

Drivers and Barriers to Sustainable Supply Chain Management in Nigeria's Logistics Sector: A Qualitative Study

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Abstract: *This study critically evaluates the drivers and barriers influencing sustainable supply chain management (SSCM) adoption in Nigeria's logistics sector and examines how implementation varies across sectoral and geographical contexts. Guided by Stakeholder Theory and the Triple Bottom Line framework, the study adopted an interpretivist qualitative case-study design. Semi-structured interviews were conducted with 10 purposively selected supply-chain professionals and managers involved in sustainability-related decisions in Nigerian logistics firms, and the data were analysed using thematic analysis. The findings identified four principal drivers of SSCM adoption: customer and international-client pressure, regulatory and certification requirements, operational efficiency and cost savings, and competitive and reputational advantage. However, implementation was constrained by high initial investment costs, limited access to finance, inadequate in-house sustainability expertise, resistance to organisational change, cost-focused industry norms and weak regulatory enforcement. The study also revealed uneven adoption across contexts. Urban and export-oriented firms benefited from better infrastructure, closer links to global markets and stronger sustainability pressure, whereas rural operations faced higher structural costs, weaker infrastructure and fewer enabling conditions. Overall, SSCM adoption was strongest where stakeholder pressure, a credible business case and organisational capability were supported by an enabling institutional and infrastructural environment. The study recommends phased implementation, targeted capacity building, collaborative investment, improved access to green finance and stronger regulatory incentives to accelerate sustainable logistics practices in Nigeria.*

Keywords: Sustainable supply chain management; logistics; Nigeria; sustainability adoption; emerging economies

1. Introduction

Sustainable supply chain management (SSCM) extends conventional supply-chain decision making beyond cost, quality and service by explicitly integrating environmental, social and economic considerations. There is a growing focus on this orientation in logistics as the choice of transport, warehousing and distribution affects fuel consumption, emissions, resource consumption and waste over the entire supply chain. Meanwhile, sustainability is not just a compliance issue anymore, it has a direct effect on customer loyalty, access to global value chains, operating efficiency and corporate legitimacy (Saeed and Kersten, 2019; Jabbour et al., 2020; Santiago et al., 2023).

The transition is particularly demanding in emerging economies. Most of the businesses are pushed to conform to international regulations in a context where they have access to limited green finance, uneven infrastructure, inadequate skills and regulatory frameworks that are not equally enforced. Research therefore cautions against the assumption that SSCM practices developed in well-established institutional contexts will transfer unchanged to developing markets (Dai et al., 2021; Jazairy and von Haartman, 2020; Luthra and Mangla, 2018). In these contexts, sustainability adoption is likely to depend not only on formal regulation but also on customer expectations, firm capacities and the strength of the business case.

Nigeria offers a good illustration of these conflicts. Operating in a setting where transport and energy shortages can drive up logistics costs, while urbanisation, global trade agreements and eco-conscious business buyers might drive a demand for more environmentally friendly logistics operations. The thesis

underpinning this article revealed that there exists an empirical problem as follows, although SSCM offers efficiency, reputation, and competitiveness benefits, Nigerian logistics companies experience financial, technical, organisational and institutional challenges that can hinder or even delay the implementation of SSCM.

This article therefore asks four related questions: what motivates Nigerian logistics companies to adopt SSCM; what barriers impede implementation; how does adoption vary across sectoral and geographical contexts as perceived by logistics professionals; and what strategies can improve integration? Rather than treating drivers and barriers as separate lists, the article develops an integrated interpretation. It argues that SSCM adoption is strongest where three conditions coincide: meaningful stakeholder pressure, sufficient organisational capability, and an enabling operating context. Where one of these conditions is weak, adoption becomes selective, delayed or largely compliance-oriented.

The study has three contributions. First, it offers qualitative evidence of practitioners who are directly engaged in logistics and supply-chain decision-making process in Nigeria. Second, it demonstrates the adoption paradox, which is that practices that are most likely to be efficient and cost-saving over the long-term often involve significant capital expenditures that are hard for many, particularly small-scale firms, to afford. Thirdly, it recognizes a two-speed sustainability transition. Sustainability expectations seem to be higher for urban and export-oriented firms and the enabling infrastructure seems to be stronger for these firms, while the expectations for sustainability and enabling infrastructure for firms that serve more local or infrastructure-constrained markets are weaker and more expensive to implement,

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respectively. These observations deepen the contextual interpretation of SSCM in emerging economies.

2. Literature Survey

2.1 Theoretical foundations

Stakeholder theory and the Triple Bottom Line (TBL) offer complementary lenses for interpreting SSCM. According to stakeholder theory, the interests of a company extend beyond the shareholders, and include customers, employees, suppliers, regulators, communities, and business partners (Freeman and Dmytriiev, 2017). This is important in supply chains, as sustainability performance is jointly produced: a focal firm can define the sustainability targets, but carriers, suppliers, financiers, customers and public institutions are also required to reach the desired result. Stakeholder pressure can therefore act as a catalyst, but its influence will vary with stakeholder power and the firm's dependence on particular relationships.

The TBL framework shifts attention from a single financial objective towards the simultaneous pursuit of economic, environmental and social value (Santiago et al., 2023; Laosirihongthong et al., 2020; Ribeiro et al., 2022). For logistics companies, this could be a cut on fuel consumption and emissions, resource-efficient warehouses, responsible employees and sustainable and profitable business activities. The value of TBL in this study is analytical, not just normative: it makes visible whether firms are balancing the three dimensions or privileging the elements that are easiest to measure and monetise. The economic argument can be particularly strong in emerging-economy contexts where sustainability investments must contend with pressing short-term operating needs.

2.2 Drivers of SSCM

Previous studies reveal that regulation is one of the key determinants in SSCM. Environmental rules and certification requirements, as well as buyer standards, can set minimum standards and decrease uncertainty regarding acceptable practice (Saeed and Kersten, 2019; Dai et al., 2021; Jasmi and Fernando, 2018; Foerstl et al., 2015). However, the impact of regulation depends on the enforcement of the rules. In the absence of strong domestic enforcement, international certification and buyer standards can to some extent replace domestic pressure, particularly for companies connected to multinational clients or export markets. This creates the possibility of uneven adoption within the same national context.

Another key mechanism is market demand. The expectations from customers have significantly increased as many demand for evidence of responsible sourcing, carbon management and environmentally preferable delivery practices. Sustainability can then serve as a tool to establish reputation, loyalty and opportunities for environmental-conscious clients as relationships (Gong et al., 2019; Jabbour et al., 2020). However, market pressure is not uniform. Cost-sensitive customers may prioritise price and delivery performance over environmental attributes, reducing the commercial incentive for suppliers to make costly sustainability investments.

A third group of drivers is related to operational & financial performance. The cost reduction and enhancement of environmental performance can be achieved through route optimization, energy saving, and waste reduction while effectively utilizing resources (Tseng et al., 2019; Wang and Dai, 2018; Esfahbodi et al., 2016). This alignment between sustainability and efficiency is strategically crucial and places sustainability as a central and key facet in SSCM, transforming it from a social initiative to an operational ability. Nevertheless, the literature also points to a timing problem: benefits may accumulate over the medium or long term while acquisition, training and infrastructure costs occur immediately.

2.3 Barriers and contextual constraints

The barrier literature reinforces this tension.

Some research has shown that high initial costs, lack of financial support, and lack of certainty of returns are among the factors that deter from implementing SSCM especially in small businesses (Sajjad et al., 2015; Moktadir et al., 2018; Kouhizadeh et al., 2021; Gonçalves et al., 2024). Capability constraints compound the financial problem. Companies can also have a shortage of employees who are capable of creating sustainability metrics, assessing technologies, understanding certification requirements or coordinating implementation among supply-chain partners (Luthra et al., 2016; Luthra and Mangla, 2018). The reliance on external consultants then can further add to the cost of implementation.

Organisational resistance is also very important factor. New sustainability processes can be seen as expensive, disruptive and as low priority as core processes for employees and managers, particularly when current incentives are geared towards immediate cost cuts (Nejati et al., 2017; Narayanan et al., 2019). Differences in goals between the logistics provider, suppliers and customers can also be a barrier during the implementation process at the inter-organisational level. Thus, SSCM needs to be coordinated, trusted and shared based on standards rather than isolated firm-level action. These coordination costs can be lowered by Industry Associations, Public-Private Partnerships and Knowledge Sharing Networks (Suryanto et al., 2018; Raut et al., 2017).

Taken together, the literature suggests that neither pressure nor capability alone is sufficient. In the presence of strong external demands, some firms may give symbolic compliance if they lack the finance and expertise, and some firms may practice underinvestment if customers and regulators do not value sustainability. The present study uses this tension as the basis for interpreting practitioner evidence from Nigeria rather than assuming a universal hierarchy of drivers and barriers.

3. Problem Definition

Despite a growing international SSCM literature, there is a dearth of evidence at the contextual level on the interplay between sustainability pressures, organisational constraints and operating conditions as experienced by logistics companies in Nigeria. The available literature either focuses on a general sample of emerging economies or studies sectors whose production technologies and stakeholder interfaces

differ from logistics. Logistics is distinctive because fuel-intensive transport, fragmented infrastructure, warehousing requirements and dependence on multiple external partners can make sustainability both operationally consequential and difficult to implement.

The empirical gap is therefore not simply whether particular drivers and barriers exist, but how they combine in practice. A company may be able to attract demanding international clients, but unable to raise sufficient funds; a company may have managerial ability but local clients value low price as their primary requirement. Geographic location can further alter access to ports, electricity, technology and regulatory scrutiny. Understanding these interactions is necessary for recommendations that are realistic for Nigerian firms rather than imported wholesale from better-resourced settings.

Accordingly, the study critically evaluates the principal drivers and barriers to SSCM within Nigerian logistics companies, examines perceived sectoral and regional variation, and identifies practical strategies for stronger integration. The analysis is exploratory and interpretive; it seeks analytical insight into mechanisms and experiences rather than statistical generalisation.

4. Methodology / Approach

The study adopted an interpretivist research philosophy, a relativist view of organisational reality and an inductive qualitative approach. This orientation was suitable since the research questions focused on how the professionals in the logistic sector understand the motives, constraints and context conditions of SSCM. The qualitative case-study design allowed one to examine these issues in detail rather than testing predetermined causal hypotheses. Participants were purposively selected. The sample included 10 professionals or managers in the logistics companies in Nigeria who participated in the activities or decisions concerning SSCM in the companies. The selection criterion was designed to make sure that the respondents could give experiences accounts and not general opinions. Purposive sampling is consistent with qualitative research where informational relevance and depth are prioritised over population representation (Schreier, 2018).

Semi structured interviews were used to collect data. A typical question list included regulatory pressure, customer demand, cost and efficiency, financial constraints, internal expertise, resistance to change, market norms, geographic conditions and solutions. The semi-structured format ensured the comparability of the results while permitting further questions when the participants raised organisation-specific experiences (Karatsareas, 2022). Interviews were conducted in a manner appropriate to participant circumstances and were recorded with consent for transcription and analysis.

The transcripts were analysed thematically. Following the six-phase logic associated with Braun and Clarke, the researcher re-familiarised with the data, developed initial codes, combined codes into candidate themes, examined themes for coherence, clarified and named themes, and integrated themes into final account (Clarke and Braun, 2017; Braun and Clarke, 2021). Coding was aligned to study questions, but remained t

sufficiently inductive to allow patterns to emerge out of participants' reports. Themes were then compared with the theoretical and empirical literature to find confirmations and tensions, as well as context-specific implications. Ethical approval was obtained via the University's ethics process. Participants were provided with information about the study and informed consent was obtained before the interview. In addition, the researcher informed the participants were on their right to withdraw and their identities were protected through anonymisation and secure handling of recordings and transcripts. The article therefore reports respondents only by participant number and omits identifying organisational details.

The design has clear boundaries. The study utilizes a small purposive sample which results in a focus on depth rather than statistical representativeness. Participant's accounts are self-reported, subject to social-desirability and recall biases, and each participant was interviewed only once. In addition, the sectoral comparisons reported below represent logistics professionals' perceptions of other industries rather than observations from an independent manufacturing or retail sample. These constraints are taken into account in the interpretation.

5. Results & Discussion

5.1 Drivers of SSCM adoption

Four interconnected drivers dominated the interviews. First, sustainability decisions are significantly influenced by the customer demand. For instance, Participant 8 observed that "Customers are more and more looking to companies to reflect their values of environmental sustainability." The respondents reported that corporate clients are requesting proof of sustainability performance and, in some instances, carbon related data. It reinforces stakeholder perspective: customers become influential when access to contracts or long-term relationships depends on demonstrating responsible practice (Freeman and Dmytriiev, 2017; Gong et al., 2019). The effect was strongest for firms serving international or sustainability-conscious clients.

Second, regulatory and certification pressures influenced the uptake of SSCM. Participant 10 said that "Government regulations on environmental impact and carbon footprints have led us to review our logistics operations as a result," and Participant 1 pointed out that ISO 14001 is a strong influence in driving environmental responsibilities. The important point, however, is that regulation was experienced unevenly. Several participants frequently distinguished between formal requirements and the strength of domestic enforcement. International standards and client requirements were therefore seen as complementary governance mechanisms, and in line with previous studies which found that global market expectations can compensate partly for institutional gaps (Dai et al., 2021; Jasmi and Fernando, 2018; Foerstl et al., 2015).

Third, operational efficiency provided a tangible business case. Participant 2 explained that "We have achieved to reduce costs while providing the same level of service by improving logistics efficiency and reducing waste." Most of the people interviewed linked route planning, tracking

systems, fuel reduction and efficient resource use with both environmental and economic benefits. This finding is consistent with evidence that SSCM can generate simultaneous cost and environmental benefits (Tseng et al., 2019; Wang and Dai, 2018). It also helps explain why efficiency-oriented sustainability measures may diffuse more readily than initiatives whose returns are harder to quantify.

Fourth, respondents associated sustainability with competitive advantage and reputation. Participant 7 noted that “with the implementation of SSCM, we can better connect with our clients and be a key player in the sustainability market.” Others associated green practices with brand positioning, partner confidence and access to environmentally conscious clients. Competitive advantage therefore functioned as both a direct driver and a mechanism through which customer and regulatory pressures were translated into managerial action. Sustainability was more likely to receive strategic attention when firms could connect it to revenue protection, market access or reputation.

5.2 Barriers to implementation

The most significant barrier was the implementation costs. Participant 9 reported that “The initial costs of sustainable infrastructure can be significant to tight budgets in the short term”, and Participant 10 noted that “there are specific challenges with funding EVs and renewables, particularly for smaller companies”. This presents an adoption paradox. The same technologies that may reduce fuel, energy or waste costs over time can be delayed by the initial capital required to obtain them. The findings are similar to previous studies which examined financial constraints in SSCM and their greater effect on smaller businesses (Sajjad et al., 2015; Moktadir et al., 2018; Kouhizadeh et al., 2021; Gonçalves et al., 2024).

The second barrier was the limited of in-house expertise. Participant 4 reported that “The lack of in-house expertise in sustainability makes it difficult to effectively implement and monitor the SSCM practices.” Participants associated the lack of knowledge with interpretation of standards, choosing the right technology, measuring progress and maintaining efforts after implementation. If companies do need to use outside advisers, then there is also the potential for an expertise problem to become a financial one. This interaction indicates that capacity building is not a peripheral human-resource intervention; it is a core implementation capability.

Thirdly, resistance to change in the organisation impeded change. Participant 6 reported that some employees were against sustainability efforts because they thought it would hinder the way they work. These are aligned with the research that suggests that new environmental procedures can be perceived as burdensome if they disrupt existing procedures or introduce new metrics, or if they do not relate to the immediate operational goals (Nejati et al., 2017; Narayanan et al., 2019). Evidence from interviews indicated that communication and training are therefore needed, but not always sufficient unless there are performance incentives to support the new practices.

Fourth, cost-focused industry norms and coordination failures weakened the incentive to act. Participant 1 noted that most companies in Nigeria prioritise cost reduction and there is little motivation to invest in sustainable practices. Respondents also reported misalignment between firms and supply-chain partners. For instance, the sustainability objective of one company when suppliers, contractors or clients continue to optimise purely for price. This is a key extension of the firm level barrier discussion. SSCM depends on network alignment; isolated investment can be commercially difficult when competitors and partners do not follow comparable standards (Raut et al., 2017; Suryanto et al., 2018).

5.3 Sectoral, geographical and market-context variation

Participants perceived logistics to be slower than some manufacturing and retail contexts in adopting SSCM, this was partly due to the reliance of logistics on fuel intensive transport. For instance, participant 7 stated that transition in the logistics sector is generally lower due to reliance on fuel than in sectors with more flexibility to redesign processes. Retail's perception was different, as there is greater visibility to sustainability pressure from the consumer. These comparisons should be read as practitioner perceptions rather than as direct cross-industry measurement, but they illuminate how technology and customer visibility may condition adoption.

The contrast was no less clear in Geography. Participant 9 talked about the challenges of sustainable practice in rural areas due to poor infrastructure and higher operating costs. Most of the participants mentioned weak roads, unstable power and limited access to relevant technologies as practical constraints. In contrast, Participant 4 reported that Lagos and Abuja were more supportive of SSCM due to the better infrastructure and clients' values on sustainability. This pattern is consistent with the broader proposition that implementation depends on the quality of the enabling environment, not solely on managerial willingness (Moktadir et al., 2018; Luthra and Mangla, 2018).

Proximity to global trading networks amplified stakeholder pressure. Firms providing services to multinational and international clients experienced higher levels of sustainability requirements, transparency expectations and certification standards. In contrast, some respondents indicated that local customers were more likely to prioritise price. This creates a two-speed transition: export-connected firms face stronger incentives to invest and demonstrate compliance, whereas firms concentrated in local, cost-sensitive markets may perceive fewer immediate rewards for the same expenditure.

5.4 Integrated interpretation

The combined findings can be interpreted through a pressure-capability-context model. Stakeholder pressure provides the reason why firms are compelled to act, organisational capability determines whether they will turn intent into routines and investments, and the operating context determines the implementation cost and feasibility. Strong pressure without capability can produce delayed or symbolic

responses. Capability without market or regulatory reward can lead sustainability to lose out to short-term cost priorities. Supportive infrastructure and global market linkages enhance the feasibility and the pay-off of action.

This interpretation also sharpens the TBL analysis. Economic and environmental dimensions were extensively discussed by the respondents: fuel efficiency, waste reduction, emissions-related expectations, technology investment and market access were recurrent themes. Evidence of social sustainability was far less common. The implication is not that social issues are unimportant, but that the practical operationalisation of TBL within the participating firms appears uneven. Therefore, future SSCM programmes should prioritise the workers' welfare and responsible labour and community impacts in addition to measurable environmental and financial indicators, as previously mentioned by Santiago et al. (2023) and by Ribeiro et al. (2022).

5.5 Implementation pathways

The findings point to a sequenced rather than all-at-once implementation strategy. Companies with capital restrictions can start with low-cost solutions that deliver obvious benefits when it comes to the operation of the fleet, such as route optimisation, energy management, waste reduction and simple sustainability measurement, and make larger fleet or infrastructure investments over time. Phasing reduces cash-flow pressure and can generate internal evidence of benefits that supports subsequent investment.

Capacity building is a second priority. Companies need employees that can understand the sustainability standards, choose technologies, gather accurate performance data, and integrate improvements into their day-to-day activities. Training, professional certification, cross-company learning and partnerships with technical institutions can reduce dependence on costly external expertise. Since resistance to change was identified as a significant barrier, there is need for organisations to incorporate capacity programmes that combine technical learning with communication, employee participation and performance incentives.

Third, collaboration can address resource and coordination barriers. Partnerships with investors, development organisations, technology providers, industry peers and government institutions were advocated by the respondents. This can cut down on duplication and clearly define expectations throughout the logistics chain by sharing infrastructure, training and common sustainability standards. Such multi-stakeholder arrangements are consistent with the core insight of stakeholder theory that supply-chain sustainability cannot be produced by one firm in isolation (Freeman and Dmytriiev, 2017; Suryanto et al., 2018).

Finally, policy should improve both incentives and enforcement. Targeted tax relief, concessional finance, grants or other support mechanisms could lower the cost of approved sustainability investments, particularly for smaller firms. At the same time, clearer standards and more consistent enforcement would reduce the competitive disadvantage faced by early adopters when less sustainable competitors can operate at lower short-term cost. Infrastructure investment

outside major urban centres is equally important if the regional sustainability gap is too narrow.

6. Conclusion

This study critically evaluated the drivers and barriers shaping SSCM adoption in Nigeria's logistics sector using qualitative evidence from 10 supply-chain professionals and managers. The study findings indicate that customer and international client pressure, regulations/certifications, operational efficiency, and cost savings/competitive positioning are drivers of adoption. These drivers demonstrate that sustainability is increasingly connected to core business performance rather than being treated only as a corporate-responsibility activity.

However, implementation remains constrained by high upfront cost, lack of specialised knowledge, potential organisational change obstacles, and cost-driven industry standards and inconsistent regulation standards. Crucially, these barriers interact. A company may have the business case for going green in the long-term and yet not have the financial resources to make the up-front investment; another company may have the commitment but their partners or customers may not see the value in the extra cost. SSCM therefore cannot be explained adequately by a simple inventory of independent drivers and barriers.

The article's central interpretation is that adoption depends on the alignment of stakeholder pressure, organisational capability and operating context. Internationally connected and urban companies seem to be in a better position, as they are subject to higher sustainability demands and they are relatively better equipped with infrastructure. The structural cost and market signals are higher for those who operate in a rural and locally oriented way. This two-speed pattern suggests that uniform policy or managerial prescriptions will be insufficient.

Based on the evidence, the following practices are suggested for practice: Phased investment, focused capability development, industry collaboration and strengthened public incentives and enforcement. For theory, the stakeholder theory can be used to explain how the level of pressure is different for each customer, regulator and partner and the TBL lens demonstrates that the environmental and economic aspects are currently more prevalent in the participants' account than social sustainability. A more mature SSCM transition in Nigeria will therefore require not only greener technologies but also stronger institutions, coordinated networks and a more balanced treatment of people, planet and profit.

7. Future Scope

Future research should examine the pressure capability-context interpretation of larger and more varied samples. The suggested sectoral differences by the present respondents could be evaluated rather than inferred if a multi-sectoral design was adopted that would allow direct recruitment of participants from logistics sector, manufacturing sector and retail sector. Similarly, stratified studies across Nigeria's

regions could distinguish the effects of infrastructure, market access and local regulatory capacity.

Longitudinal research would be particularly valuable because many SSCM investments involve a mismatch between immediate cost and delayed benefit. Before and after analyses of a firm's performance and emissions would determine the results over time of financial performance and employee acceptance, and customer retention. Mixed-method designs could combine interviews with objective indicators such as fuel intensity, energy consumption, delivery efficiency and sustainability investment.

A further priority is the role of emerging technologies. Enhancing the traceability, measurement and coordination with blockchain, Internet of Things applications, analytics and other digital tools can have an impact on the traceability, measurement and coordination, but can also exacerbate capital and skills barriers (Kamble et al., 2023; Jabbour et al., 2020). Future studies should therefore examine not only whether such technologies improve sustainability outcomes, but which firms can access them, what complementary capabilities are required and whether digitalisation reduces or widens the two-speed transition identified here. Research should also give greater attention to social TBL outcomes so that SSCM performance is not reduced to cost and environmental metrics alone.

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