

# ISRG Journal of Economics, Business & Management (ISRGJEBM)



**ISRG PUBLISHERS**

Abbreviated Key Title: Isrg J Econ Bus Manag

ISSN: 2584-0916 (Online)

Journal homepage: <https://isrgpublishers.com/isrgjebm/>

Volume – III Issue -V (September-October) 2025

Frequency: Bimonthly



## IMPLEMENTING ECO-FRIENDLY LOGISTICS IN THE GLOBAL MATERNAL OCEAN-DERIVED SUPPLEMENT MARKET

**Bekti Utomo<sup>1\*</sup> and Tri Wisudawati<sup>2</sup>**

<sup>1</sup> Vocational School, Sebelas Maret University, Indonesia

<sup>2</sup> Faculty of Engineering, Jenderal Soedirman University, Indonesia

| **Received:** 22.09.2025 | **Accepted:** 27.09.2025 | **Published:** 02.10.2025

**\*Corresponding author:** Bekti Utomo

Vocational School, Sebelas Maret University, Indonesia

### Abstract

*The maternal marine supplements sector has garnered significant attention in recent years due to growing awareness of the critical importance of maternal health and nutritional support. This study aims to examine the implementation of Green Supply Chain Management (GSCM) practices within this industry as an approach to achieving sustainable global commerce. The research employs a qualitative approach, conducting comprehensive reviews of current literature and examining case studies to identify effective strategies and obstacles related to GSCM adoption in the maternal marine supplements field. Results demonstrate that implementing GSCM practices yields multiple advantages, including enhanced environmental protection, stronger financial performance, and increased consumer confidence. The study concludes by offering strategic guidance for incorporating GSCM frameworks into the operational processes of supply chain participants.*

**KEYWORDS:** Green Supply Chain Management, Maternal Marine Supplements, Sustainable Trade, Environmental Sustainability, International Trade

### INTRODUCTION

The maternal marine supplements sector serves as a cornerstone for supporting the wellness of pregnant women and developing fetuses. Market projections indicate this industry will expand at an annual rate of roughly 7.4% in coming years (Future Market Insights Inc, 2024). As expectant mothers become increasingly informed about prenatal nutritional needs, there is a rising demand for high-quality marine-derived supplements, particularly omega-3 fatty acids that

are vital for proper fetal neurological development (Lim et al., 2025). However, this rapid expansion necessitates careful examination of the environmental consequences associated with extraction and manufacturing processes.

Green Supply Chain Management (GSCM) presents a comprehensive solution enabling organizations to minimize these

environmental effects while maintaining market competitiveness. This approach merges ecological considerations with supply chain operations to reduce waste generation, optimize energy consumption, and foster sustainability throughout the entire value chain (Ojo et al., 2022). For the maternal marine supplements sector, GSCM facilitates responsible procurement of raw materials such as fish oils, which are frequently linked to excessive fishing practices and marine ecosystem degradation.

The international scope of maternal marine supplement markets necessitates sustainable approaches that meet global standards. Organizations must embrace GSCM as a strategic imperative, as international trade frameworks and environmental policies increasingly emphasize sustainable commercial operations, according to Sánchez-Flores et al. (2020). This study examines how the maternal marine supplements industry can incorporate GSCM principles into international sustainable commerce while exploring the benefits and challenges organizations encounter during implementation.

## LITERATURE REVIEW

Green Supply Chain Management (GSCM) has emerged as a critical framework for ensuring environmental sustainability while enhancing the efficiency of supply chain operations in the context of global supply chains. As articulated by Hariyani et al. (2024), GSCM encompasses the integration of environmental considerations into the various phases of supply chain management for a product. This includes aspects such as product design, material sourcing, manufacturing processes, distribution logistics, and activities related to the product's end-of-life. The maternal marine supplement industry, which is heavily dependent on marine ecosystems, utilizes these ecosystems for resources, particularly fish oil. This reliance necessitates the implementation of GSCM practices in order to meet sustainability goals and mitigate environmental harm.

Recent scholarly work highlights the environmental challenges posed by industries that exploit ocean resources. The Food and Agriculture Organization (2020) and McAdoo (2024) have issued warnings regarding the detrimental effects of overfishing and unsustainable harvesting practices, which are leading to a decline in fish populations and disrupting biodiversity. GSCM presents a strategic avenue for addressing these challenges through ethical sourcing and the active involvement of suppliers. She et al. (2023) assert that the adoption of empathetic and proactive management responses throughout ocean supply chains not only improves environmental outcomes but also enhances coordination and compliance between organizations.

In the realm of ocean-based production, it is imperative to apply the principles of a circular economy. Green & Brown (2020) provide a case study of a marine supplement company that successfully minimised production waste and resource consumption by restructuring its operations in line with circular economy practices. This restructuring resonates with the proposals put forth by Frontiers in Marine Science (2023), which advocate for institutional frameworks and eco-design systems that promote sustainable marine production and logistics. The direction of GSCM implementation is increasingly influenced by consumer demand. Research conducted by Nielsen (2019) and the Consumer Insights Report (2022) reveals that a significant majority of consumers globally prefer brands that embrace sustainability, with over 70% expressing a willingness to pay a premium for products that are produced responsibly. This consumer-driven pressure incentivises companies to adopt GSCM not only as a moral obligation but also as a means to enhance their competitive edge.

According to Nadeem et al. (2025), firms that actively engage customers in sustainability initiatives experience tangible benefits in terms of brand loyalty and retention.

Despite the acknowledged benefits of GSCM, the literature identifies several significant barriers to its widespread adoption. One major challenge is the lack of universally accepted metrics for assessing sustainability performance. Uddin et al. (2022) argue that without internationally recognised benchmarks, companies find it difficult to quantify the greenness of their supply chains. Similarly, Gonzalez et al. (2021) highlight the fragmentation of global supply chains as a barrier to transparency, particularly with respect to traceability from ocean to shelf, which remains a persistent issue. Financial constraints also pose a significant obstacle to the broader adoption of GSCM, especially for small and medium-sized enterprises (SMEs). The International Finance Corporation (2020) concluded that although the long-term benefits of a sustainable transition are promising, the initial capital investment required for green technologies and training is prohibitively high. As a result, UNCTAD (2022) and United Nations SDG Partnerships (2024) have called for the establishment of public-private funding mechanisms to facilitate GSCM adoption among SMEs in developing regions.

## RESEARCH METHODS

This research adopts a qualitative methodology that encompasses both a comprehensive literature review and an in-depth case study analysis to critically examine the significance of green supply chain management (GSCM) within the realm of maternal marine supplements. The study draws upon a variety of scholarly works pertaining to GSCM principles and practices, alongside their implications specifically for the marine supplements industry. This includes an array of resources such as peer-reviewed articles from academic journals, insightful industry reports, and relevant government publications. By synthesising these diverse scholarly contributions, the research aims not only to delineate best practices but also to identify existing gaps in the current comprehension of GSCM in this particular context.

However, the effectiveness of this methodological approach could be significantly enhanced through the utilisation of a more formal analytical framework. The thematic analysis employed throughout this study will be guided by the model proposed by Braun and Clarke (2006). This model is particularly advantageous as it facilitates the identification, analysis, and reporting of patterns within qualitative data, with a specific focus on industry interviews and secondary data sources. The Braun and Clarke (2006) framework is well-suited for a flexible and adaptive methodology, which is essential given the intricate and interdisciplinary nature of research areas like GSCM in maternal health sectors (She et al., 2023). To ensure a rigorous triangulation of data, interviews conducted with stakeholders will be systematically compared with published findings from industry case studies (Green & Brown, 2020), thereby bolstering the internal validity of the research. Furthermore, specific inclusion criteria for both case studies and literature have been established, focusing on publications released after 2020, those indexed in Scopus, and those relevant to marine or health-oriented supply chains.

Moreover, the research will involve case studies centred on key players within the maternal marine supplements industry, particularly those recognised as exemplary models of GSCM success. For instance, Company X, which is well-regarded in the marine supplements sector, has implemented a circular economy

model aimed at minimising waste and enhancing resource-use efficiency throughout its manufacturing processes (Green & Brown, 2020). The overarching aim of examining these case studies is to extract practical insights regarding the application of GSCM principles and to ascertain the tangible benefits that these companies have realised as a result.

The study also acknowledges certain limitations inherent in its design. Firstly, there are challenges associated with accessing primary data, which necessitates a reliance on existing case studies. While this reliance allows for a broader analytical scope, it may inadvertently limit a deeper contextual understanding of the subject matter. Secondly, the data collected through interviews will be confined to a purposive sample of professionals who are reachable via LinkedIn and industry events. Although this sample may not be statistically representative, the insights garnered from these interviews are expected to provide valuable perspectives from practitioners in the field (Frontiers in Psychology, 2022). A potential avenue for future research could involve transitioning to longitudinal studies or adopting a mixed-methods approach that incorporates consumer surveys to further solidify the empirical foundation of the findings.

The research will implement a meticulous data collection strategy, utilising databases such as Scopus, Web of Science, and Google Scholar to identify pertinent publications. The search will employ a set of specific keywords, including "Green Supply Chain Management," "marine supplements," "sustainable trade," and "maternal health." The thematic analysis will concentrate on three principal areas: sustainable sourcing, production practices, and consumer engagement.

The integration of interviews with industry professionals and input from stakeholders will contribute first-hand experiences regarding the challenges and opportunities associated with GSCM in the context of maternal marine supplements, thereby enriching the existing body of literature and case studies. The structure of the interviews will strike a balance between focused questions on specific topics and the flexibility to explore new, significant themes that may emerge during the discussions. Ultimately, the findings of this research will serve to enhance the understanding of optimal approaches for implementing GSCM in the maternal marine supplements sector, while also considering sustainable trade practices on a global scale. This comprehensive examination aims to provide actionable insights that can inform future practices and contribute to the advancement of GSCM within this vital industry.

## RESULTS AND DISCUSSION

The most important findings in literature reviews include how important sustainable procurement methods are. Businesses that emphasize using certified permanent fishing sources, such as recommended by the Marine Stewardship Council (MSC), not only help preserve the maritime ecosystem but also win over customers who care about the environment (McAdoo, 2024). The market capacity for companies that implement GSCM principles is exposed to the data showing that more than 70% of consumers are ready to pay more for certified continuous products (Consumer Insights Reports, 2022).

Research through case studies demonstrates that companies implementing GSCM practices typically experience decreased costs alongside enhanced operational performance. Y implemented a closed-loop production system that led to a 40%

decrease in waste along with a 30% drop in energy consumption (Alkandi et al., 2025). This promotion indicates that stability together with financial success can exist simultaneously because they enhance environmental benefits while driving overall business profitability.

Moreover, a closer examination of Company Y's closed-loop system reveals not only does it enhance waste metrics but also cross-functional efficiency as well. For instance, Alkandi et al. (2025) discovered that by introducing GSCM in production and distribution, the company reduced lead times by 15% and improved supplier compliance by 22%. These quantifiable outcomes indicate the tangible performance gains achievable when sustainability is embedded strategically. This is consistent with She et al. (2023), who found that managerial empathy through proactive actions stimulates green innovation adoption in maritime supply chains.

In addition, the effective application of GSCM in the mother's marine complementary region depends on much of consumer participation. Strong brands, Loyalty and confidence are usually developed by companies that actively communicate their stability initiative and interact with customers through educational expeditions. For example, the company Z customer storage rate increased by 25% after starting a campaign with emphasis on the environmental benefits of the permanent sourcing methods (Nadeem et al., 2025). This underlines how important O is

However, research also identifies many challenges related to the implementation of GSCM in this industry. A significant barrier is the complexity of global supply chains, which can make and ensure compliance with stability standards in all suppliers (Uddin et al., 2022) for companies. In addition, standardized matrix deficiency can measure stability performance, preventing companies' ability to identify areas for benchmark and improve.

### A. Overview of Green Supply Chain Management (GSCM)

Mother's marine complementary Industry, which depends much more on marine resources, faces unique challenges in balanced ecological integrity with commercial viability. Research studies show that GSCM effectively minimizes waste and carbon emissions which creates a more sustainable business framework. Ojo et al. (2022) conducted a study showing that organizations which adopt GSCM practices can lower their operating costs by 20% through improved resource management. The marine complementary area of the mother region needs a special consideration since the wrong approach to the source and processing phases may entail a serious effect on marine elements.

There are key strategies that are necessary in GSCM implementation and they are subsequent to ecological design, and sustainable supply chain management and waste reduction. The development of marine supplements through eco-layout methods produces products which serve maternal fitness needs while maintaining environmental sustainability. Nordic Naturals implements eco-layout approaches through their sustainable fish oil sourcing which supports both maternal wellness and marine ecological preservation (Nordic Naturals, 2021). The two-fold awareness not only increases brand awareness but also meets consumer demands, which are shifting towards environmentally friendly products.

The maternal marine supplements industry requires essential sustainable sourcing practices for its operations. The Food and



Agriculture Organization (FAO) stated in 2020 that marine ecosystems are at risk because of both overfishing and unsustainable harvesting methods. The responsible sourcing of uncooked substances becomes possible when organizations build partnerships with licensed sustainable fisheries. The practice of sustainable sourcing protects both marine biodiversity and attracts environmentally aware customers which in turn enhances market competitiveness.

Besides, some GSCM maturity models have been put forward to benchmark levels of implementation. For instance, the *Frontiers in Psychology* (2022) model classifies GSCM maturity into five stages: first awareness, adoption, integration, institutionalization, and innovation. Its application to maternal marine supplement companies can facilitate benchmarking against progress and investment in high environmental and reputational risk areas. Subsequent studies can operationalize the model across geographic regions to enhance the understanding of regional patterns of adoption and capacity deficits.

### **B. Challenges in Implementing GSCM in the Maternal Marine Supplements Industry**

The main obstacle in achieving sustainability stems from stakeholders who lack knowledge about sustainable practices. Various suppliers and manufacturers lack proper understanding about GSCM principles which results in supply chain operations that do not adhere to these standards. A survey carried out by World Wildlife Fund (WWF) in the year 2019 indicated that sixty five percent of suppliers of sea food were not aware of certification programs on sustainable sea food which was a clear indicator that more educational programs were needed in the sector.

The complexity behind global delivery systems in most cases becomes a barrier that prevents successful implementation of GSCM. The marine dietary supplements come in various regions and this would pose a problem in meeting up with sustainable practices compliance in various jurisdictions. The necessity of the tracing of substances from ocean to shelf has been identified as one of the major shortcomings that results in inaccuracies in sustainability claims by Gonzalez et al. (2021). Client agree also suffers low degree of transparency and the companies face the challenge of regulatory compliance that requires the use of reliable tracking systems.

Budget has also been a huge constraint to adopting the GSCM. Most groups, in particular, small and medium-sized enterprises (SMEs), can also war to invest in sustainable technologies or practices because of limited resources. A report with the support of the International Finance Corporation (IFC, 2020) demonstrates that SMEs tend to experience greater expenses during the sustainable shift, which might discourage them to implement GSCM. This financing gap is most severe in developing economies, where ocean sectors are often undercapitalized and fragmented. UNCTAD (2022) points to the need for blended finance models that combine international donor capital and local investment platforms. Policy interventions such like tax incentives, low-interest finance, and sustainability-linked bonds would then be capable of propelling GSCM transitions significantly. These interventions align with the ScienceDirect (2023) framework, which depicts policy-driven financial instruments as drivers of sustainable shipping and ocean logistics. This highlights the want for monetary incentives and assist mechanisms to inspire sustainable practices in the industry.

### **C. Benefits of GSCM for the Maternal Marine Supplements Industry**

Firstly, implementing sustainable practices can cause considerable fee financial savings. According to a file by using McKinsey. Additionally, GSCM can decorate logo popularity and purchaser loyalty. The growing awareness of environmental problems among customers leads them to support brands which demonstrate their commitment to sustainability efforts. Aside from consumer attitudes, GSCM implementation also enhances regulatory compliance and minimizes the risk of fines for environmental crimes. As per UNCTAD (2022), globally compliant businesses with green trade standards are more likely to react to changing ESG expectations, especially in the EU and North American markets. This compliance proactive strategy reduces legal risks while optimizing cross-border trade readiness. Second, as per IFFO (2024), companies that utilized traceable marine ingredients saw their B2B contracts grow by 28%, showing that sustainability also translates to upstream trust.

Research through Nielsen (2019) found that 73% of global consumers will change their purchasing behavior to decrease their environmental footprint. Implementing GSCM practices allows organizations to establish market differentiation while creating a loyal customer base that places importance on sustainable practices.

## **CONCLUSION**

The paper, based on an extensive review of the literature and examples in the industry, has corroborated the view that application of GSCM practices, e.g., Sustainable procurement, Eco-design, closed-loop production, and stakeholder dialogue can considerably reduce environmental impacts and enhance operational efficiency, brand equity, and legal compliance. Despite the apparent benefits, GSCM adoption is limited by concerns of costs, the inability to have a standard and limited awareness of stakeholders of a supply chain. Addressing such obstacles will require the synergistic effort of governments, industry leaders, and consumers, via incentives and education and fair traceability standards. Ultimately, the maternal marine supplements industry is not an industry where the application of GSCM is an ethical obligation but also a strategic enabler of a sustainable trade globally. Further research should be focused on the empirical test and comparison of cross-regional case studies and development of industry-specific performance criteria to continue this essential discussion.

## **References**

1. Alkandi, I., Alhajri, N., & Alnajim, A. (2025). Green supply chain management, business performance, and future challenges: Evidence from emerging industrial sector. *Sustainability*, 17(1), 29.  
<https://doi.org/10.3390/su17010029>
2. Consumer Insights Report. (2022). Sustainable Consumer Trends. Retrieved from  
<https://abacusmarketing.co.uk/consumer-trends-2022-sustainability/>
3. *Frontiers in Marine Science*. (2023). A sustainable shipping management framework in the marine environment: Institutional pressure, eco-design, and cross-functional perspectives. *Frontiers*. Available at:  
<https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2022.1070078/full>
4. *Frontiers in Psychology*. (2022). Going green: Impact of

- green supply chain management practices on sustainability performance. *Frontiers*. Available at: <https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2022.973676/full>
5. Future Market Insights Inc. (2024, March 7). Marine nutraceutical market – Growth, demand & functional benefits. Future Market Insights. <https://www.futuremarketinsights.com/reports/marine-nutraceutical-market>
  6. Greene, C. H., Scott-Buechler, C. M., Hausner, A. L. P., Johnson, Z. I., Lei, X. G., & Huntley, M. E. (2022). Transforming the future of marine aquaculture: A circular economy approach. *Oceanography*, 35(2), 26–34. <https://doi.org/10.5670/oceanog.2022.213>
  7. Hariyani, D., Hariyani, P., Mishra, S., & Sharma, M. K. (2024). A literature review on green supply chain management for sustainable sourcing and distribution. *Waste Management Bulletin*, 2(4), 231–248. <https://doaj.org/article/4cba503c2ef946cd82933002dc83d528>
  8. IFFO - The Marine Ingredients Organisation. The Role of Marine Ingredients. Available at: <https://www.iffco.com/role-marine-ingredients>
  9. Lähdeaho, O., Hilmola, O. P., & Kajatkari, R. (2020). Maritime supply chain sustainability: South-East Finland case study. *Journal of Shipping and Trade*, 5(1), 16. <https://doi.org/10.1186/s41072-020-00073-z>
  10. Lim, H. Y., Mohammad Fadzil, M. A., Mustar, S., Abdul Shukor, I. H., & Mohamed, W. A. S. (2025). The impact of long-chain omega-3 polyunsaturated fatty acid supplementation in pregnant women toward the intelligence status of early childhood: Protocol for a systematic review and meta-analysis. *JMIR Research Protocols*, 14, e60417. <https://doi.org/10.2196/60417>
  11. McAdoo, J. (2024, May 22). Sustainable sourcing: Procurement's role for a sustainable future. Ivalua. <https://www.ivalua.com/blog/sustainable-sourcing-procurements-role-for-a-sustainable-future/>
  12. Nadeem, W., Ashraf, A. R., & Kumar, V. (2025). Fostering consumer engagement with sustainability marketing using augmented reality (SMART): A climate change response. *Journal of Business Research*, 192, 115289. <https://doi.org/10.1016/j.jbusres.2025.115289>
  13. Ojo, L. D., Adeniyi, O., Ogundimu, O. E., & Alaba, O. O. (2022). Rethinking green supply chain management practices impact on company performance: A close-up insight. *Sustainability*, 14(20), 13197. <https://doi.org/10.3390/su142013197>
  14. Sánchez-Flores, R. B., Cruz-Sotelo, S. E., Ojeda-Benitez, S., & Ramírez-Barreto, M. E. (2020). Sustainable supply chain management—A literature review on emerging economies. *Sustainability*, 12(17), 6972. <https://doi.org/10.3390/su12176972>
  15. ScienceDirect. (2023). Sustainable transition towards greener and cleaner seaborne shipping industry: Challenges and opportunities. Available at: <https://www.sciencedirect.com/science/article/pii/S2666790823000332>
  16. She, S., Zhu, J., Yi, K., & Wang, X. (2023). Active response from managers: Green marine supply chain empathic response mechanism. *Ocean & Coastal Management*, 245, 106878. <https://doi.org/10.1016/j.ocecoaman.2023.106878>
  17. The Pew Charitable Trusts. (2024). The Role of the Seafood Supply Chain in Sustainable Fisheries. Available at: <https://www.pew.org/en/research-and-analysis/articles/2021/04/13/the-role-of-the-seafood-supply-chain-in-sustainable-fisheries>
  18. Uddin, M., Hoque, N., Mowla, M. M., & Mohammad, M. (2022). Challenges and pathways to green supply chain management: Evidence from manufacturing sectors in an emerging economy. *International Social Science Journal*, 25(3), 1–25. <https://doi.org/10.1111/issj.12333>
  19. UNCTAD. (2022). Maritime supply chains need urgent investment to boost resilience to future crises. UN Trade and Development. Available at: <https://unctad.org/news/maritime-supply-chains-need-urgent-investment-boost-resilience-future-crises>
  20. United Nations Partnerships for SDGs. (2024). Global Sustainable Supply Chains for Marine Commodities. Available at: <https://sdgs.un.org/partnerships/global-sustainable-supply-chains-marine-commodities>