International Journal of Innovative Research and Advanced Studies (IJIRAS)
Volume 3 Issue 4, April 2016

ISSN: 2394-4404

Green Supply Chain Management – A Review

Sudhir Barange
M.Tech Student,
Department of Mechanical SAIT Indore

Sachin Agarwal
Asst. Professor,
Department of Mechanical SAIT Indore

Abstract: ***The trend towards developing green or sustainable supply chain is now day by day gaining popularity between many organizations and research. Green supply chain management is very important tool in purpose of environmental point of you. This paper address the issue of green supply chain management as promising area of study and practice that have the potential to provide significant benefits to the firm and the society. It helps to developed more sustainable supply chain management took over traditional supply chain management.***

Keywords: Supply chain management, Green supply chain management, Green Design, Green manufacturing.

I. INTRODUCTION

Green Supply Chain Management has its roots in supply chain management, i.e. it is based on the adoption and extension of its concepts. The "Green" component to Supply Chain Management involves addressing the influence and relationships between Supply chain management and the natural environment [1]. Harland [2] defines supply chain management as "the management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers". The concept of supply chain management can be extended by adding the aspect of sustainability. Green or Sustainability refers to an integration of social, environmental, and economic issues [3]. The implementation of Green Supply Chain Management (GSCM) is such innovative idea that is fast gaining attention in the industry and has received a great interest among researchers and practitioners of operations and SCM [4].

Supply chain management has its beginnings in physical distribution and logistics, and it has recently concentrated on close relationships between parties involved in the flow of goods from the supplier to the customer. Relationships should extend beyond the exchange of materials or services for a price towards the alignment of goals. While, SCM is the integration and management of supply chain organizations and activities through cooperative organizational relationships, effective business processes, and high levels of information sharing to create high-performing value systems that provide member organizations a sustainable competitive advantage.

The main objectives of the GSCM function include cost reduction, improvement and innovation of end-to-end processes between firms and their customers and suppliers, improved communication and interaction among supply chain partners, and improved performance and productivity in a way that benefits all contributors in the supply chain [5]. Although the Green Supply Chain Management recognizes the disproportionate environmental impact of supply chain processes in an organization.

II. LITERARETURE SURVEY

In recent years, climate change issues have been more deeply incorporated into supply chain management practices. Therefore, the current papers argues that an in-depth evaluation of Environmental supplier development impact on supplier performance needs to simultaneously consider traditional supplier operational factors, traditional supplier environmental factors, and supplier low carbon management factors [6].

The first green design literature came into context in 1991. Navin- Chandra's article was the first of the literature to consider the need for a green design to reduce the impact of product waste [7]. Green Operations in terms of reverse logistics was an important concept that came out of the GSCM

literature. Green Manufacturing, on the other hand, was not conceptualized until 1993 in the work of Crainic, Gendreau and Dejax (1993). This article established a comprehensive green supply chain model in terms of transporting containers from land to sea and vice-versa [8]. In 2008 Jason and Harnfield suggested that Environmental Management Systems (EMS) is making less progress in reducing environmental harms.

Green supply chain management (GSCM) integrates environmental thinking into supply chain management; it includes extensive stages from designing a product, material sourcing and selection, manufacturing processes, product delivery, and end-of-life management of the product [1]. Similar to the concept of supply chain management, the boundary of GSCM is dependent on the goal of the investigator. Supply chain management has the potential to make construction projects less fragmented, improve project quality, reduce project duration, and hence reduce the overall total project cost, while creating more satisfied customers.

Wang et al. (2005) gives a systematic and comprehensive description of green supply chain structure and the connections among sub-systems. It divides green supply chain into five sub-systems which are manufacturing, consumption, environmental, logistics and social systems [9]. Manufacturing systems consist of suppliers, manufacturers, distributors, retailers and recyclers, covering the whole process beginning with resource investment, and progressing to manufacturing, transportation, marketing and re-use. In this model, the movement of green supply chain is circular. Environmental systems provide resources to manufacturing systems. Through the behaviors of production and consumption, both the manufacturing system and consuming system release waste materials which enter into the environmental system. The most prominent feature of this model is the presentation of the operation of logistics systems on green supply chains. Due to the involvement of re-use, material flow and capital flow are changed from single movement to double movement, and as a newly imported component part, knowledge flow is added into the green supply chain model.

In recent years, the green supply chain management researches have made substantial progress. Many advanced ideas and analytical tools have been integrated into green supply chain management [10, 11].

III. RESEARCH METHODOLOGY

The main objectives of this paper to study of Green supply chain management and gives important suggestion to develop traditional supply chain management into Green supply chain management. The objective of green supply chain is to eliminate or minimize negative environmental impacts (air, water, and land pollution) and waste of resources (energy, materials, products) from the extraction or acquisition of raw materials up to final use and disposal of products [12].

GSCM PRACTICES

GSCM practices are composed of corporate and operational strategies to improve environmental sustainability such as internal environmental management, green purchasing, cooperation with customers and green design. Green procurement, green manufacturing, green distribution and green logistics are important dimensions of GSCM practices needed by manufacturing sectors to achieve enhanced sustainability performance [13, 14 and 15].

The green supply chain management (GSCM) has emerged as an effective management tool and philosophy for proactive and leading construction organizations. Green supply chain management (GSCM) has been adopted as an antidote for a best practice in the construction industry. Green supply chain management aims to maximize the overall environmental profit by adopting a life cycle approach through green design, green material selection, green manufacturing, and sales and recovery. Therefore, it helps the firm to realize its sustainable development and improvement [6].

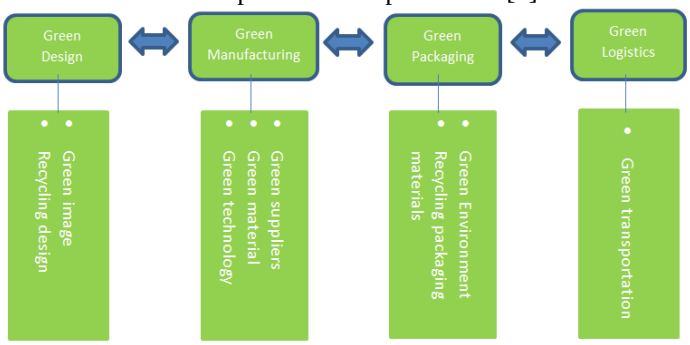

Figure 1: Flow of Green Supply Chain Management

GREEN DESIGN

Green design is an important sub-attribute to Green supply chain management. In the whole designing process, Green Designing would consider the influence on resources and environment. It would optimize the relevant designing factors, functions, quality, development cycling, and costs. All these could make the production get the lowest degree to influence the environment and consume materials. Eco-design as it is commonly quoted as is a helpful, emerging tool to improve companies' environmental performance and help organizations close the supply chain loop by addressing product functionality and simultaneously minimizing life-cycle environmental impacts. The success of eco design requires cooperation throughout the supply chain [10, 15]. Green Design would be analyzed and assessed systematically at the beginning of product development, so that we could reduce the influence on the environment. The step of product development should contain 3R (reduce, reuse, recycling), without waste design. This can also made product green image which is very helpful to make good competition in market.

GREEN MANUFACTURING

Green manufacturing is defined as production processes using inputs with relatively low environmental impacts, which are highly efficient, and that generate little or no waste or

pollution. Green manufacturing requires the enterprises to take new technology, take clean production method, and reduce raw materials and resources, so we could realize less input, high output without pollution. We should try our best to eliminate the environmental pollution in the manufacturing process. The enterprises should strengthen their management, such as using the technology without waste or low waste, reforming technologies and instruments, and replacing the poisonous materials. They could reduce the wastes and the contaminations at the beginning. With the help of green supplier this can also be possible to provide eco-friendly environment without any waste. Clean production seeks to implement environmental practices and technologies to reduce the environmental impact of manufacturing processes including any toxics used or emitted.

GREEN PACKAGE

Package would be no any using for consumers. It would not only pollute the environment, but also waste package materials. Traditional package replace by biodegradable packaging alternatives, which is help to make non pollutant environment for us. Green Package intends to implement Green Package Designing, optimize package structure, and reduce package materials. At the same time, it has considered to put package materials back to use, to deal with them and to recycle them. Using principles of industrial ecology, materials should be recovered through either biological or industrial mechanisms, or both, and made available as inputs for new systems of production. Different bio-based and renewable materials are suitable for recovery through either biological or technical means. Materials from nonrenewable resources should be recycled to the highest degree possible. Since the value of these materials cannot be recovered through natural processes and may be persistent in the environment, they require a high degree of stewardship throughout their life cycle to ensure that they are collected, recovered, and re-used.

GREEN LOGISTICS

Effective transportation is a key to the success of business. Green logistics/transportation, it is about delivering goods directly to user site, using alternative grouping orders together, rather than in smaller batches [15]. Green logistic is about reverse logistic that includes collecting used products and packaging from customers for recycling, returning packaging and products to suppliers for reuse, and requiring suppliers to collect their packaging materials.

IV. CONCLUSION

Environmental pollution and exhaustion of resources are becoming seriously. With regard to the rising global awareness of environmental protection, businesses have employed their GSCM to improve their core competitive advantage. GSCM is a progressively widely-diffused practice among companies that are seeking to improve their environmental performance. We are still facing a lot of problems to implement Green Supply Chain Management, which should be researched and reformed. Green Supply Chain Management reflects the enterprises' Green Image, and it represents the coordinated development of modern physical distribution and the environment.

REFERENCES

[1] S. K. Srivastava (2007) International Journal of Management Reviews, vol. 9, pp. 53-80.
[2] Harland CM (1996) Supply chain management: relationships, chains and networks. British Journal of Management 7(1):63-80.
[3] Carter C, Rogers DS (2008) a framework of sustainable supply chain management: moving toward new theory. International Journal of Physical Distribution & Logistics Management 38(5):360-387.
[4] P. Rao (2007), Journal of Asia Business Studies, vol. 1, pp. 55-66.
[5] A. Rai, R. Patnayakuni and N. Seth (2006), MIS Quarterly, vol. 30, pp.225-246.
[6] Joanne Meehan, David J. Bryde (2010). Sustainable Procurement practice, pp. 74-81.
[7] Navin-Chandra, D. (1991). Design for environment ability. Design Theory and Methodology, 31, pp. 99-124.
[8] Crainic, T.G. Gendreau, M. Dejax, P.J. (1993b). Dynamic stochastic models for allocation of empty containers. Operation Research 41 (1), 102-302
[9] Wang, N. M., Sun, L. Y. and Wang, Y. L. (2005). Green Supply Chain Management, Tsinghua University Press, Beijing.
[10] Zhu, Q., Geng, Y., Tsuyoshi, F. and Shizuka, H. (2010). Green supply chain management in leading manufacturers: Case studies in Japanese large companies. Management Research Review, 33(4), 380–392
[11] Handfield, R. B., Walton, S. V., Sroufe, R. and Melnyk, S.A. (2002). Applying environmental criteria to supplier assessment: a study in the application of analytical hierarchy process. European journal of operational research, 141(1), 70-87.
[12] Aref A.Hervani, Marilyn M. Helms, Joseph Sarkis, (2005) "Performance measurement for green supply chain management", Benchmarking: An International Journal, Vol. 12 Iss: 4, pp.330 – 353
[13] Lee, S. Y. (2008). Drivers for the participation of small and medium-sized suppliers in green supply chain initiatives. Supply Chain Management: An International Journal, 13(3), 185–198.
[14] Thoo, A. C., Hamid, A. B. A., Rasli, A. and Zhang, D. W. (2014a). Supply Chain Strategy and Operational Capability in Malaysian SMEs. Advances in Education Research. 44, 231
[15] Ninlawan C, Seksan P, Tossapol K, Pilada W. The implementation of green supply chain management practices in electronics industry. Proceedings of the International Multi Conference of Engineers and Computer Scientists 2010; March 17-19: Hong Kong.