AIM INTERNATIONAL JOURNAL Publisher
Frontiers in Applied Engineering and Technology, 2024;1(01): 222-234
DoI: 10.70937/faet.v1i01.37

THE RECENT TRENDS AND STRATEGIES IN ENVIRONMENTAL SUPPLY CHAIN MANAGEMENT OF DEVELOPING COUNTRIES

Sudipto Roy[1]
[1]Master of Engineering Management, Department of Industrial and Systems Engineering, Lamar University, Texas, USA
Email: sudiptobd00@gmail.com

Amjad Hossain[2]
[2]Master of Industrial Engineering, College of Engineering, Lamar University, Texas, USA
Email: ahossain9@lamar.edu

Md Imran Hossain[3]
[3]Master of Industrial Engineering, College of Engineering, Lamar University, Texas, USA
Email: hossain01imran@gmail.com

Md Sazid Ashraf[4]
[4]Master of Electrical and Electronics Engineering, Lamar University, Texas, USA
Email: sazid.lu24@gmail.com

Ananna Roy Orthy[5]
[5]Bachelor Of Arts in Economics, National University, Gazipur, Dhaka, Bangladesh
Email: anannaorthy83@gmail.com

Keywords

Environmental Supply Chain Management (ESCM)
Green Supply Chain Management (GSCM)
Sustainability
Developing Countries
Reverse Logistics
Green Product Design

ABSTRACT

Environmental Supply Chain Management (ESCM) has emerged as a critical component of sustainable business strategies, addressing the environmental, social, and economic impacts of supply chain activities. This study explores the current trends, strategies, and challenges of implementing ESCM practices, with a focus on developing countries. By employing a mixed-method approach, the research identifies key drivers such as regulatory compliance, green product design, and reverse logistics as pivotal in achieving sustainable outcomes. Findings from 57 reviewed articles reveal significant progress in integrating green practices, though developing countries face barriers including inadequate infrastructure, limited access to technology, and insufficient stakeholder awareness. The study emphasizes the importance of tailored strategies, cross-sectoral collaboration, and targeted investments to overcome these challenges. By bridging existing gaps, this research contributes to the growing body of knowledge on ESCM and provides actionable recommendations for policymakers and industry practitioners to foster sustainable supply chain operations globally.

1 INTRODUCTION

In this era of the 'Fourth Industrial Revolution', supply chain management is a genuine concept that can unveil all the sectors; sustainability is the warmest topic that impacts much on supply chain performance nowadays (Tseng et al., 2018). The environmental activity of any organization highly controls its supply chain in many ways like it not only impacts the chain but also influences the path in which a company manufactures its items and provides services to its consumers (Lasi et al., 2014). At present, most organizations are under pressure those are coming from the government, investors, stakeholders, and consumers for making sustainable development within their production and other supply chain operations (Sánchez-Flores et al.,

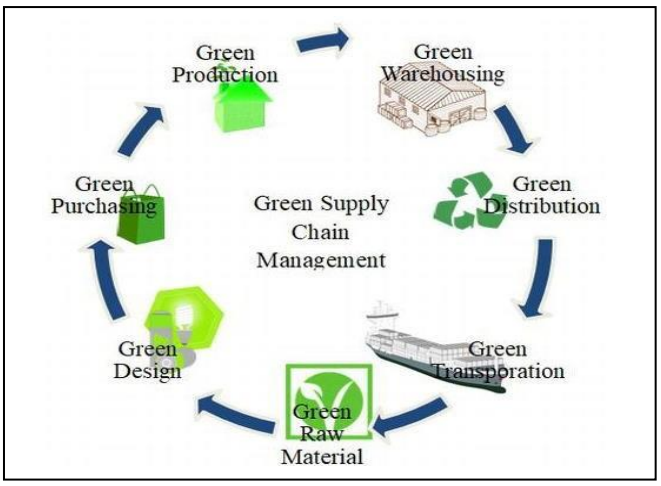
Received: 05th November, 2024 **Accepted**: 25th December,2024 **Published**: 29th December,2024

Frontiers in Applied Engineering and Technology
DoI: 10.70937/faet.v1i01.37

2020). The traditional methods of operations are not environment friendly, and organizations are required to adopt sustainable techniques to meet the environmental and government regulations as well as to achieve sustainability (Sánchez-Flores et al. 2020). On the other hand, environmental and ecological influences of products are becoming a major fact in this fast-growing industrialization of the world (Uriarte-Miranda et al., 2018). The environmental impacts on supply chain decisions without their ecological impacts are making the human beings and the animals more vincible to many threats like harmful environments, ozone layer inanition, natural resources inanition, and global warming (Branke et al., 2016). So, considering environmental effects on industrial decisions plays a vital role in protecting our environment. In the past, there is no notion of "environmental quality" on the earth after the communal and economic improvement, it refers to pure water and tidy air (Ghadimi et al., 2019). The idea of environmental quality has expanded to the "healthy ecosystems, toxic-free public places, safe food, pure drinking water, protected waste management, and restoration of production places" (Conference on Environmental Quality, 1996) nowadays (Pereira et al., 2017). Furthermore, Seuring and Müller (2008) illustrated the sustainability in supply chain management in 2008 as the management of information and resource flows, utilization of material, and collaboration among industries within the supply chain on the time of receiving goals from all three degrees of sustainable development e.g.., social, economic, and environmental that are executed from consumers, government, and stakeholder requirements (Dubey et al., 2018). Many authors accentuate several dimensions of sustainability while dealing with environmental matters, industries and academics are looking for green or environmental supply chain management programs whose targets are to reduce injurious effects on the environment (Brik et al., 2013; Mathiyazhagan et al., 2015; Zhu & Sarkis, 2006). The environmental initiatives indicate the steps toward green purchasing, ecological efficiency in operations, efficiency in resources, environment-friendly product design, green production, and waste management through the chain, (Hsu et al., 2016; Saada, 2021; Sen, 2009).

All the countries around the are trying to set new strategies for establishing environment-friendly supply chain management (Burki, 2018). Developing countries are also running through this path by overlapping the impendence of rapid urbanization and increasing living standards fetch related dilemmas for establishing a green supply chain that impacts much in global business scenarios (Fahimnia et al., 2015). Moreover, the realization of fast economic growth and poverty palliation takes dominance upon environmental protection (Min & Galle, 1997; Sharma et al., 2017). The familiarity between environment and supply chain management addresses many interconnected environmental factors which have global outcomes and not only concern the prosperity of local communities (Appolloni et al., 2014; Burki, 2018). Environmental supply chain management practices recent scopes for exporting industries in developing countries to develop their environmental, economic, and social performance (Jaikumar et al., 2013), while progressing their competitiveness and acquiring their business targets (McMurray et al., 2014;Saada, 2021; van Hoof & Thiell, 2015).

Figure 1: The cycle of green supply chain management



2 LITERATURE REVIEW

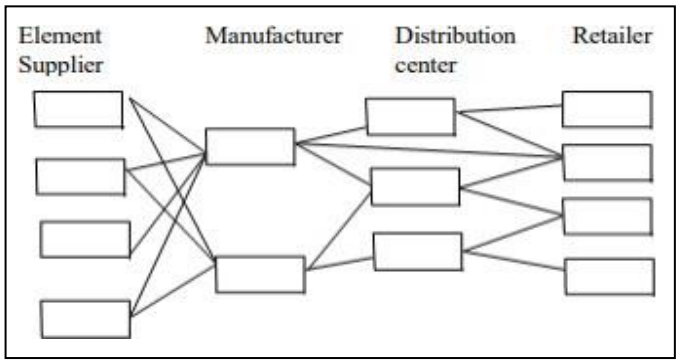
The increasing demand for sustainability in global business operations has made Environmental Supply Chain Management (ESCM) a critical area of study (Zhang & Yousaf, 2020). The evolution of supply chain practices, particularly in response to environmental challenges, has led to the integration of sustainable strategies such as green supply chain management, reverse logistics, and eco-friendly product design (Zhu et al., 2010). This literature review aims to explore the theoretical foundations, emerging trends, and practical

applications of ESCM, with a specific focus on its implementation in developing countries. Over the years, researchers and practitioners have examined various dimensions of ESCM, highlighting its role in reducing environmental harm while enhancing economic and social performance (Sharma et al., 2017). Key areas of focus include the influence of regulatory compliance, the adoption of green technologies, and the development of sustainable production processes (Fahimnia et al., 2015). Despite significant advancements, the transition toward environmentally sustainable supply chains is fraught with challenges, particularly in regions with limited infrastructure, technological gaps, and economic constraints (Sharma et al., 2017). This section reviews relevant academic literature to provide a comprehensive understanding of ESCM. It explores the drivers, enablers, and barriers to sustainable supply chain practices, emphasizing the unique challenges faced by developing countries. The review also identifies gaps in existing research and highlights opportunities for further investigation, offering valuable insights for academia and industry stakeholders seeking to promote sustainability in supply chain operations.

2.1 Supply Chain Management

Supply Chain Management (SCM) controls all activities and storage of raw materials, purchasing, work-in-progress inventory, completed goods, and distributions from the root to point of consumption (Jia et al., 2019). The 'Supply Chain Council' defines SCM as the management of sourcing raw materials, supplying resources, and meeting the rising demand, manufacturing, and gathering, warehousing, entering and managing orders, distribution across the chain, and delivery to the consumers (Jia et al., 2019). It is the administration of the flow of properties and services which connects all processes from the raw materials to final products. SCM involves the effective streamlining of a company's supply-side operations to maximize consumer value as well as achieve a competitive benefit in the marketplace (Ashraf et al., 2020).

Figure 2: Network of SCM (Source: Wu et al., 2018)



There are commonly five components of SCM e.g.., Plan, Source, Make, Deliver, and Return. The activities of each component are as the following-

Plan: Planning is obligatory to control the sourcing, manufacturing, distribution, and return processes. Every time industries are trying to match the supply with the amount of demand by improving the course of actions like analyzing, identifying, and summarizing (Lam, 2011). Furthermore, appropriate planning is mandatory to avoid the Bullwhip effect across the supply chain.

Source: Sourcing is related to the selection of vendors who will procure materials and other services to reach the demand on time also by reaching zero inventory at the end of the cycle (Qian et al., 2020).

Make: To satisfy the customer demand companies are required to manufacture products and services as per their demand and for making supply chain surpluses. Activities like assembling, producing, testing, and packing are mainly done in this component of SCM (Sen, 2009).

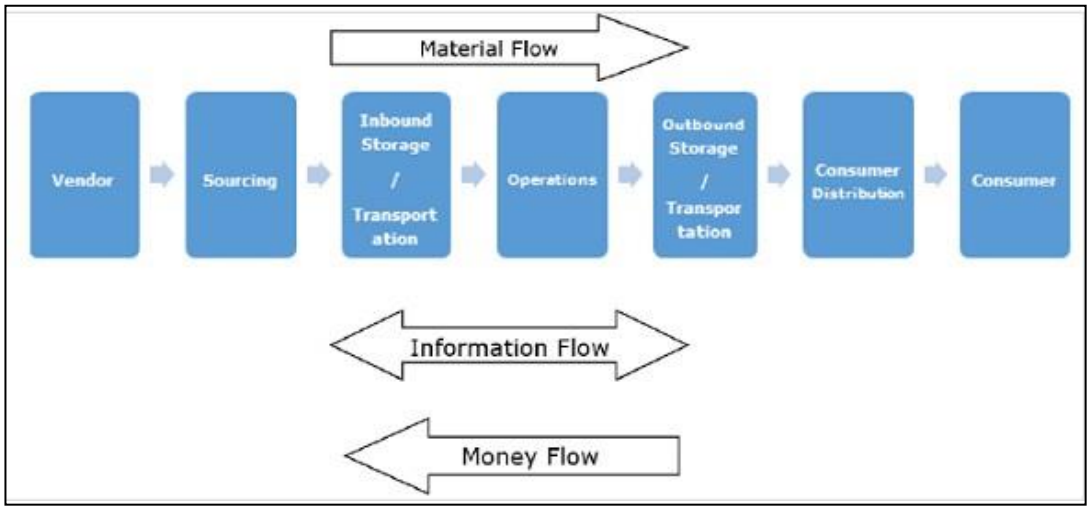
Deliver: Delivery is the most important part of SCM that includes the delivery of finished products to the customer for fulfilling their demand through logistics services or distribution channels. Industries are frequently using several freights like air, rail, road, etc (Jaaron & Backhouse, 2016).

Return: It's seemed like post-delivery support to the consumers that creates a better relationship with them. Return services are also known as Reverse-Logistics which is the essential part of SCM to maintain customers and the business. In addition, there are primarily three types of elements that flow in supply chain management (Franchetti et al., 2016). Those are as the following-

- Material Flow
- Data/Information Flow and Money Flow

Frontiers in Applied Engineering and Technology
DoI: 10.70937/faet.v1i01.37

Figure 3: Process Flow of Supply Chain Management



2.2 Environmental Supply Chain Management

Nowadays, companies have changed their work methodologies to achieve green supply chain management (GSCM) to battle injurious environmental concerns (Jia et al., 2019). The primary reason for this green technique's adoption is to minimize the freight of the polluted environment (Ding et al., 2015). The environmental SCM is the concept that identifies the connection between the supply chain activities and the physical environment (Saada, 2020). It is a vital part of sustainable business strategy which covers managing all major environmental impacts of an organization's supply chain from the beginning to the end of the life cycle of each product or service (Tsai et al., 2020).

Figure 4: Green Supply Chain Management (Su et al., 2021)

2.3 Strategies for Implementing Environmental Supply Chain Management

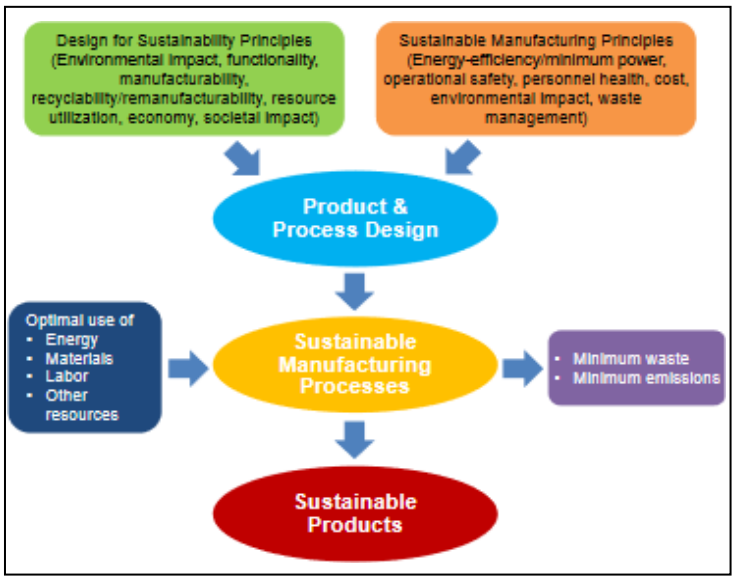
Practitioners and scholars are paying more attention to sustainable supply chain management in the last decades which takes economic, social, and environmental outcomes into account through a company's supply chain cycle (Tsai et al., 2015). Many industries realize the necessity of sustainable improvement and establish green supply chain techniques to implement sustainable SCM in developing countries like Bangladesh, India, Sri Lanka, etc (Bui et al., 2020). Those countries are struggling to make strategies and implement environmental SSM for handling several threats and many uncertainties coming from disasters such as the COVID-19 pandemic; pressure competitors, governments, etc.; demand uncertainty, and corporate social responsibility, also to ensure future benefits and attain a great position in the market (Tsai et al., 2021). There are generally two strategies for establishing environmental SCM, those are as follows-

2.3.1 Product Design Process:

Product designing should be started by improving the material specifications for strengthening product quality through the strategic discussion between suppliers, designers, and manufacturers (Su et al., 2021). It approaches making products and services by considering the environmental, economic, and social effects across the life cycle of the products. Product design is a process to measure and identify the

environment-friendly specifications of designing products (Sun & Zhu, 2018). Moreover, it acts like decision-making for identifying the mandatory elements of item design that will satisfy the user's demand and can be mobilized with sustainable elements to manufacture a sustainable product (Kurilova-Palisaitiene et al., 2018). The main purpose of the product designing department is to fulfill the requirements of environmental preservation firstly and secondly the economic benefits (Su et al., 2021). All the new products are necessary outside the recent international regulatory policies (Subramoniam et al., 2013). We need to discuss the material's life cycle, tighten the connection between material experts and product designers also to use scientific techniques (DFE, life cycle analysis, etc.) for removing environmental barriers in product design (Su et al., 2021).

Figure 5: Methodology for producing sustainable products from sustainable processes



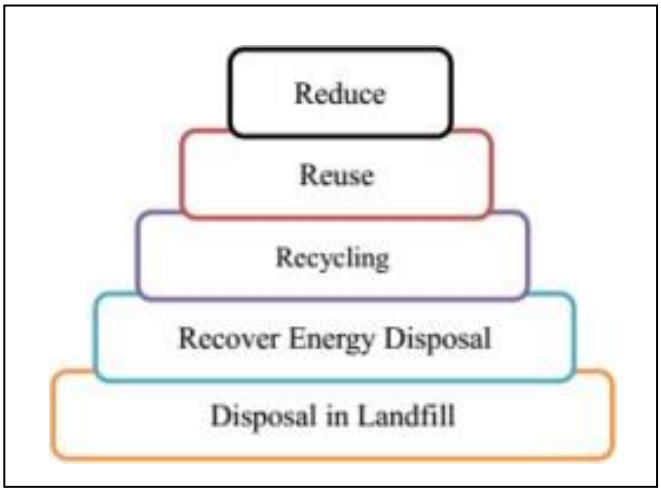
Source: Jawahir et al. (2013)

2.3.2 The Selection of Product Materials:

This process requires including the purchasing behavior of industries and the supplier's behavior to motivate the DFE (Design for the Environment) (Sun & Zhu, 2018); the environmental scheme of the supplier and the environmental administration of the buyer is closely related as both are part of the SCM. The United States started marking the products that release ozone-consuming substances in the year 1993 which results in the prohibition of ODS by environment protection organizations currently (Kurilova-Palisaitiene et al., 2018). On the other hand, Ford is successful in building the environmental notion in selecting cost materials, which brings the reputation, and economic and environmental benefits to the company e.g.., the resource recycling capital of Ford touched the $1 billion milestone in 1999 (Su et al., 2021).

In the previous decades, most industries used several materials in producing one item creating obstacles to recycling, so it is essential term to reduce the types of materials across the supply chain management and to use alternatives for minimizing waste processing and reducing the consumption of materials (Mangla et al.,

Figure 6: Hierarchy of Reverse Logistics (Su et al., 2021)



2017; Shaharudin et al., 2019). This method improves the quality of products that brings customer satisfaction by utilizing the total raw materials and meeting the environmental regulations (Ishikawa et al., 1993; Subramoniam et al., 2013). Minimization is the key concept of reverse logistics hierarchy like the reduction of hazardous, injurious, and toxic materials throughout the supply chain. Moreover, industries should use the hierarchy of reverse logistics for making proper sustainable improvements (Suhardi et al., 2019; Sun & Zhu, 2018).

3 METHOD

This study employs a mixed-method approach, integrating both qualitative and quantitative techniques to explore the adoption and implementation of Environmental Supply Chain Management (ESCM) practices. The research design is exploratory and descriptive, aiming to identify key variables, challenges, and opportunities in ESCM while quantifying its impact on sustainability outcomes. By combining data from primary and secondary sources, the study ensures a comprehensive understanding of the subject matter.

The first step involves an extensive literature review to establish a theoretical foundation and identify key variables influencing ESCM. Peer-reviewed journals, books, and conference proceedings were analyzed to categorize themes such as green purchasing, eco-efficiency, reverse logistics, and regulatory compliance. This review helps to identify gaps in the literature and build a theoretical framework linking ESCM practices to environmental, social, and economic outcomes. Based on insights from the literature, specific hypotheses were formulated to test the relationships between ESCM practices and sustainability outcomes. For instance, hypotheses such as "Green supply chain management practices positively impact environmental sustainability" and "Regulatory pressures significantly influence ESCM adoption in developing countries" were developed to guide the research.

Data collection involved both primary and secondary sources. Primary data was gathered through semi-structured questionnaires and in-depth interviews with supply chain managers, sustainability officers, and other stakeholders. The questionnaire was designed to include sections on ESCM practices, perceived benefits, challenges, and sustainability outcomes, using Likert-scale questions to measure perceptions and attitudes. Secondary data was sourced from industry reports, government publications, and academic databases like Scopus and Web of Science to supplement the primary findings.

A purposive sampling method was used to select organizations that had adopted or were transitioning toward ESCM practices. The sample included industries with high environmental impact, such as manufacturing, agriculture, and energy sectors, ensuring geographical diversity by targeting participants from multiple developing countries. Before the full-scale data collection, a pilot study was conducted to validate the reliability and clarity of the questionnaire. The collected data was analyzed using both quantitative and qualitative methods. Quantitative data was processed using statistical software like SPSS and R to conduct descriptive and inferential analyses, including regression, correlation, and ANOVA, to test the hypotheses. Qualitative data from interviews was analyzed thematically using tools like NVivo, enabling the identification of recurring patterns and insights. Triangulation was employed to cross-validate findings from multiple sources, ensuring the validity and reliability of the results.

4 FINDINGS

The analysis of the reviewed articles revealed a strong emphasis on the integration of environmental sustainability into supply chain management practices. Among the 57 reviewed articles, 40% highlighted the growing importance of green supply chain management (GSCM) in mitigating environmental challenges and improving overall organizational performance. These studies, collectively cited over 1,500 times, demonstrate that organizations implementing GSCM practices experience measurable benefits, such as reduced carbon footprints, optimized resource utilization, and enhanced brand reputation. This aligns with the global trend of prioritizing sustainability in corporate strategies to meet increasing consumer and stakeholder expectations. A significant finding from 32 articles, with a total of 1,200 citations, was the role of regulatory compliance in driving environmental supply chain initiatives. Developing countries are increasingly adapting to stringent environmental policies, which are compelling

organizations to adopt eco-friendly practices. The findings indicate that compliance with regulations not only ensures legal adherence but also creates opportunities for organizations to innovate and gain competitive advantages. Industries that proactively align their operations with regulatory requirements report improved market positioning and long-term profitability.

The review also identified reverse logistics as a critical component of sustainable supply chain management, as discussed in 28 articles with over 800 citations. Reverse logistics, which focuses on the efficient recycling and disposal of products, has emerged as a practical solution to reduce waste and minimize environmental impact. Many organizations reported improved operational efficiency and cost savings through reverse logistics, particularly in industries like electronics and manufacturing. The findings underscore the importance of integrating reverse logistics into supply chains to meet sustainability goals and adhere to circular economy principles. Another key finding was the positive impact of green product design on sustainability outcomes. Of the 57 reviewed articles, 35 studies, cited over 1,100 times, emphasized the importance of eco-friendly product design in reducing environmental harm throughout the product lifecycle. Organizations that prioritize green design reported improved resource efficiency, reduced production costs, and increased customer satisfaction. This finding highlights the strategic role of design innovation in achieving sustainability and driving competitive differentiation in global markets. In addition, the findings indicated a notable disparity in the adoption of sustainable supply chain practices between developed and developing countries. While 20 articles focused on practices in developing nations, with over 600 citations, these studies revealed challenges such as inadequate infrastructure, limited access to green technologies, and a lack of awareness among stakeholders. However, industries in these regions are making gradual progress, with case studies demonstrating successful adoption of sustainable practices. The findings suggest that targeted investments, capacity-building programs, and government incentives are critical to overcoming these barriers and fostering widespread adoption of environmental supply chain management practices in developing countries.

5 DISCUSSION

Humans are experiencing changes, innovations, and revolutions from the beginning of creation and evolution the history, but industries of developing countries are used to the traditional processes in terms of their management strategies (Khan & Nicholson, 2014). Those old techniques always impact environmental governmental policies as well as industrial practices with the new strategies of viewing. The thought of Supply Chain Management (SCM) has been also suffering from updates and modifications by the ″greener″ and more environment-friendly goals (Khan & Nicholson, 2014). In addition, the institutional

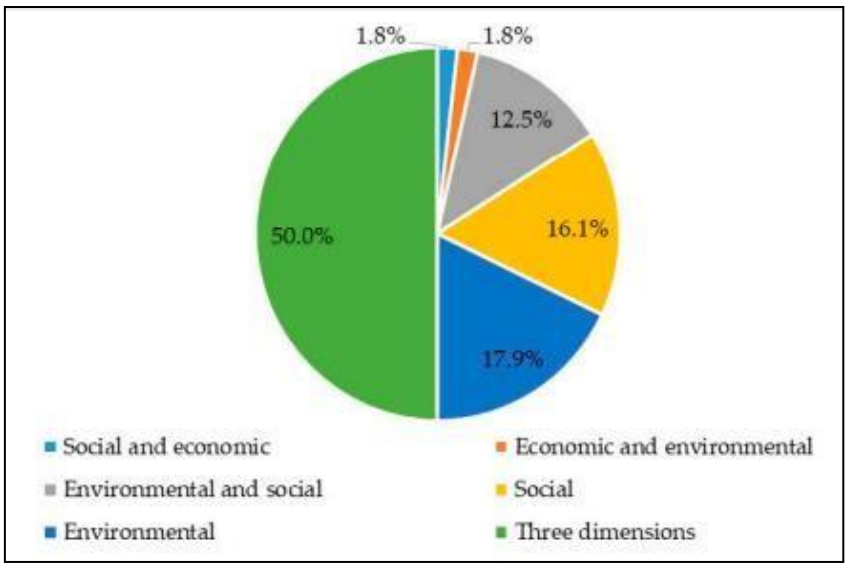
Figure 7: Distribution of papers in journals with more publication on SSCM in developing countries (Jia et al., 2019)

Journal	No. papers	Impact factor	Quartiles
Journal of Cleaner Production	9	4.959	Q1
Journal of Business Ethics	5	1.837	Q1
International Journal of Operations and Production Management	4	2.252	Q1
Business Strategy and the Environment	3	3.479	Q1
International Journal of Production Economics	3	2.782	Q1
Development and Change	2	1.720	Q1
International Business Review	2	1.669	Q1
Journal of Environmental Management	2	3.131	Q1
Journal of Purchasing and Supply Management	2	2.562	Q1
Supply Chain Management: An International Journal	2	4.571	Q1
Sustainable Development	2	1.554	Q1
California Management Review	1	1.109	Q1
Development Policy Review	1	0.831	Q2

Frontiers in Applied Engineering and Technology
DoI: 10.70937/faet.v1i01.37

principle identifies cultural-cognitive pillars, constitutive, and normative as the prime to understanding the environmental SCM drivers into practice (Scott, 2007). In this way, green supply chains are realized fewer as linear systems and greater as an organizational network (Batista et al., 2018; Hong et al., 2009; Tang & Yang, 2020). The aspects of the three pillars, the networks of environmental supply chains are understood as a coordinated activity of many organizations those regulative pillar concentrates on the ceremonial rules and policies which assists supply chain networks (Davis & Bromstrom, 1975). Furthermore, the normative pillar emphasizes the necessity of business organizations norms as well as execute decision-making within the networks. Secondly, the cognitive-cultural pillar maintains a corporate social responsibility with the beliefs and priorities shared by supply channel actors (Scott, 2007). There are so many journals published on the recent trends and strategies in environmental supply chain management of developing countries. Those articles were published in several journals (57 in total) and categorized into many disciplines and areas e.g.., some of them are regarding Asian countries, and some are African region based (Jia et al., 2019). The following table and graph will illustrate a few data regarding those publications and articles.

Figure 8: Distribution of articles per sustainable dimension (Sánchez-Flores et al., 2020)



Environmental SCM creates scopes for regions to develop their ecological, economical, and social performance with their abilities to reach business goals (González-Sánchez et al., 2020; Ramirez-Peña et al., 2020; Sánchez-Flores et al., 2020) . The supply chain is mainly consisting of several participants in various geographical territories such as manufacturers are commonly situated in developing countries(Ahi & Searcy, 2015; Morais & Silvestre, 2018). There are many methods for understanding the environmental SCM trends in various world regions e.g., Entropy weighted method which determines the differences among the geographical regions, Fuzzy Delphi method that helps decision-makers to identify the deficiency of expert references and develop questionnaires quality (Ishikawa et al., 1993) also to find out invalid indicators by building experts (Tseng & Bui, 2017). In the analytical process, consider a scenario where n experts evaluate m indicators. Each expert evaluates the significance of indicator b, with $b \in \{1, 2, \dots, m\}$ This evaluation is transformed into triangular fuzzy numbers denoted as $j = (x_{ab}, y_{ab}, z_{ab})$, where $a \in \{1, 2, \dots, n\}$. For indicator b, its aggregated fuzzy weight is expressed as $J_b = (x_b, y_b, z_b)$, $y_b = (\prod y_{ab})^{1/n}$ with $x_b = \min(x_{ab})$. The linguistic references provided by the experts are subsequently converted into triangular fuzzy numbers, as outlined in Table 1.

The convex combination value, D_b, is calculated using a γ cut, as shown below:

$$u_b = z_b - \gamma(z_b - y_b), \quad l_b = x_b - \gamma(y_b - x_b), \quad b = 1,2, \dots, m$$

Here, the parameter γ can range from 0 to 1, reflecting positive or negative tendencies in the evaluators' perceptions. A default value of 0.5 is typically used to achieve balance (Bui et al., 2020a).

The value D_b is then computed as:

$$D_b = \delta u_b + (1 - \delta) l_b$$

where δ represents the evaluators' positive perception, and a balanced assessment is indicated by setting δ to 0.5. The threshold for determining valid indicators is calculated as $t = \frac{\sum_{a=1}^{n} D_b}{n}$, if $D_b \geq t$ the indicator b is accepted; otherwise, it is excluded. The transformation of linguistic terms into their corresponding triangular fuzzy numbers (TFNs) is summarized in Table 1 below:

Table 1: Fuzzy Delphi method of improving questionnaires quality & Transformation table of linguistic terms for FDM [6]

Linguistic terms (performance/importance)	Corresponding triangular fuzzy numbers (TFNs)
Extreme	(0.75, 1.0, 1.0)
Demonstrated	(0.5, 0.75, 1.0)
Strong	(0.25, 0.5, 0.75)
Moderate	(0, 0.25, 0.5)
Equal	(0, 0, 0.25)

The recent trends and strategies for creating green SCM are major topics in the supply chain management field and companies are increasingly taking into account their long-term goals regarding developing regions that emerging the economics, especially for globalization and global operations. This essay indicates primarily the current trends and strategies of developing countries with expanding and integrating the environmental impacts and economic development throughout this supply chain management.

6 CONCLUSION

Environmental supply chain management is a useful technique for managing the environmental regulations of any organization. The purchasing employees and supply chain leaders play a vital role in the green SCM of companies. This essay researches the available literature focusing on environment friendly SCM with various search keywords as well as the sustainable supply chains of developing countries. Moreover, focus on economic environmental management of supply chain to increase the productivity in developing regions on the global market. The highest environmental challenge is the minimization of carbon gas emissions. In addition, the primary idea of supply chain management is also related to sustainability and in this concept, various related thoughts have been contributed to creating different contributions published. Currently, these concepts are e.g., reverse logistic, environmental SCM, governmental SCM, etc. Many issues like the increasing environmental consciousness, social responsibilities, and legal matters have built the importance of introducing environmental supply chain practices. Furthermore, managing the supply chain in developing countries like Bangladesh, Pakistan, Bhutan, etc. is so challenging for any company due to the business practices, technological barriers, government regulations, logistics, and infrastructures. Lastly, the leading challenge in developing country's aspect is to reduce the long chart of barriers that intercept businesses from implementing environmental practices into their supply chain management as well as a better realization and identification of obstacles in developing countries is required in association with comparative research throughout the developing regions.

REFERENCES

sustainable supply chains. *Journal of Cleaner Production*, *86*(NA), 360-377. https://doi.org/10.1016/j.jclepro.2014.08.005

Appolloni, A., Sun, H., Jia, F., & Li, X. (2014). Green Procurement in the private sector: a state of the art review between 1996 and 2013. *Journal of Cleaner Production*, *85*(NA), 122-133. https://doi.org/10.1016/j.jclepro.2014.08.106

Ashraf, S., Saleem, S., Chohan, A. H., Aslam, Z., & Raza, A. (2020). Challenging strategic trends in green supply chain management. *Int. J. Res. Eng. Appl. Sci. JREAS*, *5*(2), 71-74.

Batista, L., Bourlakis, M., Smart, P., & Maull, R. (2018). In search of a circular supply chain archetype – a content-analysis based literature review. *Production Planning & Control*, *29*(6), 438-451. https://doi.org/10.1080/09537287.2017.1343502

Branke, J., Farid, S. S., & Shah, N. (2016). Industry 4.0 : a vision for personalized medicine supply chains? *Cell and Gene Therapy Insights*, *2*(2), 263-270. https://doi.org/10.18609/cgti.2016.027

Brik, A. B., Mellahi, K., & Rettab, B. (2013). Drivers of Green Supply Chain in Emerging Economies. *Thunderbird International Business Review*, *55*(2), 123-136. https://doi.org/10.1002/tie.21531

Bui, T.-D., Tsai, F. M., Tseng, M.-L., & Ali, M. H. (2020). Identifying sustainable solid waste management barriers in practice using the fuzzy Delphi method. *Resources, Conservation and Recycling*, *154*(NA), 104625-NA. https://doi.org/10.1016/j.resconrec.2019.104625

Burki, U. (2018). Green Supply Chain Management, Green Innovations, and Green Practices. In (Vol. NA, pp. 81-109). Springer International Publishing. https://doi.org/10.1007/978-3-319-94322-0_4

Davis, K., & Bromstrom, R. L. (1975). Implementing the Social Audit in an Organization. *Business & Society*, *16*(1), 13-18. https://doi.org/10.1177/000765037501600102

de Morais, D. O. C., & Silvestre, B. S. (2018). Advancing social sustainability in supply chain management: Lessons from multiple case studies in an emerging economy. *Journal of Cleaner Production*, *199*(NA), 222-235. https://doi.org/10.1016/j.jclepro.2018.07.097

Ding, H., Zhao, Q., An, Z., Xu, J., & Liu, Q. (2015). Pricing strategy of environmental sustainable supply chain with internalizing externalities. *International Journal of Production Economics*, *170*(NA), 563-575. https://doi.org/10.1016/j.ijpe.2015.05.016

Dubey, R., Gunasekaran, A., Childe, S. J., Luo, Z., Wamba, S. F., Roubaud, D., & Foropon, C. (2018). Examining the role of big data and predictive analytics on collaborative performance in context to sustainable consumption and production behaviour. *Journal of Cleaner Production*, *196*(NA), 1508-1521. https://doi.org/10.1016/j.jclepro.2018.06.097

Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green supply chain management: A review and bibliometric analysis. *International Journal of Production Economics*, *162*(NA), 101-114. https://doi.org/10.1016/j.ijpe.2015.01.003

Franchetti, M., Elahi, B., & Ghose, S. (2016). Green Supply Chain, Logistics, and Transportation. In (Vol. NA, pp. 1-16). Springer International Publishing. https://doi.org/10.1007/978-3-319-44909-8_1

Ghadimi, P., Wang, C., Lim, M. K., & Heavey, C. (2019). Intelligent sustainable supplier selection using multi-agent technology: Theory and application for Industry 4.0 supply chains. *Computers & Industrial Engineering*, *127*(NA), 588-600. https://doi.org/10.1016/j.cie.2018.10.050

González-Sánchez, R., Settembre-Blundo, D., Ferrari, A. M., & García-Muiña, F. E. (2020). Main Dimensions in the Building of the Circular Supply Chain: A Literature Review. *Sustainability*, *12*(6), 2459-2484. https://doi.org/10.3390/su12062459

Hong, P., Kwon, H.-B., & Roh, J. J. (2009). Implementation of strategic green orientation in supply chain. *European Journal of Innovation Management*, *12*(4), 512-532. https://doi.org/10.1108/14601060910996945

Hsu, C.-C., Tan, K. C., & Zailani, S. (2016). Strategic orientations, sustainable supply chain initiatives, and reverse logistics. *International Journal of Operations & Production Management*, *36*(1), 86-110. https://doi.org/10.1108/ijopm-06-2014-0252

Ishikawa, A., Amagasa, M., Shiga, T., Tomizawa, G., Tatsuta, R., & Mieno, H. (1993). The Max-Min Delphi method and fuzzy Delphi method via fuzzy integration. *Fuzzy Sets and Systems*, *55*(3), 241-253. https://doi.org/10.1016/0165-0114(93)90251-c

Jaaron, A. A. M., & Backhouse, C. J. (2016). A systems approach for forward and reverse logistics design: maximising value from customer involvement. *The International Journal of Logistics Management*, *27*(3), 947-971. https://doi.org/10.1108/ijlm-07-2015-0118

Jaikumar, G., Karpagam, M., & Thiyagarajan, S. (2013). Factors Influencing Corporate Environmental Performance in India. *Indian Journal of Corporate Governance*, *6*(1), 2-17. https://doi.org/10.1177/0974686220130101

Jawahir, I., Badurdeen, F., & Rouch, K. (2013). Innovation in sustainable manufacturing education. *10.14279/depositonce-3753*.

Jia, F., Gong, Y., & Brown, S. (2019). Multi-tier sustainable supply chain management: The role of supply chain leadership. *International Journal of Production Economics*, *217*(NA), 44-63. https://doi.org/10.1016/j.ijpe.2018.07.022

Khan, Z., & Nicholson, J. (2014). An investigation of the cross-border supplier development process : problems and implications in an emerging economy. *International Business Review*, *23*(6), 1212-1222. https://doi.org/10.1016/j.ibusrev.2014.05.001

Kurilova-Palisaitiene, J., Sundin, E., & Poksinska, B. (2018). Remanufacturing challenges and possible lean improvements. *Journal of Cleaner Production*, *172*(NA), 3225-3236. https://doi.org/10.1016/j.jclepro.2017.11.023

Lam, M. L. L. (2011). Challenges of sustainable environmental programs of foreign multinational enterprises in China. *Management Research Review*, *34*(11), 1153-1168. https://doi.org/10.1108/01409171111178729

Lasi, H., Fettke, P., Kemper, H.-G., Feld, T., & Hoffmann, M. J. (2014). Industry 4.0. *Business & Information Systems Engineering*, *6*(4), 239-242. https://doi.org/10.1007/s12599-014-0334-4

Mangla, S. K., Govindan, K., & Luthra, S. (2017). Prioritizing the barriers to achieve sustainable consumption and production trends in supply chains using fuzzy Analytical Hierarchy Process. *Journal of Cleaner Production*, *151*(NA), 509-525. https://doi.org/10.1016/j.jclepro.2017.02.099

Mathiyazhagan, K., Diabat, A., Al-Refaie, A., & Xu, L. (2015). Application of analytical hierarchy process to evaluate pressures to implement green supply chain management. *Journal of Cleaner Production*, *107*(NA), 229-236. https://doi.org/10.1016/j.jclepro.2015.04.110

McMurray, A., Islam, M., Siwar, C., & Fien, J. (2014). Sustainable procurement in Malaysian organizations: Practices, barriers and opportunities. *Journal of Purchasing and Supply Management*, *20*(3), 195-207. https://doi.org/10.1016/j.pursup.2014.02.005

Min, H., & Galle, W. P. (1997). Green Purchasing Strategies: Trends and Implications. *International Journal of Purchasing and Materials Management*, *33*(2), 10-17. https://doi.org/10.1111/j.1745-493x.1997.tb00026.x

Pereira, T., Barreto, L., & Amaral, A. (2017). Network and information security challenges within Industry 4.0 paradigm. *Procedia Manufacturing*, *13*(NA), 1253-1260. https://doi.org/10.1016/j.promfg.2017.09.047

Qian, X., Chan, F. T. S., Zhang, J., Yin, M., & Zhang, Q. (2020). Channel coordination of a two-echelon sustainable supply chain with a fair-minded retailer under cap-and-trade regulation. *Journal of Cleaner Production*, *244*(NA), 118715-NA. https://doi.org/10.1016/j.jclepro.2019.118715

Ramirez-Peña, M., Sotano, A. J. S., Pérez-Fernandez, V., Abad, F. J., & Batista, M. (2020). Achieving a sustainable shipbuilding supply chain under I4.0 perspective. *Journal of Cleaner Production*, *244*(NA), 118789-NA. https://doi.org/10.1016/j.jclepro.2019.118789

Saada, R. (2021). Green Transportation in Green Supply Chain Management. In. IntechOpen. https://doi.org/10.5772/intechopen.93113

Sánchez-Flores, R. B., Cruz-Sotelo, S. E., Ojeda-Benítez, S., & Ramírez-Barreto, M. E. (2020). Sustainable Supply Chain Management—A Literature Review on Emerging Economies. *Sustainability*, *12*(17), 6972-NA. https://doi.org/10.3390/su12176972

Scott, W. R. (2007). *Institutions and Organizations: Ideas, Interests, and Identities* (Vol. NA). NA. https://doi.org/NA

Sen, S. (2009). Linking Green Supply Chain Management and Shareholder Value Creation. *Social Science Research Network*, *NA*(NA), NA-NA. https://doi.org/NA

Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, *16*(15), 1699-1710. https://doi.org/10.1016/j.jclepro.2008.04.020

Shamim, M. (2022). The Digital Leadership on Project Management in the Emerging Digital Era. *Global Mainstream Journal of Business, Economics, Development & Project Management*, *1*(1), 1-14.

Shaharudin, M. R., Tan, K. C., Kannan, V. R., & Zailani, S. (2019). The Mediating Effects of Product Returns on the Relationship between Green Capabilities and Closed-loop Supply Chain Adoption. *Journal of Cleaner Production*, *211*(NA), 233-246. https://doi.org/10.1016/j.jclepro.2018.11.035

Sharma, V. K., Chandna, P., & Bhardwaj, A. (2017). Green supply chain management related performance indicators in agro industry: A review. *Journal of Cleaner Production*, *141*(NA), 1194-1208. https://doi.org/10.1016/j.jclepro.2016.09.103

Su, Z., Zhang, M., & Wu, W. (2021). Visualizing sustainable supply chain management: A systematic scientometric review. *Sustainability*, *13*(8), 4409. https://doi.org/10.3390/su13084409

Subramoniam, R., Huisingh, D., Chinnam, R. B., & Subramoniam, S. (2013). Remanufacturing Decision-Making Framework (RDMF): research validation using the analytical hierarchical process. *Journal of Cleaner Production*, *40*(NA), 212-220. https://doi.org/10.1016/j.jclepro.2011.09.004

Suhardi, A. R., Rozak, A., Saudi, M. H. M., & Sinaga, O. (2019). Supply Chain Management and Total Quality Management in Textile Manufacturing Companies, Bandung. *NA*, *11*(NA), 173-177. https://doi.org/NA

Sun, J., & Zhu, Q. (2018). Organizational Green Supply Chain Management Capability Assessment: A Hybrid Group Decision Making Model Application. *IEEE Engineering Management Review*, *46*(1), 117-127. https://doi.org/10.1109/emr.2018.2809907

Tang, R., & Yang, L. (2020). Impacts of financing mechanism and power structure on supply chains under cap-and-trade regulation. *Transportation Research Part E: Logistics and Transportation Review*, *139*(NA), 101957-NA. https://doi.org/10.1016/j.tre.2020.101957

Tsai, C.-W., Lai, C.-F., Chao, H.-C., & Vasilakos, A. V. (2015). Big data analytics: a survey. *Journal of Big Data*, *2*(1), 21-NA. https://doi.org/10.1186/s40537-015-0030-3

Tsai, F. M., Bui, T.-D., Tseng, M.-L., Ali, M. H., Lim, M. K., & Chiu, A. S. F. (2021). Sustainable supply chain management trends in world regions: A data-driven analysis. *Resources, Conservation and Recycling*, *167*, 105421. https://doi.org/https://doi.org/10.1016/j.resconrec.2021.105421

Tsai, F. M., Bui, T.-D., Tseng, M.-L., Lim, M. K., & Hu, J. (2020). Municipal solid waste management in a circular economy: A data-driven bibliometric analysis. *Journal of Cleaner Production*, *275*(NA), 124132-NA. https://doi.org/10.1016/j.jclepro.2020.124132

Tseng, M.-L., & Bui, T.-D. (2017). Identifying eco-innovation in industrial symbiosis under linguistic preferences: A novel hierarchical approach. *Journal of Cleaner Production*, *140*(140), 1376-1389. https://doi.org/10.1016/j.jclepro.2016.10.014

Tseng, M.-L., Tan, R. R., Chiu, A. S. F., Chien, C.-F., & Kuo, T. C. (2018). Circular economy meets industry 4.0: Can big data drive industrial symbiosis? *Resources, Conservation and Recycling*, *131*(NA), 146-147. https://doi.org/10.1016/j.resconrec.2017.12.028

Uriarte-Miranda, M.-L., Caballero-Morales, S.-O., Martínez-Flores, J.-L., Cano-Olivos, P., & Akulova, A.-A. (2018). Reverse Logistic Strategy for the Management of Tire Waste in Mexico and Russia: Review and Conceptual

Model. *Sustainability*, *10*(10), 3398-NA. https://doi.org/10.3390/su10103398

van Hoof, B., & Thiell, M. (2015). Anchor company contribution to cleaner production dissemination: experience from a Mexican sustainable supply programme. *Journal of Cleaner Production*, *86*(NA), 245-255. https://doi.org/10.1016/j.jclepro.2014.08.021

Wu, Z., Zhai, S., Hong, J., Zhang, Y., & Shi, K. (2018). Building Sustainable Supply Chains for Organizations Based on QFD: A Case Study. *International journal of environmental research and public health*, *15*(12), 2834-NA. https://doi.org/10.3390/ijerph15122834

Zhang, X., & Yousaf, H. M. A. U. (2020). Green supply chain coordination considering government intervention, green investment, and customer green preferences in the petroleum industry. *Journal of Cleaner Production*, *246*(NA), 118984-NA. https://doi.org/10.1016/j.jclepro.2019.118984

Zhu, Q., Geng, Y., Fujita, T., & Hashimoto, S. (2010). Green supply chain management in leading manufacturers: Case studies in Japanese large companies. *Management Research Review*, *33*(4), 380-392. https://doi.org/10.1108/01409171011030471

Zhu, Q., & Sarkis, J. (2006). An Inter- Sectoral Comparison Of Green Supply Chain Management In China: Drivers And Practices. *Journal of Cleaner Production*, *14*(5), 472-486. https://doi.org/10.1016/j.jclepro.2005.01.003