

# A Conceptual Framework for Green Supply Chain Management based on Drivers and Challenges

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**Abstract:** -- Green supply chain management has been seemed as an environmental innovation with considering several environmental affect into chain management. The essential reason of this find out about is to reveal the new progressive areas of this emerging field such as all those improvement that are relevant to environmental and social sustainability towards operation management and furnish chain management. Sustainable improvement has made top notch growth in establishing environmental and social sustainability in the direction of operations administration and the furnish chain. This paper also point out the reasons why any company adopt green supply chain management. The motive of this research paper is formed a conceptual framework for green supply chain management based on drivers and challenges. Several drivers and challenges are obtained by literature review

**Keywords—** Performance optimization, Improvements in supply chain management, conventional supply chain management, waste management.

## I. INTRODUCTION

Green supply chain management includes different aspect of environment during the formation of supply chain management. This includes environmental thinking during product design, choose of environmental friendly material, selection of manufacturing process which is environmental friendly, transport of ultimate product to the consumer and finally there should be proper management of the product after its useful life. In the early days, conventional supply chain management only focus on the management of flow of goods and services. This supply chain management also include transport and storage of raw material, work in process inventory and final product in different level of product use. For any country as there economy grow there energy requirement as well as material consumption also increase, which contribute the several environmental issues. So government set up several regulatory board to control and pressurize the company to adopt different environment friendly aspect during supply chain management and other business activity. This paper will provide summing up all the various literature of the green supply chain management. There are various literature that surround on green supply chain management especially from 1980 to the present. The main key themes come into view of green supply chain management after reading various literature is green operation, reverse logistics, waste management and green manufacturing. At the end, this paper will point out importance of green supply chain management in any organization.

## II. THEORY ON GREEN SUPPLY CHAIN MANAGEMENT

In current there is no fixed definition related to green supply chain management. Green supply chain management is in initial stage there is more research requirement in this field. These days various researcher give unique definition on green supply chain management. These researcher give definition about green supply chain management according to there research. Some definition of green supply chain management are.

Table 1: Definition of Green supply chain management

Authors	Definition
Narasimhan and carter (1998)	Green supply chain management is an activity done by any organization for reducing pollution, reducing material wastage and increase productivity of system
Dan and liu (2000)	Green supply chain management is administration process in which various environmental impact due to business activity and improving performance of resources usage in whole business activity. This theory formed by combination of both supply chain management technique and green production theory. This theory

	involve every element of supply chain management, inventory control, green manufacturing technique, retailer and consumer.
Zsidisian and siferd (2001)	Green supply chain management technique which is used to remove all the activity which caused environmental problems within manufacturing system. According to this theory green supply chain management technique is management technique which is used to increase economic growth along with improving environmental performance by using minimum resource.
Zhu (2004)	Green supply chain management technique is used to improving effectiveness of all the activity in company within their supply chain management for effective economic performance along with taking care of environmental issue.
Beamon (1999)	According to definition given by Beamon, green supply chain management is new structural model of green supply chain which include traditional supply chain management along with new manufacturing technique such as reuse, recycling etc. This theory describe how to waste material again use in supply chain management.

### III. GREEN SUPPLY CHAIN MANAGEMENT

Detail research on green supply chain management arrived in the nineties. Webb (1994) studied the consequences of few products on the environment. This study pioneered the concept of “green purchasing”. This research convey to purchase the appropriate material which is environmental friendly and easily recycle. In year 1995, an institute was established by way of CIPS (chartered institute of purchasing and supply) and BIE (business in the environment), that specially helped companies to keep balance between business aspect and environmental aspect. This help in improving supply chain management (green et al. 1998). The idea of green supply chain management was once first posted in a study known as “Environmentally Responsible Manufacturing” in 1996 by the Manufacture research

consortium (MRC) of Michigan state university. This work was about the development of manufacturing supply chain mainly based on various environmental effect and usage of resources in efficient manner (Handfield et al. 1997). In year1997, EPSRC (The engineering and physical science research council) was also doing research. The main objective of this research was performance of green supply chain management. ISO (international standard organization) also launch of ISO 14000 series require mental management system (Walton et al 1998). After then terminology green supply chain coined up and mention by various institutes and researcher who presented there perspective on green supply chain management. General Motor Corporation stated work on green supply chain management with objective to discover option to enhance both the environmental and economic capacity in green supply chain management. Texas tech University also established green supply chain management research centre for out various aspect on green supply chain management through research (Min and Galle 2001).

An international journal “greener management international published a special edition on green supply chain management ( Sarkis, 2001) in 2001. There has been various research done on green supply chain in which mainly emphasis on green purchasing (Murray,2000 ; Wu et al 2001 ; Zhang et al 2014) , green design( arena et al. 2003 ; Srivastava 2007) ,reverse logistics ( Srivastava and Srivastava 2006, Min et al 2006) and environmental potential evaluation system ( Dowell et al 2000; Farrow et al 2000; Sharma 2000, Clemens 2001)

### IV. LITERATURE REVIEW

List of different previous literatures along with review is given below.

**Table 2: Table contain summary of the main challenges identified by literature review**

year	title	Author	Challenges
2014	Barriers analysis for GSCM implementation in Indian industries using analytic hierarchy process	kannan et al	<ul style="list-style-type: none"> <li>• Absence of new technology</li> <li>• Complexity of controlling environmental process in supply chain</li> <li>• Complexity to invent reuse product</li> </ul>

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			<ul style="list-style-type: none"> <li>• Absence of environmental information</li> <li>• Shortage of customer awareness about GSCM</li> <li>• Absence of inter department collaboration</li> <li>• Absence of higher management engagement</li> </ul>			<ul style="list-style-type: none"> <li>• Legal challenges</li> <li>• Economic Challenges</li> </ul>		
2013	GSCM, hierarchical framework of barriers	A of	Dashore et al	<ul style="list-style-type: none"> <li>• Absence of corporate serial responsibility</li> <li>• Absence of energy and waste management system</li> <li>• Competition in Market</li> <li>• Absence of government regulation</li> <li>• Increase in product cost</li> <li>• Absence of trained professional</li> <li>• Lack of developer and consultant related to green technology</li> </ul>	2011	Role of green issues of Mining supply chain on sustainable development	Muduli et al	<ul style="list-style-type: none"> <li>• Difficulty in adopting new technology</li> <li>• Government and organization ignorance related to environment</li> <li>• Improper method to implement GSCM</li> <li>• Technology barrier</li> <li>• Financial barrier</li> </ul>
					2012	Identification of stimuli, enablers and inhibitors of GSCM and an analysis of their dynamic	Dileep more et al	<ul style="list-style-type: none"> <li>• Absence of government financial support</li> <li>• Absence of resources</li> <li>• Absence of industry infrastructure</li> <li>• Absence of technical expert</li> <li>• Absence of organization policy</li> </ul>
2010	An organizational theoretic review of GSCM literature		Joseph et al	<ul style="list-style-type: none"> <li>• Absence of green technology culture in organization</li> <li>• Government intention to promote GSCM</li> <li>• Knowledge Barrier</li> </ul>	2012	An empirical study of GSCM in Indian Perspective	Toke et al	<ul style="list-style-type: none"> <li>• Security risk</li> <li>• Participation of chain member</li> <li>• Absence of forecasting and planning</li> <li>• Absence of support financial institution to industry</li> <li>• Inferior product quality</li> </ul>

**Table 3:**

NO.	CHALLENGES
1	Economic challenges
2	Technical challenges
3	Unawareness of customer
4	Lack of incentives
5	Information and knowledge challenges
6	Government legislation

**Table 4 : Table contain Drivers**

year	Title	Author	Drivers
2014	Identifying the driver of Green Supply Chain Management in Tile Industry	Saeed et al	<ul style="list-style-type: none"> <li>• Green Purchasing</li> <li>• Green operation</li> <li>• Green product</li> <li>• Green Distribution</li> <li>• Green marketing</li> <li>• Green logistics</li> </ul>
2014	Empirica Analysis of Green Supply Chain Management practices in Indian Automobile industry	Haleem et al	<ul style="list-style-type: none"> <li>• Green product</li> <li>• Green design</li> <li>• Green purchasing</li> <li>• Use of Cleaner technology</li> <li>• Green Management</li> <li>• Green Marketing</li> <li>• Green logistic</li> </ul>
2015	Classification of external stakeholders Pressures in Green Supply Chain Management	Rahim et al	<ul style="list-style-type: none"> <li>• Eco design</li> <li>• Green purchasing</li> <li>• Reverse logistic</li> <li>• Green Regulation</li> <li>• Green consumerism</li> </ul>
2009	Opportunities in Green Supply Chain	Ho et	<ul style="list-style-type: none"> <li>• Green Manufacturi-</li> </ul>

	Management	al	<ul style="list-style-type: none"> <li>• ng</li> <li>• Green Packaging</li> <li>• Green Distribution</li> </ul>
2012	Environmental orientation and Corporate performance: The mediation Mechanism of GSCM and moderating effect of competitive intensity	Ricky et al	<ul style="list-style-type: none"> <li>• Green Purchasing</li> <li>• Green logistics</li> <li>• Green Marketing</li> </ul>
2014	Socio – Economic and Demographic Determinants of Green consumption	Ibok et al	<ul style="list-style-type: none"> <li>• Green Marketing</li> <li>• Green Consumption</li> <li>• Green Manufacturing</li> </ul>

**Green Purchase:**

Green purchase is describe as an environment friendly purchasing that help the organization to achieve environment targets set by the organization or government.

**Green Operation:**

Green operation is refer to used of technology that give high output with minimum consumption without affect the environment.

**Green Distribution:**

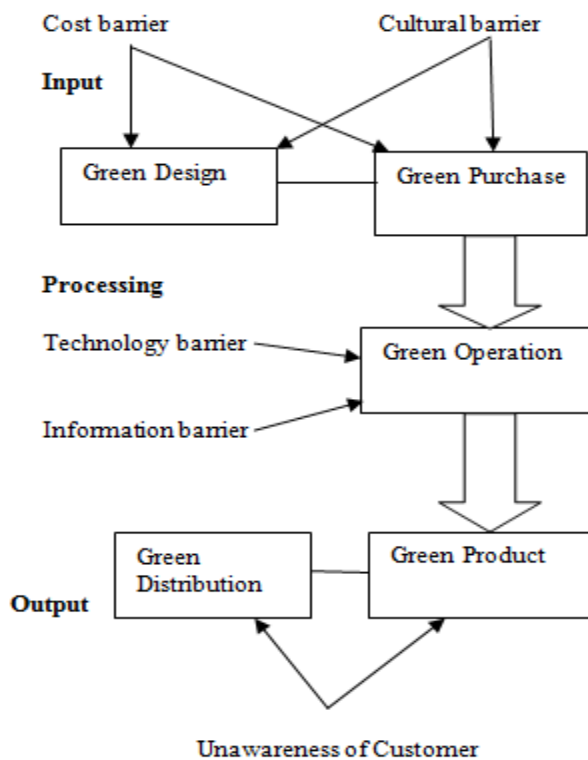
Green Distribution is comprised of green packaging and green logistic. Green packaging means packaging means packaging with material that does not impact environment. Material can be easily reuse. Green logistic refer to distributing product in sustainable way.

**Green Design:**

Green design refer to design a product by considering environment affect caused by product during it life cycle.

**V. FRAMEWORK FOR GSCM**

The framework show different barrier occur at different phase of manufacturing on different drivers.



### CONCLUSION

The paper provides a conceptual framework for green supply chain management based on drivers and challenges. The framework show different barriers occur at different level of manufacturing on different driver in green supply chain management. Some of the important advantages of the conceptual framework are.

- This framework can be used for dealing different barrier at different level.
- This framework help in increasing the efficiency of green supply chain management.
- This framework can also be used managing green supply chain management in organization more effectively.

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