Original Article

The Impact of Green Logistics Practices on Social Sustainability of Fast-Moving Consumer Goods Firms in Lagos State, Nigeria: An Empirical Investigation

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Abstract: Social sustainability has increasingly taken the centre stage of today’s organisation. Thus, organisations have begun to align priorities to focus on factors that improve the effectiveness of their operations and integrate environmental concerns into the supply chain management system, especially among fast moving consumer goods (FMCG) firms. Despite this, studies have established that FMCG firms are faced with the challenge to maintain substantial level of social sustainability. This impediment has been created due to poor management of green logistics practices (green production, green procurement, green transportation, green packaging, and reverse logistics). However, most of the extant researches focus more on other industries other than FMCG and developed countries than developing countries. This study looked on the social sustainability and environmentally friendly logistics methods of a few selected FMCG companies in Lagos State, Nigeria. The research design used in the study was survey. 13,782 management workers from eight listed FMCG companies in Lagos State, Nigeria made up the study’s population. The Taro Yamane formula was used to determine the sample size of 519. Survey respondents were chosen using a straightforward random sampling procedure. Data were gathered using a standardized, validated questionnaire, and the range of the Cronbach's alpha reliability coefficient for the components was 0.78 to 0.94. 96.7% of respondents responded. Descriptive and inferential (multiple and hierarchical regression) statistics were used to analyse the data. The findings revealed that green logistics practices had significant effect on social sustainability of selected FMCG firms in Lagos State, Nigeria (Adj. R² = 0.066, F (5, 496) = 8.036, p < 0.05). The study found that certain FMCG companies in Lagos State, Nigeria, benefited significantly from green logistics practises in terms of their social sustainability. In order to improve their long-term social sustainability performance, this study advised the management of FMCG enterprises in Lagos State, Nigeria, to take a holistic approach to sustainability and incorporate green logistical practises into their larger sustainability plan.

Keywords: Green logistics practices, Green product, Green transportation, Product sustainability, Social sustainability.

I. INTRODUCTION

Social sustainability has increasingly taken centre stage in today's organizations, as sustainability overall has gained prominence. Consequently, organizations have started aligning their priorities to improve the effectiveness of their operations and integrate environmental concerns into their supply chain management systems, particularly among fast-moving consumer goods firms. However, it has been observed, especially among these fast-moving consumer goods firms, that the outcomes fall short of the standard expected. This shortfall can be attributed to poor management of green logistics practices, which hinders the maintenance of a substantial level of social sustainability. Nevertheless, this situation presents excellent opportunities for businesses to embrace environmental consciousness by providing ecologically friendly products and services that cater to consumers' environmentally influenced purchasing habits.

Global research attention has been directed towards the imperative for firms to be environmentally sustainable (Yingfei., et al, 2022; Liu, & Ma, 2022; Singh., et al, 2019). In the United States of America, the Fast-moving Consumer Goods Firms (FMCG) are continuously adapting to evolving consumer demands and market trends to enhance firm sustainability, encompassing both environmental and social aspects (Zuiderveen., et al, 2020). Being the largest consumer market in the world, with a market size of 18.6 trillion dollars, the United States operates within an economy heavily reliant on consumption, facing challenges such as escalating food and energy costs, a tight labour market, and an inflation rate of approximately 7% by the end of 2022, all of which have a detrimental impact on the social sustainability of FMCG (World Bank, 2023; The Economist, 2022). Moreover, the fast-moving consumer goods market has witnessed significant influences from digital innovation, the COVID-19 pandemic, and the increased emphasis on sustainable and healthy practices in recent years (Trihatmoko & Mulyani, 2018). Furthermore, the COVID-19 problem led to an increase in job loss claims in the US.
with 30 million US residents applying for unemployment benefits by the end of April 2020, underlining the negative impacts on the social and economic viability of FMCG (Deloitte, 2020).

Social sustainability plays a crucial role in the fast-moving consumer goods (FMCG) industry in the United Kingdom. As the largest manufacturing market in the country, FMCG firms have a significant impact on society, and addressing social sustainability issues has become a pressing concern. One notable aspect of social sustainability within the FMCG sector is the increasing focus on promoting healthy eating and offering vegan products. In response to growing consumer demand for nutritious and ethical options, smaller, niche brands have emerged, challenging the dominance of larger companies (Alsaifi et al., 2020; Mariani & Wamba, 2020). These brands prioritize sustainability, transparency, and ethical sourcing practices, aligning with the values and preferences of socially conscious consumers. Furthermore, the FMCG industry in the UK has recognized the importance of responsible and inclusive employment practices. With over 400,000 individuals employed across approximately 7,000 companies, the sector has a significant influence on the workforce. Efforts are being made to ensure fair wages, safe working conditions, and opportunities for career development within the industry. Companies are also increasingly prioritizing diversity and inclusion, aiming to create inclusive work environments that value and respect employees from all backgrounds. However, challenges persist in achieving comprehensive social sustainability in the FMCG sector. Issues such as supply chain transparency, responsible sourcing, and reducing waste remain areas of concern. Efforts are being made to address these challenges through collaborations, partnerships, and the adoption of sustainable practices throughout the value chain (Gong et al., 2020).

The challenge of social sustainability within the fast-moving consumer goods (FMCG) sector in Africa is evident through various factors highlighted in the previous texts. One significant aspect is the changing consumer behaviour towards healthier lifestyles and preferences for sustainable products (Atanda, 2019). In South Africa, consumers have increasingly adopted healthier eating habits, reaching similar levels as other developed and developing markets (Schönborn et al., 2019). This shift indicates a growing demand for FMCG companies to provide products that align with these preferences. However, meeting these demands while ensuring social sustainability can be challenging for FMCG companies. Additionally, the COVID-19 pandemic has accelerated the trend of utilizing digital channels for grocery and consumer goods shopping. This shift towards online shopping is expected to persist even after the pandemic subsides (Boyer et al., 2016). While this presents opportunities for FMCG companies to reach a wider customer base, it also raises social sustainability concerns. Ensuring equitable access to digital platforms and addressing potential exclusion of marginalized communities becomes crucial in fostering social sustainability in the FMCG sector across Africa.

The fast-moving consumer goods (FMCG) sector in Nigeria faces significant challenges in achieving social sustainability, as evidenced by the findings and citations provided. While FMCG firms in Nigeria have experienced a surge in profits, reaching five-year highs and surpassing pre-pandemic levels, the overall sustainability of these companies is questionable (Nairametrics, 2022). According to the Manufacturers Association of Nigeria (MAN, 2021), only 10% of FMCG manufacturing firms in Nigeria can be considered sustainable, while a staggering 60% are on the verge of shutting down. This situation is primarily driven by financial instability, poor technology adoption, policy challenges, and other crises affecting the country (Salau et al., 2018). These factors indicate that the FMCG sector in Nigeria struggles to address social sustainability concerns.

Social sustainability encompasses various aspects, including fair labor practices, employee welfare, community engagement, and ethical sourcing. The financial instability of FMCG firms in Nigeria hinders their ability to address these social sustainability dimensions adequately. Limited resources and capital constraints may result in suboptimal working conditions, low wages, and reduced investments in community development programs. Furthermore, poor technology adoption within the FMCG sector in Nigeria exacerbates the challenge of social sustainability. Inadequate access to advanced technologies and digital tools can limit efficiency, productivity, and the ability to implement sustainable practices. Embracing technology can facilitate supply chain transparency, traceability, and environmental impact assessments, all of which are critical for achieving social sustainability.

The FMCG sector in Nigeria faces significant challenges concerning poor green supply chain practices and social sustainability issues. These challenges hinder the sector’s ability to achieve sustainable and responsible operations. One of the primary challenges is the lack of emphasis on green supply chain practices (Salau et al., 2018). Many FMCG companies in Nigeria have yet to prioritize sustainable sourcing, environmentally friendly production processes, and responsible waste management. This lack of focus on sustainability within the supply chain contributes to environmental degradation, resource depletion, and pollution. Additionally, social sustainability issues pose significant challenges within the FMCG sector in Nigeria. These issues include inadequate worker rights and welfare, unsafe working conditions, and limited community engagement (Ayodele, 2021). Some FMCG firms may exploit low-wage labour, engage in unfair labor practices, or neglect workers’ health and safety. These practices undermine social sustainability and the well-being of workers. Furthermore, there is
a lack of transparency and accountability in supply chains, making it challenging to trace the origin of raw materials, ensure fair trade practices, and address issues such as child labour and human rights violations (Benfratello & Shiqian, 2021). Limited transparency can also hinder efforts to promote ethical sourcing practices and ensure responsible production processes. The prevalence of counterfeit products in the Nigerian market is another social sustainability challenge for FMCG companies. Counterfeit goods not only pose risks to consumer health and safety but also undermine the reputation and trustworthiness of legitimate brands (Owoeye, F. (2020).

Furthermore, the lack of proper implementation of green logistics practices in FMCG firms contributes to the emission of toxic materials and gases, including carbon dioxide and methane, into the atmosphere. This detrimental practice negatively impacts human existence and gives rise to a range of diseases such as stroke and chronic obstructive pulmonary diseases, thereby jeopardizing the social sustainability of organizations (Wan, & Ng, 2018; Zhu, & Xu, 2019). Additionally, the absorption of radiation by carbon dioxide and methane from the sun contributes to global temperature fluctuations, further exacerbating the environmental challenges. Given the paucity of empirical studies on the relationship between social sustainability and the FMCG industry in Lagos State, Nigeria, it is critical to look at how green logistics practices affect social sustainability results in this particular setting. This study seeks to close this knowledge gap by offering insightful information on the possible advantages, difficulties, and effects of implementing green logistics practices for FMCG companies operating in Lagos State, Nigeria.

II. LITERATURE REVIEW
A) Green Logistics Practices
According to Chiamogu and Okoye (2020), the notion of "green logistics" entails taking steps to include environmental or ecological issues into supply chain management. In order to increase production efficiency, customer satisfaction, competitive advantage, and overall performance, it focuses on managing a firm's resources, raw materials, goods, and services effectively (Baah, Jin, & Tang, 2020). Green logistics strategies seek to provide goods and services in a manner that is both inexpensive and ecologically beneficial. They involve preserving resources, reducing waste, increasing efficiency, and meeting societal requirements for ecological protection. In addition, green logistics contribute to the definition of sustainability in terms of the environment, economy, and society, making it an environmentally and socially responsible way to produce and distribute goods (Agyabeng-Mensah & Tang, 2021).

The movement of goods, handling of materials, processing of information, and exchange of information with supply chain partners are only a few examples of the different activities covered by green logistics practices (Afum et al., 2021). These practices contribute to reducing environmental problems associated with logistics operations, including greenhouse gas emissions, noise pollution, and accidents. By adopting green logistics practices, organizations can achieve environmental sustainability while improving financial performance (Abdel et al., 2021). To reduce waste, conserve energy and resources, and lessen the impact on the environment and human lives, they can adopt eco-friendly policies and methods into their logistical operations (Agyabeng-Mensah, Annan, & Asamoah, 2020). In addition, green logistics practises encourage the use of techniques like reverse logistics, eco-friendly transportation and distribution, eco-friendly packaging and design, carbon management, eco-friendly procurement, and eco-friendly warehousing, among others, to manage the supply chain in a sustainable and environmentally friendly manner.

a. Green Production
Green production refers to the adoption of environmentally friendly manufacturing solutions by companies, regardless of their size, in order to upgrade outdated production methods and reduce waste generation (Liu et al., 2020). It is a successful method that entails minimising the environmental impact of new products by incorporating environmental factors into the design and production processes (Yang et al., 2020). Examples of green manufacturing practices include recycling, resource consumption reduction, and emissions reduction. Green production integrates environmental and resource considerations into its planning and management, reflecting the growing interest of companies in adopting environmentally friendly approaches and producing goods and services that meet environmental safety standards (Zameer et al., 2020).

Green production is a sustainable approach that focuses on minimizing the negative environmental effects of product creation and operations (Li, Wang, Lu, Huang, & Wang, 2020). The idea of eco-innovation gave rise to it around the beginning of the 1990s, and it seeks to improve social, economic, and environmental performance by cutting costs and waste (Baah et al., 2021). Implementing green production processes presents both challenges and opportunities for industries, as it requires developing new market opportunities and considering environmental aspects in manufacturing (Denisa & Zdenka, 2015). Green production involves the integration of product design and manufacturing processes, with a focus on identifying, evaluating, and managing environmental waste to minimize environmental impact (Gong et al., 2018). Due to stakeholder demands for environmental preservation and the introduction of standards like ISO 14001, the adoption
of green production practices has grown in importance (Baah et al., 2021; Paul, Bhole, & Chaudhari, 2014). However, implementing green production processes requires compliance with strict regulations and policies, particularly in developed countries (Govindan et al., 2015).

b. Green Procurement

Buying products and services with a minimal impact on the environment is known as green procurement. It is fueled by consumer demand for recyclable goods, energy-saving devices, clean technologies, and fuels, indicating an increased focus on environmentally friendly business practices (Galeazzo et al., 2021). Businesses engaged in green procurement put the environmental impact of their decisions above the cost of the goods and services they are purchasing (Fang et al., 2020). By incorporating environmentally responsible techniques into their corporate activities, such as satisfying resource, goods, utilities, and service needs, green procurement becomes a vital component of sustainable purchasing (Dinu, 2020).

According to Chelagat and Ismail (2018), green procurement is a branch of pollution prevention that focuses on evaluating the cost, technology, quality, and environmental impact of goods, services, and contracts. It applies to businesses of all sizes and includes a variety of activities, from straightforward ones like using recycled office paper or renewable energy to more difficult ones like setting environmental requirements for suppliers and contractors. Green products and services not only consume fewer resources and have a longer lifespan but also have a reduced environmental impact from production to disposal (Bao & Zhang, 2018). Moreover, they often meet higher safety standards, leading to a lower impact on human health. Implementing a green procurement program involves evaluating existing purchasing practices, conducting life cycle assessments, and developing environmental standards (Alqadami et al., 2020). A well-defined green purchasing policy, integrated into organizational plans and policies, ensures ongoing environmental responsibility and includes priorities, targets, responsibilities, accountability, and communication plans (Bag, 2017).

c. Green Transportation

As defined by Wan-Ming (2019), "green transportation" refers to a system of diverse and sustainable transportation that prioritises the effective use of resources, modification of the transportation infrastructure, and adoption of environmentally friendly choices like carpooling, public transportation, cycling, and walking. It is characterised as a kind of transportation that reduces adverse environmental effects and depends on renewable energy sources rather than depleting natural resources (Li, 2016). This can include private options like fast e-bikes, as well as public modes of transportation such as electric city buses, all with the common goal of sustainability (Hamurcu & Eren, 2020). By reducing reliance on fossil fuels and embracing renewable energy sources like wind, solar, hydroelectricity, and biomass, green transportation aims to minimize environmental effects and address the pressing challenge of transportation-related greenhouse gas emissions (Chen & Wang, 2020).

A low-carbon, ecologically friendly kind of transportation, "green transportation" seeks to reduce its negative effects on both human health and the environment (Naidoo, 2014). It offers numerous benefits, including reduced traffic congestion, lower pollution levels, improved air quality, and enhanced citizen health (Li, 2016; Joseph et al., 2020). By promoting the use of public transit, walking, cycling, and clean energy vehicles, green transportation provides a cost-effective, pollution-free, and space-saving transportation system suitable for all travelers (Ouyang & Xu, 2022). It aligns with the principles of sustainable development, emphasizing the need for efficient resource management, ecological harmony, and urban development that caters to both transportation demands and environmental considerations (Jahromi et al., 2021). With its focus on minimizing social expenses while maximizing traffic efficiency, green transportation contributes to the economic development and growth of cities, providing improved access to services and goods and creating employment opportunities (Rabbani et al., 2020).

d. Green Packaging

Green packaging, also referred to as sustainable packaging, and is concerned with lowering energy consumption and reducing the negative effects of package components and production methods on the environment. According to Rabnawaz et al. (2017), it entails using biodegradable and recyclable materials rather than plastic and Styrofoam. The goal of green packaging, as defined by Jafarzadeh et al. (2020), is to create packaging designs with the lowest possible environmental impact. This is achieved through various measures such as limiting packaging waste, maximizing the use of sustainable materials like recyclable and biodegradable elements, and incorporating renewable energy during production. By being mindful of their carbon footprint, businesses can adopt ecologically friendly manufacturing methods and utilize recyclable and biodegradable materials for product packaging, resulting in containers with minimal environmental impact and energy consumption (Hao et al., 2019). However, the burden on the environment brought on by packaging waste has increased due to the ongoing advancement of science and technology (Liu & Pang, 2017).
Green packaging techniques have been adopted as a result of customer desire for natural, biodegradable, and recyclable packaging materials (Alhanish & Abu Ghalia, 2021). Green packaging entails not only implementing recycling and pollution-reduction industrial processes, but also using reusable, biodegradable, or compostable materials to wrap, pack, and ship items. It is essential to the growing circular economy, in which resources are repaired, recycled, reused, and harvested to extend their useful lives (Pan et al., 2021). Recyclable packaging is designed to be recycled at conventional facilities, ensuring a sustainable approach to packaging waste. By embracing green packaging practices, companies can reduce environmental consequences, enhance brand image, and positively impact the Earth's ecosystems and overall sustainability (Nguyen et al., 2020). Green packaging also offers long-term benefits beyond shipment, as it lowers the carbon footprint and environmental impact while utilizing alternative sustainable materials that are biodegradable and recyclable (Hao et al., 2019).

**e. Reverse Logistics**

According to Sepúlveda et al. (2017), reverse logistics is a branch of supply chain management that deals with transporting goods from buyers to sellers or manufacturers. After a customer receives a product, reverse logistics are required for processes like returns and recycling. Reverse logistics start with the client and move forward via the supply chain to the manufacturer or the distributor. Reverse logistics can also apply to processes where the client manages the item's ultimate disposal, such as recycling, refurbishment, or reselling. According to Govindan and Bouzon (2018), reverse logistics is the section of supply chains that deals with goods entering the system again or travelling backward through the system. Network design is one of the most significant strategic challenges that may have a long-term impact on the effectiveness of reverse logistics, according to Agrawal et al. (2015). The network would include of remanufacturing, recycling, direct reuse, and secondary markets that would function in tandem, to some extent, to successfully handle reverse logistics processes.

Reverse logistics' green logistics planning for end-of-life products involves reuse, remanufacturing, disassembly, and recycling, among other characteristics of environmentally conscious manufacturing (Sathish & Jayaprakash, 2017). Specifically, this is about exercising control over the production, distribution, and product returns to customers. Distribution returns include functional returns, commercial returns such as erroneous and damaged deliveries, unsold goods, stock adjustments, and product recalls. Manufacturing returns include quality control returns, raw material surplus, and production leftovers. Additionally, according to Hammes et al. (2020), user and customer returns cover warranty claims, service claims for things like spare parts and repairs, reimbursement promises, and end-of-use and end-of-life situations. Redesigning their structures and connections, companies specialising in reverse logistics systems are building a knowledge chain that facilitates and enhances data, knowledge sharing and coordination, decision-making, and planning (Alshamsi & Diabat, 2015).

**f. 2.6 Social Sustainability**

The ability of an organisation to exist without having a negative influence on people's quality of life, economic prospects, societal conditions, or the environment is a crucial component of its long-term sustainability (Kaur & Sharma, 2017). However, the concept of social sustainability lacks a consensus on specific goals to be achieved, both in literature and in practice (Boyer, Galbreth, & Evers, 2016). It involves identifying and managing the positive and negative impacts that businesses have on various stakeholders, such as suppliers, customers, employees, and local communities (Kumar & Anbanandam, 2019). Maintaining strong relationships and actively engaging with stakeholders is crucial for companies as they directly or indirectly influence the wellbeing of employees, workers in the value chain, customers, and local communities (Kumar & Anbanandam, 2019).

Expanding the scope of social sustainability beyond an organization's daily operations is important, encompassing different segments and channel partners across the supply chain and involving trading partners in the societies they operate (Schönborn & Zimmermann, 2019). Key areas for assessing social sustainability include health, safety, human rights, labor issues, community initiatives, and employment benefits (Eizenberg & Jabareen, 2017). Organizational performance should include social performance, which entails providing a healthy work environment, demonstrating social commitment, offering education and training, and investing in human resources development (Chien, 2014). Social sustainability seeks to meet basic human needs while preserving nature's regenerative abilities, benefiting individuals, society, and organizations (Bhamu & Singh Sangwan, 2014; Ross, 2015). Social sustainability helps to create sustainable and affluent communities by developing the physical and social infrastructure that supports social and cultural life, citizen involvement, and the evolution of people and places (Missimer et al., 2017).

**B) Theoretical Framework**

The institutional and triple bottom line theories serve as the foundation for this investigation. Institutional theory is centred on the variety of institutions that are responsible for external and internal pressures on the organisation as well as the
corresponding organisational responses that have been established within each business. Institutional theory is well adapted to explain the factors related to organisational supply because of the nature of green logistics management practice. In addition, the triple bottom line theory is a useful tool for evaluating sustainable business practices and green logistics. The concepts of sustainability, as measured in the three dimensions of social, economic, and environmental, are primarily associated with triple bottom line approach and their varied expectations. Institutional theory posits that organizations are influenced by their external environment, including the norms, values, and expectations of their stakeholders (Lok, 2019).

According to this hypothesis, businesses will implement green logistics strategies in response to demand from their stakeholders, including clients, government officials, and nongovernmental organisations (NGOs), who are becoming more concerned about environmental sustainability. Green logistics practices might involve lowering carbon emissions through the use of cleaner transportation, optimising packaging to reduce waste, and utilising renewable energy sources in the context of Fast-moving Consumer Goods (FMCG) companies. In order to achieve sustainable development, the triple bottom line theory places a strong emphasis on striking a balance between social, environmental, and economic performance. According to this notion, businesses should work to balance these three aspects of sustainability throughout all aspects of their operations, including their logistics strategies (Svensson, 2018). This means that in the context of FMCG companies, green logistics practices should not only minimise negative environmental effects but also boost social and economic benefits. Utilising electric vehicles as a means of transportation, for instance, can lower carbon emissions and air pollution while simultaneously enhancing community health and well-being and lowering operational costs.

C) Conceptual Model

![Conceptual Model](image)

Source: Researcher's Conceptual Model (2023)

### III. RESEARCH METHODOLOGY

With a quantitative research methodology, this study adhered to the positivist research ethic. This study used a survey research design using a well-structured, self-administered questionnaire to collect primary data. 13,783 workers from Bua Foods Plc, Cadbury Nigeria Plc, Flour Mills Nigeria Plc, Honeywell Flour Mill Plc, Dangote Sugar Refinery Plc, Nascon Allied Industries Plc, PZ Cussons Nigeria Plc, and Unilever Nigeria Plc made up the study's population. The aforementioned fast-moving consumer goods businesses that operate in Lagos State, provide food and hygiene items, and are listed on the Nigerian Stock Exchange were chosen for the study. The companies were considered for the study because of their involvement in the green logistics activities, in procurement, manufacturing, packaging, transportation, reverse logistics, waste management, warehousing and sustainability (Okunuga et al., 2022; Ogunlale, 2018). Lagos State was considered for the study due to its industrial nature, a cosmopolitan city, and the commercial centre of Nigeria. (Ukah et al., 2019). The study made use of Taro-Yamane sample size determination formula to determine the of 519. The formula was applied at 95% confidence interval and 5% margin error. The justification for using Taro Yamane is because the researcher is working with a known population. The Yamane formula is commonly used in a special case of the Finite Population Correction Factor (Stamatopoulos, 2022). In order to choose the sample for analysis, the study used a straightforward random sampling procedure.

To assess the appropriateness and comprehension of the study questions, a pre-test of the questionnaire was completed. Employees of Nestle Food Agbara, Ogun State, were used in the study. The reason for choosing Nestle Foods is because it
represents same fast moving consumer goods industry the researcher targeted, but it is located outside the research area which is Lagos State. A total of 52 questionnaire representing 10% of the sample size was distributed, forty-five copies of the questionnaire were returned, and the reliability of the research instrument was tested using Statistical Package for Social Sciences (SPSS).

Table 1: KMO and Bartlett’s Test of Sphericity

<table>
<thead>
<tr>
<th>Variables</th>
<th>No of Items</th>
<th>KMO</th>
<th>Bartlett’s Test</th>
<th>Sig</th>
<th>Average Variance Extracted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Procurement</td>
<td>5</td>
<td>0.870</td>
<td>185.195</td>
<td>0.000</td>
<td>0.627</td>
</tr>
<tr>
<td>Green Production</td>
<td>5</td>
<td>0.823</td>
<td>120.721</td>
<td>0.000</td>
<td>0.688</td>
</tr>
<tr>
<td>Green Transportation</td>
<td>5</td>
<td>0.768</td>
<td>67.582</td>
<td>0.000</td>
<td>0.647</td>
</tr>
<tr>
<td>Green Packaging</td>
<td>5</td>
<td>0.793</td>
<td>171.539</td>
<td>0.000</td>
<td>0.746</td>
</tr>
<tr>
<td>Reverse Logistics</td>
<td>5</td>
<td>0.800</td>
<td>104.496</td>
<td>0.000</td>
<td>0.635</td>
</tr>
<tr>
<td>Social Sustainability</td>
<td>5</td>
<td>0.812</td>
<td>128.831</td>
<td>0.000</td>
<td>0.692</td>
</tr>
</tbody>
</table>

Source: Research Study (2023)

To make sure the research tool is accurate, it underwent validity testing. While Sampling Adequacy was assessed using KMO and the Bartlett sphericity test, Construct Validity was statistically assessed using average variance extract (AVE). The questions appeared to have tested the variables in the sample because the KMO values were larger than 0.5. When assessing the variables under examination, the Bartlett test of sphericity yielded a result of 0.000, or less than 5%, which shows that there is a highly significant link between the variables.

Table 2: Internal Consistency Reliability Result

<table>
<thead>
<tr>
<th>Variables</th>
<th>No of Items</th>
<th>Cronbach’s Alpha</th>
<th>Composite Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Procurement</td>
<td>5</td>
<td>0.933</td>
<td>0.894</td>
</tr>
<tr>
<td>Green Production</td>
<td>5</td>
<td>0.886</td>
<td>0.917</td>
</tr>
<tr>
<td>Green Transportation</td>
<td>5</td>
<td>0.787</td>
<td>0.856</td>
</tr>
<tr>
<td>Green Packaging</td>
<td>5</td>
<td>0.911</td>
<td>0.936</td>
</tr>
<tr>
<td>Reverse Logistics</td>
<td>5</td>
<td>0.850</td>
<td>0.895</td>
</tr>
<tr>
<td>Social Sustainability</td>
<td>5</td>
<td>0.882</td>
<td>0.918</td>
</tr>
</tbody>
</table>

Source: Researcher’s Field Survey (2023)

All of the study variables have Cronbach’s Alpha coefficients over 0.70, which indicated that the instrument employed for evaluation was quite reliable. As a result, the researcher declared that the study tool to be employed was trustworthy.

Model Specification

\[ Y = f(X) \]

Y = Dependent Variable
X = Independent Variable

Where:

\[ Y = \text{Social Sustainability (FSus)} \]
\[ X = \text{Green Logistics Practices (GLP)} \]

\[ X = f(x_1, x_2, x_3, x_4, x_5) \]

Where:

\[ x_1 = \text{Green Production (GP)} \]
\[ x_2 = \text{Green Procurement (Gproc)} \]
\[ x_3 = \text{Green Transportation (GT)} \]
\[ x_4 = \text{Green Packaging (GPkg)} \]
\[ x_5 = \text{Reverse Logistics (RL)} \]

Where:

\[ Y = \text{Social Sustainability (SS)} \]

Regression Equation

\[ SS = \beta_0 + \beta_1 GP + \beta_2 Gproc + \beta_3 GT + \beta_4 GPkg + \beta_5 RL + \mu \]

Regression equation 1
A) Analysis, Results and Discussion of Findings

The researcher ran pre-diagnostic tests on the gathered data to make sure the key hypotheses behind regression analysis were met. These tests evaluated multicollinearity, homoscedasticity, linearity, and normality. The researcher gave out 519 copies of the questionnaire to the respondents, and 502 of those copies were duly completed, returned, and used in the study. According to Johnson and Wislar (2012) and Mugenda and Mugenda (2012), who both stated that a response of above 60% is generally accepted as a threshold for survey quality in the social sciences, this represents a response rate of approximately 96.7% of the population used in the study. This is regarded as an excellent response rate.

Table 1: Summary of multiple Regression of green logistics practices and financial sustainability of selected consumer goods firms in Lagos State, Nigeria.

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Sig.</th>
<th>T</th>
<th>ANOVA (Sig.)</th>
<th>R</th>
<th>Adjusted R²</th>
<th>F (5,496)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>3.561</td>
<td>.000</td>
<td>6.386</td>
<td>0.350b</td>
<td>0.106a</td>
<td>0.001</td>
<td>1.117</td>
</tr>
<tr>
<td>Green production</td>
<td>-0.083</td>
<td>.641</td>
<td>.467</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green procurement</td>
<td>0.006</td>
<td>.938</td>
<td>.078</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green transportation</td>
<td>0.159</td>
<td>.123</td>
<td>1.543</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green packaging</td>
<td>0.005</td>
<td>.949</td>
<td>.064</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reverse logistics</td>
<td>0.058</td>
<td>.095</td>
<td>1.675</td>
<td></td>
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</tbody>
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Predictors: (Constant), Green Production, Green Procurement, Green Transportation, Green Packaging, Reverse Logistics.

Dependent Variable: Financial Sustainability

Source: Researcher's Findings, 2023

B) Interpretation

Table 1 shows the multiple regression analysis results for the green logistics practices components on financial sustainability of selected fast moving consumer goods firms in Lagos State, Nigeria. The results showed that green procurement (β = 0.006, t = 0.78, p>0.05), green transportation (β = 0.159, t = 1.543, p>0.05), green packaging (β = 0.005, t = 0.064, p>0.05) and reverse logistics (β = 0.058, t = 1.675, p>0.05) all have positive and insignificant effect on financial sustainability of selected fast moving consumer goods firms in Lagos State, Nigeria while green production (β = -0.083, t = 0.467, p>0.05) showed a negative and insignificant effect on financial sustainability. This suggests that the components that drive the financial sustainability of fast-moving consumer goods companies’ green production, green procurement, green transportation, green packaging, and reverse logistics are not particularly significant.

This conclusion is supported by the R value of 0.106, which shows that certain fast-moving consumer goods companies in Lagos State, Nigeria, have a marginally favourable association with their financial sustainability. The coefficient of multiple determination Adj R² = 0.001 indicates that about 0.1% of the variation that occurs in the financial sustainability in selected fast-moving consumer firms can be accounted for by the green logistics practices while the remaining 99.9% changes that occurs are accounted for by other variables not captured in the model. The predictive multiple regression models are thus expressed:

\[ FS = 3.561 + 0.006GP + 0.159GProc + 0.005GT + 0.058Gpkg + U_i \]  --Eqn (i) (Predictive Model)

Where:
- FS= Financial sustainability
- GP = Green Production
- GProc = Green Procurement
- GT = Green Transportation
- GPKG = Green Packaging
- RL = Reverse Logistics

According to the regression model, financial sustainability would be 3.561, which is a positive number, if green logistics practises were held constant at zero. The management of the organisation can minimise these variables because it is evident from the predictive model that they are all unimportant, which is why they are not included in the prescriptive model. According to the results of the multiple regression analysis as seen in the prescriptive model, when all other green logistic practises (green procurement, green transportation, green packaging, and reverse logistics) are improved by one unit, financial sustainability would also increase by 0.006, 0.159, 0.005, and 0.058 respectively, and vice versa. This suggests that increasing green transportation, packaging, reverse logistics, and green procurement may boost the financial viability of particular fast-moving consumer goods companies in Lagos State, Nigeria.
Also, the F-statistics (df = 5, 496) = 560.928 at p = 0.000 (p>0.05) indicates that the overall model is insignificant in predicting the effect of green logistics practices on financial sustainability of selected fast moving consumer goods firms in Lagos State, Nigeria. The result suggests that such fast moving consumer goods firms should down play the variables. Therefore, the null hypothesis (H0) which states that green logistics practices have no significant effect on financial sustainability of selected fast moving consumer goods firms in Lagos State, Nigeria was not rejected.

C) Discussion of Findings

The results of the multiple regression analysis combined for hypotheses two demonstrated that green logistics practices (green production, green procurement, green transportation, green packaging, and reverse logistics) have a positive and negligible impact on the financial sustainability of particular fast-moving consumer goods firms in Lagos State, Nigeria. (Adj. R2 = 0.106; F (1,117) = 560.928, p > 0.05). As a result, no significant difference could be seen between the independent sub variables when forecasting the financial sustainability of a few chosen fast-moving consumer goods enterprises in Lagos State, Nigeria.

Empirically, the findings of the study were consistent with those of Khan and Dong (2017), who investigated the effects of green supply chains on the economic and environmental performance of manufacturing enterprises in developing nations of Asia, particularly Pakistan. They discovered that a company's profitability suffers as a result of green purchasing. Similar findings were found in Agyabeng-Mensah et al. (2020), who found that green storage and logistics optimisation have a negative impact on economic performance but have a positive impact through supply chain sustainability. It is further established that social values and ethics have a favourable impact on the economic performance and sustainability of supply chains.

Additionally, Miroshnychenko et al. (2017) discovered that adopting ISO 14001 has a detrimental effect on a company's financial performance. According to Chou et al. (2017), there is a link between community development expenses and business performance that is unfavourable. Similar findings were made by Zaid et al. (2018) who discovered a bad correlation between green supply chain practises and financial performance in China and Pakistan, respectively. According to Green et al. (2019), green practises enable businesses to win over green consumers, which in turn boosts market value and sales and enhances financial performance.

Contrarily, Baah et al. (2021) found that sustainable logistics practises had a significant impact on both financial performance and environmental reputation. Environmental reputation did not mediate the relationship between financial performance and waste management, but it did partially mediate the relationship between financial performance and sustainable transportation and information sharing, and it fully mediated the relationship between reverse logistics, sustainable packaging and distribution, and green monitoring and evaluation. Additionally, Osman et al. (2022) discovered that consumers are increasingly asking for green transport and are often willing to pay slightly more for it. Zhang et al. (2018) investigated the relationship between green logistics and economic development and growth in the setting of industrialised countries. The research showed that the logistics sector is essential to enhancing and elevating a nation's economic growth. Search engine optimization (SEO) has a direct, considerable positive impact on social and environmental performance, but not financial success, according to Afum et al.'s findings from 2021. However, SEO frequently has a major impact on all sustainability performance elements, including environmental, financial, and social performance, through sustainable supply chain management.

Accordingly, Sroufe and Gopalakrishna-Remani (2018) discovered in their research that green supply chain practises improve financial performance by allowing a company to access the global market, which boosts sales and market share. In addition, green supply chain practises boost market share, improve brand perception, draw in potential customers, increase net income, and reduce cost of sales (Laari et al. 2018). Aldakhil et al. (2018) did a panel study to look into the factors that influence green logistics practises in BRICS member states. The results demonstrated a significant correlation between sustainable economic and environmental growth and green practises in logistics operations. To investigate the effect of logistics performance on macroeconomic and environmental indices, Khan et al. (2018) conducted empirical research on developed countries in Europe. The findings demonstrated that while strong performance in logistics promotes national economic expansion, it has a detrimental impact on the sustainability of the environment in terms of air pollution, climate change, and global warming. According to a 2017 study by Khan and Dong, superior logistical performance is significantly correlated with both high trade volume and per capita income.

Agyabeng-Mensah et al. (2020) also looked into the relationship between green warehousing and economic performance. The findings demonstrated that supply chain sustainability enhances economic performance but green warehousing and logistics optimisation had a negative impact. Similar to this, research by Migdadi and Elzzqaibeh (2018) revealed three key clusters of green manufacturing strategies: the agile environment, the caretaker environment, and the lean
environment. Agile strategic group's performance ranges from high to moderate; caretaker and lean group's performance, however, was somewhat low. Each strategic group adopted a unique set of perfectly matched green actions and performance metrics. The majority of prior studies did not address significant actions and performance indicators in detail, and the majority of prior studies did not cluster or group manufacturing companies based on green key performance indicators. This is one of the first studies to report the green manufacturing strategic patterns in the Middle East. Agyabeng-Mensah et al.'s results from 2020 also showed that Green Logistics Management Practices (GLMPS) had a good impact on both social and environmental sustainability. GLMPS, however, had a detrimental effect on corporate performance. The findings also showed that with the use of the mediation effect technique, logistics eco-centricity and supply chain traceability augment GLMPS to significantly increase both company performance and environmental sustainability.

Khan and Dong (2017) carried out research to examine the effects of green supply chains on the economic and environmental performance of manufacturing firms in developing nations of Asia, particularly Pakistan. They discovered a strong positive association between green practices and environmental performance, including green product design, customer interaction, green raw material and component sourcing, and green transportation and distribution. Green business practices, particularly green purchasing, hurt a company's profitability. Khan and Dong (2017) investigated the effects of green supply chain and logistics practices on the financial and environmental performance of businesses. According to the findings, adopting green business practices increases customer happiness and trust, boosts operational efficiency, and promotes environmental sustainability by lowering carbon emissions and solid waste. In China and Pakistan, respectively, Feng et al. (2017) and Zaid et al. (2018) discovered a bad link between green supply chain practices and financial performance.

IV. CONCLUSION AND RECOMMENDATION

The study looked at how certain FMCG companies in Lagos State, Nigeria, may improve their social sustainability by using green logistics practices, including green production, green sourcing, green transportation, green packaging, and reverse logistics. According to the empirical findings, green logistics techniques are an essential component in boosting social sustainability among FMCG companies in Lagos State, Nigeria. Based on the study's empirical findings, it was determined that green logistics techniques are essential for boosting social sustainability among FMCG companies in Lagos State, Nigeria. By implementing these practices, FMCG firms can reduce their environmental impact, support sustainable supply chains, mitigate transportation-related pollution, promote eco-friendly packaging, and manage waste effectively. These actions contribute to creating a more socially sustainable business environment in Lagos State.

This work has added to our understanding of sustainable logistics in a number of ways. In order to improve the social sustainability of FMCG companies in Lagos State, Nigeria, the study has underlined the significance of green logistics practices. According to the study's findings, green logistics techniques can greatly increase social sustainability, making them an important component of a company's overall sustainability strategy. Also, the study has identified the specific green logistics practices that are most effective in enhancing sustainability performance. The study offers insightful information on the best practices for businesses to adopt green logistics practices and improve their sustainability performance by looking at the effects of green production, green procurement, green transportation, green packaging, and reverse logistics on social sustainability. In addition, the study has provided empirical proof of the link between sustainable performance and green logistics practices in the context of FMCG companies in Lagos State, Nigeria. Managers and politicians in the area can use the study's findings to create more effective sustainability policies that put emphasis on eco-friendly logistics practises.

The study was conducted in a specific context (Lagos State, Nigeria) and focused on a specific industry (FMCG). As such, the findings may not be generalizable to other industries or contexts. Additionally, a sample of eight FMCG companies in Lagos State served as the study's foundation. Also, while the sample size is reasonable for a qualitative study, it may not be sufficient for drawing generalizable conclusions about the population of FMCG firms in Lagos State. Future studies could replicate this research in other contexts or industries to determine whether the findings are generalizable.

V. REFERENCES


Boyer, R. H., Peterson, N. D., Arora, P., & Caldwell, K. (2016). Five approaches to social sustainability and an integrated w...


