Sarcouncil Journal of Entrepreneurship and Business Management

ISSN(Online): 2945-3720

Volume- 05| Issue- 11| 2026

Research Article **Received:** 10-10-2026 | **Accepted:** 05-11-2026 | **Published:** 19-11-2026

The Role of Green Supply Chain Management in Enhancing Global Trade Competitiveness

Sheikh Jahid Hasan Prince[1], Rubayet Yeasir Mustafa[2], Faysal Ahmed[3], Kazi Mohammad Shamsul Hoq[4] and Mazedul Hoque[5]

[1]*Department of Management, University of Dhaka, Dhaka, Bangladesh.*
[2]*Department of Loans and Advance, BASIC Bank PLC, Dhaka, Bangladesh.*
[3]*Department of Marketing Analytics & Insights, Wright State University, Dayton, USA.*
[4,5]*Department of Logistics & Supply Chain Management, Wright State University, Dayton, USA.*

Abstract: Global trade is increasingly shaped by environmental requirements, resource constraints, climate-related risks, digital transparency, and changing expectations from buyers and regulators. Within this environment, green supply chain management (GSCM) has developed from a narrowly environmental initiative into a strategic approach for coordinating purchasing, production, logistics, information, product development, reverse flows, and supplier relationships. This paper examines, through a literature-based analytical approach, how green supply chain practices can strengthen global trade competitiveness. The analysis concentrates on green purchasing, eco-design, cleaner production, green logistics, supplier collaboration, environmental information systems, circular practices, and reverse logistics. Existing literature indicates that these practices can influence competitiveness through several interconnected mechanisms, resource efficiency, cost control, innovation, quality improvement, risk reduction, regulatory readiness, market access, reputation, and resilience. The paper further argues that competitiveness should not be interpreted only as lower production cost. In international markets, the ability to demonstrate environmental responsibility, traceability, reliable delivery, product conformity, and adaptability increasingly contributes to a firm's capacity to enter and retain foreign markets. The review also identifies implementation barriers, including initial investment, supplier capability gaps, data limitations, fragmented standards, and the risk of greenwashing. A conceptual framework is proposed in which GSCM practices affect global trade competitiveness through operational efficiency, environmental performance, innovation, resilience, and market legitimacy. The paper concludes that green supply chain management can become a strategic trade capability when environmental objectives are integrated with purchasing, operations, logistics, digital systems, and international market strategy rather than treated as an isolated compliance activity.

Keywords: Green Supply Chain Management, Global trade, Competitiveness, Green purchasing, Eco-Design, Green logistics, Sustainability, Supply Chain Resilience, Environmental Performance.

INTRODUCTION

Sustainable development has moved from the margins of business discussion toward the center of strategic decision-making. Organizations operating across borders now face a combination of environmental pressure, volatile resource prices, climate-related disruption, regulatory expectations, and increasingly informed customers. These pressures are especially important for supply chains because environmental impacts are distributed across suppliers, manufacturers, transport providers, warehouses, retailers, and end users. Green supply chain management therefore provides a means of connecting environmental responsibility with the operational decisions through which international trade is actually performed. Green supply chain management extends conventional supply chain management by incorporating environmental considerations into the movement and transformation of materials, information, products, and financial resources(Xu *et al*., 2022). The concept includes activities such as environmentally responsible purchasing, supplier assessment, eco-design, cleaner production, energy efficiency, waste reduction, green transportation, reverse logistics, and recycling. Srivastava described GSCM as a broad field linking environmental thinking with supply chain management, while later studies have examined how individual practices influence organizational performance. Earlier empirical work has provided evidence that green purchasing, green information systems, eco-design, and other GSCM practices can be associated with environmental, operational, and economic performance(Xuan Hung Nguyen, Quang Son Nguyen, Mai Huong Le, Phuong Dung Nguyen, Trong Hieu Do, Van Hop Vu, 2022). examined multiple GSCM practices and organizational performance, while (Fang & Zhang, 2018) and (Bekele & Bogale Abegaz, 2024) investigated internal and external GSCM practices. Research in different industrial contexts has reported positive links between green practices and operational outcomes, although the strength of individual relationships varies by sector, country, organizational capability, and measurement approach. A later systematic review and meta-analysis likewise found that the relationship

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

***Corresponding Author:** Sheikh Jahid Hasan Prince

DOI-https://doi.org/10.5281/zenodo.24362868

between GSCM practices and performance is meaningful but dependent on the type of practice and the performance dimension being examined (Wiredu *et al*., 2024). This distinction is central to interpreting evidence across countries and industries. The present study builds on this body of literature but changes the central lens from organizational performance alone to global trade competitiveness. Competitiveness is considered here as the ability of firms and supply networks to create and deliver value in international markets while maintaining cost efficiency, quality, reliability, regulatory conformity, innovation capacity, and resilience. The purpose is not to claim a universal causal effect from GSCM, because the reviewed literature contains different methods and contexts. Instead, the study synthesizes recurring mechanisms through which green supply chain practices may improve the international competitive position of firms. The paper has five principal objectives (Wang *et al*., n.d.). First, it explains the major dimensions of GSCM relevant to international business. Second, it reviews how these practices influence cost, quality, innovation, environmental performance, resilience, and market legitimacy. Third, it examines the specific connection between GSCM and global trade competitiveness. Fourth, it identifies barriers that may prevent environmental initiatives from becoming competitive capabilities. Fifth, it proposes an integrated conceptual framework for future empirical research (Veljković *et al*., 2022).

LITERATURE REVIEW

Supply chain management traditionally emphasizes coordination among organizations so that materials, products, information, and services reach the required location at the required time and cost. GSCM adds an environmental dimension to this coordination (Uddin *et al*., 2023). The environmental objective is not confined to the factory gate. It extends upstream toward suppliers and raw materials and downstream toward distribution, consumption, recovery, reuse, and disposal (Stroumpoulis & Kopanaki, 2022). The literature identifies several recurring GSCM dimensions. Green purchasing incorporates environmental criteria into supplier selection and purchasing decisions. Eco-design considers environmental impacts during product and packaging design (Sonar *et al*., 2022). Cleaner production seeks to reduce pollution, material loss, energy consumption, and hazardous outputs during manufacturing. Green logistics focuses on transportation, warehousing, routing, vehicle utilization, packaging, and distribution efficiency. Green information systems support the collection, sharing, and analysis of environmental and supply chain information. Supplier collaboration involves joint problem solving, environmental training, technology transfer, and performance improvement. Reverse logistics concerns the movement of used products, components, packaging, and materials back through the supply chain for recovery, reuse, remanufacturing, recycling, or appropriate disposal (Sahoo *et al*., 2024).

GSCM Practices, Specifically Green Purchasing and Supplier Collaboration

A major stream of research investigates whether green supply practices improve organizational performance. Green Jr. *et al*. reported relationships among GSCM practices and economic, environmental, and operational outcomes. Zhu *et al*. found that institutional pressures and organizational practices are relevant to the development of green supply management. (Azevedo *et al*., n.d.), and Machado examined green practices in the automotive supply chain and linked them with supply chain performance. These studies collectively suggest that environmental initiatives can produce operational consequences rather than remaining separate from conventional business objectives. However, the literature also shows that not every green practice produces an immediate financial gain. Some initiatives require capital expenditure before benefits become visible. Supplier development may involve training and auditing costs (Rodríguez-González *et al*., 2022). Cleaner technology can require new equipment. Environmental information systems require data infrastructure. Reverse logistics may initially increase handling complexity (Rasheda Akter Rupa' and Abu Naser Mohammad Saif**, 2021). Therefore, performance should be assessed over a sufficient time horizon and across multiple dimensions. A systematic review of GSCM research found recurring connections between green practices, organizational performance, supplier participation, and adoption conditions. A meta-analysis by Fang and Zhang further emphasized that the performance effect of GSCM should be examined according to the nature of the practice and the context in which it is implemented (Palus' *et al*., n.d.). This supports a balanced interpretation: GSCM is not automatically profitable, but it can create capabilities that support efficiency, innovation, risk management,

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

and market positioning. Purchasing decisions determine many environmental characteristics of a supply chain before materials reach the production facility. Green purchasing may include environmental certification, recycled content, lower toxicity, energy efficiency, responsible extraction, reduced packaging, and supplier environmental performance. When buyers use such criteria consistently, suppliers receive incentives to develop cleaner products and processes. Supplier collaboration can make green purchasing more effective. A transactional buyer-supplier relationship may only transfer environmental requirements through specifications (Nureen *et al*., 2023). A collaborative relationship can instead involve joint environmental targets, technical assistance, shared data, training, process improvement, and coordinated investment. Such collaboration is particularly important in global supply chains where a focal company may depend on suppliers in several countries with different technical capabilities and regulatory systems (Novitasari & Agustia, n.d.).

Eco-Design and Product Competitiveness

Eco-design integrates environmental considerations into product development. Decisions about materials, durability, energy use, packaging, reparability, recyclability, and end-of-life recovery are often made before production begins in [Figure 01]. These decisions can influence the environmental footprint and total cost of a product throughout its life cycle. Eco-design may contribute to international competitiveness in several ways (Nazir *et al*., 2024). First, material reduction can lower input costs and shipping weight. Second, modularity and durability can increase customer value. Third, recyclable or recoverable components may support circular business models (Nazir *et al*., 2024). Fourth, products designed to meet environmental requirements in demanding markets may face fewer adaptation costs when entering other markets. Finally, eco-design can stimulate innovation by requiring designers to reconsider conventional materials and processes (Mukhsin & Suryanto, 2022).

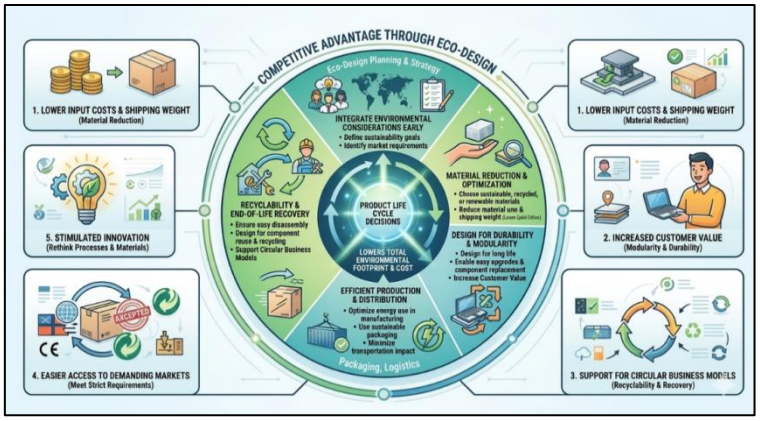


Figure 01: Eco Design Advantages

Green Logistics and International Trade

Logistics is a central component of international competitiveness because transportation and distribution affect cost, delivery time, reliability, emissions, and customer service. Green logistics seeks to improve these outcomes through route optimization, vehicle utilization, modal choice, consolidation, packaging efficiency, warehouse energy management, and, where feasible, lower-emission transport options (Mugoni *et al*., 2024). International trade magnifies the importance of logistics. Long distances, multiple transport modes, ports, customs procedures, and cross-border warehouses create opportunities for delay and environmental impact. Green logistics can therefore contribute to competitiveness when environmental improvements also reduce fuel consumption, empty trips, unnecessary packaging, handling, or inventory. Digital tracking and planning systems can further improve visibility and allow firms to respond more effectively to disruptions (Lin *et al*., 2020). Circular supply chain practices extend GSCM beyond reducing environmental damage during production. They seek to maintain product and material value through reuse, repair, refurbishment, remanufacturing, recycling, and recovery. Reverse logistics is an important operational mechanism for these activities (Kale, n.d.). Circularity can support competitiveness by reducing dependence on scarce raw materials, creating secondary revenue streams, and improving resource security. It may also differentiate products in markets where

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

customers value durability and responsible consumption (Jo & Kwon, 2021).

Green Information Systems and Global Trade Competitiveness

Information is increasingly an environmental resource because credible sustainability claims depend on reliable data. Green information systems can collect, integrate, and communicate data on energy consumption, emissions, materials, supplier performance, waste, transportation, and product characteristics. Such systems support monitoring and decision-making while strengthening traceability. Traceability is especially important in global trade. Buyers, regulators, logistics providers, certification bodies, and consumers may require evidence about where materials originate, how products were manufactured, and whether specified standards were met. Firms unable to produce credible information may face additional verification costs or lose access to environmentally sensitive markets. Competitiveness in international trade is multidimensional. Price remains important, but firms also compete through quality, delivery reliability, innovation, compliance, flexibility, reputation, service, and resilience. Environmental performance increasingly interacts with these dimensions. Green practices can influence price competitiveness through resource efficiency and waste reduction. They can influence quality competitiveness through better process control and supplier standards. They can influence innovation through eco-design and cleaner technologies. They can influence market access through environmental conformity. They can influence reputation through credible sustainability performance (Glushkova' *et al*., n.d.). Finally, they can influence resilience by reducing dependence on vulnerable resources and improving visibility across the supply network. Recent literature on sustainable supply chain management and competitiveness reinforces this broader interpretation. A 2024 systematic review found that sustainability-oriented supply chain strategies can support competitiveness through resource efficiency, innovation, resilience, compliance, differentiation, customer satisfaction, transparency, and risk management. Evidence from export-oriented apparel manufacturing in Bangladesh has also linked sustainable supply chain practices with competitive advantage, with productivity playing an important mediating role. These findings are particularly relevant to developing economies whose export sectors depend on international buyers and increasingly demanding sustainability expectations (Fu *et al*., 2022).

METHODOLOGY

This paper adopts a literature-based analytical research design. No primary questionnaire, interview, experimental observation, or fabricated statistical dataset is used. The purpose is to synthesize established findings and develop an analytical explanation of how GSCM practices may enhance global trade competitiveness. The source base is centered on the supplied reference paper, which examined GSCM practices including green purchasing, green information systems, and eco-design in relation to competitiveness and organizational performance. Additional peer-reviewed literature and institutional material are used to broaden the discussion from organizational performance to international trade competitiveness. The review emphasizes studies concerning GSCM practices, supply chain performance, sustainability, competitiveness, resilience, logistics, supplier collaboration, and international market requirements (Ananda *et al*., n.d.).

Analytical Procedure

The analysis was conducted in four stages. First, recurring GSCM practices were identified from the literature. Second, the performance mechanisms associated with these practices were grouped into efficiency, environmental performance, innovation, resilience, and market legitimacy. Third, these mechanisms were connected to dimensions of global trade competitiveness, including cost, quality, delivery, market access, compliance, differentiation, and adaptability (Feng *et al*., 2024). Fourth, barriers and boundary conditions were examined to avoid assuming that every green practice produces an immediate competitive benefit. The approach is analytical rather than statistical. Consequently, the paper does not report new coefficients, significance values, sample statistics, or causal estimates. Findings from previous empirical studies are treated as evidence within their original contexts and are not presented as new results of this paper (Ekene Cynthia Onukwulu *et al*., 2023).

Scopes and Limitations

The analysis covers firm-level and supply-chain-level competitiveness in internationally connected industries. It recognizes that the meaning of competitiveness varies by sector. An apparel exporter may prioritize traceability and buyer

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

compliance, whereas a chemical manufacturer may prioritize hazardous-material management, and an electronics firm may focus on material recovery and product energy efficiency. The principal limitation is that a literature-based study cannot establish a universal numerical effect of GSCM on trade competitiveness. The reviewed studies use different indicators, samples, countries, industries, and methodologies. In addition, environmental regulations and buyer requirements change over time. Therefore, the conceptual relationships developed here should be tested with sector-specific empirical data.

Research Objectives

1. To examine the role of Green Supply Chain Management (GSCM) practices in enhancing firm-level competitiveness in internationally connected industries.
2. To analyze the influence of GSCM practices on supply-chain-level competitiveness across different industrial sectors.
3. To identify sector-specific GSCM practices that contribute to international competitiveness, particularly in apparel, chemical, and electronics industries.
4. To evaluate how traceability, regulatory compliance, hazardous-material management, material recovery, and energy efficiency contribute to firms' competitiveness in global markets.
5. To identify the limitations of existing literature and establish directions for future sector-specific empirical research on the relationship between GSCM and global trade competitiveness.

RESULT AND DISCUSSION

The central argument emerging from the literature is that GSCM becomes strategically valuable when an environmental practice is converted into an organizational capability. For example, reducing material waste is an environmental objective, but systematic material optimization can also lower cost. Supplier environmental auditing is a compliance activity, but supplier development can also improve quality and reliability. Energy monitoring is an environmental measure, but it can reveal production inefficiencies. Product recycling is an environmental objective, but it can support resource recovery and new revenue models (Das' *et al*., n.d.). This capability perspective explains why the relationship between GSCM and competitiveness is not necessarily direct. Green purchasing may improve supplier quality, which reduces defects, which lowers rework, which improves delivery reliability, which strengthens customer relationships. Similarly, eco-design may reduce material use, which lowers weight, which reduces transportation costs, which improves price competitiveness. The competitive effect is therefore often mediated by operational and organizational improvements.

Resource Efficiency, Cost Competitiveness and Innovation

One of the strongest potential links between GSCM and competitiveness is resource efficiency. Materials, energy, water, packaging, and transportation represent significant components of supply chain cost. Waste represents a loss of purchased resources as well as a potential environmental liability. Firms that identify and reduce these losses can improve both environmental and economic performance. However, resource efficiency should be evaluated across the supply chain rather than within a single department. A cheaper material may create higher waste during manufacturing. A lightweight package may reduce transportation emissions but require more protective material if product damage increases. A local supplier may reduce transportation distance but have lower production efficiency (Cheng *et al*., 2023). The correct decision is therefore based on total life-cycle and supply chain consequences. Environmental constraints can stimulate innovation. Eco-design challenges firms to reconsider materials, packaging, product durability, and end-of-life options. Cleaner production can motivate process innovation. Green logistics can stimulate new routing and distribution models. Digital traceability can create new information services. Innovation can strengthen global trade competitiveness because international customers may value products that provide measurable environmental benefits in addition to functional performance. In crowded markets, a credible green attribute can become a differentiation mechanism. Nevertheless, environmental claims must be supported by evidence. Unsubstantiated claims can create reputational and regulatory risks. International markets increasingly contain environmental requirements embedded in product standards, procurement policies, disclosure expectations, packaging rules, carbon-related measures, and customer codes of conduct. Firms with mature GSCM capabilities may find it easier to identify these requirements and integrate them into product and process decisions. Regulatory

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

readiness can be viewed as a form of competitive insurance. A firm that anticipates environmental requirements may avoid costly redesigns when a market standard changes. It can also respond faster to buyer requests. In contrast, firms that treat environmental compliance as a last-minute documentation exercise may face delays, additional testing, or loss of customer confidence (Bekele & Bogale Abegaz, 2024).

Resilience and Supply Security

Supply chain resilience [Figure 02] has become an important competitive concern because international networks are exposed to climate events, geopolitical tensions, resource scarcity, transport
interruptions, and sudden demand changes. GSCM can support resilience when it encourages resource efficiency, supplier diversification, visibility, circularity, and reduced dependence on vulnerable inputs. Circular practices are particularly relevant to resource security. Reuse and recovery can create alternative sources of materials and reduce exposure to volatile primary commodity markets. Environmental information systems can improve early warning by revealing supplier or logistics risks. Green supplier development can strengthen the technical capacity of strategic suppliers. Yet resilience should not be equated automatically with localization (Barakat *et al*., 2023). A globally distributed supply chain may be efficient and resilient if it has sufficient visibility, redundancy, and flexibility. GSCM should therefore support a balanced network design based on risk, cost, environmental impact, and service requirements.



Figure 02: Supply chain resilience in GSCM

Digitalization and Transparency

Digital technologies can amplify GSCM [Figure 03] because environmental information must increasingly move across organizational boundaries. Suppliers, manufacturers, logistics providers, customers, and regulators may need access to consistent information. Digital systems can support product traceability, emissions accounting, supplier evaluation, demand forecasting, route optimization, and environmental reporting. The competitive value of transparency depends on data quality (Azizi, n.d.). Poorly defined indicators, inconsistent measurement boundaries, and unsupported claims can weaken trust. Firms therefore need governance systems defining who collects data, how data are verified, and how environmental performance is communicated.

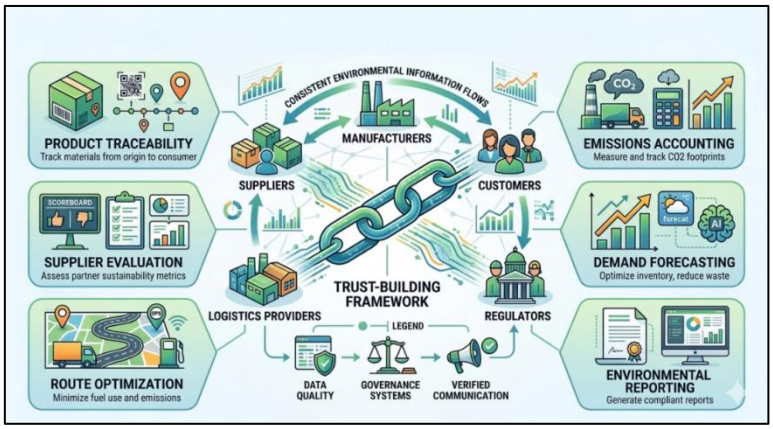


Figure 03: Digital Technologies in GSCM

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

Supplier Capability, Emerging Economies and Risks

The competitive benefits of GSCM can be unevenly distributed across supply chains. Large multinational buyers may have the financial and technical resources to introduce environmental systems, while smaller suppliers may struggle with certification costs, data collection, cleaner equipment, or specialist personnel. If requirements are transferred without support, smaller suppliers may become less competitive or be excluded from international supply chains. Supplier development is therefore an important component of responsible GSCM. Buyers can provide training, technical guidance, shared tools, longer-term contracts, and collaborative improvement programs. Such approaches can strengthen the entire supply network rather than simply shifting environmental responsibility to weaker suppliers. For emerging economies, this issue is especially significant. Export competitiveness depends not only on low labor or production cost but also on the ability to satisfy international environmental and quality expectations. Green supply chain capabilities can therefore become part of industrial upgrading. Despite its potential, GSCM faces several barriers. Initial investment is a common obstacle. Firms may also lack qualified personnel, supplier data, digital infrastructure, environmental measurement systems, or senior management commitment. Fragmented standards can increase compliance complexity, particularly for firms serving multiple markets. Another challenge is the possibility of greenwashing (Azevedo *et al.*, n.d.). If environmental communication is stronger than actual performance, short-term marketing benefits may be followed by reputational damage. Transparent measurement, third-party verification where appropriate, and clear reporting boundaries can reduce this risk. There can also be trade-offs. A green input may be more expensive, a reverse logistics system may require additional transportation, and an environmental redesign may increase production complexity. Managers should therefore compare alternatives using total cost, life-cycle impact, service performance, and market value rather than a single indicator.

PROPOSED OUTLINE

Based on the literature, this paper proposes that GSCM practices influence global trade competitiveness through five principal capability pathways. The first pathway is efficiency. Green purchasing, cleaner production, eco-design, and green logistics can reduce material, energy, waste, and transportation inefficiencies. Efficiency can strengthen cost competitiveness and operational performance. The second pathway is environmental performance. Pollution reduction, resource conservation, recycling, and emissions management improve the environmental profile of the supply chain. Strong environmental performance can support buyer confidence, compliance, and market acceptance. The third pathway is innovation. Eco-design, circularity, cleaner technologies, and digital systems can generate new products, processes, and business models. Innovation can support differentiation and long-term competitive advantage. The fourth pathway is resilience. Supply visibility, supplier collaboration, resource efficiency, circularity, and diversified sourcing can improve the capacity of firms to absorb and recover from disruptions. The fifth pathway is market legitimacy. Environmental compliance, traceability, credible reporting, and responsible supplier practices can improve access to international customers and reduce the risk of exclusion from environmentally demanding markets. These pathways collectively influence global trade competitiveness through cost competitiveness, quality, delivery reliability, market access, innovation, reputation, compliance, and adaptability (Ananda *et al.*, n.d.). The framework also assumes that institutional pressure, industry characteristics, firm size, supplier capability, technological maturity, and regulatory conditions moderate the relationship. Based on this framework, [Table 01] shows the following propositions are advanced for future empirical testing: P1: Green purchasing capability is positively associated with global trade competitiveness through resource efficiency and supplier performance. P2: Eco-design capability is positively associated with global trade competitiveness through innovation, material efficiency, and product-market differentiation. P3: Green logistics capability is positively associated with global trade competitiveness through transportation efficiency, service reliability, and emissions reduction. P4: Green information systems and supply chain traceability are positively associated with global trade competitiveness through transparency, regulatory readiness, and risk management. P5: Supplier collaboration strengthens the relationship between GSCM practices and global trade competitiveness by improving implementation capability across the supply network (Vachon & Klassen, n.d.). P6: Circular economy and reverse logistics practices strengthen global trade competitiveness by

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

improving resource security and creating recovery value. P7: The effect of GSCM on global trade competitiveness is stronger when environmental requirements from international customers and regulators are high (Zhu *et al*., n.d.).

Table 01: Strategic GSCM Performance Framework

Proposition	Core GSCM Practice	Primary Enablers & Mediators	Impact Mechanism on Competitiveness
P1	**Green Purchasing Capability**	Resource Efficiency, Supplier Performance	Lowers procurement waste and optimizes input costs via high-performing green suppliers.
P2	Eco-Design Capability	Innovation, Material Efficiency, Product-Market Differentiation	Drives unique market value by engineering sustainable, premium, and easily recognizable products.
P3	Green Logistics Capability	Transportation Efficiency, Service Reliability, Emissions Reduction	Lowers fuel costs, cuts transit downtime, and eliminates carbon-tax risks during shipping.
P4	Green Information Systems & Traceability	Transparency, Regulatory Readiness, Risk Management	Grants seamless passage through customs by offering instant compliance data and real-time tracking.
P5	**Supplier Collaboration** *(Moderator)*	Implementation Capability Across the Supply Network	Acts as a force multiplier, ensuring uniform execution of green policies across all external vendors.
P6	Circular Economy & Reverse Logistics	Resource Security, Recovery Value	Insulates operations from material scarcity by reclaiming and reusing end-of-life products.
P7	**External Demands** *(Contextual Trigger)*	International Customer & Regulator Requirements	Maximizes financial and market share returns for firms targeting highly regulated global trade regions.

MANAGERIAL AND POLICY IMPLICATIONS

Managers should avoid treating GSCM as an isolated environmental department responsibility. Procurement, product design, manufacturing, logistics, information technology, marketing, finance, and senior leadership should share measurable sustainability objectives. The first managerial step is to map environmental impacts and costs across the supply chain. This can identify high-priority opportunities where environmental improvement and economic value overlap. Procurement teams should integrate environmental criteria into supplier selection while maintaining attention to quality, reliability, price, and capacity. Supplier scorecards can combine delivery, defect rates, environmental performance, resource efficiency, and transparency. Strategic suppliers should be encouraged to participate in joint improvement programs(Alzubi & Akkerman, 2022). Product development teams should use life-cycle thinking. Environmental criteria should be considered during material selection, packaging, durability, reparability, and end-of-life planning. Such integration can prevent environmental requirements from becoming expensive redesigns after products have already entered production. Logistics managers should examine route utilization, consolidation, warehouse energy, packaging, and modal choice. Digital systems can support real-time monitoring and performance comparison. The objective should be to minimize total supply chain cost and environmental impact while protecting service quality. Policy makers also have an important role. Harmonized environmental standards, accessible certification systems, green finance, technical assistance, and supplier-development programs can lower the barriers faced by smaller firms. Export-oriented industries may benefit from shared testing facilities, digital traceability platforms, and training programs that help suppliers meet international requirements (Alkaraan *et al*., 2025).

FUTURE RESEARCH DIRECTIONS

Future research should empirically test the proposed framework across industries and countries. Comparative studies could examine whether GSCM produces different competitive outcomes in manufacturing, agriculture, apparel, electronics, chemicals, construction materials, and logistics services. Researchers should distinguish between domestic and export-oriented firms

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

because international buyer requirements may alter the value of green practices. Longitudinal research is also needed. Some benefits of GSCM appear only after investment and organizational learning. Cross-sectional studies may therefore underestimate long-term effects. Future research can examine whether early green investments create capabilities that become difficult for competitors to imitate. More research is required on small and medium-sized enterprises (Aljoghaiman *et al*., 2024). SMEs frequently face greater financial and technical constraints, yet they form critical parts of global supply networks. Studies should examine which forms of supplier support, financing, digital tools, and collaborative procurement most effectively improve SME green capability. Measurement is another important area. Global trade competitiveness should not be represented by a single variable. Future empirical models could combine export growth, foreign-market retention, delivery reliability, quality, innovation, compliance, customer satisfaction, resilience, and resource productivity. Environmental indicators should similarly include emissions, energy, material use, waste, water, and circularity where relevant (Agrawal *et al*., 2023).

CONCLUSION

This literature-based analysis examined the role of green supply chain management in enhancing global trade competitiveness. The review indicates that GSCM should be understood as a strategic capability rather than a narrow environmental compliance activity. Green purchasing, eco-design, cleaner production, green logistics, supplier collaboration, environmental information systems, circularity, and reverse logistics can contribute to competitiveness through several interconnected mechanisms. The strongest strategic argument is that environmental improvement and competitiveness need not be opposing objectives. When green practices reduce waste, improve resource productivity, stimulate innovation, strengthen supplier capability, increase supply visibility, and prepare firms for international environmental requirements, they can create economic and strategic value. The benefits are not automatic, however. Investment requirements, capability gaps, fragmented standards, measurement difficulties, and implementation trade-offs can weaken the business case. Global trade is becoming increasingly dependent on supply chains that are transparent, adaptable, resource-efficient, and capable of meeting environmental expectations. Firms that develop these capabilities may be better positioned to protect market access and compete on more than price. For emerging economies, green supply chain management can therefore support a transition from cost-based competition toward productivity, quality, innovation, resilience, and responsible international value creation. The proposed framework connects GSCM practices with global trade competitiveness through efficiency, environmental performance, innovation, resilience, and market legitimacy. Future empirical research should test these pathways using sector-specific and longitudinal evidence. Until then, the literature supports a cautious but strategic conclusion: GSCM is most valuable when sustainability is embedded in the architecture of the supply chain and aligned with the economic and competitive objectives of international business.

REFERENCES

1. Agrawal, V., Mohanty, R. P., Agarwal, S., Dixit, J. K., & Agrawal, A. M. "Analyzing critical success factors for sustainable green supply chain management: V. Agrawal *et al*." Environment, development and sustainability 25.8 (2023): 8233-8258.
2. Aljoghaiman, A., Hasanein, A. M., Elshaer, I. A., & Sobaih, A. E. E. "Does environmental performance make any difference in the relationship between green supply chain management and hotel competitiveness?." *Logistics* 8.3 (2024): 70.
3. Alkaraan, F., Elmarzouky, M., de Sousa Jabbour, A. B. L., Jabbour, C. J. C., & Gulko, N. "Maximising sustainable performance: Integrating servitisation innovation into green sustainable supply chain management under the influence of governance and Industry 4.0." *Journal of Business Research* 186 (2025): 115029.
4. Alzubi, E., & Akkerman, R. "Sustainable supply chain management practices in developing countries: An empirical study of Jordanian manufacturing companies." *Cleaner production letters* 2 (2022): 100005.
5. Ananda, A. R. W., Astuty, P., & Nugroho, Y. C. "Role of green supply chain management in embolden competitiveness and performance: Evidence from Indonesian organizations." *International Journal of Supply Chain Management* 7.5 (2018): 437-442.
6. Azevedo, S. G., Carvalho, H., Duarte, S., & Cruz-Machado, V. "Influence of green and lean upstream supply chain management practices on business sustainability." *IEEE*

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

Transactions on engineering management 59.4 (2012): 753-765.
7. Marhamati, A., & Azizi, I. "The impact of green supply chain management on firm competitiveness." *International Journal of Supply Chain Management* 6.4 (2017): 215-223.
8. Barakat, B., Milhem, M., Naji, G. M. A., Alzoraiki, M., Muda, H. B., Ateeq, A., & Abro, Z. "Assessing the impact of green training on sustainable business advantage: exploring the mediating role of green supply chain practices." *Sustainability* 15.19 (2023): 14144.
9. Bekele, T., & Abegaz, B. "M. Sustainable Supply Chain Management for Business Competitiveness: A Systematic Literature Review." *International Journal of Business and Management Practices (IJBMP)* 2.4 (2024): 513-542.
10. Cheng, Y., Masukujjaman, M., Sobhani, F. A., Hamayun, M., & Alam, S. S. "Green logistics, green human capital, and circular economy: the mediating role of sustainable production." *Sustainability* 15.2 (2023): 1045.
11. Das, G., Li, S., Tunio, R. A., Jamali, R. H., Ullah, I., & Fernando, K. W. T. M. "The implementation of green supply chain management (GSCM) and environmental management system (EMS) practices and its impact on market competitiveness during COVID-19." *Environmental Science and Pollution Research* 30.26 (2023): 68387-68402.
12. EKENE, C. O., MERCY, O. A., & NSISONG, L. E. U. "Sustainable supply chain practices to reduce carbon footprint in oil and gas." *GLOBAL JOURNAL OF RESEARCH IN MULTIDISCIPLINARY STUDIES Учредители: Global Scholar Publications* 1.2 (2023): 024-043.
13. Fang, C., & Zhang, J. "Performance of green supply chain management: A systematic review and meta analysis." *Journal of Cleaner Production* 183 (2018): 1064-1081.
14. Feng, T., Qamruzzaman, M., Sharmin, S. S., & Karim, S. "Bridging environmental sustainability and organizational performance: The role of green supply chain management in the manufacturing industry." *Sustainability* 16.14 (2024): 5918.
15. Fu, Q., Abdul Rahman, A. A., Jiang, H., Abbas, J., & Comite, U. "Sustainable supply chain and business performance: The impact of strategy, network design, information systems, and organizational structure." *Sustainability* 14.3 (2022): 1080.
16. Glushkova, S., Lomakina, O., & Sakulyeva, T. "The economy of developing countries in the context of globalization: Global supply chain management." *International Journal of Supply Chain Management* 8.1 (2019): 876-884.
17. Jo, D., & Kwon, C. "Structure of green supply chain management for sustainability of small and medium enterprises." *Sustainability* 14.1 (2021): 50.
18. Naik, S. "Global Competitiveness: Role of Supply chain Management." *International Journal of Engineering and Management Research (IJEMR)* 4.1 (2014): 194-199.
19. Lin, Y. H., Kulangara, N., Foster, K., & Shang, J. "Improving green market orientation, green supply chain relationship quality, and green absorptive capacity to enhance green competitive advantage in the green supply chain." *Sustainability* 12.18 (2020): 7251.
20. Mugoni, E., Kanyepe, J., & Tukuta, M. "Sustainable Supply Chain Management Practices (SSCMPS) and environmental performance: A systematic review." *Sustainable Technology and Entrepreneurship* 3.1 (2024): 100050.
21. Mukhsin, M., & Suryanto, T. "The effect of sustainable supply chain management on company performance mediated by competitive advantage." *Sustainability* 14.2 (2022): 818.
22. Nazir, S., Zhaolei, L., Mehmood, S., & Nazir, Z. "Impact of green supply chain management practices on the environmental performance of manufacturing firms considering institutional pressure as a moderator." *Sustainability* 16.6 (2024): 2278.
23. Novitasari, M., & Agustia, D. (n.d.). "Management, Competitive Advantage and Firm Performance in PROPER Companies in Indonesia."
24. Nureen, N., Sun, H., Irfan, M., Nuta, A. C., & Malik, M. "Digital transformation: fresh insights to implement green supply chain management, eco-technological innovation, and collaborative capability in manufacturing sector of an emerging economy." *Environmental Science and Pollution Research* 30.32 (2023): 78168-78181.
25. Palus', H., Parobek', J., Slait'anova', N., Nosal'ova', M., Louéanova', E., & Bruno, A. (n.d.). "On the Competitiveness and Economic $Soge ". *SAGE Open*.

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher

26. Rupa, R. A., & Saif, A. N. M. "Impact of green supply chain management (GSCM) on business performance and environmental sustainability: case of a developing country." *Business Perspectives and Research* 10.1 (2022): 140-163.
27. Rodríguez-González, R. M., Maldonado-Guzmán, G., Madrid-Guijarro, A., & Garza-Reyes, J. A. "Does circular economy affect financial performance? The mediating role of sustainable supply chain management in the automotive industry." *Journal of Cleaner Production* 379 (2022): 134670.
28. Sahoo, S., Kumar, S., Sivarajah, U., Lim, W. M., Westland, J. C., & Kumar, A. "Blockchain for sustainable supply chain management: Trends and ways forward." *Electronic Commerce Research* 24.3 (2024): 1563-1618.
29. Sonar, H., Gunasekaran, A., Agrawal, S., & Roy, M. "Role of lean, agile, resilient, green, and sustainable paradigm in supplier selection." *Cleaner logistics and supply chain* 4 (2022): 100059.
30. Stroumpoulis, A., & Kopanaki, E. "Theoretical perspectives on sustainable supply chain management and digital transformation: A literature review and a conceptual framework." *Sustainability* 14.8 (2022): 4862.
31. Uddin, M. H., Razzak, M. R., & Rahman, A. A. "Sustainable supply chain management practices, dynamic capabilities and competitive advantage: Evidence from Bangladesh ready-made garments industry." *Business Strategy & Development* 6.2 (2023): 176-188.
32. Vachon, S., & Klassen, R. D. "Extending green practices across the supply chain: the impact of upstream and downstream integration." *International journal of operations & Production Management* 26.7 (2006): 795-821.
33. Veljković, J., Milovanović, G., & Talić, M. "Green supply chains and global competitiveness of companies." *Ekonomika* 68.3 (2022): 29-43.
34. Wang, D. F., Dong, Q. L., Peng, Z. M., Khan, S. A. R., & Tarasov, A. "The green logistics impact on international trade: Evidence from developed and developing countries." *Sustainability* 10.7 (2018): 2235.
35. Wiredu, J., Yang, Q., Sampene, A. K., Gyamfi, B. A., & Asongu, S. A. "The effect of green supply chain management practices on corporate environmental performance: Does supply chain competitive advantage matter?." *Business Strategy and the Environment* 33.3 (2024): 2578-2599.
36. Xu, J., Yu, Y., Wu, Y., Zhang, J. Z., Liu, Y., Cao, Y., & Eachempati, P. "Green supply chain management for operational performance: anteceding impact of corporate social responsibility and moderating effects of relational capital." *Journal of Enterprise Information Management* 35.6 (2022): 1613-1638.
37. Yildiz Çankaya, S., & Sezen, B. "Effects of green supply chain management practices on sustainability performance." *Journal of Manufacturing Technology Management* 30.1 (2019): 98-121.
38. Yadav, A., Garg, R. K., & Sachdeva, A. "Artificial intelligence applications for information management in sustainable supply chain management: A systematic review and future research agenda." *International Journal of Information Management Data Insights* 4.2 (2024): 100292.
39. Zaid, A. A., Qassas, N., Saleh, Y., Jum'a, L., Zahran, S., Kanan, M., & Assaf, R. "Green information systems implementations, green supply chain management practices, and business sustainability in a developing countries context: an empirical study." *Operational Research in Engineering Sciences: Theory and Applications* 6.2 (2023).
40. Zhu, Q., Sarkis, J., & Geng, Y. "Green supply chain management in China: pressures, practices and performance." *International journal of operations & production management* 25.5 (2005): 449-468.

Source of support: Nil; **Conflict of interest:** Nil.

Cite this article as:
Prince, S. J. H., Mustafa, R. Y., Ahmed, F., Hoq, K. M. S. & Hoque, M. “The Role of Green Supply Chain Management in Enhancing Global Trade Competitiveness." *Sarcouncil Journal of Entrepreneurship and Business Management* 5.11 (2026): pp 1-11.

Copyright © 2022 The Author(s): This work is licensed under a Creative Commons Attribution- NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND 4.0) International License

Publisher: SARC Publisher