

# Green Supply Chain Management- Challenges and Opportunities

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**Abstract - Green Supply Chain Management can be defined as “integrating environment thinking into supply chain management, including product design, material sourcing and selection, manufacturing process, delivery of the final product to the consumers, and end-of-life management of the product after its useful life.”**

These days people are more concerned of the world’s environmental problems such as global warming, toxic substance usage, and decreasing in non-replenish resources. Growing attention is given to the development of environment management strategies for supply chains. The Government has released campaigns to promote this problem to people. Several organizations responded to this by applying “GREEN” principles to their company, such as using environmental friendly raw material, reducing the usage of petroleum power, and using the recycle papers for packaging. Still, the ‘Green’ concept is not the core part of the company’s core strategies as the path towards green supply chain has not yet been properly determined by them.

So, in the current competitive scenario, the driver of Green Supply Chain Management assumes a significant importance and call for serious research attention. This paper focuses light on the necessity of ‘green’ and green concepts on business. The purpose is also to reveal the challenges and opportunities associated with the successful implementation of green concept in the supply chain of the companies. Finally, this paper suggests some effective ways for its successful implementation.

**Keywords:** Green Supply Chain Management, Supply Chain Management, Recycle.

## I. INTRODUCTION:

In this era of globalization, organizations are facing rapid changes in the business environment, including increased internationalization and global competition. To remain successful, companies are putting their best effort and deploying the resources in the best possible way. In a way they are contributing to the country’s economy as well. The economic growth increases the level of energy and material consumption, which actually contributes to

the environmental issues and resource depletion problems. In this scenario, it has become increasingly significant for organizations facing competitive, regulatory and community pressures to balance economic and environmental performance [1].

To face these challenges these days companies are increasingly focusing on environmentally conscious supply chain, also called as green supply chain. Although this environmental issue has been realized very important for business, the introduction of ‘Green’ concept to supply chain management has only been developed recently. The literature about environmentally conscious supply chain is very limited.

### The Green Concept in Supply Chain Management

Supply chain management (SCM) is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer [2]. Green supply chain management (GSCM) involves traditional supply chain management practices, which integrate environmental criteria, or concerns, into organizational purchasing decision and long term relationships with suppliers. Green Supply chain management mandates to incorporate the environmental idea in each and every stage of the product and service in a Supply Chain [3].



**Figure 1: Green Supply Chain Food Points (BPIR.com)**

According to Srivastava, GSCM can be defined as “integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing process, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life” [4]. Adding the green component to supply chain management

involves addressing the influence and relationships of supply chain management to the natural environment.

Outstanding features of leading green supply chains include an emphasis on life cycle costing, asset efficiency, and waste reduction and service innovation and recycling. Executed effectively, GSCM stimulates product and service innovation, improves asset utilization, and deepens customer relationships and service levels through a shared focus on reducing waste and cost.

**GSCM**= Green purchasing + Green manufacturing /materials management + Green Distribution / marketing + Reverse logistics + Recycling.

This paper focuses light on the necessity of ‘green’ and green concepts (*like- manufacturing and re-manufacturing of green products, reverse logistics, transportation and waste management*) on business. The purpose is also to reveal the challenges and opportunities associated with the successful implementation of green concept in the supply chain of the companies. Finally, this paper suggests some effective ways for its successful implementation.

II. WHY TO GO ‘GREEN’?

Green Supply Chain Management (GSCM) emerges as a new systematic environmental approach in supply chain management and has been increasingly accepted and practices by forward-thinking organizations these days.

**Difference Between The Conventional And Green SCM**

**Table 1: Difference- Conventional & Green SCM**

Characteristics	SCM	Green SCM
<i>Values from the System</i>	Economic	Economic and ecological
<i>Ecological Impact</i>	High[negative] ecological impacts	Low[positive] ecological impacts
<i>Selection of Supplier</i>	Short-term relationships – Main focus is on cost	Long-term relationships- Main focus is on Ecological aspects
<i>Speed and flexibility</i>	High	Low

III. GREEN ISSUES INCREASINGLY IMPORTANT BUT NOT YET CORE PART OF CORPORATE STRATEGY

A study conducted by the Center of Innovation for Transport and Logistics at the **Berlin Institute of Technology “Global Logistics 2015+”**, showed that the majority of the respondents expect that the absence of ecologically sustainable logistics will lead to financially tangible disadvantages [6]. Yet, in most companies, the efforts for implementing green logistics are still at its

There are different motivators for companies to switch to ‘green’ in their supply chain. The most important motivator is of course sustainability. According to the **World Commission on Environmental Development (1978)**, ‘Sustainable Development’ is “meeting the needs of the present without compromising the ability of the future generations to meet their own needs” [5]. Studies, however, have shown that profitability and cost reduction are some of the main motivators for businesses to become ‘green’ in the supply chain.

Consumers say that they increasingly prefer to purchase products that are free of toxins, produced with a minimum of pollution, and with a minimal environmental impact. But in many cases a significant gap exists between consumers’ green claims and their actual purchasing power, mainly driven by the price difference of ‘green’ products. Companies that successfully adopt a ‘green’ policy can generate profits, provide positive social impact, and reduce environmental impact. Companies taking voluntary steps to become greener will gain visibility, earn credibility, and develop a reputation for leadership. But for this they need to implement the “Green” strategy in an effective way.

We can understand the purpose of going “Green” with the help of following differentiation:

early stage. The majority has not yet assessed the environmental compatibility of their logistics. While firms can have a great impact on the natural environment, the responsibility should not be theirs alone. When we talk about the society, the general people are still not much aware of the environmental issues or they are not so much ready to accept it due to various reasons. In an Environmental Protection Act 1994 (EPA) study, consumers gave the appended reasons why their actions are perceived as “damaging the environment” [7].

**Table 2: Study to know Reasons for Damaging the Environment (%)**

NO ALTERNATIVES	26%
TOO CHEAP	8%
DON’T UNDERSTAND THE ISSUE	10%
NO TIME	12%
NOT CONVENIENT	21%
LAZY	23%

Source: Synovate In fact April 2005

The following are few more interesting facts which clearly shows, why the adoption of green concept in business activities are still at its early days-

- Consumers are increasingly putting plastic shopping bags and non-green wrapping items on their naughty list, according to *Deloitte's 2008 Annual Holiday Survey* [8].
- Americans are quick to identify polluting companies as "socially irresponsible" and make their purchasing decisions accordingly, says a new survey. The poll also found that American consumers between the ages of 18-29 are more likely to spend more on organic, environmentally preferable or fair trade products than other age groups [9].
- The GMI Poll found that only 42% of all Americans are willing to spend more for products branded as organic, environmentally friendly, or fair trade, except for the Y Generation, which clearly shows that still a large amount of people are not yet ready to accept it [10].

#### IV. HURDLES IN THE PROCESS OF GOING GREEN

The firms are facing many a problems while finding the way for Green initiatives. Implementing Green Supply Chain successfully is not an easy task. Challenges for its successful implementation are listed as under:

- Practicing green marketing initially is a costly affair. Green SCM encourages green products/services, green technology, green power/energy; a lot of money has to be spent on R&D programs.
- The customers may not believe in the effectiveness of firm's green strategies. The firm therefore should ensure that they convince the customer about their green initiatives, this can be done by implementing Eco-labeling schemes. Eco-labeling schemes offer its "approval" to "environmentally less harmless" products and have been very popular in Japan and Europe.
- Initially the profits will be very low since renewable and recyclable products and green technologies are more expensive. Green SCM will be successful only in long run.
- Many customers may not be willing to pay a higher price for green products which may affect the profitability of the company.
- The firms practicing Green SCM have to strive hard in convincing the stakeholders and many a times there may be some who simply may not believe and co-operate.

- Impacts of Globalization- In the 21st century, changes in the business environment have contributed to the development of supply chain networks. Technological changes, particularly the dramatic fall in communication costs (a significant component of transaction costs), have led to changes in coordination among the members of the supply chain network (Coase, 1998) [11].

By considering the above barriers it can be concluded that the path towards green supply chains has not yet been determined by the companies. To companies it seems to be unclear, the tools and methods for the creation of green supply chains. Furthermore, in many cases it seems to be the methods are partially known, are not mature enough or are just not available [12].

So, it is lack of motivation or lack of awareness from the side of the corporate leaders towards going green or choosing and implementing the appropriate green strategies for their supply chain, so that they can make their business competitive in this globalised era of business [13].

Clearly, there is widespread uncertainty about how to move forward with green supply chain initiatives. Doing nothing is not an option. As sustainability is not yet a widespread core strategy for the companies, the question arises, is this really a need of the day? The answer is - **YES**.

#### V. REWARDS OF GOING GREEN ARE BOTH TANGIBLE AND INTANGIBLE

Companies that adopt a pro-environment policy will see numerous positive results, both tangible and intangible. Early adoption of environmental strategies and green supply chain initiatives will:

- ✓ Mitigate business risks, by differentiating themselves from competitors, transforming their companies into industry leaders, building credibility with stakeholders and attracting investors.
- ✓ Motivate better performing suppliers, become preferred vendors in green supply chain and attract consumers in the rapidly-growing green marketplace.
- ✓ Preserve business continuity, by attracting (the interest of) top job candidates, enhancing employee satisfaction and enhancing market access and degrees of business strategy freedom.
- ✓ Create significant competitive advantage by creating brand distinction and recognition [14].

On the other hand, it is helpful for the society and the general people as well-

- ✓ Green Supply Chain initiatives are rapidly becoming high priorities for the society these days, as it reduces carbon footprint and becoming better stewards of the planet's natural resources. Over 75% of a company's

carbon footprint is related to transportation and logistics activities.

- ✓ Organizations are producing products which are technologically advanced and environment friendly (Green products) [15].

#### VI. 'GREENING' GAINS IMPORTANCE IN ALL SECTORS

Greening the industry, gains its importance in all sectors. In high-tech, electronics, fast moving consumer goods (FMCG), followed by automotive original equipment manufacturer (OEM), sustainable solutions hold the greatest importance. This applies to the own

implementation and expectations of supply chain partners. Along with FMCG retail sector will display the highest future growth in these issues. The majority of companies in these sectors consider sustainable concepts as a competitive advantage. In these industries there even seems to be a humble willingness to pay for sustainable supply chain concepts.

Some examples to show the impact of 'GREEN' on supply chain in various national and international corporations from various sectors [ICICI, WIPRO, IDEA CELLULAR LTD, INDUSIND BANK LTD, ITC, WALMART, PEPSICO and FORD MOTOR][16]:

**Table 3: Green Initiatives undertaken by various corporations**

Company Name	Green Initiatives Undertaken
<b>ICICI Bank Ltd.</b>	<p>ICICI has undertaken many green initiatives to make this world greener. Its aim is to collaborate with each of its customers and making 'green' an integral part of their lives.</p> <p><b><u>Green Products &amp; Services</u></b></p> <ol style="list-style-type: none"> <li>1. <b><u>Instabanking</u></b>: It aims to avail banking "anytime, anywhere" to all its customers through internet banking, mobile banking and IVR banking. This will help in reduction in carbon footprint of the customer as don't need to travel to branches.</li> <li>2. <b><u>Vehicle Finance</u></b>: ICICI is offering waiver on processing fee on vehicles that uses alternate mode of energy for auto loans. <u>For e.g.</u> - Reva electric cars, Tata Indica CNG and Mahindra Logan CNG versions.</li> <li>3. <b><u>Home Finance</u></b>: Customers can take advantage of reduced processing fees offered by ICICI if they purchase 'Leadership in Energy and Environmental Design' (LEED) certified buildings.</li> <li>4. <b><u>Green Communication</u></b>: As an initiative towards making the environment "Greener", ICICI is collaborating with each of its customers and motivating them to be the part of green initiatives by conveying a message regarding 'Go Green' credit card slips. Along with this, it is advocating and motivating customers to go for 'paperless' mode of transactions, such as; online bill payment, online fund transfers.</li> </ol>
<b>WIPRO</b>	<p><b><u>CORE MISSION</u></b></p> <p>Wipro Limited, a leading player in Global IT and R&amp;D services. It is taking green initiative to make environment more sustainable by minimizing the usages of hazardous substances and chemicals.</p> <p>It has joined hands with WWF, India, one of the largest conservation organizations that deals with water and waste management and biodiversity conservation and every issue related to climate change.</p> <p>Moreover WIPRO has four biogas plants that convert food waste to cooking fuel translating into a net reduction of 100 tons per annum.</p>
<b>IDEA CELLULAR LTD</b>	<p>As far as the telecom sector is concerned, IDEA pioneered the concept of "Shared Telecom Infrastructure" services. This aims towards optimization of future tower rollouts and enhanced operational efficiencies leading to a substantial reduction of carbon footprint.</p>
<b>INDUSIND BANK LTD.</b>	<p>It has taken initiatives with an aim to reduce carbon footprint. Some of the initiatives under its project "Hum aur Hariyali" are as follows-</p> <ul style="list-style-type: none"> <li>✓ Paperless Fax</li> <li>✓ Solar ATM</li> <li>✓ Disposal of computer hardware after contents are destroyed</li> </ul>
<b>INDIAN TOBACO COPANY</b>	<p>It is known as the 'pioneer' of "Responsible Luxury" as far as its hotels are concerned. "Responsible Luxury" is a term used for providing all luxuries with world class green practices. This initiative of ITC ensures the best of luxury facilities in the greenest possible manner. This unique initiative has made ITC hotels the "greenest luxury hotel chains" in the world.</p> <p>Moreover, all ITC units are mandated to achieve total recycling of waste produced by their operations. As a result 99.9% of</p>

	waste is being recycled.
<b>RELIANCE INDUSTRIES LTD.</b>	A zero garbage campaign has been launched in Reliance Townships to propagate the concept of solid waste (dry and wet waste) management. This is a part of cleanliness drive for a disease-free environment at employees' township, the surrounding villages of Hazira Manufacturing Division and also Surat city in Gujarat.  Further, RIL in partnership with Gujarat Engineering Research Institute (GERI) and R & B Department constructed a 900 meter road stretch using 5% plastic waste.
<b>WAL-MART</b>	➤ As the world's largest retailer, <b>Wal-Mart</b> , actions have the potential to save their customers money and help ensure a better world for generations to come. Their decisions in this area are tied to three aspirational goals: <ul style="list-style-type: none"> <li>• Energy -- Be supplied 100% by renewable energy</li> <li>• Waste -- Create zero waste</li> <li>• Products -- Sell products that sustain people and the environment</li> </ul>
<b>PEPSICO</b>	➤ The company is continuously focusing on finding new ways to package and deliver products to minimize the adverse impact on the environment. In this effort, they strive for the "5 Rs" - to reduce, recycle, use renewable sources, remove environmentally sensitive materials, and promote the reuse of packaging in the entire process of packaging, design and procurement.
<b>NESTLE</b>	➤ The company has applied the strategy to its use of product packaging by initiating an integrated approach that favors source reduction, re-use, recycling, and energy recovery.
<b>FORD MOTOR</b>	➤ The 2013-14 sustainability report of Ford Motors outlines their progress towards their goal of maintaining a strong future in six key areas: financial health, people, climate and environment, water, vehicle safety and supply chain.

## VII. CONCLUSIONS:

*Green Supply Chain Management* reveals the implications of today's most pressing environmental issues and demonstrates how green practices can actually save money, increase efficiency and reduce delivery time. Still the 'green revolution' has yet to be started. The development of green supply chain models requires proper strategies, appropriate supplier and partner selection, reverse logistics should be part of an integrated approach to green supply chain management.

Several recent studies reveal, however, that most strategies are not real long-term strategies, but isolated single solutions. Difficulties also lies with the unawareness of the 'green mechanism' and its impact upon consumers, society, environment and ultimately on the business organization itself. But proper assessment of the problems and implementation of the strategy can add value to the overall business.

### Green SCM improves operations by employing an environmental solution:

Mitigation of Risk – Promoting greater understanding of sustainability within the company's supply chain will mitigate environmental, social, and market risks.

Innovation – Incorporating sustainability concepts into the supply chain will be a catalyst for supplier innovation.

Differentiation - Creating uniquely different green supply chain practices will differentiate the company and its products in the market place.

Profitability - Proactively incorporating sustainability concepts into the supply chain will decrease cost and add the value to operations.

So, it is of utmost importance to keep pace with changes to relevant regulations at a national level when it comes to operating in a sustainable way. Because-

- Sustainability is consistently becoming the future requirement.
- Most companies are still struggling to become environmentally responsible.
- Consumer awareness and increased regulation will put added demands on companies to drive green initiatives and efficiencies in the supply chain.
- The green strategies must be the integral part of the company's core strategies.

Once companies gain the proper motivation and start looking at greening of their supply chains in earnest, supply chain managers will need to focus on three areas of relevance for them:

I] Greener product and Green packaging:

Designers will need to use the maximum amount of environmentally-safe product components, and finished goods and packaging will need to be more biodegradable and minimally harmful to the environment.

II] Supply network compliance:

It will become imperative for companies to do an audit of their suppliers and their suppliers' suppliers to ensure every firm - both local and global - that has an impact on their products is complying with green guidelines.

III] Reverse logistics:

When government will start imposing increased regulations on recycling, up-cycling etc., supply chain systems will have to accommodate products being returned for recycling or disposal at end-of-product life. This will require a truly closed-loop supply chain, where

goods have to return to the supply chain to be broken down and properly disposed of [17].

Furthermore, as the recent evolution of the logistics service industry shows third party logistics providers (3PLs) are also playing a critical role in the supply chain than in the past. As the green logistics market is also in an evolving phase there are clear mismatches between the market requirements and the offerings of 3PLs (Martinsen and Björklund, 2010). So, it is very much crucial for the organizations to focus on proper training of 3PLs in this regard [18].

Developments that mentioned above will have a positive effect on the supply chains and will result in the addition of ‘Green’ concept to traditional supply chain structure, which are profit, efficiency and effectiveness oriented. So “green supply chain management” which considers environmental concerns is the need of the hour, especially in this competitive era of globalization.

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