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ijmrset@gmail.com



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Sustainable Supply Chain Management in Small and Medium-Sized Enterprises

Mohd Almogees, Sohail Akhtar, Dr.Bhavna Sharma

School of Finance and Commerce, Galgotias University, Greater Noida, India

School of Finance and Commerce, Galgotias University, Greater Noida, India

Mentor, School of Finance and Commerce, Galgotias University, Greater Noida, India

ABSTRACT: In both industry and academia, there has been a notable surge in interest in sustainable supply chain management in recent years. The increasing quantity of papers, conferences, special publications, and webpages devoted to the topic is indicative of this. However, the importance of sustainable development in emerging economies is relatively new. This article's goal is to review the body of research on sustainable supply chain management (SSCM) in emerging economies from a global standpoint. A comprehensive literature review was conducted with the aim of achieving this goal. A descriptive and content method was used to analyze 56 papers published between 2010 and April 2020. The findings are then given, demonstrating the growing interest in SSCM but the research in emerging nations is still lagging behind that in wealthy economies. Results show that the context in underdeveloped nations plays a crucial part in carrying out case study or empirical research. Furthermore, research from the perspective of emerging economies must integrate the three elements of sustainability and how they affect supply chain performance. As a result, the work's shortcomings are noted and prospects for additional research are noted, particularly in relation to important supply chain operations.

I. INTRODUCTION

Small and medium-sized enterprises (SMEs) play a crucial role in the global economy, contributing significantly to employment generation, innovation, and economic growth. However, as the world increasingly grapples with environmental challenges and social concerns, the imperative for sustainable business practices becomes more pressing. Sustainable Supply Chain Management (SSCM) emerges as a vital strategy for SMEs to navigate this landscape effectively. SSCM encompasses the integration of environmental, social, and economic dimensions into every stage of the supply chain, from sourcing raw materials to delivering products or services to customers. It entails fostering long-term relationships with suppliers, ensuring ethical labor practices, minimizing waste and emissions, and promoting transparency and accountability throughout the supply chain network. Despite its benefits, SMEs often face unique challenges in adopting sustainable practices within their supply chains. Limited resources, lack of expertise, and constrained bargaining power with suppliers can pose significant barriers. Moreover, the complexity of global supply chains and the need to comply with evolving regulations further compound these challenges.

This research aims to explore the current landscape of sustainable supply chain management in SMEs, identify key challenges and opportunities, and propose strategies for overcoming barriers to adoption. By shedding light on best practices and innovative approaches, this study seeks to empower SMEs to embrace sustainability as a driver of business success and positive societal impact. While larger corporations have been at the forefront of sustainability initiatives, SMEs face unique barriers and opportunities in implementing SSCM. Limited financial resources, lack of expertise, and reliance on external suppliers with varying levels of sustainability commitment present significant challenges. However, SMEs also possess inherent advantages such as agility, flexibility, and closer relationships with suppliers, which can be leveraged to drive sustainable practices.

II. LITERATURE REVIEW

It's not only measured by business, but also by how it affects the social structure and the environment. Therefore, if the supply chain is fully sustainable, it will produce long-term profits while also not causing any net harm to social systems or ecosystems. Over the past 20 years, supply sustainability issues have received more attention in the SCM literature. It is not unexpected that sustainable SCM first conceptualizes from multiple angles given the divergent beginning points of SCM. A sustainable supply chain can continue to operate for as long as its clients so want. The business,



environmental, and social components are all well-balanced in the sustainable supply chain. Sustainable supply chain management, or SSCM, refers to activities that take into account the relationships and interdependencies between the components that are implemented throughout the supply chain to attain sustainable development. But overseeing the supply chain is a challenging undertaking.

* Operational, in that it takes into account the flows of materials and information, supports the organization or establishes organizational actions for generating value, and so comprises conventional supply chain management structures.

* Transformational: this refers to the long-term development of corporate practices with regard to issues outside the economic domain, such as social and environmental issues.

Over the years, a number of outstanding evaluations that cover different facets of SSCM-related research have been produced. Although some evaluations take a different stance than ours, they might nevertheless be helpful to readers who want to learn more about a certain area of SSCM. For example, a large number of studies now in publication examine the SSCM literature to determine how environmental issues may affect a firm's specific duties, which may include inventory management, production scheduling, or product design. Conversely, we analyze the literature from a value-chain viewpoint and talk about how management choices across functions take the environment into account. More than ten years' worth of literature is covered by the majority of the reviews that are currently in existence. Our review concentrates on more recent studies in this rapidly developing and expanding subject.

III. RESEARCH METHODOLOGY

The scanning objectives of an enterprise were categorized by Fabbe-Costes et al. into multiple levels, such as the social, network, supply chain, and corporate levels; also, corporate social responsibility and the dedication and mindset of a company's stakeholders (the human level) were included. Based on these considerations, as well as the diverse range of sample features that emphasize processes and products over markets and research methodologies, the three main structures- enterprise commitment, supply chain integration, and operational mechanism integration—are integrated into the model that is being suggested

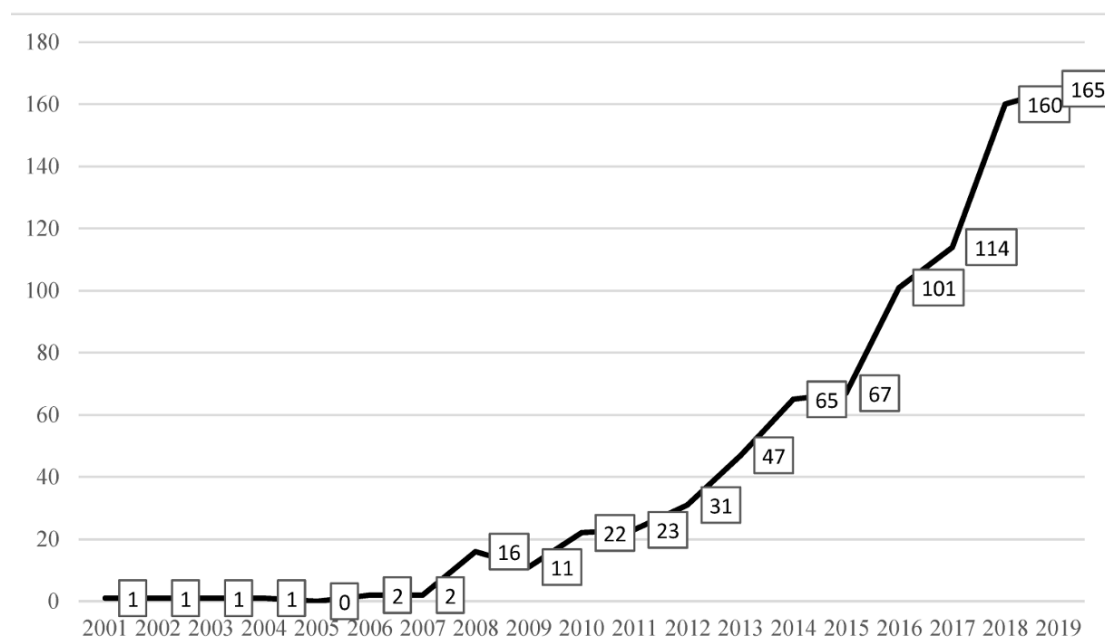
Step 1. Material collection: The material to be collected and the unit of analysis are defined and delimited.

Step 2. Descriptive analysis: Formal aspects of the material are assessed.

Step 3. Category selection: Structural dimensions including the major topics of analysis and related analytic categories with detailed classifications of each structural dimension are selected to be applied to the collected material.

Step 4. Material evaluation: The content of the papers is analysed according to the structural dimensions and analytic categories to identify relevant issues and to interpret the results.

Research Productivity in the Field.





The number of publications is a measure of the scientific productivity of research on sustainable supply-chain management (SCM). Source: Independent research using data taken from the Scopus database on December 27, 2019.

The most widely read citations on SSC1 were chosen in order to identify the SSC-related topics that pique the most interest. In order to do this, Web of Science datasets, including.

* Science Citation Index Expanded (SCI-EXPANDED) --1945-2015.

* The Social Sciences Citation Index (SSCI) ranges from 1956 to 2015.

* Citation Index for the Arts and Humanities (A&HCI) - 1975-2015.

* CPCI-S (Conference Proceedings Citation Index) - 1990-2015.

* The Conference Proceedings Citation Index (CPCI-SSH) covers social science and humanities from 1990 to 2015.

According to Carter and Easton (2011), the focus of SSCM research has shifted from a perspective and investigation of stand-alone studies in social and environmental fields to a convergence of perspectives on sustainability as the triple bottom line through the lens of corporate social responsibility. Securing and Muller (2008), however, find that while the sustainability triple bottom line receives very little attention, the majority of research focuses on green supply chains. We should be aware that the original supply chain model, or "green supply chain," comprised SSCM. It was, however, mostly restricted to environmental concerns. Its expansion on social issues aided in the creation of sustainable chains in later works

IV. DATA ANALYSIS AND DISCUSSION

There are many phases involved in analysing and interpreting data on sustainable supply chain management (SSCM) in small and medium sized businesses (SMCs) this is a methodical approach:

1. Explain Goals : Clearly state the precise objectives of your analysis. Are you looking at how often sustainable practices are being adopted? evaluating how SSCM affects financial performance? Recognising implementation obstacles? Your data gathering and analysis will be guided by clearly defined objectives.

2. Data Collection : Compile pertinent information from SMEs involved in supply chain operations. Information on supply chain procedures, financial data, performance indicators, and sustainability initiatives may be included in this. Company reports, interviews, and surveys are examples of primary data sources. Academic research, government publications, and industry reports are examples of secondary data sources.

3. Analysis of Data: Descriptive Analysis

a. To determine the present status of SSCM in SMEs, begin by summing the data. This might entail describing important factors like adoption rates, investment levels, or performance indicators using fundamental statistics like means, medians, and percentages.

b. Comparative Analysis : Examine the performance and SSCM practices of other SMEs, sectors, or geographical areas. Determine any trends, patterns, or variations that can provide light on the variables affecting the uptake and efficacy of SSCM.

c. Correlation Analysis : Examine connections between different outcomes—like stakeholder satisfaction, operational effectiveness, or financial performance—and SSCM processes. These relationships may be quantified with the use of statistical methods such as regression analysis and correlation analysis.





Above shows the distribution of the articles reviewed per industry sector. As it is observed, out of the 56 articles, 22 articles (39.3%) are focused on multiple industry sectors, followed by the manufacturing sector with 18 articles (32.1%); the mining and quarrying sector with four articles (7.1%); the agriculture, forestry, and fishing sector with three articles (5.4%), and the remaining of papers include a diversity of different industry sectors (16.1%). Manufacturing, as the second most researched sector, could be mainly due to the triple bottom line taking more managerial attention since it has become fundamental in managing any business.

Data analytics plays a crucial role in sustainable supply chain management by providing insights, optimizing processes, and enabling informed decision-making. Here's how it contributes:

1. Predictive Analytics : By analyzing historical data and trends, predictive analytics can forecast future demand, enabling companies to optimize inventory levels and reduce waste. This leads to more efficient resource utilization and lower environmental impact.
2. Risk Management : Data analytics helps in identifying and assessing risks within the supply chain, such as disruptions due to natural disasters, political instability, or supplier issues. By understanding these risks, companies can develop strategies to mitigate them and ensure continuity in their operations while minimizing environmental risks

V. CONCLUSION

The theoretical considerations, study methods, and findings that were presented indicated the broad picture of the goals that SMEs are currently pursuing in the field of SSCM. The literature assessments of the earlier research broadened the enterprises' sector's knowledge base. It demonstrates how issues with supply chain sustainability are still being fully investigated. It was common knowledge that there were limitations when it came to applying a single theory to a topic as vast and dynamic as sustainable supply chain management, but that using multiple theoretical facets produced insightful insights and advantageous research opportunities. Larger companies are currently the subject of increased public attention and examination with reference to SSCM procedures . Considering this, a considerable amount of research is focused on huge businesses.

The media is currently focusing more on and scrutinising larger corporations when it comes to SSCM practices . In light of this, a sizable portion of research is focused on large businesses; this work identified knowledge gaps in the body of literature currently available on SMEs in the context of supply chains. The viewpoints of businesses in the SMEs' sustainable development sector created new avenues for research enquiries and new topics of enquiry into sustainable supply chain management. The ways in which SMEs operate and the way the business approaches sustainable development in the supply chain appear to align. The informal and frequently personal relationships that SMEs rely on in the supply chain are heavily impacted by the priorities of the owner-manager. These order of importance is additionally represented in the supplier chain's handling of environmental and social issues and in the strategy for sustainable development.

Future Research Directions

It is crucial to investigate potential avenues for future research on sustainability in Indian industrial sectors in order to advance knowledge, tackle new issues, and direct practice and policy. Here is a thorough examination of several possible points:

1. Longitudinal Studies: Monitoring the advancement of sustainability projects over time through longitudinal research can yield important insights into the efficacy and effects of different interventions. Trends, patterns, and opportunities for improvement can be found by tracking and analysing sustainability performance indicators over an extended period of time, such as carbon emissions, resource efficiency, and social impacts.
2. Impact Assessment: To measure the environmental, social, and economic effects of sustainability programs in India's manufacturing sectors, future study should concentrate on carrying out thorough impact studies. Quantifying the advantages and defending investments in sustainability can be aided by evaluating the direct and indirect consequences of sustainable practices on variables including public health, employment creation, water and air quality, and economic development.
3. Technology Adoption and Innovation: Future research should focus on how emerging technologies, like Industry 4.0, the Internet of Things (IoT), artificial intelligence (AI), and advanced manufacturing techniques, are influencing sustainability in India's manufacturing sectors. Strategies for sustainable technology adoption and innovation can be informed by an understanding of how these technologies can improve environmental performance, optimize manufacturing processes, decrease waste, and increase resource efficiency.



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3. <http://moef.gov.in/> Provides information on environmental policies, regulations, and initiatives relevant to sustainability in Indian manufacturing industries.
4. Confederation of Indian Industry (CII): Website: <https://www.cii.in/> Publishes reports, case studies, and best practices on sustainability and corporate social responsibility (CSR) in Indian manufacturing industries.
5. The Energy and Resources Institute (TERI): Website: <https://www.teriin.org/> Conducts research and advocacy on environmental sustainability, energy efficiency, and renewable energy adoption in the Indian manufacturing sector.
6. Federation of Indian Chambers of Commerce and Industry (FICCI): Website: <https://www.ficci.in/> Produces publications, policy briefs, and events related to sustainability, clean technology, and green manufacturing practices.
7. Indian Green Building Council (IGBC): Website: <https://www.igbc.in/> Offers resources, certification programs, and case studies on green building and sustainable supply chain construction practices in India.
8. Centre for Science and Environment (CSE): Website: <https://www.cseindia.org/> Conducts research and advocacy on environmental sustainability, pollution control, and sustainable development in India.
9. International Institute for Sustainable Supply Chain Development (IISD): Website: <https://www.iisd.org/>



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