

**Working Paper Series**

**ANALYZING THE IMPACT OF FACTORS AFFECTING SUSTAINABLE SUPPLY  
CHAIN MANAGEMENT ON THE ORGANIZATIONAL PERFORMANCE IN THE  
UAE: MEDIATING ROLE OF GOVERNMENT REGULATIONS**

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## **Abstract**

Sustainability has become a key factor for many businesses to compete. Business sustainability encompasses environmental, social, and economic factors, combined into a triple bottom line (TBL) approach (Dzikriansyah et al., 2023). Well-organized supply chain (SC) activities boost efficacy, ensuring economic, environmental, and social sustainability. The main objectives of the current study are to assess the impact of sustainable procurement, sustainable design, sustainable distribution, and investment recovery on sustainable supply chain management in organizations in the UAE and to assess the relation between sustainable supply chain management and organizational performance (environmental performance, cost performance, and non-financial performance) in organizations in the UAE. The current study also examines whether government regulations mediate the relationship between sustainable supply chain management and organizational performance in the UAE. The study highlights that adopting sustainable supply chain practices can simultaneously improve environmental and cost performance, offering firms a competitive advantage while supporting social responsibility. Managers can leverage supplier collaboration, green procurement, and eco-design strategies to reduce waste, energy use, and operational costs. Policymakers can enhance the adoption of sustainability by providing clear guidelines, incentives, and awareness programs that align organizational practices with national sustainability agendas. The research also reinforces the relevance of the Triple Bottom Line framework, showing that ecological, economic, and social performance are interlinked and mutually reinforcing.

**Keywords:** Sustainable Supply Chain Management, Supply Chain, Organizational Performance, Government Regulations.

## **Introduction**

The incorporation of sustainability as a business approach, whether environmental, social, or economic, has become a pivotal element of competition. The impact of climate

change and social governance issues has compelled enterprises to implement integrated sustainable business methods, particularly within their supply chains (Dzikriansyah et al., 2023; Koberg & Longoni, 2019). Sustainable supply chain management (SSCM), unlike traditional sustainable management, seeks to integrate the three TBL (Tangible, Balanced, Long-term) or three core TBL (Triple Bottom Line) principles to minimize adverse environmental effects while enhancing social and economic value. Sustainability collaborative planning with suppliers, innovative operational consolidation toward resource optimization, and the management of stakeholder activism and issues within your organization have been addressed (Jawabreh et al., 2023).

In the UAE, supply chains remain the critical connectors that link its economic activities and contribute to the country's GDP, as well as the logistics functions in Dubai and the rest of the Emirates. The UAE, and Dubai specifically, has been recognized as a leading global logistics and mobility connector. The Dubai economy has developed logistics and mobility connectors, accelerating economic activities. Dubai has recognized connectors and supply chains as instrumental in focusing economic activities and promoting economic diversification. Even as initiatives to diversify the economy continue, the UAE and Dubai's economy has to connect to the oil supply chains. Rhaman and Ahmed (2024) have highlighted the challenges connectivity and sustainability face, as well as the lack of initiatives in emerging markets. Reliance on oil supply chains and a lack of sustainability initiatives result in supply chains that have economic activities that are the weak links to unsustainability, and the socio-economic impacts are severe, including forced labor, pollution, and depleted resources. These impacts have, and will continue to, affect the economic bottom line, as highlighted by Shahzad et al. (2024).

In achieving SSCM, suppliers' resources and operations are the focal activities. Ineffective supplier management will lead to socially irresponsible supply chain activities.

Jawabreh et al. (2023), as well as other scholars, have noted that effective management and collaboration, facilitated by codes of conduct and standards, are crucial for operational efficiency. The extended value that the supplier organization creates is significant for the bottom line, as identified by business performance scholars, as well as the other economic gains outlined in the SSCM principles. In SSCM, the extended value that the organization creates is significant and extends beyond profit to encompass the supply chain and the network of stakeholders identified by Khan et al. (2021).

While there are efforts at the global and national levels regarding sustainability, including discussions at COP28, the UAE's development agendas, and the Green Agenda 2030, it appears that sustainability, and especially its integration within supply chains, remains in its early stages within the country. Most concerning is that the total supply chain emissions exceed those from operations, and many Chief Procurement Officers still lack an understanding of the sustainability performance of their supply chains (Shekarian et al., 2022; Wang et al., 2023). This research also notes the need for social, economic, and environmental sustainability balanced with the development of policies and frameworks that incorporate national procurement strategies.

The research problem involves understanding the gap in sustainable supply chains and the challenges faced in the UAE. For developing and emerging economies, contextual differences and sustainability complexities complicate challenges. Organizations face the dual challenge of complying with supplier regulations, demonstrating social responsibility, and practicing environmental stewardship while maintaining their core economic activities. This study focuses on the most neglected area in research concerning the social dimension of SSCM, aiming to propose effective sustainable supply chain practices within the UAE (Mangla et al., 2020; Centobelli et al., 2021).

## **Literature Review**

The evolution of Supply Chain Management (SCM) from a descriptive concept to a full-fledged area of study encompassing integration of logistics, procurement, manufacturing, and distribution to streamline the movement of goods and services, and the related information (Dzikriansyah et al., 2023) is remarkable. Koberg and Longoni (2019) describe the supply chain as a logistics conduit that bridges providers and consumers through the interlinked activities of organizations. Among the definitions of SCM, the one that is most widely referenced is that of Handfield and Nichols (1999), which describes SCM as the timely provision of products to consumers, at the required service level and at the least cost, through the efficient integration of suppliers, manufacturers, and storage facilities.

SCM is a complex phenomenon encompassing procurement, production, and the distribution of finances, which is, to a greater extent, the integration of a range of business functions and the diverse set of stakeholders (Rhaman & Ahmed, 2024). The core objective is to enhance both efficiency and effectiveness by structuring and controlling the interrelationships of the central business, suppliers, and customers (Jawabreh et al., 2023). Nonetheless, the influence of SCM on the pillars of business and industry sustainability has not been widely explored, which has, in turn, prompted the development of sustainable supply chain management (SSCM) (Mangla et al., 2020).

### **The Shift Toward Sustainability**

The final decade of the 20th century saw the first steps towards adopting practices in SSCM as a response to new challenges in the social and ecological spheres. SCM in its initial iterations mainly concerned itself with the economic and operational efficiencies of a business. However, the evolution of SCM to SSCM was driven by new challenges, including social responsibility, the social and ecological impacts of business activities, and the long-term sustainability challenges (Centobelli et al., 2021).

As noted by Jawabreh et al. (2023), this change was a response to several drivers, including State policies, growing consumer interest in the sustainability of products, and the competitive unsustainability of business practices, among others. As noted by Jawabreh et al. (2023), the 1980s were an era of world exploitation. With it, the grossly unfettered industrial activities created a negative ecological legacy of waste and pollution. The 1990s consumer was more demanding and expected businesses to provide environmentally friendly products (Jawabreh et al., 2023). All this led to the first 'triple bottom line' supply chain (Jawabreh et al., 2023).

The depletion of natural resources and SSCM as a global business strategy to achieve competitive advantage rank high as the drivers for firms to design and implement sustainable business practices (Saeed & Kersten, 2019; Khan et al., 2021). This new SSCM strategy created the need to extend the scope of traditional SCM to incorporate sustainable procurement, sustainable distribution, product stewardship, and reverse logistics (Basit, 2022).

### **SSCM and GSCM**

As a result of this shift, two concepts of a related nature, but distinct, have emerged. These are Green Supply Chain Management (GSCM) and Sustainable Supply Chain Management (SSCM). While GSCM seeks to minimize negative consequences by performing activities and utilizing green logistics (Khan et al., 2022) and operations in an environmentally friendly manner, SSCM adopts a more comprehensive approach by engaging in environmentally, socially, and economically balanced activities (Jawabreh et al., 2023).

GSCM addresses solely the environmental consequences, whereas SSCM integrates social corporate responsibility, the environment, and the economy to increase the organization's long-term value (Wang et al., 2023). There is a consensus in the literature that SSCM is the most comprehensive approach, aligning with the principles of sustainable development on which this research is based (Shahzad et al., 2024).

Regarding the supply chain, SSCM combines efficiency with environmentally, socially, and economically sustainable frameworks. As Arda Rhaman and Ahmed (2024) note, SSCM focuses on the strategic integration of sustainable objectives within inter-organizational activities aimed at enhancing long-term value. The proposed framework conceptualizes SSCM as an intersection of environmental, social, and economic spheres, emphasizing that sustainability initiatives must be feasible, viable, and equitable (Yang & Wang, 2023). In this regard, an energy-saving measure is of value only if it is economically feasible to implement and maintain for the organization (Basit, 2022).

Most studies focus on the environmental and economic components, while the social component is the hardest to operationalize. However, improving eco-efficiency or economic resilience will indirectly improve social performance through reputation and the outcomes of CSR (Sharafuddin, Madhavan, & Chaichana, 2022).

### **Sustainable Development Dimensions**

The World Commission on Environment and Development (WCED) argues that ‘Sustainable Development’ is achieving today’s objectives without compromising on those for the future (Carter et al., 2019). SSCM contextualizes the definition into the three dimensions:

1. Environmental: Lower the impact on the environment achieved through minimizing emissions, conservation of energy, and rational use of the goods of the earth (Das & Hassan, 2022).
2. Social: Redress inequity, enhance respect for the labor, corporate social responsibility (CSR), and community initiatives, and thereby improve the reputation and social performance (Mukhsin & Suryanto, 2022; Dzikriansyah et al., 2023).
3. Economic: Ensuring a positive bottom line, albeit scrutiny on the social and ecological facets of the business for long-range results (Ahmad et al., 2022; Wang et al., 2023).



These three components reflect the SSCM acts on and emphasize the holistic nature of sustainability.

### **Theoretical Foundations of SSCM**

Various organizational theories influence the development and adoption of Sustainable Supply Chain Management (SSCM). The Resource-Based View (RBV) acknowledges that sustainable practices, such as green procurement and design, can be valuable and unique, leading to a competitive advantage (Kazancoglu, Kazancoglu, & Sagnak, 2018). On the other hand, Stakeholder Theory emphasizes the need to manage and balance relationships with stakeholders who have conflicting interests, such as customers, employees, and communities, through supply chains that consider social and environmental issues (Habib et al., 2022).

The Triple Bottom Line (TBL) framework assesses whether success has been achieved through the three pillars of people, planet, and profit, which align with the social, environmental, and financial integration of outcomes in SSCM (Rhaman & Ahmed, 2024). Furthermore, Institutional Theory posits that the primary drivers of SSCM adoption are largely external factors, including regulations, norms, and competitive behavior (Nazam et al., 2020).

Additional insights come from different theories. The Contingency Theory suggests that no single management style is universally applicable, and SSCM practices should be tailored to specific situations (Sajjad, Eweje, & Tappin, 2020). The Diffusion of Innovations Theory illustrates why some industries adopt certain sustainability practices more readily than others (Li, Waris, & Bhutto, 2024). In contrast, Ecological Modernization Theory (Dzikriansyah et al., 2023) argues that economic expansion and environmental sustainability can be achieved simultaneously through innovative technologies; therefore, economic growth should be seen as an opportunity for environmental advocacy. Lastly, the Theory of Planned Behavior (TPB) and Transaction Cost Economics (TCE) frameworks focus on individual

perceptions and the net costs and benefits of adopting SSCM as the determining factors (Shahzad et al., 2024).

These theories, taken together, create a solid conceptual foundation for understanding the drivers, practices, and performance outcomes of SSCM.

### **Core Components of SSCM**

Sustainable Procurement is recognized as one of the most fundamental components of SSCM because it sets the foundation for environmentally responsible supply chain practices. It goes beyond traditional cost- and quality-focused purchasing by requiring firms to collaborate closely with suppliers to source eco-friendly inputs and develop sustainable products, services, or integrated offerings (Habib et al., 2022). This approach encompasses a wide range of activities, including reducing raw material usage, promoting recycling, and adopting standards that align with environmental goals (Jawabreh et al., 2023). Supplier evaluation plays a crucial role, as firms must ensure that the goods they procure conform to predefined environmental requirements (Yang & Wang, 2023). Sustainable procurement also emphasizes fostering long-term relationships with suppliers, including second- and third-tier vendors, to ensure consistency in environmental initiatives (Bustinza, Vendrell-Herrero, & Jabbour, 2024). By taking proactive measures, such as implementing environmental audits and verifying compliance with international standards like ISO 14000, firms can embed sustainability into their procurement systems (Yang, Thoo, Ab Talib, & Huam, 2024). In doing so, procurement becomes a critical entry point for embedding sustainability throughout the supply chain.

Sustainable Manufacturing represents the operational core of SSCM and is often considered its most critical activity. It focuses on designing and executing production processes that minimize environmental harm through reduced energy consumption, waste elimination, and responsible use of resources (Gonçalves et al., 2024; Shahzad et al., 2024). Often referred

to as green manufacturing or clean production (Das & Hassan, 2022), this concept has evolved into a comprehensive framework integrating sustainable design. Sustainable design, also known as eco-design, emphasizes the integration of environmental considerations into every stage of a product's life cycle, from inception to disposal (Le, 2022). The use of Life Cycle Assessment (LCA) enables firms to systematically measure and analyze the ecological footprint of their products (Kazancoglu, Kazancoglu, & Sagnak, 2018). Key principles include minimizing the use of harmful substances, promoting reuse and recycling, and developing products that support recovery processes (Yildiz Çankaya & Sezen, 2019). Importantly, sustainable manufacturing requires collaborative partnerships with both suppliers and customers to succeed, as stakeholders must jointly pursue cleaner production and eco-design initiatives. Positioned strategically between suppliers and customers, sustainable manufacturing ensures that products are created in a manner consistent with environmental sustainability and is therefore central to achieving SSCM's broader goals (Saeed & Kersten, 2019).

Sustainable Distribution deals with the movement, storage, and delivery of products in ways that reduce environmental impact. It expands the traditional concept of logistics to incorporate ecological considerations into packaging, warehousing, transportation, and delivery processes (Jawabreh et al., 2023). Packaging choices—including material type, size, and design—directly affect transport efficiency and emissions, making them a vital focus area (Dzikriansyah et al., 2023). Firms can enhance sustainability by using lighter, recyclable packaging and optimizing loading patterns to reduce material use and maximize warehouse and transport space utilization (Habib et al., 2022). Logistics decisions, such as the selection of centralized versus decentralized warehousing systems, direct shipping versus hub-and-spoke models, or private fleets versus third-party services, also influence sustainability outcomes (Alzubi & Akkerman, 2022). Practices such as route optimization, reducing shipment

frequency, maximizing truckload capacity, and minimizing empty miles reduce waste and emissions (Le, 2022). Sustainable distribution is situated at the intersection of manufacturers and customers, highlighting the need for collaboration to adopt eco-friendly packaging, reduce energy use, and ensure environmentally conscious delivery (Carter et al., 2019). Ultimately, sustainable distribution plays a decisive role in balancing environmental, economic, and operational performance.

Reverse Logistics completes the supply chain loop by facilitating the return of end-of-life products, excess materials, and idle assets for recycling, remanufacturing, and environmentally sound disposal (Saeed et al., 2022). It extends the life of products and materials, diminishes waste, and lowers environmental impact (Alzubi & Akkerman, 2022). In the automotive manufacturing industry, the importance of reverse logistics has increased significantly due to the implementation of standard car collection and recycling programs (Centobelli et al., 2021). It has recently expanded its scope to include investment recovery, which focuses on retrieving financial value through resale, reuse, and divestment of unused equipment, surplus stock, and by-products (Khan et al., 2021; Yadav et al., 2020). As reverse logistics is positioned near the end of the SSCM framework, it optimizes ecological efficiency by delivering economic value through the closure of the loop and reintroduction of waste into the production system (Jawabreh et al., 2023). This transformative waste value ability defines reverse logistics as the key component of the circular economy and an imperative component of SSCM.

Together, these four components—sustainable procurement, manufacturing, distribution, and finally, reverse logistics—constitute the operational backbone of SSCM. Each practice uniquely contributes to minimizing environmental consequences, optimizing Internal efficiencies, and generating long-lasting benefits, while collectively incorporating sustainability throughout the entire life cycle of a product. It also reinforces the notion that

SSCM transcends conventional supply chain management by incorporating sustainability as a fundamental strategic consideration throughout all supply chain functions.

### **SSCM Driving Forces**

Sustainable Supply Chain Management (SSCM) focuses on the internal integration of supply chain management with the principles of sustainability. Internal integration must be the focus of the first supply chain management principle because it is, first and foremost, a management activity. Internal and external integration of supply chain management will be discussed in subsequent sections of this study.

The external integration of supply chain management involves incorporating the supply chain management with the external operational systems of the organization. External integration of supply chain management is characterized by collaboration between the organization and all the external supply chain stakeholders. External operational systems encompass those of governmental and non-governmental organizations, all customer systems, and the operational systems of all suppliers—collectively referred to as external stakeholders. The consolidation of goals between organizations characterizes cross-organizational collaboration.

The external integration of an organization's supply chain management systems also relies on the collaboration of non-supply chain stakeholders. Depending on the organization's type, non-supply chain stakeholders may include governmental organizations, non-governmental organizations, customers, and other suppliers. The integration of supply chain management and other operational systems within the organization enhances systems, aligns organizational goals, and fosters alignment with the value system. The focus of alignment must be, and it primarily integrates with the organization's systems and management systems. The objective alignment then provides management with a clear organizational process focus.

Consideration of market forces remains crucial. Competitors who adopt sustainability strategies compel other firms to follow suit (Jawabreh et al., 2023). Access to funding is tied to ecological performance. Investors and financial institutions dictate the inclusion of sustainability (Dzikriansyah et al., 2023). Sustainable practices within collaborative networks are also enforced by suppliers (Das & Hussan, 2022).

Internal influences encompass strategic alignment, culture, resources, and management, with those that are most significant emanating from the top of the hierarchy. Executive backing entails the most crucial organizational commitment, given the leadership's influence on strategic system integrations of sustainability (Sajjad, Eweje, & Tappin, 2020). The organizational culture of innovation and ideals of civic responsibility advance the cause of socially responsible supply chain management (SSCM) (Nazam et al., 2020).

Cost-cutting, risk control, and employee participation (Baig et al., 2020) are motivational factors to pursue SSCM for resource use efficiency, energy savings, and waste management to secure sustainable profit margins over time (Moktadir, Ali, Rajesh, & Paul, 2018). The implementation of SSCM is also positively correlated with having the necessary resources, which include sophisticated technology and skilled personnel (Yildiz Çankaya & Sezen, 2019).

Organizational size and globalization influence the adoption of SSCM. For larger firms, SSCM and strategic supply chain management face greater market and stakeholder pressure. Multinational firms must also accommodate regional variations geographically while projecting cohesive global sustainability standards (Li, Waris, & Bhutto, 2024).

While both external and internal factors shape specific triggers that incentivize firms to adopt sustainable supply chain management (SSCM), these include government policies, shareholder expectations, consumer preferences, and competition (Abdulnabi et al., 2022).

These triggers tend to cascade down supply chains, creating a need for focal firms and their suppliers to work together on sustainable compliance.

Environmental regulations compel firms to modify their production processes, while shareholder activism demands greater ecological transparency and accountability. Moreover, the sustainable practices adopted by competitors create mimetic pressures that lead to imitation (Dzikriansyah et al., 2023). As such, these triggers illustrate the intertwined nature of institutional, social, and market pressures that influence the incorporation of socially sustainable practices into supply chain management.

### **SSCM Performance Outcomes**

Sustainable Supply Chain Management (SSCM) seeks to achieve specific performance outcomes, encompassing economic, environmental, and social returns. These outcomes sustain efforts for positive corporate social activities and determine the continuation of investments in such activities.

Cost efficiency, profitability, and competitive advantage are the pillars of economic sustainability. SSCM, such as lean operations, waste reduction, and investment recovery, facilitate the minimization of production costs, while net positive monetary returns grow over time (Nazam et al, 2020). The incorporation of sustainability into procurement and production methods is a paradox, wherein firms save substantial amounts by reducing energy and resource expenditure (Moktadir, Ali, Rajesh, & Paul, 2018). Furthermore, the positive correlation between customer satisfaction and the purchase of sustainable items not only increases sales volume but also expands market share (Abdulnabi et al., 2022).

Environmental outcomes are the primary motivation for implementing SSCM. Policies such as green procurement, eco-design, and reverse logistics minimize waste, save resources, and reduce emissions (Das & Hassan, 2022). Firms that adopt sustainable distribution methods, such as improved transportation and packaging, achieve reductions in their carbon footprints

(Dzikriansyah et al., 2023). Reverse logistics also aids by reclaiming end-of-life products for recycling or reuse, thereby closing the supply chain loop (Koberg & Longoni, 2019). These outcomes enhance environmental compliance and improve the reputational impact on the ecosystem.

Considering labor rights, equality, CSR activities, and community engagement, the social dimension comes together fully. The incorporation of SSCM practices, as noted by Mukhsin and Suryanto (2022), leads to improved working conditions, the adoption of moral supplier attitudes, and ultimately, an enhancement in corporate standing. Trust will be gained and deepened, as will the loyalty of the brand, if the community and employees are engaged and sustained responsibility is observed (Dzikriansyah et al., 2023). Despite the elusive nature of determining the social aspect as opposed to profits and the environment, it is highly developed and needs to be included to ensure social performance.

## **Conclusion**

SSC implementation, however, remains a complex process. When attempting to integrate sustainability into supply chains, firms encounter financial, operational, and organizational barriers. The adoption of 'green' technology, supplier audits, and redesign of a production process to upfront resource requirements and cost outlays may be a key component of a company's balance sheet when the intended SC green redesign is SC 'green' (Shekarian et al., 2022). Resource outlays and costs may also be a barrier to adoption, given the sluggishness and lack of awareness among the firm's managers and employees (Jawabreh et al., 2023).

Crossing the various supply chain actors is the most advanced of the SC challenges. The provision of SSCM is heavily reliant on the synergy of supplier, manufacturer, distributor, and customer networks; however, their different goals and conflicting interests result in compartmentalized reasoning and underdistributed information, and more fundamentally, no



SC integration and synergy (Jawabreh et al., 2023). In addition, the complexities of a global SC incorporation or of horizontally and vertically integrating multiple global SC systems and elements, or tiers of SC, make the SC especially difficult to ensure compliance with being sustainable or eco-friendly (Sharafuddin, Madhavan, & Chaichana, 2022).

Operationalizing the social dimension of SSCM, focusing on relations and constituents, is the most complicated aspect. The relationships with SC constituents involve resource and relation optimization, addressing complex components of loss, equity, disaster, and community growth (Cantele et al., 2023). SC disasters ESG - eco-friendly, sustainable redesign, while social is underexplored in research; most practices emphasize the economic and environmental aspects.

According to the researcher, the SSCM drivers–practices–performance model proposed in this study integrates well with the principles of the Triple Bottom Line (TBL). Within this model, environmental performance constitutes the ecological pillar, while cost performance covers the economic pillar. The inclusion of the OEM and core SSCM constructs fulfills the social pillar, as firms that practice environmental stewardship are also socially responsible. This confirms that the model assesses the comprehensive and integrated performance of the triad of financial, environmental, and social value, thus enhancing its theoretical robustness and completeness.

This study examines the relationship between selected key Sustainable Supply Chain Management (SSCM) practices—sustainable procurement (SP), sustainable design (SD), sustainable distribution (SDIST), and investment recovery (IR)—and the environmental and cost performance of the firm. These practices are driven by both external and internal initiatives aimed at minimizing adverse environmental impacts while also enhancing cost performance. SSCM practices are designed to environmentally enhance a firm by reducing materials, waste, emissions, as well as energy and excess inventories. At the same time, they provide cost

reductions by decreasing the expenditures associated with energy, materials, waste disposal, inventory maintenance, and environmental penalties. The empirical literature provides ample evidence of a positive relationship between SSCM practices and both environmental and cost performance.

In sustainable procurement, materials sourced from suppliers that practice environmental sustainability are procured, thus enhancing environmental performance with the availability of green inputs. Furthermore, costs are also lowered through waste minimization and optimized procurement processes. Similarly, sustainable design entails the adoption of eco-design principles where the goal is to reduce energy, materials, and hazardous substances throughout a product's life cycle. This not only improved environmental performance but also reduced costs associated with production and disposal. In addition, sustainable distribution focuses on and implements environmentally friendly logistics (e.g., optimized routing, green packaging, and minimizing emissions). This results in improved ecology as well as reduced costs associated with transportation and energy. Investment Recovery (IR) involves regaining value from end-of-life products and unproductive assets through reuse, recycling, and surplus sales, thereby gaining value. This strengthens the overall environmental performance and results in decreased value of assets that must be maintained.

In relation to the study, value is also derived from a company's environmental performance, including environmental costs. Notably, the incorporation of SSCM initiatives leads to improved environmental performance, as well as a decrease in associated costs (e.g., energy, materials, waste disposal, and penalties), forming a positive and mutually reinforcing cycle with environmental performance. Environmental performance also enhances a company's brand image, market competitiveness, and organizational legitimacy, thereby improving value and cost performance. Ultimately, the study demonstrates that SSCM

initiatives yield positive economic and environmental benefits. This is a value that positively supports the business sustainability initiatives.

The present study demonstrates how sustainable supply chain management (SSCM) practices can enhance both the environmental and cost performance of a firm, thereby providing it with a competitive edge and contributing to social benefits. A manager can achieve waste, energy, and cost reductions at the operational level by implementing supply chain collaboration, green procurement, and eco-design. To increase the adoption of sustainability, policymakers can align organizational practices with national policies by providing compliance roadmaps, offering incentives for adoption, and launching educational campaigns. The study also confirms the importance of the Triple Bottom Line, which postulates that the social, economic, and environmental dimensions of sustainability are interconnected and reinforce one another.

The study leaves ample room for further research in several areas. For one, the social aspect of sustainable supply chain management (SSCM) also requires further research, especially regarding the relationships with the workforce, stakeholders, and social equity (Dzikriansyah et al., 2023). Furthermore, the development of sustainable supply chains, along with their enhanced traceability and accountability, can be facilitated by Industry 4.0 technologies (e.g., blockchain, AI, and IoT) and digital transformation (Das & Hassan, 2022).

To sum up, SSCM offers firms a strategic prerequisite, along with an opportunity: it satisfies stakeholders and regulatory requirements, while also improving their competitive standing, reputation, and longevity. Organizations that leverage SSCM can design supply chains that are both economically and operationally efficient, as well as equitable and sustainable.

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