IMPACT OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES ON ORGANIZATIONAL PERFORMANCE: A REVIEW

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ABSTRACT

Environment management is the new development in the field of management which has emerged due to high production and consumption rate, globally. In addition, it has become need of present competitive business environment that, organizations should take some environmental initiatives and reduce environmental impact of their operations. This research paper attempts to review previous research studies in the field of Green Supply Chain Management (GSCM) Practices and its impact of Organizational Performance. This review shows that there are basically three GSCM practices, which studied, large number of times in the last, more than a decade, these are; Green Design; Green Manufacturing; and Green Reverse Logistics. Similarly, three performance measures are found common in majority of studies; Environmental Performance; Economic Performance; and Operational Performance, which are combinedly called as Organizational Performance.

Key Words: Green Supply Chain Management (GSCM) Practices, Organizational Performance.

1. Introduction

In the last two decades globalization has changed manufacturing organizations drastically with large number of opportunities at various locations and customers. This change has created numerous opportunities for economic growth and employment as well as challenges related to availability of resources, complex supply chain and environment management. Therefore, researchers have inclined their interest towards manufacturing supply chain and environmental management.

According to Hervani et al. (2005) Supply Chain Management (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. All these activities of supply chain directly or indirectly interact with natural environment and causes environmental issues. To overcome those issues, environmental friendly green supply chain has been emerged.

Srivatava (2007) defined GSCM as integrated environmental thinking into the SCM which includes designing of product, material selection and sourcing, manufacturing, delivery of product and end-of-life management of the product after use. Similarly, it covers all phases of a product’s life cycle, from the extraction of raw materials through the design, production, and distribution phases, to the use of the product by consumers and its disposal at the end of the product’s life cycle (Walker et al., 2008).

Whereas, innovative techniques in SCM to reduce environmental impact and maximize economic benefits are known as GSCM practices. GSCM practices include all environmental supply chain practices which aimed to reduce waste and emissions, recollection, recycling, remanufacturing or reuse of used products. Consecutively, effective implementation of GSCM practices can benefit an organization in various ways like; reduction in wastage, reduction in wastages disposal penalties, reduction in wastage treatment cost, improve brand image as a green organization, improve customer responses to buy green product, improvement in productivity, quality and delivery time, increase in market share and competitive advantage and many more. These are called as GSCM Performance measures.
This research paper has reviewed various research articles on GSCM practices and performance and provided main common factors analyzed by various researchers followed by conceptual model of GSCM practices and performance, to create base for future empirical investigation.

2. Literature Review

Researchers argued that organizations adopt only those practices which are economically beneficial to them for a long run. Besides, GSCM practices enhance various performance aspects of organization like, environmental, economic, operational, competitive, social and others. There are many authors who have developed relationship between GSCM practices adoption and its impact on performance. Few of them are as below:

Rao et al. (2002) investigated the implementation level of GSCM practices with only two stages of supply chain namely, environmental initiatives within organization and greening of suppliers and its impact on performance in manufacturing sector in South East Asia. They found that significant link in GSCM practices and environmental, economic and competitive performance, whereas, environmental performance found no significant link with economic performance. Hence, environmental performance may not generate economic benefits to organization. In addition, Zhu at al. (2004) examined the moderating effect of quality management and Just in Time (JIT) techniques on relationship between GSCM practices and performance in Chinese manufacturing enterprises.

They found quality management as a positive moderator to enhance performance along with GSCM practice, whereas, JIT found negative moderator which may cause degradation of environmental performance. Hervani et al. (2005) provided issues related to the environmental (green) supply chain management performance management through literature review. They have provided an integrative framework to study, design and evaluate GSCM performance tools.

Meanwhile, Rao & Holt (2005) empirically tested relationship in GSCM practices, competitiveness and economic performance with the help of Structural Equation Modeling (SEM). They found significant link in greening in-bound, production and out-bound practices with competitiveness and economic performance. Whereas, Menzel et al. (2010) analyzed annual and sustainability reports of European automobile and pharmaceutical industries to investigate the trend and effect of green manufacturing on financial performance. They found decrease trend in the use of electricity and reduction in the CO2 emission. However, green manufacturing found insignificant to improve profit margin and sales.

Eltayeb et al. (2010) empirically investigated effect of GSCM practices (which include green purchasing, eco- design and reverse logistics) on environmental, economic, operational and intangible outcomes. The study was conducted ISO 14001 certified organizations in Malaysia. Their study revealed a significant positive effect of eco-design on all the performance outcomes, whereas, reverse logistics found positive relationship with operational and green purchasing found ineffective to improve organization performance.

Thus, GSCM practices have divergent influence on organization performance. Additionally, selection about performance criteria and performance measurement is also important task for organization while implementing GSCM practices. Lin et al. (2011) explored criteria for GSCM performance evaluation of the automobile manufacturing industry by using fuzzy set theory, decision making system trail and evaluation laboratory.

They used this hybrid method to find out key criteria in improving the manufacturers green performance namely, environmental, economic positive, economic negative and operational performance. They found that increase in the cost for purchasing environmentally friendly material is the most influential and significant criteria for performance evaluation. In addition, pollution control initiatives are the most effective performance criteria for automobile manufacturing industry.

They conclude that increase in the cost for purchasing environmentally friendly material is the cause of all issues in automobile industry. Hence, increase in the investment to reduce environmental burden is an important concern for implementing GSCM practices in automobile sector.

In addition, Dey & Cheffi (2012) developed an analytical framework for measuring environmental performance of focal manufacturer supply chain by combining three major concepts: supply chain management, environment management and performance measurement. They integrated supply chain processes (supplier relationship management, internal supply chain management and customer relationship management) with organizational decision levels (both strategic and operational) and developed a framework to measure environmental performance. This framework includes namely; environmental planning, environmental auditing, management commitment, environmental performance, economic performance and operational performance.

Chiou et al. (2011) constructed and validated a relationship model of greening the supply chain, green innovation, environmental performance and competitive advantage in Taiwan Industry. They found that greening the supplier through green innovation significantly contribute to improve environmental performance and competitive advantage of the firm. Lee et al. (2012) explored effect of GSCM practices on business performance in electronics SMEs industry in Korea. They developed a research model
relating to GSCM practice and business performance through three organizational variables (employee job satisfaction, operational efficiency, relational efficiency) and tested using structural equation modeling method. They found insignificant direct link between GSCM practices and performance. Besides, significant indirect relationship was found between GSCM practices and business performance through mediators: operational efficiency and relational efficiency.

Thus, their study reveals that business performance will be improved when implementation of GSCM practices enhance operational and relational efficiency.

They considered operational efficiency as: the ability of supplier to reduce cost and cycle time, improve product quality, create greater customer value. Whereas, relational efficiency as: the ability of supplier to increase transparency and openness in the business process, jointly work with buyer so that trust and credibility can be developed with buyers.

In addition, Giovanni (2012) compared impact of internal and external environment management practices on performance in 138 Italian firms. They found internal environment management practices more effective to improve environmental and economic performance than external management. Their study provides insights into effectiveness of GSCM.

Kung et al. (2012) applied multiple regression analysis to investigate relationship in value (supply) chain management and environmental performance, in Taiwanese manufacturing industries. Their findings revealed a positive relationship between green value chain and environmental performance. Green et al. (2012) collected data from US manufacturing managers and applied structural equation modeling method to test impact of comprehensive GSCM practices on performance.

Their finding reveals adoption of GSCM practices leads to improve environmental performance and economic performance which in turn positively impact operational and organizational performance.

Sezen & Cankaya (2013) investigated the influence of green manufacturing and eco innovation on corporate sustainability performance (economic, environmental and social) in automobile, chemistry and electronic organizations in Turkey. They found significant positive impact of green manufacturing and eco-process on environmental and social performance, whereas, eco–product innovation was found insignificant.

In addition, Digalwar et al. (2013) explored the performance measures for the green manufacturing practices in the Indian manufacturing industries with the help of factor analysis.

They found 12 parameters to measure green manufacturing performance namely, top management commitment, knowledge management, employee training, green product and process design, employee empowerment, environmental health and safety, suppliers and materials management, production planning and control, quality, cost, customer environment performance requirement, customer responsiveness and company growth.

As discussed earlier that GSCM practices can be divided into proactive or reactive practices. Similarly, Laosirihongthong et al. (2013) grouped GSCM practices as: pro-active practices (green purchasing, eco-design, reverse logistics) and re-active practices (legislation and regulation). They examined the relationship between GSCM practices implementation Impact on performance. Their study revealed a significant relationship in reactive practices and environmental, economic and intangible performance, whereas, reverse logistics found low levels of adoption and insignificant impact on GSCM performance.

Yu et al. (2014) empirically tested a conceptual framework of integrated GSCM practices and operational performance (flexibility, delivery, quality and cost) with the help of structural equation modeling method. They found significant positive relationship in integrated GSCM practices i.e., internal GSCM, GSCM with customers, GSCM with suppliers and operational performance of automobile manufacturers in China.

In addition, Donghyun et al. (2015) investigated the impact of GSCM practices on performance with mediating role of collaborative capabilities. They applied hierarchical regression on data collected through manufacturing organizations in South Korean. They found that implementation of GSCM practices improves environmental and financial performance. In addition, collaboration among all the partners of supply chain in the implementation of GSCM practices improves financial performance of the organization.

Hence, there are large numbers of studies found in the research areas and on the basis of these studies some common practices and performance are listed in Table 1. The factors extracted from the past studies, provided base in the form of conceptual model to research for future empirical investigation of impact of practices on performance of GSCM in manufacturing industry.
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<thead>
<tr>
<th>Practices/Performances</th>
<th>Parameters</th>
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<tbody>
<tr>
<td><strong>Green Design</strong></td>
<td>✓ Design of Products for Optimum Consumption of Material/Energy.</td>
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<td></td>
<td>✓ Design of Products to Avoid or Reduce Use of Hazardous of Products.</td>
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<td></td>
<td>✓ Design of Products to Reduce Waste &amp; Costs.</td>
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<tr>
<td><strong>Green Manufacturing</strong></td>
<td>✓ Optimization of Process to Reduce Noise.</td>
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<td></td>
<td>✓ Use of Environmental Friendly Raw Materials.</td>
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<td></td>
<td>✓ Taking Environmental Criteria into Consideration in Selection of Manufacturing Process.</td>
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<tr>
<td><strong>Green Reverse Logistics</strong></td>
<td>✓ Collects Back Used Products from Customers for Recycling, Reclamation of Materials, or Reuse.</td>
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<tr>
<td></td>
<td>✓ Collects Back Used Packaging from Customers for Reuse or Recycling.</td>
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<tr>
<td></td>
<td>✓ Returns Back its Products to Suppliers for Recycling, Retaining of Materials, or Remanufacturing.</td>
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<tr>
<td><strong>Environmental Performance</strong></td>
<td>✓ Reduction of Emissions and Solid Waste.</td>
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<td>✓ Recycle of Waste Water.</td>
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<td></td>
<td>✓ Improve in Environmental Situation</td>
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<tr>
<td><strong>Economic Performance</strong></td>
<td>✓ Reduction of Fine for Environmental Accidents.</td>
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<td></td>
<td>✓ Reduction in Waste Treatment Cost.</td>
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<td>✓ Increase in Operational Cost.</td>
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<td>✓ Increase in Investment</td>
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<td>✓ Effective Reverse Logistics.</td>
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<td>✓ Reduction in Scrap.</td>
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<td>✓ Optimization of Capacity Utilization</td>
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3. Conclusion

Through this research an attempt has been made to review related available literature and it proved that there is significant impact of GSCM practices on performance in manufacturing sector. In addition, the research has found various GSCM practices and performance measurement parameters for future empirical investigation. In the last a conceptual model has been presented.

4. Reference

