



Diverging Mysterious in Green Supply Chain Management

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Abstract

The sustainability and environmental considerations have slowly become divergences, but having greatest influence in the supply chain management that must be contemplated to examine the environmental and organizational factors. The research considers environmental and sustainable strategies within companies, the efficient supply chain management strategies for manufacturers and consumers, and to the environment friendly product design and services, taking a case-by-case perspective and concentrating on enterprise businesses scale. Our finding reveals that green supply chain management firms are delivering exuberant environmental efficiency at an added cost. Among the identified obstacles we identified different obstacles and conceptual relations and barriers are graded based on dependency and driving sand. In future, green policies have greater customer services avenues thereby, appeal for suppliers, manufacturers and officials.



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Introduction

In the past few years, Green Supply Chain Management (GSCM) has gained increased coverage.¹ GSCM's criteria have expanded because of public interest, cultural, environmental or legislative causes. The GSCM includes traditional management of the supply chain that integrates environmental criteria and concerns in the decision on purchasing organizations and long-term relationships with suppliers. It is about confining waste, within the

industrial system to conserve energy and prevent hazardous materials from being dissipated to the environment. The GSCM principles are commonly understood by industry as tracking the environmental performance of suppliers. However, conscious trade activities have been gaining growing consideration. In their policy designs an increasing number of businesses are pondering on the amalgamation of ecological practices.² Costs are one of the greatest barriers to the green supply chain. The time and

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resources needed to transform a company's existing processes into greener are not sufficient to justify changes by the top management. The environmental impact will occur at all stages of the supply chain and the lifespan of a product, and GSCM emerges as a major new strategy for businesses to achieve a reduction in their ecological impact.¹

Manufacturing executives are in charge of the operations of the organizations under which they are involved. How can they best improve the performance of organizations in their supply chains? Local managers must first and secondly adopt decisions supporting the supply chain. In the light of the environmentally friendly goods or services created by environmentally sustainable practices and government environmental legislation, manufacturing companies have started adopting green supply chain management (GSCM) activities. Such activities allow producers to collaborate with vendors and consumers to increase the quality of the environment.⁴ In order to increase the environmental efficiency of GSCM operation, reductions in air

pollution, effluent waste, solid waste and the use of hazardous materials are required. However, there is fear that this focus on environmental protection would eventually lead to stronger market share and productivity.⁵

Gscm V/S Regular Scm

The GSCM and the Conventional SCM,⁶ are distinct in different ways. GSCM takes environmental and economic issues as a goal, whereas Traditional SCM is typically based on the economy as a single objective. GSCM are renewable, interconnected and ecologically efficient, whereas conventional SCM does not take into account human toxicological consequences. Conventional SCM relies mainly on managing the finished product; no matter how detrimental the consequences are to the ecosystem during manufacturing and delivery.⁷ Ecological standards are crucial conditions for goods and exports and, at the same time, the company must maintain its economic survival by being competitive and sustainable. The discrepancy between GSCM and SCM is summarized in Table 1.

Table 1: Characteristics of GSCM and SCM

S.No	Features	Green Supply Chain Management	Conventional Supply Chain Management
1	Objectives	Ecological and Economic	Economic
2	Ecological Optimization	High Ecological Impacts	Integrated Approach Low ecological impacts
3	Supplier Selection criteria	Eco logical Aspects Long Term relationship	Short term partnerships Cost change vendors rapidly
4	Cost Pressure	High	Low
5	Flexibility	Low	High
6	Speed	low	High

Mystery to Implement Green Supply Chain Management

There are numerous driving barriers which hiatus to a smooth implementation of GSCM specially related to automobile industry. As the automobile industry is world's largest single manufacturing sector. The rise in the population of the world has also boosted demand for automobiles. Enterprises must concentrate on energies and capital to keep the supply chain environmentally friendly.⁸

The biggest hurdles in the automobile industry are the introduction of GSCM are

- Lack of IT Implementation
- Resistance to Technology Advancement Adoption
- Lack of Organization Encouragement
- Poor Quality of Human Resources
- Market Competition and Uncertainty
- Lack of Government Support System

- Lack of Implementing Green Practices
- Lack of Top Management Commitment
- Cost Implications

Methodology

A conceptual framework of GSCM has been illustrated through Fig. 1, that encompasses the drivers, mysterious, and the performance. Drivers are the stimulator that motivates or even forces focal companies to follow the GSCP. A stronger presence of the drivers results in a quicker adoption of GSCP because the inability to respond to the driving force timely might result in a threat to the existence of

the firms. In contrast, there are barriers that exist which hinder the implementation process of GSCM. It can be concluded that the stronger the presence of these barriers, the poorer the implementation level of GSCM. Green arrows represent the positive relationship between drivers and the entities.⁹ A stronger involvement of the drivers results in a faster adoption of GSCP as the failure to respond to the driving force timely could result in a challenge to the life of the firms. In comparison, there are obstacles that exist which hinder the deployment phase of GSCM.

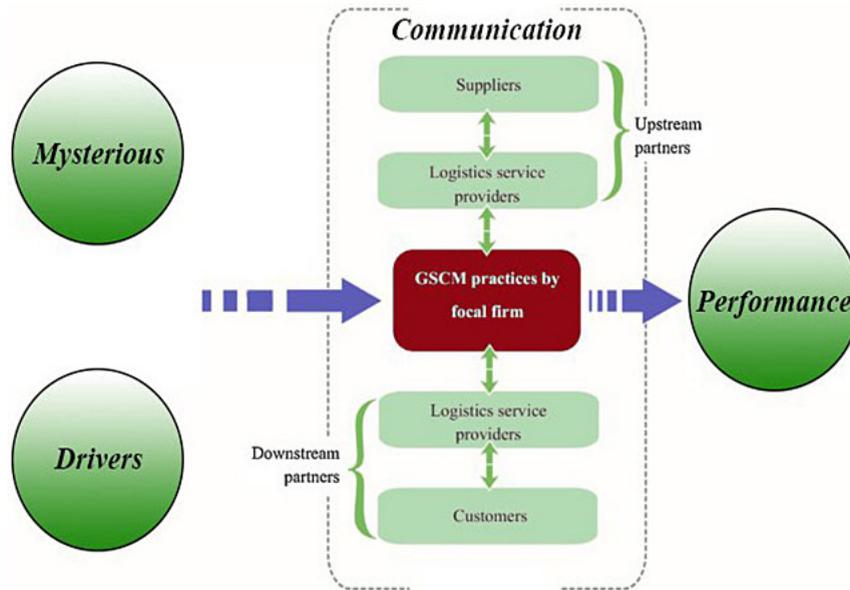


Fig. 1: Framework of green supply chain management

Related Findings

It's a common saying that compliance with the legislation is a primary component of green buying. It is predicted that the impact of environmental regulations on purchasing activities will become the second biggest issue in the future.¹⁰ Although the relation between Green Supply Chain Management (GSCM) and the success of the companies was examined, the results were not conclusive. There are two opposite theories concerning the relation between performance and the effect on the environment. The first argues that environmental management should only ensure compliance with the legislation and the second suggests that

environmental management should be able to raise costs and expenditures in order to produce better performance.¹¹ The effect of environmental parameters on investment in the use of electricity concluded that they related to the decline in industrial production. An optimistic link between the performance of a firm and environmentally friendly practices was reported in. The suggested structure and empirical findings indicate a positive effect on market share and cost from ecological practices. Recent work has provided an overview of the future nature of supply chain activities to enhance efficiency in an environmentally sustainable way. Smaller and more regional businesses have been found

easier to adopt more environmentally sustainable approaches.¹² Connecting with owners promotes the adoption and development of innovative environmental technologies, while working with customers and staff and cooperative R&D leads to better results in climate. The real long-term economic effect is not easily measured by considering a single factor, such as productivity in the short run or sales performance. Companies' impact on the environment face increased cost of production, but are also projected to slowly gain an increased market share.¹³

Authors in,¹⁴ noted that environmental management is in essence an innovative environmental design for institutional efficiency enhancements. It has been reported that an eco-efficient approach to administration is capable of improving the functional efficiency of a firm. A clear connection has been identified between target meetings and the contribution of staff to environmental administration. Cost returns will be positively affected if consumers choose environmentally friendly business products

/ services, while expenditure can be reduced by diligent management of environmental criteria that can trigger hurdles.¹⁵ Furthermore, eco-friendly strategies can lead to developments that can provide businesses with a head-start advantage, at least from a marketing point of view. A positive relation between community, business performance and benefit has also been documented. Nevertheless, empirical studies about GSCM practices should be listed as scarce. The questions set out during finds are: i) what are the effects of the green supply chain on firms' environmental and functional efficiency, and

ii) what kinds of environmental management activities are recommended to boost the company's eco-efficient efficiency. The study framework is designed to explore the connection between the various GSCM practices.¹⁶ In the literature, there is agreement that eco-friendly activities are a crucial factor in increasing the success of a firm. Previous research illustrated multiple GSCM measurements (Table 2).

Table 2: Effective environmental Trends

Environmental management trends	Trends of GSCM for suppliers and consumers	Environmentally oriented quality and service architecture	System quality	Operational quality
GSCM commitment -level executives	Sustainable manufacturers	Environmentally safe raw ingredients	Solid / liquid waste and	Price savings and productivity
Maximum resource sustainability control	ISO 14000 approval of the manufacturer	Development of goods with decreased content and energy usage	emissions control Reduction of hazardous / toxic material intake	boost Improved product consistency
Green policy and inspection Program	Company-wide assessments of the workplace	Material construction for reuse, recycling and content recovery	Minimization of environmental incident incidence	Different prospects for the sector Enhance the morale and efficiency of workers
Excepting trends	Corporate regulation for local vendors	Material construction to prevent or reduce the use and/or production of dangerous goods	Electricity consumption loss	

It was found that support from moderate-scale, executives, apart from management guidance, is also a key factor in the successful implementation

of the GSCM. It has also been observed that GSCM can deliver many advantages from cost savings to increased public participation (i.e. establishing a

trend) in the company's strategy and, ultimately, increased market share. So environmental issues are becoming a clear component in corporate tactical patterns.¹⁷ Green ads and environmentally friendly packaging are activities which could boost the supply chain's environmental impact. To highlight the environmental impact of packaging, some countries have programs aimed at minimizing wrapping costs. It has been stated that standardized recyclable containers and fine merchandising designs reduce availability and turnaround time, rendering the product cost-effective while still being environmentally friendly. Eco-efficient manufacturing of warnings and procedures may combine many such concepts, from the use of materials and resources during the first stages of the supply chain, to introducing sustainable practices to reduce solid and liquid waste, to using environmentally friendly logistics. Consequently, the Return on Investment (ROI) was considered a key aspect of GSCM.

Finding Mysterious

Based on public data, the GSCM operations of four major organizations are considered, depending on market shares, the position, data quality and overall environmental policy, companies are chosen. Major firms have been chosen such that the principles and practices mentioned can be used as a potential pattern guide for smaller firms and policy makers.¹⁸

Eastman Chemical Company

Eastman focuses on sustainable supply chain management methods and practical presentation improvement activities such as evaluating broker contributions, designing supplier substitution approaches, designing broker solutions, improving packaging, using recyclable packaging and promoting supply chain networking, as well as developing consumer solutions and managing material recovery. Eastman implements many environmental quantifiers and by incorporating a greenhouse mitigation target, called TRI (Toxic Release Inventory),¹⁹ has established the eco-efficient task practices. The design of Eastman's energy management strategy has balanced demand for fair energy consumption with demand to minimize cost of production, for example by ensuring that the heat generated is used in more than one chemical process. The organization also claims to use

effective water management methods and recyclable materials to the wastage.²⁰

Result and Discussion

This is sufficient to say that in the coming days, green emissions are to be used as currencies. Measures to track the supply chain and quantify future costs and obligations are also critical for multinational businesses. About 40% of companies have invested in renewable energy production to combat energy inflation and rising domestic emissions, providing a firm grip on energy costs and strengthening firm reputation and could even become profitable when selling the surplus electricity generated. In order to increase their market share, rising traders are battling the launch of sustainable production. Sustainability is an opportunity for sales growth in a significant number of participants. The areas where sustainability and carbon policy opportunities emerge require reputation plus the brand name. Several leading companies must assess in the sustainable chain management account the full prospective and future advantages and profits. If the supply chain is found to be communally insensitive, the credibility of a corporation is harmed. Environmentally friendly and sustainable activities on the other hand boost a company's image and eventually, even with higher cost goods, its market shares.

An ethical supply chain is critical for a business. Enhanced risk management and reputation are the practical component to be incorporated into the current framework. Companies that use SSCM activities have major environmental and functional impacts. Such work was constrained by the ease of sampling, so that more detailed case studies could be performed.

Internal environmental management is closely related to green information systems and both serve as an antecedent to the successful introduction of green procurement, consumer engagement, eco-design and investment recovery. Manufacturing companies must consider environmental responsibility as a competitive priority before changing current information structures to collect data and produce knowledge on environmental sustainability programs and results. The first step in adopting GSCM activities is to develop a corporate approach and

to change current enterprise resource planning (ERP) information structures to track environmental programs. The second stage entails the introduction of renewable sourcing, collaboration with clients, eco-design and investment recovery activities. The comparisons between stage one and stage two of the practices are both constructive and important in favor of the idea that the activities will be applied in phases.

Conclusion

As global warming increases and biodiversity improves, there is growing demand on companies to boost environmental efficiency. In addition, there is a rise in environmental consciousness among stakeholders, which allows companies to mitigate the negative environmental effect of firms' activities. Green supply chain management (GSCM) has been described as an approach to optimizing the efficiency of systems and goods in compliance with the criteria of environmental legislation. While major barriers have been established to the GSCM adoption in the automotive industry are also discussed. The findings are carried out in order to investigate the complexities in a realistic way, as well as in a social context, the partnership of SSCM activity in businesses.

A structure has been set up and attempts have been made in case studies to verify the structure. In particular, the implementation of sustainable policies and the functional performance of organizations in the supply chain administration were evaluated. In addition, a system-based methodology has been developed. Market competitiveness and uncertainty; lack of adoption of Green Practices; cost implications; lack of awareness of Consumers and Manufacturer Resistance to move in GSCM have been described as contingent variables. The research is intended to help incorporate environmental or ecological management of the supply chain to improve productivity on the world market. The biggest environmental challenge is the reduction in carbon emissions. The main aim of this study is to analyze and take a path to tackle the ecological aspects of supply chain management.

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Conflict of Interest

The authors do not have any conflict of interest.

References

1. K. Bhattacharjee, "Green Supply Chain Management- Challenges and Opportunities," *Manag. Res.*, vol. 05, no. 01, p. 6.
2. K. W. Green, P. J. Zelbst, J. Meacham, and V. S. Bhadauria, "Green supply chain management practices: impact on performance," *Supply Chain Manag. Int. J.*, vol. 17, no. 3, pp. 290–305, Apr. 2012, doi: 10.1108/13598541211227126.
3. S. Ashraf, M. Gao, Z. Chen, S. Kamran, and Z. Raza, "Efficient Node Monitoring Mechanism in WSN using Contikimac Protocol," *Int. J. Adv. Comput. Sci. Appl.*, vol. 8, no. 11, 2017, doi: 10.14569/IJACSA.2017.081152.
4. M. Hariga, R. As'ad, and A. Shamayleh, "Integrated economic and environmental models for a multi stage cold supply chain under carbon tax regulation," *J. Clean. Prod.*, vol. 166, pp. 1357–1371, Nov. 2017, doi: 10.1016/j.jclepro.2017.08.105.
5. S. Ashraf, T. Ahmed, A. Raza, and H. Naeem, "Design of Shrewd Underwater Routing Synergy Using Porous Energy Shells," *Smart Cities*, vol. 3, no. 1, pp. 74–92, Feb. 2020, doi: 10.3390/smartcities3010005.
6. M. Igarashi, L. de Boer, and A. M. Fet, "What is required for greener supplier selection? A literature review and conceptual model development," *J. Purch. Supply Manag.*, vol. 19, no. 4, pp. 247–263, Dec. 2013, doi: 10.1016/j.pursup.2013.06.001.
7. M.-L. Tseng, M. S. Islam, N. Karia, F. A. Fauzi, and S. Afrin, "A literature review on green supply chain management: Trends and future challenges," *Resour. Conserv. Recycl.*, vol. 141, pp. 145–162, Feb. 2019, doi: 10.1016/j.resconrec.2018.10.009.
8. S. Luthra, V. Kumar, S. Kumar, and A. Haleem, "Barriers to implement green supply chain management in automobile industry using interpretive structural modeling technique: An Indian perspective," *J. Ind. Eng. Manag.*, vol. 4, no. 2, pp. 231–257, Jul. 2011, doi: 10.3926/

- jiem.2011.v4n2.p231-257.
9. R. M. Grant, "Prospering in Dynamically-Competitive Environments: Organizational Capability as Knowledge Integration," *Organ. Sci.*, vol. 7, no. 4, pp. 375–387, Aug. 1996, doi: 10.1287/orsc.7.4.375.
 10. S. Ashraf, M. Gao, Z. Mingchen, T. Ahmed, A. Raza, and H. Naeem, "USPF: Underwater Shrewd Packet Flooding Mechanism through Surrogate Holding Time," *Wirel. Commun. Mob. Comput.*, vol. 2020, pp. 1–12, Mar. 2020, doi: 10.1155/2020/9625974.
 11. S. Ashraf, A. Raza, Z. Aslam, H. Naeem, and T. Ahmed, "Underwater Resurrection Routing Synergy using Astucious Energy Pods," *J. Robot. Control JRC*, vol. 1, no. 5, 2020, doi: 10.18196/jrc.1535.
 12. N. P. Archer, "Supply chains and the enterprise," *J. Enterp. Inf. Manag.*, vol. 19, no. 3, pp. 241–245, May 2006, doi: 10.1108/17410390610658432.
 13. G. Kannan, A. N. Haq, P. Sasikumar, and S. Arunachalam, "Analysis and selection of green suppliers using interpretative structural modelling and analytic hierarchy process," *Int. J. Manag. Decis. Mak.*, vol. 9, no. 2, p. 163, 2008, doi: 10.1504/IJMDM.2008.017198.
 14. S. Ashraf *et al.*, "Underwater Routing Protocols Analysis of Intrepid Link Selection Mechanism, Challenges and Strategies," *Int. J. Sci. Res. Comput. Sci. Eng.*, vol. 8, no. 2, pp. 1–9, Apr. 2020, doi: 10.26438/ijsrcse/v8i2.19.
 15. F. Lettice, C. Wyatt, and S. Evans, "Buyer–supplier partnerships during product design and development in the global automotive sector: Who invests, in what and when?," *Int. J. Prod. Econ.*, vol. 127, no. 2, pp. 309–319, Oct. 2010, doi: 10.1016/j.ijpe.2009.08.007.
 16. A. Jean-Vasile, Ed., *Food Science, Production, and Engineering in Contemporary Economies*: IGI Global, 2016.
 17. Y.-F. Wang, S.-P. Chen, Y.-C. Lee, and C.-T. (Simon) Tsai, "Developing green management standards for restaurants: An application of green supply chain management," *Int. J. Hosp. Manag.*, vol. 34, pp. 263–273, Sep. 2013, doi: 10.1016/j.ijhm.2013.04.001.
 18. X. Chen and G. Xiu, "Research on the Degree of Ecological Supply Chain Management Practice among Chinese Manufacturing Enterprises," *J. Qual. Reliab. Eng.*, vol. 2014, pp. 1–5, 2014, doi: 10.1155/2014/160957.
 19. S. Mahapatra, R. Pal, T. Hult, and S. Talluri, "Assessment of Proactive Environmental Initiatives: Evaluation of Efficiency Based on Interval-Scale Data," *IEEE Trans. Eng. Manag.*, vol. 62, no. 2, pp. 280–293, May 2015, doi: 10.1109/TEM.2015.2413938.
 20. M. A. Sellitto, J. Luchese, J. M. Bauer, G. G. Saueressig, and C. V. Viegas, "Ecodesign Practices in a Furniture Industrial Cluster of Southern Brazil: From Incipient Practices to Improvement," *J. Environ. Assess. Policy Manag.*, vol. 19, no. 01, p. 1750001, Mar. 2017, doi: 10.1142/S1464333217500016.