

Green Supply Chain Management: Indian Perspective

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Abstract

The supply chain consists of those activities associated with manufacturing from raw material acquisition to final product delivery. Because of the recently changed environmental requirements that affect manufacturing operations and transportation systems, growing attention is given to the development of environment management strategies for supply chains. A green supply chain aims at confining the wastes within the industrial system so as to conserve energy and prevent the dissipation of harmful materials into the environment. This is one of the recent buzz world in the industrial enterprises in India for the enhancing the capabilities of their supply chain management through sustainability. Industries are more interested in profit making due to sustainable supply chain activities rather than to save environment.

In this research, we aim to study the various activities involved in the supply chain processes of the various Indian manufacturing industries & finds how much eco-friendly they are in their logistics as well as supply chain activities by taking into account from the procurement of the raw material to the transportation of the end product. This study will serve the purpose of analyzing the performance of the Indian

industry which includes both small scale as well large scale industrial houses. The major six activities of the supply chain - green procurement, green manufacturing, green warehousing, green distribution, green packaging, green transportation are being covered throughout the research from these above process activities, we measured the performance of the various Indian manufacturing industries with the help of various crucial performance indicators & their sub-indicators. In this study, we discuss the various environment factors affecting in the manufacturing sectors while greening the supply chain.

KEYWORDS: Green procurement, Green manufacturing, Green warehousing, Green distribution, Green packaging, Green transportation, six sigma.

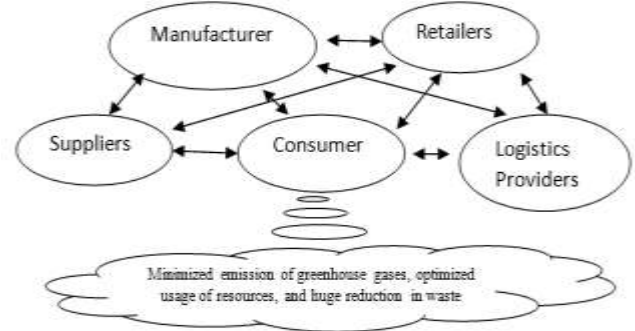
INTRODUCTION:

Green supply refers to the way in which innovations in supply chain management and industrial purchasing may be considered in the context of the environment. Green supply chain management consists of the purchasing function's involvement in activities that include reduction, recycling, reuse and the substitution of materials. Nowadays, most organizations are starting to go green in their business as concern to environmental sustainability. Integrating environmental thinking into a supply chain management, including product design, material

resourcing and selection, manufacturing processes, delivery of the final product to the consumer as well as end-of-life management of the product after its useful life.

The current changing in environmental requirements that influenced manufacturing activities had increased attention in developing environmental management (EM) strategies for the supply chain. Thus, the concept of GSCM arises as a new systematic approach and becoming an important factor for business activities today. Awareness level of customers of Green practices opted by organizations has got raised in India also. So organizations need to focus on the utilization of energy and resources for making environmentally sound supply chain.

Green Supply Chains consider the environmental effects of all processes of supply chain from the extraction of raw materials to the final disposal of goods. Environment objectives and performance measurement are then integrated with financial and operational objectives. With this integration, the Green Supply Chains then will achieve what any individual organization on its own could not possibly achieve i.e. minimized waste, minimized environmental impact while assuring maximized consumer satisfaction, and good profits. As consumers have become more aware of environmental issues, such as global warming, they have started asking questions about the products they are purchasing. Nowadays, organizations face queries from the customers about how Green their manufacturing processes and supply chain are, how wasteful their packaging is, and how they will recycle. Few organizations around the globe have been able to convert the consumer's interest in Green issues into increased profits. A number of projects within organizations have shown that there is a link between improved environmental performance and financial gains. Organizations that have looked to their supply chain have discovered areas where operational and environmental improvements can produce profits.



GREEN PURCHASING

Environmentally preferable purchasing (EPP) or green purchasing is process of selection and acquisition of product and services which minimize negative impact over the life cycle of Manufacturing, transportation, use and recycling.

Green Purchasing Network India:

GPNI is an evolving network of professionals interested and active in the general area of sustainable consumption and production- more specifically: green purchasing and public procurement. It is currently a loose informal network of professionals primarily operating as an internet based electronic forum.

The objectives of the GPNI are:

- i. To create awareness amongst Indian industry and other stakeholders about green purchasing and procurement (GPP).
- ii. To encourage and facilitate implementation of GPP and greening supply chain (GSC) projects to enhance the competitiveness of the Indian industries.

GREEN MANUFACTURING

The term green manufacturing can be looked at in two ways: a manufacturing of green products, particularly those used in renewable energy systems and clean technologies equipment of all kinds, and the “greening” of manufacturing : reducing pollution and waste by minimizing natural resources use, recycling and reusing what was considered waste, and reducing emissions.

LEAN MANUFACTURING

Lean manufacturing or lean production , often simply “lean” is a systematic method for the elimination of waste within a manufacturing process .lean also takes into account waste created through over burden and waste created through unevenness in workload .lean principles are derived from Japanese manufacturing industries .

Comparison table is constructed based upon the very useful and meaningful factors are shown

| Comparisons of Objectives of various lean manufacturing processes with green manufacturing | | | | |
|--|-----|--------------------|------------------|----------------------|
| Factors | | Lean manufacturing | | Green Manufacture -g |
| | JIT | Six sigma | ISO 9000 & 14000 | |
| Eliminates defects | ✓ | ✓ | | ✓ |
| Reduction of cost | ✓ | ✓ | | ✓ |
| Quality improvement. | ✓ | ✓ | | ✓ |
| Quality standards | | | ✓ | |
| Improve efficiency | ✓ | ✓ | | ✓ |
| customers satisfaction | ✓ | ✓ | | ✓ |
| Reduced resource consumption | | ✓ | | ✓ |
| Reducing emissions in manufacturing processes | | | | ✓ |
| Recycling programs for raw materials | | | | ✓ |

| | | | | | |
|--|--|--|--|---|--|
| Recycling programs for reusable components parts | | | | ✓ | |
| Remanufacturing programs | | | | ✓ | |

GREEN MARKETING:

Green marketing can be viewed as adherence to ethical an social responsibility requirements in marketing. This approach emerged as a response to increased environmental challenges in recent years. This marketing approach has emerged in response to a global increase in concern about protecting consumer rights, and a concurrent growth of organized movements to address environmental trends in such a way that people will be protected and assured a clean and safe environment in which to live.

GSCM = Green purchasing + Green manufacturing/materials management + Green Distribution / marketing + Reverse logistics.

GREEN SUPPLY CHAIN MANAGEMENT:-

A recent analysis has however revealed the following key additional point. Companies are still primarily focused only on having environmentally conscious internal production. For example, any company can become totally carbon neutral by outsourcing all its production, however, shifting the carbon producing activity up or down the supply chains does nothing more than hide the dirt under someone else’s carpet. A holistic approach to carbon management is required, and this is provided by adoption of a Green Supply Chain methodology.



Six Sigma :

Six Sigma is another management methodology which became very popular. It supports green production by primarily eliminating defects from manufacturing processes and hence, cutting waste. Through exercising greater care and management control minor investment defects are caught as early as possible through the process. As a result, significant Savings can be made by reducing the number of defects, rework, and spending time on defectives pieces.

Eliminating completely or making barriers less intense: proposed solutions

International environment agreements may support Indian government to take initiatives towards green practices. ISO14001:2004 (Environment management system) and ISO26000:2010(Guidance on social responsibility) should be promoted by Indian government. In last few decades, many important steps have been taken to promote green practices. In 11th five year plan (2007-2012) environment and social responsibility is given special importance. There are several ministries (under Government of India) having direct and indirect role in controlling ‘Green’ issues like ministry of environment and forests;

ministry of water resources; ministry of earth sciences and ministry of science and technology; ministry of mines and ministry of chemicals and

fertilizers etc. these ministries should implement and control green policies and fund allocation more effectively. Indian government may announce some extra benefits to the organizations following green practices. Implementation of government policies towards green practices will lead to more committed top management. IT enablement will reduce a lot of paper work which will further reduce the need of cutting trees.

CONCLUSIONS

- More than one third [40%] of Indian manufacturing sectors use electronic processes to increase energy efficiencies in sourcing and procurement, reveals that new technologies when used in procurement reduces paper usage and hence are eco friendly.
- Recycling of raw materials and component parts are the top green manufacturing and production focused initiatives, indicates that 3R’s(Recycle ,Reuse, Recover) concept will popular among Indian manufactures.
- Cost and complexity are perceived as the biggest barriers to implementing Green SCM, which highlights the need for cost effective and easy to implement solutions.
- 64 % of companies are not using e-tools extensively to support their supply chain operations, suggesting an opportunity to explore greater usage of electronic tools to facilitate green practices.

Research Papers of special note have been highlighted as:

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