

REVIEW ARTICLE



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## QUALITATIVE ANALYSIS OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES IN INDIAN AUTOMOBILE INDUSTRY

KAMAL MONGIA<sup>1</sup>, EARNEST VINAY PRAKASH<sup>2</sup>, Dr. AJEET KUMAR RAI<sup>3</sup>,  
RAHUL CHARLES FRANCIS<sup>4</sup>

<sup>1</sup>M.Tech Scholar, <sup>2</sup>Assistant Professor, <sup>3</sup>Assistant Professor (Sr. Grade), <sup>4</sup>Assistant Professor  
Department of Mechanical Engineering, SHAITS University, Allahabad



### ABSTRACT

This research aims to survey current green activities in Automobile manufacturers in India and to evaluate green supply chain management. To survey current green activities in automobile manufacturers in India, one OEM(Original Equipment Manufacturer) i.e. AMW Motors Ltd., whose single art of the manufacturing facility at Bhuj, Gujarat and headquarters based in Mumbai is case studied who provided in-depth interview about green procurement, green manufacturing, green distribution, and/or reverse logistics. To evaluate green supply chain management, the questionnaire related to investigate GSCM practices, measure GSCM performance, and explore GSCM pressure/ driver within Indian automobile industry is used to obtain survey results. Then suggestions to develop GSCM in Automobile industry are presented.

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### I. INTRODUCTION

Supply chain management is the coordination and management of a complex network of activities involved in delivering a finished product to the end-user or customer. All stages of a product's life cycle will influence a supply chain's environment burden, from resource extraction, to manufacturing, use and reuse, final recycling, or disposal. Beyond this definition with adding the "green" component, it refers to green supply chain management (GSCM) which is defined as "green procurement+ green manufacturing+ green distribution+ reverse logistics". The idea of GSCM is to eliminate or minimize waste (energy, emissions, and chemical/hazardous, solid wastes) along supply chain. Environmental issues under legislation and directives from customer especially in the US, the European Union (EU), and Japan become an important concern for manufacturers. As a more systematic and integrated strategy, GSCM has

emerged as an important new innovation that helps organizations develop "win-win" strategies that achieve profit and market share objectives by lowering their environmental risks and impacts, while raising their ecological efficiency. Recent studies of GSCM can be separated into two ways: framework for GSCM, and performance measurement. Some frameworks propose how to improve the collaborative relationships between manufacturers and suppliers, to explore the gaps between the framework and the present state, to aid managerial decision making, or to develop general procedure towards achieving and maintaining the green supply chain. A set of performance measures is used to determine the efficiency and/or effectiveness of an existing system, to compare competing alternative systems, or to design proposed systems by determining the values of the decision variables that yield the most desirable levels of performance. This research aims

to survey current green activities in Automobile Industry in India and to evaluate green supply chain management.

## II. REVIEW OF LITERATURE

Walton et al. (1998) observed that, the term "green supply chain" has been discussed by various organizations and researchers who have offered their own views on green supply chain and green supply chain management. Min and Galle (1997) discussed how to factor environmental protection into supplier selection, and the effects of green purchasing on waste reduction. Beamon (1999) introduced some environmental elements into a supply chain model and offered a new supply chain design. Hoek (1998) spearheaded efforts to keep ecological balance in supply chain practical operation. In 1999, General Motors Corporation formed a green supply chain working group with another twelve.

Liu et al. (2010) in China has analyzed the relationship between green supply chain management level (LGSCM) and the classified determinant factors. The study confirmed that a company's environmental management capacities will be strongly enhanced by frequent internal training of employees to increase its involvement in GSCM practices.

Qinghua et al. (2010) says at present, there is still no single uniform and authoritative definition of "green supply chain". Such a definition is not to be found in the Logistics Terms Standards where the concepts and connotation of green supply chain and green supply chain management are still at the exploratory stage. They suggested that a new and necessary requirement for modern enterprises to survive in global and information-based competition, is to understand the importance, operational modes and process methods of green supplier management. Green supplier management in this study will focus on how enterprises select green suppliers and how to green suppliers are developed.

Ali and Diabat (2011) using Interpretive Structure Modelling (ISM) through an Indian case study have investigated eleven drivers to implement GSCM practices. Top drivers mentioned in the

research were green design, integrated quality environmental management into the planning and operation process, reducing energy consumption, and reusing and recycling materials and packing drivers.

Nathalie et al. (2011) says since the 1970s, the relationship among the population, source and environment has begun to be considered rationally and the concept of sustainable development was conducted in Our Common Future in 1987.

Zhu et al. (2012) has evaluated and explained GSCM drivers, practices and performance among diverse Chinese manufacturing firms. They concluded that the higher environmental awareness and pressures in International Journal of Managing Value and Supply Chains (IJMVSC) Vol. 3, No. 1, March 2012 5 Chinese enterprises has not contributed into strong or higher GSCM practice adoption, let alone to improvements expected in some areas of performance. Concern about the environmental issue has also rise the interest of researchers to investigate the adoption and implementation of GSCM practices in another Asian Countries such as Thailand, India and Malaysia.

## III. OBJECTIVES

To identify the lean and green wastes in the automobile industry in India and recommending the suitable waste reduction methods and techniques for eliminating the wastes.

To create an environmental awareness among the industries.

## IV. MATERIALS AND METHODS

In analysis there are two methodologies qualitative and quantitative research. According to Bryman (2002) the choice of the analysis method depends upon the aim of the inquiry and use of the findings. The method used in this thesis would be a qualitative method instead of quantitative method because the qualitative method will be helpful for investing questions like how and why of research instead of calculating exact figures using quantitative methods. The qualitative method served the purpose well since the objective of the thesis was to find what will be the best method and tools for eliminating their wastes and what they considered as main obstacles on implementing the

concept and also how to develop Automobile Industry in India according to GSCM concept. These questions can be answered only through qualitative method and also according to the discussion carried out through the interviews it clearly points out that achieving Quantitative method out of it is really hard.

## V. RESULTS AND DISCUSSIONS

### Waste Recognition

- Chip materials removed from machining of tipper box manufactured inside plant containing cast iron pieces of broken chips, cast steel serrated chips were kept to be sold to an outside vendor and were not reused.
- Semi-finished cabs Imported from FAW, China were having internal seat linings which are dumped after they get into assembly.
- Big Card boxes were thrown away to fire after removal of cabs from them.
- Tools worn out after machining were kept aside to be taken by vendor to sale outside.
- Retro parts were kept aside earlier and few were sent back to the vendor again.
- Fifth wheel coupling comes with a metal extruded on periphery. This is for the easy carriage for the part and is machined before using it in the assembly of long haul.
- Trailers from Tranztar unit of while manufacturing produces a lot of scrap that is kept aside for days and most of the metal becomes waste due to corrosion and lack of measures takes to preserve it.
- The special featured trucks needs special machining processes and the waste generated is in the primary form of liquids that are needed to carry heavy semi finished parts safely, chip formation in machining.
- The pollution impact of the transportation of semi finished parts by the vendors to the manufacturing facility takes miles of distances. Major vendors of AMW includes from the region of Pune, Ahmadabad, Rajkot, Vadodara, Surat, Hazira, Noida,

Talegaon. Vendor uses road transportation from these facilities and the vehicles were emitting pollution as they were not up to current BS Norms. They were using vehicles of BS III(Bharat Stage III) while the current scenario lays down norms of BS V. Thus there was a vast gap and the OEM has no role in asking vendors to correct the same.

- The distribution consists of completed units movement to dealers across pan India over heavy logistics vehicles provided by the outsourced vendor. They were also BS III norms certified.

### GSCM Implementation

- The broken cast iron chips produced were immediately collected and a casting area is set up to recast and use the same metal chips in making small other sub assemblies earlier needs to be purchased from outside vendor. Now the waste is eliminated and also cost over purchase is reduced and the time lapse is also eliminated to supply the same.
- The internal seat linings of the CAB imported from FAW, China was collected and communicated upon with the vendor to take them back and also use the same safety lining again for the resupply of those parts.

## VII. CONCLUSIONS

Automobile Industry in India is need of a sustainable development, so the awareness and demands of green products must be encouraged. Some possible ways have been discussed and among these legislation, education and government subsidiaries can be suitable. The industry should initially improve the knowledge on lean and green supply chain management and to adopt the compatible ways of implementing/practicing the supply chain in their manufacturing firm. Funding from the government for implementing the concept and spreading the knowledge on the concept is necessary. The success stories from the developed nations on implementing the concept should be promoted vigorously.

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