

DEFINING GREEN SUPPLY CHAIN MANAGEMENT PRACTICES

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Abstract

Presently, Environmental Management has given new area of management to business organizations and government. To manage overall environmental impact of organizational activities, Green Supply Chain Management (GSCM) concept has been emerged, which comprises of various practices. According to the available literature, GSCM practices mainly comprise of Green Design, Green Procurement, Green Manufacturing, Green Packaging, Green Warehousing & Building, Green Distribution & Transportation and Green Reverse Logistics. This research paper has defined these various practices.

Keywords:

Green Supply Chain Management (GSCM), Green Design, Green Procurement, Green Manufacturing, Green Packaging, Green Warehousing & Building, Green Distribution & Transportation and Green Reverse Logistics.

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1. Introduction

Supply Chain Management (SCM) is an indispensable area of the organization, which consumes investment of time, money and efforts simultaneously influence overall performance of organization. According to Hervani et al. (2005) SCM is a vital business function which includes sourcing, manufacturing/assembly, storage, order entry and tracking, distribution throughout the various channels of distribution and delivers to the end customer. It is a set of approaches utilized to efficiently integrated suppliers, manufacturers, warehouses and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level (Simchi- Levi et al. 2003).

SCM of each organization interacts with natural environment and discharge various emissions into air and water. Green Supply Chain Management (GSCM) has been emerged to minimize environmental impact of SCM practices. Rettab & BenBrik (2008) addressed green supply chain as a managerial approach which minimizes a product or service's environmental and social impacts or footprint. Thus, GSCM is an integrated effort by all supply chain members of the organization, to put "green" as a strategic part of operations and mitigate environmental harm at all the levels of product life cycle.

2. Defining Green Supply Chain Management Practices

Zhu et al. (2006) provided a range of GSCM practices includes, green purchasing to integrated supply chain from suppliers to manufacturers, to customer and reverse logistics. According to Hervani et al. (2005) GSCM includes various practices; green purchasing, green manufacturing/materials management, green distribution, marketing, and reverse logistics.

As per the literature available on GSCM practices, the following are included in GSCM Practices:

- a. Green Design,
- b. Green Procurement,
- c. Green Manufacturing,
- d. Green Packaging,

- e. Green Warehousing & Building,
- f. Green Distribution & Transportation, and
- g. Green Reverse Logistics.

a. Green Design: Design stage of supply chain can be defined as the function of the product, process, or service and selects the raw materials, supplies, and process chemicals to be used. These choices in turn determine the energy consumed to create products and the waste generated. In addition, the durability, serviceability, and energy consumption of products during their lifetime can be determined (WBCSD, 2006). Thus, design of product affect environment from the source to final disposal.

Fiksel (1996) considered green design as addition of ecological terms with new product development stage which includes “cost”, “performance”, “quality” and “environmental” characteristics of product.

Green design is also called as “eco-design” or “design for environment”. It refers to identify and minimize the environmental aspect of product over its entire life cycle. It is considered as very important stage of supply chain, because most environmental impact arises from the production, consumption, and disposal of the product are direct consequences of decision made in the design stage (Handfield et al., 2001).

Accordingly, green design practices reduce environmental risk of product and provide economic benefits to manufacturers and users as well.

b. Green Procurement: Green procurement is aimed to assure the environmental soundness of purchasing items, processes and suppliers. It helps manufacturers to reduce waste at the source and maintain quality of raw material. According to Min & Galle (1997) green procurement is environmentally – conscious purchasing activities that ensure meets environmental goals of purchasing organization.

Hsu et al. (2013) considered green procurement as external linkages with suppliers. It address issues such as environmental certifications, recyclable environmental purchasing, sourcing with

minimum wastage and proper guidance to suppliers for environmental practices development in their internal operations. Ninlawan et al. (2010) stated environmentally conscious purchasing that includes the reduction, reuse and recycling of materials in the purchase stage of supply chain. In addition, it is a solution for environmentally concerned and economically conservative business, and a concept of acquiring a selection of products and services that minimizes environmental impact (Salam, 2008).

Consequently, green procurement provides economic and environmental both benefits to while dealing with upward supply chain members; suppliers.

c. Green Manufacturing: Green manufacturing aims to continuous integration of environmentally consciousness production processes and resources to reduce and prevent waste, emission into land, water or air. It helps to reduce environmental and human health risk throughout the conversion process of raw material to finish goods.

Ninlawan et al. (2010) defined green manufacturing as a production process which inputs are with relatively low environmental impacts, highly efficient and which generates little or no waste or pollution. In the view of Kung et al. (2012) it is the environmental standard manufacturing processes. Sah et al. (2014) denoted green manufacturing as processes which aims to 3Rs; reduce, reuse, and recovery, the environmental burden by using appropriate materials and technologies.

Accordingly, it helps organizations to optimize production process, reduce or remove waste, emission and noise while using cleaner technology, save overall cost of production, disposal of waste and improved corporate image.

d. Green Packaging: Packaging plays a major role in environment pollution. By using environmentally friendly packaging materials and recycling techniques organization can reduce the waste and extra cost burden of it. Crumrine et al. (2004) stated green packaging is a use of green or recycled packaging materials, improved packaging design and techniques.

According to Ho et al. (2009) green packaging materials are used for making sustainable packing with least or no impact on environment. On the broader perspective, green packaging starts from designing of green packaging, optimize package structure, reduction in packaging material size and weight and at the same time reuse or recycling of used or waste packaging material. Packaging has its direct negative impact on the environment. Adoption of green packaging reduces environmental risk of organization and its related supply chain members.

e. Green Warehousing & Building: Basically, warehouse is designed for loading and unloading of goods and storage of material whereas, building includes manufacturing plant and other facilities of organization. Smith and Perks (2010) stated that businesses should use space-saving warehousing or storage facilities that cut costs and reduce the impact on the environment.

It requires considering the construction materials used, as well as considering heating and cooling facilities and using natural light. It aims to balance and manage economic and environmental inputs and outputs of the warehousing function of supply chain. Besides, Environment Pollution Agency (EPA) has defined green building as environmentally responsible and resource efficient structure and process throughout the building's life cycle.

Green warehousing & building identifies the environmental impact of energy, material and resources required in plant building facilities and warehousing. The aim is to minimize environmental impact and reduce energy consumption. Organization can achieve this by energy, energy efficient material handling, and day lightning system. Accordingly, it optimizes storage resources, reduces CO2 emission and improved economic performance.

f. Green Distribution and Transportation: Transportation greening is crucial because while sourcing of raw material and delivery of final product vehicle consumes fuel and other energy sources and it increase air pollution. Smith and Perks (2010) suggests that bio - fuels could be used for the transportation fleet to reduce carbon emissions; containers used for transport are at full capacity to reduce transport trips, or try to limit the number of transport trips. In an effort to become greener, alternative means of transport could also be used.

Zhu et al. (2008) indicated that use of less energy during product transportation is an important measure to minimize emissions during transportation when shipping or moving by road, rail or sea. Consequently, it improves the economic and environment performance, by releasing less pollution, meanwhile meeting product volume requirements and cost performance goals.

g. Green Reverse Logistics: It includes the recycling of products, packaging and material within the organization or with coordination of third party logistics. According to Brito & Dekker (2002), reverse logistics is about collection of goods and redistribution processed goods already supplied to the market either as return inwards or faulty products.

Stock (1998) explored new aspects of reverse logistics as product returns, source reduction, recycling, material substitution, reuse of material, waste disposal and refurbishing, repair and remanufacturing. It is the process whereby companies can become more environmentally efficient through recycling, reusing, and reducing the amount of materials used (Rogres & Tibben-Lembke, 2001).

Accordingly, effective use of green reverse logistics can help organization to reduce cost, improve social, economic and environmental aspects of performance. Organization can compete in high intense competition and low profit margin with green reverse logistics.

3. Conclusion

Environmentally concern business activities are not only required for environmental management, but also required for cost reduction and developing good brand image. This paper has defined various GSCM practices. The definitions clarified various organizational internal and external activities with suppliers and customers. GSCM is an integrated environment management system of an organization which starts from designing of product and processes and ends with the disposal of product with minimal environmental impact.

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