

A Literature Review to Identify Drivers and Barriers Affecting the Adoption of Green Practices for Indian Manufacturing Companies.

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Abstract

Environmental concerns are an increasingly important issue for many businesses for sustainable development. A supply chain with eco-friendly practices is called a 'Green supply chain' and is commonly observed in most manufacturing companies today. The present study provides an overview of the factors influencing the adoption of green practices by Indian manufacturing companies, including both drivers and barriers. Approximately 260 papers from various journals in the field of green supply chain management were collected to conduct this review to identify the major drivers responsible for implementing green practices and the associated challenge. This review has contributed to identifying the research gap concerning the necessity to explore the key factors influencing the Indian retail manufacturing sector. The study assists organizations in recognizing both the drivers and obstacles that affect the effective and enduring implementation of green manufacturing practices. Embracing these processes is increasingly vital for organizations aiming for sustainability, as well as for comprehending the factors that are propelling the swift transition towards green practices.

Key Words – Green supply chain drivers, Green Practices, Retail Manufacturing Sector , Sustainable supply chain.

1.0 Introduction

1.1 Green supply chain practices

Green supply chain management is becoming popular day by day and is taking an important place during corporate strategy formulation (Mutingi, Mapfira, & Monageng, 2014). It is on the agenda list of most organizations big or small because it is no more a matter of pride or just a philanthropical concern. Today, it has become an essential tool for the organizations that need to sustain in the changing scenarios. Especially the manufacturing organizations could be on the verge of extinction if they do not comply with the changing needs of environmental requirements for example: Deforestation and unavailability of water can drastically affect the raw material availability (Kurien & Qureshi, 2011) and reduce the profits of businesses by upto US\$906 billion and \$14 billion respectively (Simpson, Power, & Samson, 2007). If we believe these estimates, it is very alarming for many supply chains because the raw material availability and green house gas emissions can lead to not only loss of business and human health but permanent closure of many businesses. Thereby, generating a strong need for organizations to shift from regular practices to greener ones.

1.2 Global context for Green supply chain Practices

The manufacturing industry is a driving force of many economies in the world. (Kurien & Qureshi, 2011) Green supply chain practices have become essential for companies to achieve market advantage and profits. Organisations are under increased security and high pressure from customers and the Government regarding their compliance with environmental and social responsibilities. (Shaw, Grant, & Mangan, 2010) As mentioned, multiple manufacturers, retailers, and vendors are dispersed locally or globally in supply chains. So, measuring the business Performance of inter-organizations is challenging at this level for organizations. It is significantly more complicated when it is associated with numerous-level suppliers. With these difficulties and barriers in mind, organisations require a Green supply chain performance measurement system. (Hervani, Helms, & Sarkis, 2005).

Companies should incorporate the principles of a loop supply chain, which is a part of the green supply chain process and helps the organizations improve their environmental footprints as well as generate sustainable profit. Companies

have to act at a very fast pace because the time lapse between planning and execution could lead to severe damages in terms of resource depletion and competitive advantage.

Motivated by the importance of greening the supply chain in the bigger domain of supply chain management. This research was conducted with the objective of analysing the major drivers behind the implementation of green practices in supply chain management. The study was mainly conducted through a literature review of research papers, articles and books. The drivers identified through the literature review are discussed in the paper.

1.3 Context & ISO 14001 in manufacturing companies.

Transitioning to a green economy has sound monetary and social legitimization. There is a solid case for governments and the private division to participate in this monetary change. For governments, this move would include evening the odds for greener items by eliminating unsafe appropriations, transforming approaches and motivating forces, fortifying the business sector foundation, presenting new market-based components, diverting open ventures, and greening open acquirement. For the private division, this move would involve reacting to these approach changes and motivations through expanded financing and venture and building aptitudes and advancement abilities to exploit openings emerging from a green economy

Green SCM practices are the major exemplars that have made inroads into sustainable supply chains, and it is the right time to dissect their implementation, their relationship, and their impact on organizational performance. (Laosirihongthong, Adebajo, Tan, & Choon Tan, 2013) scrutinized that adopting green purchasing is one of the commonly accepted factors of GSCM practices. Some organizations also adopt a less collaborative approach by demanding their suppliers follow environmental systems such as ISO 14001 guidelines. (Hervani et al., 2005) Stated that the basic purpose of GSCM performance measurement is external reporting, internal control and internal analysis. These fundamental requirements drive the development of a framework for business performance measurement

2.0 Research Methodology

The research aims to investigate the primary factors that drive green supply chain practices in India and their impact on the decision to transition to such practices, particularly in the manufacturing industries and MSMEs. The methodology involves conducting a comprehensive literature review and analysing secondary data from research papers, books, and articles. The findings indicate that while green supply chain practices are a significant global trend, they are not widely adopted in India's manufacturing and MSME sectors.

3.0 Literature review

Businesses can cause serious damage to the world, including carbon emissions, waste materials, disposal of toxic substances, environmental impacts and different types of pollution. Today, natural problems are testing the organization in the face of the expansion of inadequate heritage, ecological imperatives, consumer awareness and permeability of the ecological impact of the business chain (SC). Therefore, ecological and ethical should be used in all areas of the success of the organization chain, especially in the connected activities, processes, contacts and interactions. Global business and financial models have made the supply chain difficult (Varma et al., 2013) and there has been a significant shift from companies focusing on their own centralized skills and decentralized skills for their suppliers (Darnall et al., 2008)). This then leads to difficulties in creating and planning an efficient and effective supply chain.

3.1 Drivers and barriers affecting green practices.

Addressing environmental issues, meeting regulatory requirements and meeting consumer needs for sustainable products has led consumer businesses to shift to a green chain. Despite the challenges, implementing a green supply chain in the manufacturing sector is essential for long-term sustainability and competitive advantage. Some factors that are advantageous for the industry that have been adopted and are called success key factors or drivers while some factors can act as bottlenecks if ignored which are called barriers.

The literature study identified 31 drivers. For manufacturing enterprises, many motivations called 'drivers' motivate and/or force the industry to adopt green manufacturing. Drivers play an active role in the adoption and diffusion of green manufacturing in companies.

Table : 1 Summary of Literature Specifying key Drivers & Dimensions

Author(s)&Year	GSCM Practice Dimensions	Green Practices Drivers & Barriers
(Dwayne Whitten, Green, & Zelbst, 2012), (K. W. Green et al., 2011), (Deshmukh & Sunnapwar, 2013) ,(Bhool & Narwal, 2013) , (Dandekar, 2012), (Abu Seman, 2012) , (Duarte et al., 2011), (Hervani et al., 2005)	Green Process & Product Design	Environmental Cost Eco Design CO2 Emission Waste disposal Supplier Pressure Consumer Pressure Energy Use Operational Cost Product Modification Process Modification.
(Bhool & Narwal, 2013),(Dandekar, 2012)(Hervani et al., 2005) , (Baroto, 2013), (Perotti et al., 2012),(S.-Y. Lee, 2015), (K. W. Green et al., 2011), (K. Green et al., 1998)	Regulatory norms	Cost of Sales Non-Financial Factors Revenue Investor & Share Holder Pressure. ROE Disposal Norms Recycling Government Rules & legislation ISO 14000 Guidelines
(G.P., 2012), (Bhool & Narwal, 2013), (K. Green et al., 1998), (Perotti et al., 2012), (Varsei et al., 2014), (Wang & Sarkis, 2013) ,	Green Purchasing	Green Procurement (Eco product) Supplier Awareness Supplier Audit Certified Supplier ISO 14000 Certified
(Duarte et al., 2011), (Hervani et al., 2005), (Dwayne Whitten et al., 2012), (Kurien & Qureshi, 2011)	Green Logistics	Green Fuels Eco product lifecycle Green Packaging Lead Time Green Disposal
(Perotti et al., 2012), (Wang & Sarkis, 2013) , (Duarte et al., 2011), (Hervani et al., 2005).(Olugu & Wong, 2009)	Firm's Performance	Customer Satisfaction Market Share Competitiveness

The table labelled '01' summarises research work that highlights the significance and status of green supply chain management on a global scale. This summary serves as the foundation for identifying the key drivers of the discussed research work.

3.2 Barriers:

Green Supply Chain also considers environmental risks, such as resource scarcity, regulatory changes, and the potential impact of environmental degradation on the supply chain as Barriers. In summary, while a traditional supply chain prioritizes efficiency, cost, and speed, a green supply chain integrates environmental considerations into all aspects of supply chain management, aiming for a balance between profitability and sustainability.

3.3 Research Gape and Performance Measurement Drivers

As discussed in Table 1, particularly by Wang & Sarkis (2013), has shown that green supply chain management (GSCM) practices involve upstream, downstream, and reverse logistics, effectively closing the loop. To effectively measure the multidimensional performance of these practices, businesses need an assessment framework, as Varsei et al. (2014) highlighted. A literature review also indicated a high awareness of green supply chain management in industries, suggesting it can be leveraged as a competitive advantage for MSMEs. The adoption of GSCM practices is most prevalent in areas with a clear correlation to efficiency, cost savings, and sustainability, but it is relatively lower in MSMEs. The importance of green manufacturing cannot be overstated, as it holds significant long-term benefits for the industry, especially for small and medium-sized enterprises (SMEs). The prevalence of SMEs in any given country highlights the potential impact of green manufacturing within this sector. In developed countries, green manufacturing is either rigorously implemented or not implemented. In contrast, in developing countries like India, there is still a lack of widespread understanding of green manufacturing.

4.0 Results & Discussions

The literature review revealed 31 drivers and barriers influencing the adoption of green supply chain practices worldwide. These drivers and barriers include adherence to legislative regulations, using GSCM practices for competitive advantage, employing GSCM practices as a marketing strategy, compliance with corporate social responsibility, concerns about depleting raw materials and pursuing sustainable profit generation. According to numerous researchers consulted for the review, the primary global drivers for implementing a green supply chain are changing environmental, health, and safety regulations. The stringent environmental norms set by governments globally are a significant driver, prompted by the pressure to reduce carbon emissions and address escalating health issues and fatalities due to increasing pollution levels.

Organizations are encouraged to embrace GSCM due to its potential for long-term profitability, as it reduces waste, promotes product recycling, conserves energy, and alleviates uncertainties through closed-loop systems. Furthermore, GSCM practices enhance quality, allowing organizations to uphold high standards and achieve environmental health and safety certifications. The implementation of GSCM necessitates modifications in process and product design that improve operational efficiency and establish organizations as leaders in providing superior quality products. While the aforementioned drivers are primarily relevant in a global context, there is a pressing need to further cultivate these motivations within the Indian manufacturing sector and among small and medium-sized enterprises (SMEs). Although advancements in this area are gradually occurring, substantial progress is still required.

The findings of this literature review highlight the importance of green supply chains in manufacturing companies and indicate that it is becoming an essential tool for organizations. The future trends of green manufacturing in the industry are uncertain, making it a potential game changer. Green manufacturing is expected to become increasingly important as it is a crucial component in the international trend towards sustainable development. Sustainable development aims to meet the needs of the current generation without compromising the needs of future generations, making green manufacturing a long-term goal in this context.

An extensive literature search has identified that compliance with changing regulations for environmental health & safety, gaining competitive advantage, cost reduction, and quality improvements are some of the major drivers behind the adoption of a green supply chain. However, globally, these drivers do not seem enough to motivate the Indian manufacturing sector to implement a green supply chain in their system.

5.0 Limitations and Future Research Directions

One major limitation of the current work is that it is primarily based on a literature review and would greatly benefit from validation through primary data. Furthermore, most reviewed papers predominantly focus on the global scenario, with only a limited number of papers addressing India-specific situations, highlighting the need for further investigation in this area. A case study approach could be considered for future research to validate empirical findings. It is worth noting that numerous manufacturing companies have effectively implemented Green Supply Chain Management (GSCM) and studying and benchmarking their practices could significantly enhance the strategic formulation of GSCM.

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