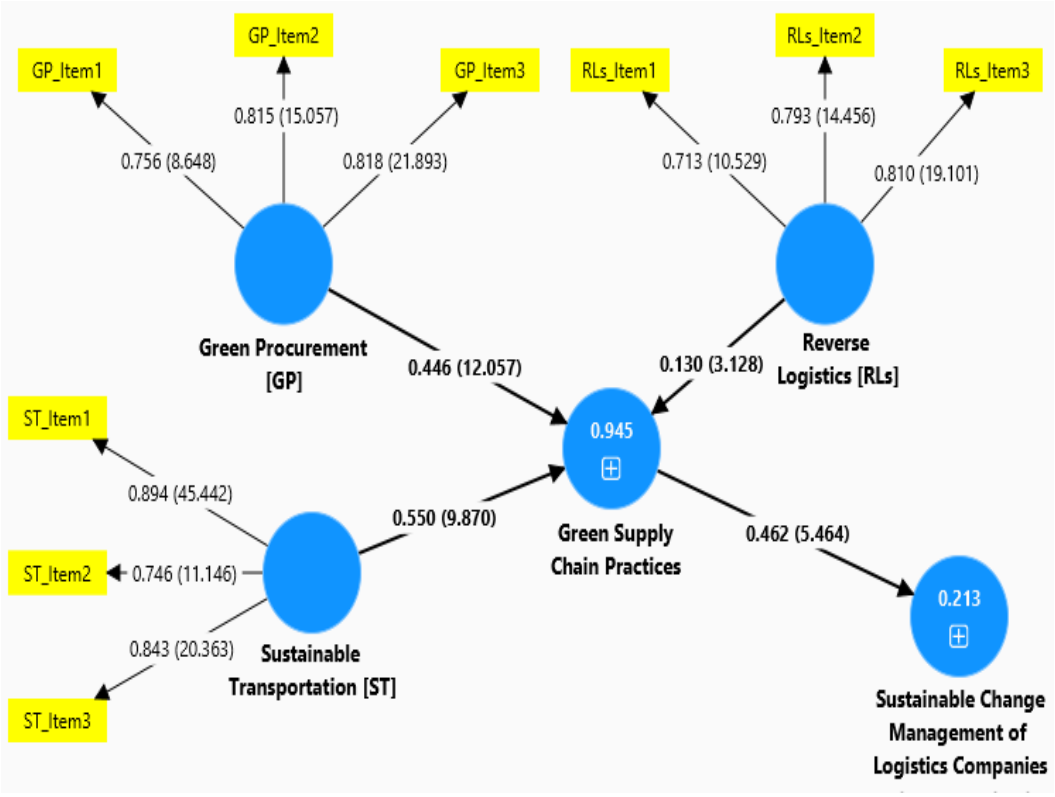


Figure 2: Path Diagram and T-values

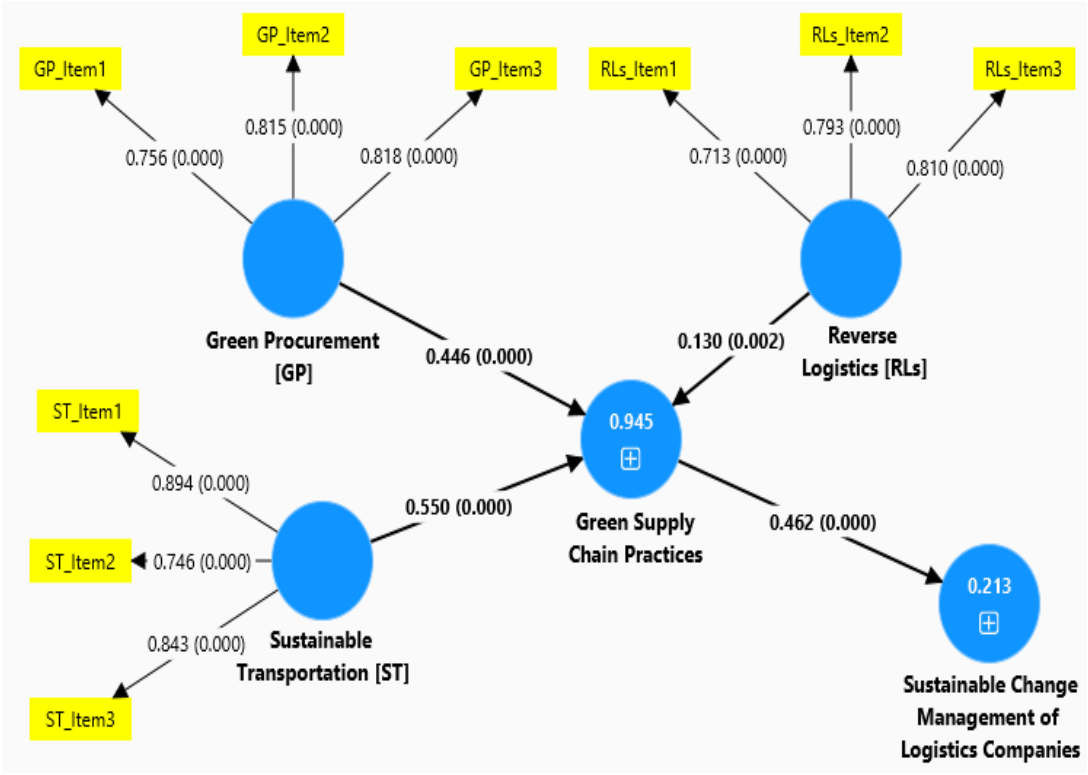


Figure 3: Path Diagram and P-values

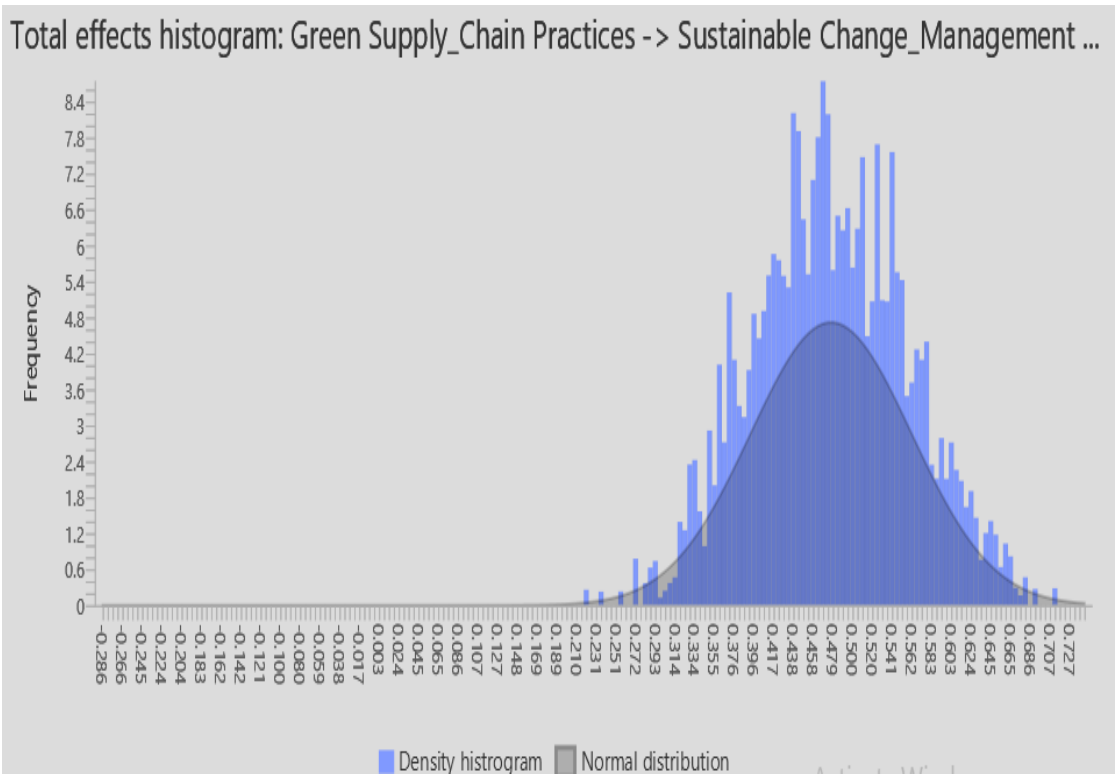


Figure 4: Total Effects Histogram

Table 3: Path Coefficients of Green Supply Chain Practices and Change Management

SN	Variables	Co-efficient [Indirect Effect]	Std Dev.	R-Square	T value	Sig.	Decision
1	Green Procurement [GP] ➔ Sustainable Change Management	0.446 **[0.206]**	0.037	0.945	12.057	0.049	Significant
2	Sustainable Transporation [ST] ➔ Change Management of Logistic Firms	0.550 **[0.254]**	0.056		9.870	0.000	Significant
3	Reverse Logistics [RLs] ➔ Sustainable Change Management	0.130 **[0.060]**	0.042		3.128	0.002	Significant
4	Green Supply Chain Practices [GSCPs] ➔ Sustainable Change Management	0.462	0.085	0.213	5.464	0.000	Significant

The statistical importance and strength of the linkages between several green supply chain practices and sustainable change management within logistics organisations are illustrated by Table 3, which displays the path coefficients of these practices. According to the data, there is a substantial and significant impact of sustainable transport (ST) on change management in logistics enterprises, as evidenced by its maximum path coefficient of 0.550 with a standard deviation of 0.056 (T value = 9.870, p 0.000). This result is consistent with the research conducted by Agyabeng-Mensah et al. (2021), who highlight the significant contribution that sustainable transportation makes to lowering carbon footprints and improving operational effectiveness in the logistics industry. In order to meet environmental standards and achieve sustainability goals, it is imperative to reduce emissions and improve fuel economy through the use of sustainable transportation strategies.

With a path coefficient of 0.446 and a standard deviation of 0.037, green procurement (GP) trails closely behind and has a considerable positive impact on sustainable change management (T value = 12.057, $p < 0.049$). This outcome is in line with the research of Ahmed et al. (2019), who claim that the promotion of sustainability in supply chain management is greatly aided by green procurement techniques, such as the selection of environmentally friendly suppliers and materials. In order to promote long-term sustainability and competitive advantage, logistics organisations must incorporate environmentally friendly criteria into their purchasing decisions, as highlighted by the relevance of green procurement.

The influence of reverse logistics (RLs) on sustainable change management is significant, despite its lower path coefficient of 0.130 with a standard deviation of 0.042 (T value = 3.128, $p < 0.002$). The findings of Choudhary and Sangwan (2022), who emphasise that reverse logistics—which entails the return and recycling of products—contributes to sustainability by reducing waste and fostering resource efficiency, lend weight to this conclusion. Reverse logistics is important because it supports a circular economy model, which reduces environmental impact and improves resource utilisation in logistical operations. This is true even though its coefficient is relatively lower.

A path coefficient of 0.462 with a standard deviation of 0.085 (R-Square = 0.213, T value = 5.464, $p < 0.000$) indicates the overall effect of green supply chain practices (GSCPs) on sustainable change management. This all-encompassing impact illustrates how several green approaches have collaborated to impact logistics organisations' sustainable transformation. These results are corroborated by studies by Aslam et al. (2018) and Cherrafi et al. (2018), which show that incorporating green supply chain methods improves sustainability outcomes, operational effectiveness, and environmental performance. These findings support the important role that GSCPs play in

promoting sustainable transformation and highlight the need for logistics companies to implement comprehensive green strategy.

Table 4: Total Effects and Confidence Interval

SN	Variables	Co-Efficient	Sample Mean	2.5%	97.5%
1	Green Procurement [GP] ➔ Green Supply Chain Practices	0.446	0.449	0.365	0.520
2	Green Procurement [GP] ➔ Sustainable Change Management	0.206	0.214	0.136	0.304
3	Sustainable Transporation [ST] ➔ Green Supply Chain Practices	0.550	0.543	0.422	0.650
4	Sustainable Transporation [ST] ➔ Change Management of Logistic Firms	0.254	0.260	0.161	0.377
5	Reverse Logistics [RLs] ➔ Green Supply Chain Practices	0.130	0.134	0.050	0.212
6	Reverse Logistics [RLs] ➔ Sustainable Change Management	0.060	0.064	0.022	0.117
7	Green Supply Chain Practices [GSCPs] ➔ Sustainable Change Management	0.462	0.477	0.322	0.645

Table 4 presents the overall impacts and confidence intervals of different green supply chain strategies on long-term change management in Nigerian logistics firms. According to the analysis, change management is significantly impacted by sustainable transportation (ST) (Co-efficient = 0.254, 2.5% CI = 0.161, 97.5% CI = 0.377) and has the strongest overall effect on green supply chain practices (Co-efficient = 0.550, 2.5% CI = 0.422, 97.5% CI = 0.650). Additionally, there is evidence that green procurement (GP) has a significant impact on sustainable change management (Co-efficient = 0.206, 2.5% CI = 0.136, 97.5% CI = 0.304) and green supply chain practices (Co-efficient = 0.446, 2.5% CI = 0.365, 97.5% CI = 0.520). The impact of reverse logistics (RLs) on sustainable change management (Co-efficient = 0.060, 2.5% CI = 0.022, 97.5% CI = 0.117) and green supply chain practices (Co-efficient = 0.130, 2.5% CI = 0.050, 97.5% CI = 0.212) is less pronounced but still significant. Green supply chain practices (GSCPs) have a highly significant overall influence on sustainable change management (Co-efficient = 0.462, 2.5% CI = 0.322, 97.5% CI = 0.645). These results highlight how crucial it is for Nigerian logistics companies to implement and improve green procurement and sustainable transportation strategies in order to facilitate successful change management. The data is in favour of concentrating on these areas in order to enhance sustainability outcomes and operational efficiency, meeting the industry's economic and environmental objectives.

Table 5: Total Effects and Confidence Interval Bias Corrected

SN	Variables	Co-Efficient	Sample Mean	Bias	2.5%	97.5%
1	Green Procurement [GP] ➔ Green Supply Chain Practices	0.446	0.449	0.003	0.353	0.510
2	Green Procurement [GP] ➔ Sustainable Change Management	0.206	0.214	0.008	0.125	0.291
3	Sustainable Transporation [ST] ➔ Green Supply Chain Practices	0.550	0.543	-0.007	0.434	0.658
4	Sustainable Transporation [ST] ➔ Change Management of Logistic Firms	0.254	0.260	0.006	0.157	0.369
5	Reverse Logistics [RLs] ➔ Green Supply Chain Practices	0.130	0.134	0.003	0.045	0.205
6	Reverse Logistics [RLs] ➔ Sustainable Change Management	0.060	0.064	0.004	0.020	0.113
7	Green Supply Chain Practices [GSCPs] ➔ Sustainable Change Management	0.462	0.477	0.015	0.288	0.615

The overall impacts and bias-corrected confidence intervals for a range of green supply chain strategies on sustainable change management in Nigerian logistics firms are shown in Table 5. The study reveals that sustainable transport (ST) has a noteworthy influence on change management (Co-efficient = 0.254, 2.5% CI = 0.157, 97.5% CI = 0.369) and the biggest impact on green supply chain practices (Co-efficient = 0.550, 2.5% CI = 0.434, 97.5% CI = 0.658). Additionally, there is evidence that green procurement (GP) has a significant impact on sustainable change management (Co-efficient = 0.206, 2.5% CI = 0.125, 97.5% CI = 0.291) and green supply chain practices (Co-efficient = 0.446, 2.5% CI = 0.353, 97.5% CI = 0.510). Reverse logistics (RLs) has a lesser but substantial influence on sustainable change management (Co-efficient = 0.060, 2.5% CI = 0.020, 97.5% CI = 0.113) and a moderate impact on green supply chain practices (Co-efficient = 0.130, 2.5% CI = 0.045, 97.5% CI = 0.205). Sustainable change management is generally greatly impacted by green supply chain practices (GSCPs) (Co-efficient = 0.462, 2.5% CI = 0.288, 97.5% CI = 0.615). These findings highlight the significance of improving green procurement and sustainable transportation for logistics companies in Nigeria in order to accomplish sustainability and change management objectives. They also imply that significant improvements in operational and environmental performance can result from investments made in these areas.

5. Conclusion

This study has shown how important it is for Nigerian logistics companies to adopt green supply chain strategies in order to support long-term change management. The study emphasises the need for logistics companies to embrace and incorporate environmentally friendly practices such as reverse logistics, sustainable transportation, and green procurement into their operations, given their substantial benefits. The idea that investing in green practices improves environmental performance and adds to overall operational efficiency and long-term sustainability is supported by the empirical evidence presented. The study's conclusions also provide insightful information for legislators and industry participants, supporting the creation of strong legal frameworks and focused incentives to encourage the use of green supply chain methods. The study emphasises how crucial it is to

invest in technology, foster collaboration, and build capacity in order to promote sustainable development in the logistics industry. The adoption of these suggestions may be essential to attaining resilient and sustainable growth in Nigeria's logistics sector as the country develops its economic and environmental policies.

6. Recommendations and Policy Implications

The study's conclusions suggest that Nigerian logistics firms give green buying, environmentally friendly transportation, and reverse logistics top priority when integrating these strategies into their daily operations. Companies should spend money on staff capacity-building and training so they can execute these green initiatives successfully. Furthermore, implementing cutting-edge technologies to track and improve supply chain operations can greatly improve sustainability results. Achieving long-term sustainability goals also requires cultivating a culture of continual improvement in environmental practices and forming collaborations with eco-friendly suppliers.

From a policy standpoint, the government of Nigeria ought to encourage green supply chain projects by offering grants, tax exemptions, and subsidies to companies that use sustainable techniques. In order to enforce environmental standards and promote compliance among logistics companies, regulatory frameworks should be reinforced. The development of infrastructure, such as recycling facilities and green transport networks, that facilitates sustainable logistics must also be a priority for policymakers. In order to spur innovation and guarantee the widespread adoption of green supply chain methods, cooperation between the government, industry players, and academic institutions is crucial. This would ultimately support Nigeria's economic development and environmental sustainability.

7. Contributions to Knowledge and Suggestion for Further Studies

By providing empirical evidence of the major effects of green supply chain practices—green procurement, sustainable transportation, and reverse logistics—on sustainable change management in the Nigerian logistics industry, this study adds to the body of knowledge. For logistics firms looking to improve their sustainability performance, it gives practical insights. For policymakers, it provides a framework for supporting green efforts. It is advised that future research examine the long-term financial effects of these green practices on the competitiveness and profitability of logistics organisations. Future studies may also look into how cutting-edge technologies like blockchain and the Internet of Things might improve green supply chain management.

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