



Contents lists available at ScienceDirect

Resources, Conservation and Recycling

journal homepage: www.elsevier.com/locate/resconrec



Full length article

Sustainable supply chain management practices in Indian automotive industry: A multi-stakeholder view

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ARTICLE INFO

Article history:

Received 28 June 2016

Received in revised form 5 January 2017

Accepted 5 January 2017

Available online xxx

Keywords:

Sustainable supply chain management

Automotive industries

Emerging economies

Sustainable supply chain management practices

Inter influences

ABSTRACT

As one of the largest manufacturing sectors, the automotive industry has a deep impact on the society and environment. Automotive products provide mobility to millions and create jobs, but also threaten the environment. Consumer pressure, government regulations, and stakeholder demands for a competitive edge have forced the automotive industry to consider their environmental and social impacts in addition to their economic status. These pressures have led many automotive industry businesses to adopt Sustainable Supply Chain Management (SSCM) practices. Specific practices that are adopted into the traditional supply chain and that help an industry shift towards a sustainable supply chain are called SSCM practices. Firms have difficulty identifying the most useful practices and learning how these practices impact each other. Unfortunately, no existing research has studied the interrelated influences among these practices in the automotive industry, nor from an Indian perspective. The current study aims to give a better understanding of the interrelated influences among SSCM practices with a particular look at the automotive industry. Our research presents views from multiple stakeholders, including managerial, environmental, societal, and governmental associations. We propose a framework model, using the Decision Making Trial and Evaluation Laboratory method, to evaluate automotive industry SSCM practices specifically situated in the emerging economy of India. Through a questionnaire survey with the above-mentioned stakeholders, we find interinfluences and the prominence of the identified practices. A prominence causal relationship diagram is obtained depicting the cause groups and the effect groups of the practices. The differences and similarities between individual perspectives and combined stakeholder perspectives are identified. The results reveal that management commitment towards sustainability and incorporating the triple bottom line approach in strategic decision making are the most influential practices for implementing the sustainable supply chain management. This study provides a foundation for industrial managers to understand the inter influences among the practices and increases the probability of successful implementation of SSCM practices within the automotive industry.

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1. Introduction

The automotive industry plays a key role in the day to day activity of human life, not only by providing mobility but also by the enormous impact of the industry on economic, environmental, and social activities throughout the globe (Xia et al., 2015). As arguably the largest manufacturing sector worldwide, the industry faces high profile environmental challenges; they are held responsible for deteriorating air quality, contributing to global warming, and for ineffectively handling end of life automobiles (Orsato and Wells, 2007). These environmental challenges and government-

tal globalization policies have forced many automotive firms to shift towards using specific practices to help incorporate sustainability (Govindan et al., 2015a; Zhu et al., 2007). These practices, termed SSCM practices (Jayaraman et al., 2007; Linton et al., 2007; Carter and Rogers, 2008), help to reverse the well-known adverse effects of the industry, and the use of environmentally-friendly and socially beneficial practices may help to improve the profitability of the business. According to a report by the World Commission on Environment and Development (WCED) by Brundtland (1987), sustainability is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” Sustainability creates balance between the economic, social, and environmental aims of organizations (Székely and Knirsch, 2005). Evidence indicates that to achieve sustainable performance, some practices in the traditional sup-

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ply chain must be incorporated (Govindan et al., 2016d; Gimenez and Tachizawa, 2012; Taticchi et al., 2013). Thus, the benefits of SSCM practices are well understood, but the challenges associated with their implementation and understandings are not as clearly identified especially in developing nations such as India (Epstein, 2008).

Since inception, the automotive industry has been a major contributor to the Indian economy. The AMP 2026 report by Auto Tech Review (Automotive Mission Plan 2016–2026 – A Curtain Raiser, 2015) estimated that automotive sectors will contribute more than 12% of the overall GDP of the country. Automotive industries also face environmental and societal pressures from customers, employees, and partners due to globalization (Zhu et al., 2007). In the present scenario, Indian automotive industries are at peak pressure to shift towards SSCM, due to continuous globalization pressures, rules and regulations framed by the government, and from daily increases in societal awareness and standards. Hence, Indian industries now consider the social and environmental issues more vital than ever (Kannan et al., 2016), and they face difficulty in identifying the prominent SSCM practices for improving their sustainable performance (Thanki et al., 2016). The increasing need for firms to adopt sustainability practices in order to achieve competitive advantages and, at the same time, not to compromise aspects of sustainability is the need of the hour (Smith and Ball, 2012). Indian automotive industries are also experiencing challenges in terms of global competition; well-known global giants seek to claim some of the local market. Indian industries understand that following the concepts of sustainability will not only help them to thrive in this healthy competition, but also may provide a competitive edge (Bouzon et al., 2016). Although the implementation of practices has been studied from different perspectives, no work has been done to find the prominent practices and the inter influences among the practices in a leading sector such as the automotive industry in an emerging economy like India. Once the prominent practices and their mutual influences with the other common practices are identified, the shift to SSCM is made easier and much effective. By Pareto 80/20 principle, it is believed that roughly 80% of the effects are only based on 20% of causes. Concentrating on the prominent practices first will automatically increase the chances for successful adoption of SSCM (Diabat and Govindan 2011). By identifying the inter influences between the practices one can develop a suitable mapping for thorough implementation of all the practices. Of late the multi-stakeholder strategy has gained much importance in the field of sustainability since the strategy is cohesion of resources, market-based perspectives and ethical values, which in concurrence with the SSCM strategy. Hence, there is a need to investigate SSCM practices in these industries from a multi stakeholder perspective. For any firm, the three main stakeholders are (1) the government who pose the standards, rules and regulations, (2) the society on whose demand the goods are produced and who comprise the end consumers of the products, and (3) the internal stakeholders and managers who decide what is done within the organization. The views of all three categories of stakeholders are considered in the current study. Although their views may differ, the main motto of sustainability is a common function among them for assessing the real situation. Hence, the prominent practices based on their views are to be found for better understanding and easier implementation of SSCM.

The research questions we pursue include what are the SSCM practices that can be identified and incorporated in automotive firms to achieve sustainable performance?, what are the categories to which they belong?, and what are the inter influences and prominence among these practices? Identifying and categorizing these practices to build a framework model is just like building a theory towards sustainable supply chain management; proper evaluation of the model is necessary (Wacker, 2004). This work intends,

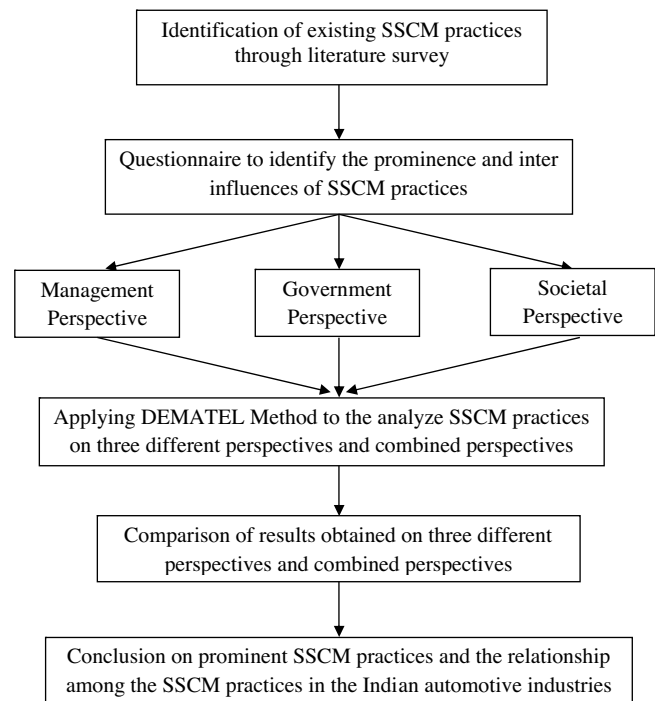


Fig. 1. Proposed research framework for identifying the prominent SSCM practices in Indian automotive industries.

first, to identify the various SSCM practices followed in automotive sectors by review of previous literatures from peer reviewed articles. We analyze practices from multiple stakeholder perspectives. Next we apply DEMATEL, a Multi Criteria Decision Making (MCDM) tool to evaluate the inter influences and prominences between the identified practices, and we include responses from governmental, management, and socially conscious staff. Fig. 1 shows the proposed framework for analyzing the SSCM practices in an Indian automotive industry.

The remaining paper is structured as follows. Section 2 summarizes the literature study. It also establishes the research gap addressed in the current study, followed by the problem description. An application of the proposed DEMATEL-based framework is described in Section 3, and we discuss the results obtained from multiple stakeholder perspectives in Section 4. Our conclusions and the managerial implications, along with limitations of the present study and future scope, are presented in Section 5 and Section 6 respectively.

2. Literature review

This literature review section is divided into three subsections. In the first sub section, we provide a brief understanding of what a SSCM is by trying to point out some of its various widely accepted definitions from previous publications. This will provide a brief introduction to what SSCM is and how it is understood by the academicians and the industrialists over the years. The next subsection gives an outline of the various investigations published in reference to the SSCM practices in accordance with automotive industries. This provides the base for identifying the research gap for the current study which is explained in the third sub section.

2.1. Sustainable supply chain management (SSCM)

SSCM is an area of research which has seen remarkable growth over the last few years, evidenced by a dramatic increase in the number of publications in this field (Seuring and Müller, 2008).

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