

# Green Supply Chain Management in India - An Overview

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## ABSTRACT

Dealing with global resource exhaustion and increasing environmental deterioration, organisations have to stand up and take notice of environmental issues in today's business. With the new Companies Bill making emphasis towards corporate social responsibility (CSR), activities and pressure from the public, laws, and environmental standards, organisations have been pushed to improve their environmental performance. The answer to these challenges is to address them proactively through sustainable SCM and logistics practices. Thus in recent times, Green Supply Chain Management (GSCM) has gained a lot of significance among the organisations. It includes purchasing, inbound logistics, production, distribution (outbound logistics and marketing), and reverse logistics. Green SCM amalgamates ecological management and supply chain management. This paper is an effort to give an insight on the green SCM concept, its need and importance, the challenges and opportunities involved and recommending crucial factors for implementing and sustaining GSCM with a focus on the Indian market.

**Keywords:** Green SCM, Green Marketing, Environment Management, Sustainable Supply Chain Management.

## 1. INTRODUCTION

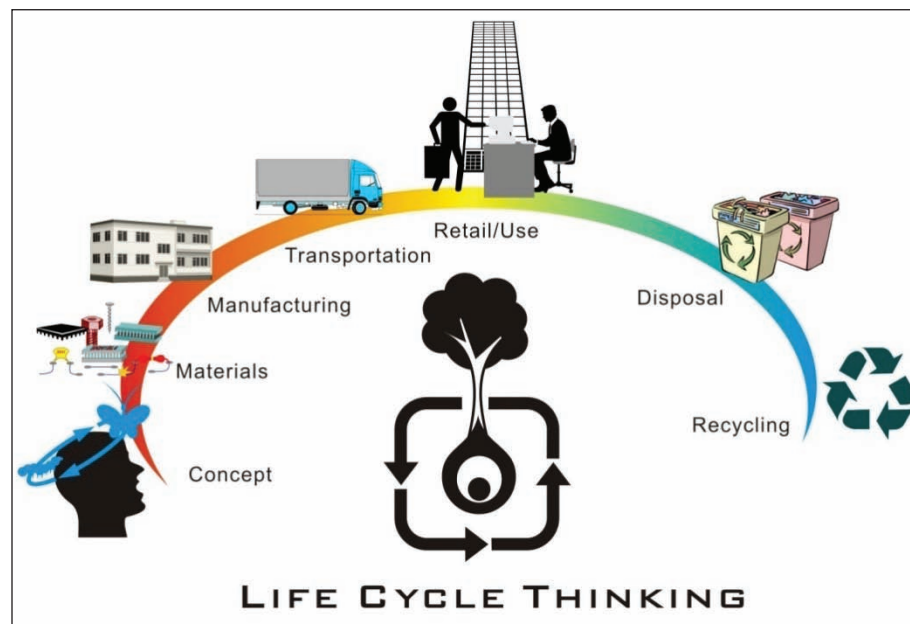
Around the world, interest in protecting the environment and in purchasing Green products is becoming more and more popular. In 2012 earth summit held at Rio de Janeiro, Brazil, the prime focus was given to “sustainable economic development”. To protect the environment from getting spoiled, the international companies along with the governments from different countries came to a common page and recognized the need for taking corrective action. Carbon emissions are considered to be a single biggest factor when it comes to making economic development sustainable. In this context the waste and emissions caused by the supply chain has become one of the main sources of serious environmental problems. Green supply chain (GSCM) has come into existence as one of the recent innovations to preserve the environment. It not only helps in improving the efficiency of the organisation but profitability as well. Therefore there exists a vast scope in developing countries such as India to adopt GSCM practices and achieve organisational excellence. GSCM practice should be a part of a company's DNA – right from the blueprint and creativity of a product to its distribution and consumption and lastly to its recycling. Fig.1 shows the life cycle of the GSCM activity from the conceptual stage till the recycling of the product.

GSCM can become a source of competitive advantage for organisations through improvement in the environmental performance. Organisations can adopt the best eco-friendly practices and can create a benchmark for other non-green organisations to follow. While sustainable supply chain objectives are becoming more crucial, the emphasis on value for money, bottom line, risk, delivery times and flexibility are not diminishing. In fact environmental conscientiousness has become a crucial part of an organisation's operations in realizing their business goals.

### 1.1. Green Supply Chain Management (GSCM)

Patrick Penfield of the Whiteman School of Management very appropriately defines Green Supply Chain Management as “the process of using environmentally friendly inputs and transforming these inputs into outputs that can be reclaimed and re-used at the end of their life cycle thus, creating a sustainable supply chain”.

Organisations worldwide continue to use toxic chemicals, wasteful packaging, and transportation practices that produce clouds of gases that contribute to global warming. However, from materials acquisition and manufacturing to packaging, logistics, and distribution, every stage of

**Figure 1: Life cycle of the GSCM activity**

Source: - Dlink Energy

the supply chain offers opportunities to reduce waste and pollution. As shown in Fig. 2, at every stage of the cycle there is pollution in terms of air, water and waste. Here recycling and effective and efficient use of the resources can drastically help in reducing the pollution. The companies should take note of the fact that GSCM measures can not only improve their performance levels but also help in protecting the environment.

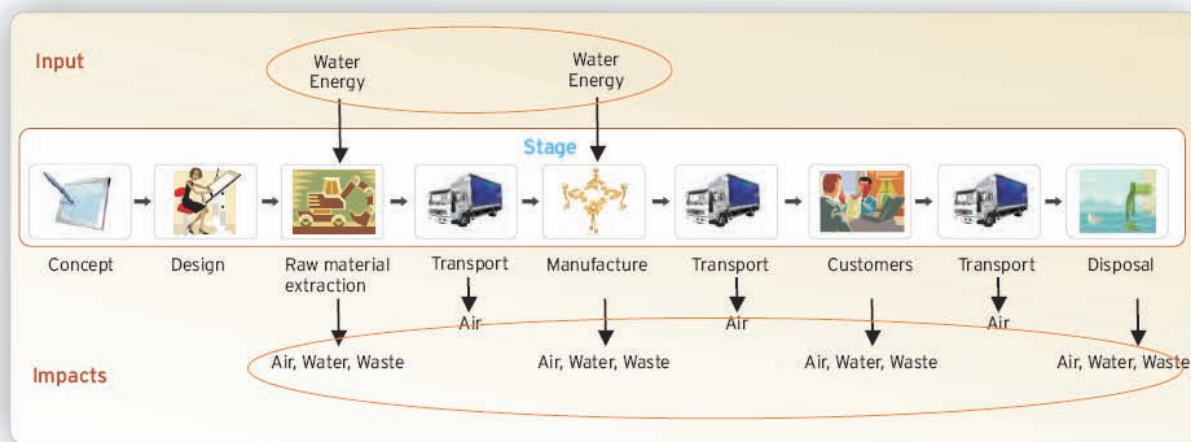
With the help of GSCM operational efficiencies can be improved. Following are some of the benefits that can be realized out of this initiative which is termed as **CI** benefits:-

- ◆ **(CI) Continuous Innovations**– It helps to alleviate risk and gives momentum to innovations.
- ◆ **(CI) Continuous Improvements**– Analyzing GSCM activities generally leads to innovative processes and regular improvements
- ◆ **(CI) Continuous Interactions** – It involves negotiating policies with all the stakeholders like suppliers and customers, resulting into better alignment of business processes and principles.

It also aims to create a synergy among the supplier community to purchase environmentally superior products and reduce reduction of waste.

## 2. LITERATURE REVIEW

There are only a few studies related to sustainable supply chain management or green supply chain management (GSCM) till now. Some of the researchers have tried to examine the concept. Shang *et al.* (2010) conducted a study based on six dimensions of GSCM i.e. eco-designing, green manufacturing and packaging, environmental participation, green marketing, stock and suppliers. The results inferred that the firms which were focusing on green marketing had become successful competitors against their rivals. Considering the consumers' behaviour for green products as an important business issue, Wang *et al.* (2009) developed a methodology to identify those customers, who were ready to pay more for green products. Yuang and Kielkiewicz-Yuang (2001) presented an overview of current practices in managing sustainability issues in supply networks. Ramudhin A.*et al.* (2010) proposed a strategic planning model and insisted that internal and external control mechanism are of great importance to decision makers while designing a sustainable supply chain network. Qinghua Zhu in 2006 studied green supply chain management: pressures, practices and performance within the Chinese automobile industry in which he observed that increasing pressures from different stakeholders had caused the Chinese automobile supply chain managers

**Figure 2: Stages of the supply chain**

Source: - Creating a Green Supply Chain – Cognizant.

to consider and initiate implementation of green supply chain management (GSCM) practices to improve both their economic and environmental performance. Lamming and Hampson (1996) explored the concept of environmentally sound management and linked them to supply chain management practices such as vendor assessment, collaborative supply strategies, establishing environmental procurement policy and working with suppliers to enable improvements. Chung-Hsiao in 2008 studied the Green supply chain management practices in the electronic industry and mentioned that there were different propositions to implement GSCM but no investigations were carried out regarding the reliability and validity of such practices in the electronic industry. He used the fuzzy analytic hierarchy process method to prioritize the relative importance of four dimensions and twenty approaches among nine enterprises in electronic industry. The findings indicated that the enterprises emphasized on supplier management performance as a crucial point in implementing green supply chain management. Quinghu Zhu *et al.* (2008) conceptualized Green Supply Chain Management practices implementation as encompassing different dimensions of practices including Green Procurement, Internal Environmental Management, Eco-Design, Customer Cooperation, and Investment Recovery. Fengfei Zhou in 2009 studied the implementation of green supply chain management in textile industry and deduced that GSCM can significantly help in resource utilization efficiency and also gave a special reference on how to implement GSCM in special industrial operation. A decision model to measure environmental practices of suppliers using a multi attribute utility theory approach

was developed by Handfield *et al.* (2002). Walton *et al.* (1998) identified several dimensions of change to increase the impact of procurement on environmental results.

### 3. OBJECTIVE

The rapid and continuous growth of Indian Industries be it manufacturing, IT, chemical etc. have brought great challenges towards energy resource security. Industry's concern towards environment is comparatively very low and the knowledge on GSCM practices limited. There are a handful of Indian companies which follow an environment-friendly GSCM initiative. The diversity in the adoption rates has seen some manufacturing supply chain companies proactively implementing environmental strategies such as green purchasing and eco-design. Indian manufacturing companies have experienced increasing environmental pressure while simultaneously recognizing various benefits and incentives to green their supply chains. Thus, GSCM practices have emerged as a systematic approach in India to balance the economic and environmental sustainability of firms. The study tries to point out the benefits of implementing the concept of GSCM. It also tries to recognize the need to encourage and facilitate the implementation of GSCM projects to enhance the competitiveness of the Indian industries. A study of selective implementation of GSCM initiatives has been carried out pertaining to national and international companies for GSCM strategy formulation. And lastly the objective is to understand the problems, recent trends and challenges associated with GSCM and the related benefits for the participating stakeholders.

## 4. RESEARCH QUESTIONS

- ◆ How has the implementation of green supply chain management in India taken shape?
- ◆ What measures/utilization of waste materials from different industries have been taken care or disposed?
- ◆ What are the current practices in Indian companies regarding green supply chain management?
- ◆ What are the advantages and challenges associated with the implementation of green supply chain management?

## 5. RESEARCH METHODOLOGY

The study is based on the information collected from literature review of various journals, articles, research papers, magazines etc. A wide range of sustainability innovations across business types, industries and corporate functional areas were considered, and the types of benefits generated were looked at. A thorough research on various companies' initiatives towards GSCM has been done and pertinent suggestions and benefits have been derived.

## 6. INDIAN MARKET AND WORLDWIDE IMPLEMENTATION

The largest retail giant in the world launched an extensive business sustainability strategy in 2005. Wal-Mart, a behemoth in retail industry had a huge problem relating to waste through packaging. It came to an understanding that if there is a 5% reduction in packaging it could save around 6.5 metric tons of carbon dioxide from entering the atmosphere and around \$10 billion dollar of savings as well. The company decided to implement the strategy and benefited from it.

Many MNCs are trying to target for “zero waste for disposal”. This Swiss multinational food and beverage company is striving for the same goal. Nestlé the company under discussion tries to address the concerns related to rural communities, safety of soil, water and air through efficient use of water disposal techniques. Due to their sustainability efforts around 35+ factories of Nestle have generated zero waste for disposal in 2012.

Heineken has implemented a program named “Aware of Energy”. Through this program the company creates awareness related to energy among its employees. The company focuses on conserving waste heat, use of

renewable energy etc. The company has saved 17 percent of energy per hectoliter of beer. It is also aiming to reduce 50 percent carbon footprint by 2020 on its installed fridge base.

Talking about the neighboring country China, which is the third largest economy in the world is facing a big challenge in terms of tons of solid waste. The country has taken a major step in waste to energy capacity (WTE). From 2 million tons to 14 million tons of WTE capacity, China has become the fourth largest user of WTE. According to estimates there were 66 WTE plants in 2007 which is now increased to 100+. Through this China has been able to generate \$30 per MWH of electricity.

Little far off in the heart of Abu Dhabi the city has been chosen to be the headquarters of International Renewable Energy Agency (IRENA). An investment of \$22 billion has been made to develop Masdar city which will be powered entirely by renewable energy. More than 1500 companies will be part of the city. Their main focus will be to fund the research and development activities and help in creating new and sustainable technologies. A carbon neutral zero waste city will come into existence where no automobiles will be allowed to run and solar powered desalination plant will help in providing the water supply to the whole city. Also due to large open areas land and its exposure to direct sunlight Saudi Arabia is poised to become the largest exporter of solar energy in the world.

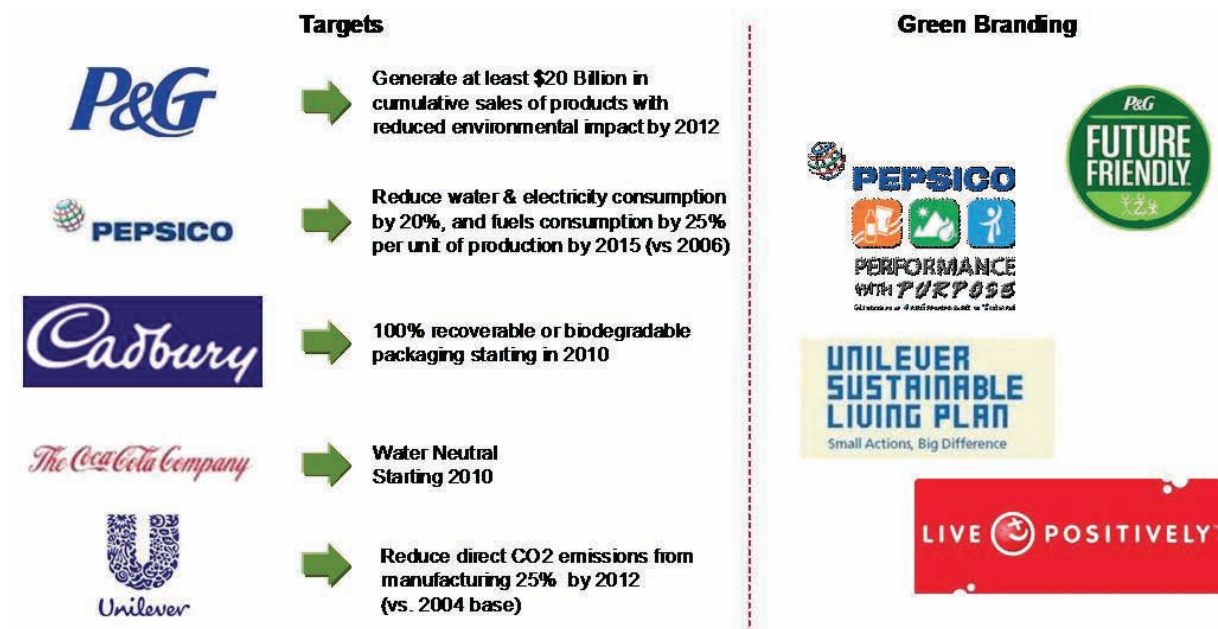
A lot of emphasis has been given to sustainability and the issue has become part of boardroom discussions. Due to growing population and usage of energy global warming has become a growing concern. To create an eco-friendly environment the companies have started branding their internal initiatives (e.g. P&G, PepsiCo, Cadbury, Coca-Cola – refer Fig. 3)

Some of the Indian organisations are taking a leaf out of the foreign enterprises in implementing Green supply chain management. The following figure depicts the progress India has made in terms of sustainable and environmental issues:

### 6.1. ITC

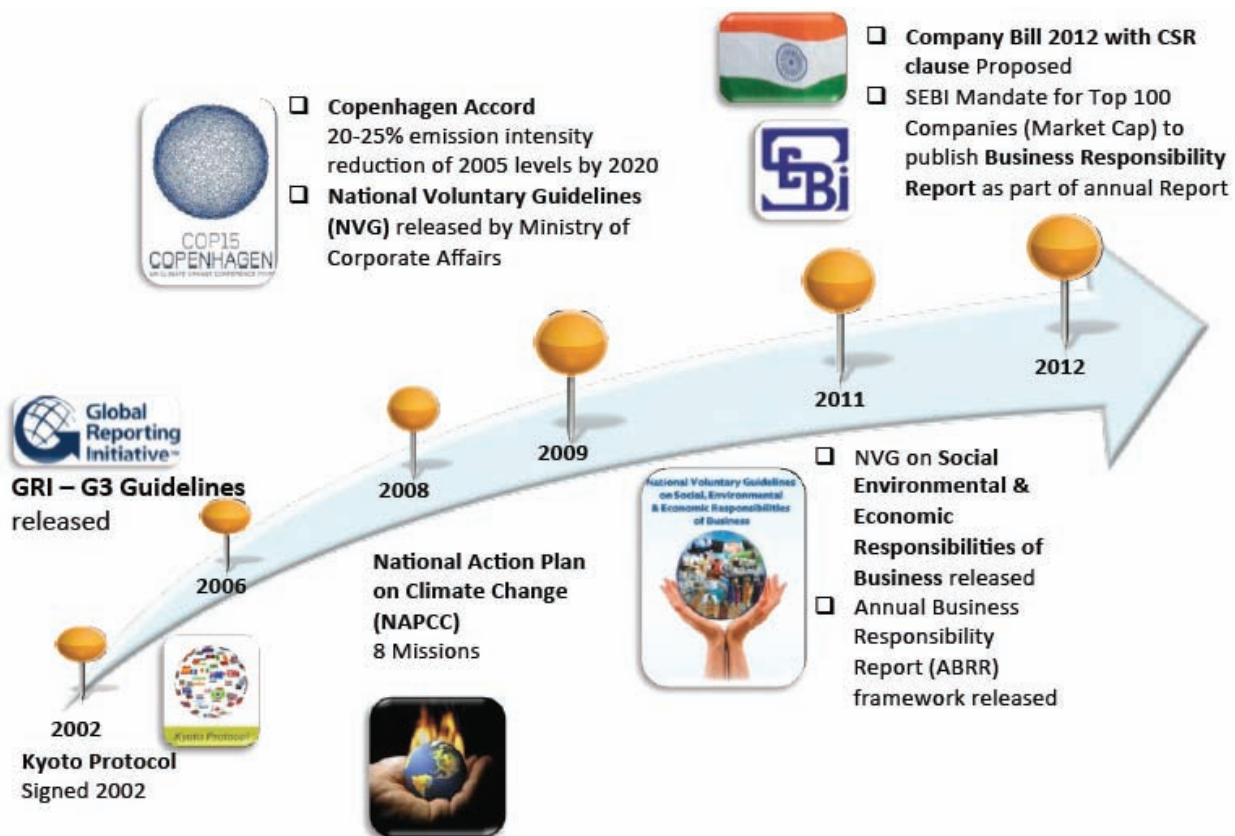
ITC is a much diversified business house, ranging from FMCG to hotels, paper and packaging to agribusiness and so on. With an annual turnover of about \$8 billion it is a part of the famed Forbes 2000 list. The company is leading by example in many green initiatives some of being the use ECF (Elemental Chlorine Free) technology, Ozone bleaching, energy and water management techniques

Figure 3: Branding of different companies



Sources: Company Websides, Annual Reports, CSR Reports, RT, Booz & Company Analysis

Figure 4: Progress in India in terms of sustainable and environmental issues



and recently incepted the green boiler mechanism. By implementing the mentioned green techniques the company is able to reduce its dependence on fossil fuels like coal by over 100000 tons per annum. The recycling of waste materials has helped ITC to manufacture paperboards for packaging purposes. Through the use of e-choupals, ITC has built a significant advantage in raw material sustainability and thus is reaping benefits out of it. The company has therefore become a frontrunner in Green management initiatives and is committed to reduce carbon footprints.

## 6.2. Dr Reddy's

Pharmaceutical industry in India is facing a lot of heat from consumers as well as from regulators to reduce the environmental impact of its actions. In this scenario the supply chain of pharmaceutical companies has come under a lot of scanner. Dr. Reddy's is one such company that gives emphasis on sustainable sourcing. They have initiated a process of interaction with all the business partners known as "mentoring" in which all the stakeholders are guided about following good sustainable practices. The company also focuses on periodical training on quality to all its vendors especially for those who have recently become business partners. These kinds of half-yearly activities help the company to convey to all its partners their business processes and culture.

## 6.3. L&T

Larsen & Toubro Limited (L&T) is an engineering and construction company with an annual turnover of about \$14 billion. The company is massively involved in construction, hydrocarbon, heavy engineering, power, infotech etc. It is the first company in India to start reporting about sustainability. The company in its various initiatives has implemented 3R principle i.e. Reduce, Recycle and Reuse. Due to this L&T is able to harvest more than 23 million liters of rainwater. There is an overall reduction of 6% in water consumption and 16 campuses have witnessed zero wastewater discharge. In terms of infrastructure they have built energy efficient offices and extensive usage of renewable energies like wind and solar power across its facilities. The company uses recycled materials like fly ash, crush sand etc. as an input to its raw material requirements. In fact the company is regularly involved in stakeholder (internal and external) engagement to identify key material issues. The organisation also encourages usage of video conferencing for internal meetings so that traveling of the employees

can be reduced and indirectly minimize the usage of automobiles.

## 6.4. TCS

Tata Consultancy Services (TCS) is committed to use environment friendly components in all its processes. Starting from the infrastructure, TCS has increased the usage of renewable energy in its offices. As of 2012-13 data the solar water capacity is around 86,600 litres per day which is an increase of 55% from the previous year's figures. The company is also focusing on green procurement from its suppliers. It has given emphasis on procuring energy star rated equipment. The company has initiated various drives and internal communications among its employees regarding energy saving benefits. Some of the fundamental things like switching off the computers at the end of the day, minimizing the usage of lights to more technical like installing variable frequency drives. With the implementation of rain water harvesting, sewage treatment plants and other water management techniques TCS is able to reduce the use of fresh water by over 13% as compared to 2008 figures. A major challenge for all the IT majors is the issue of e-waste. The defunct/obsolete computers are being legally disposed-off through government authorized recyclers. Promotion of video conferencing is done in all the TCS facilities to reduce the travelling of employees to client locations through automobiles, thus reducing the greenhouse gas emission.

## 6.5. State Bank of India

"Green channel counter", a first of its kind initiative by SBI bank, has given a new dimension to paperless banking. An account holder can transfer fund, withdraw money and even deposit money to another account without filling any physical forms. A mere swipe of card can do all these transactions. The bank has also launched solar powered ATM machines in remote areas which not only help in extending their customer base but reduces the power consumption by 1000 watts as compared to the conventional ATM machines.

## 6.6. Oil and Natural Gas Company (ONGC)

India's largest oil producer, ONGC has partnered with Mokshda Paryavaran Evam Van Suraksha Samiti to develop an energy-efficient green crematorium. This will change the traditional system of burning. The new invention will help in reducing the wood consumption by

**Figure 5: Benefits of sustainable innovation**

<b>Benefits of Sustainable Innovation</b>	
<p><b>Environmental Benefits</b></p> <ul style="list-style-type: none"> <li>• Greenhouse gas emissions reduced</li> <li>• Energy use reduced or efficiency increased</li> <li>• Hazardous pollutants released in air, water or land reduced</li> <li>• Solid waste reductions, materials use reduced or efficiency increased</li> <li>• Supplier behaviour influenced, resulting in environmental benefits</li> <li>• Natural resources protected or restored</li> </ul>	<p><b>Business Benefits</b></p> <ul style="list-style-type: none"> <li>• Cost savings</li> <li>• Increased revenues or earnings</li> <li>• Reduced liability or risk</li> <li>• Return on investment/payback period</li> <li>• New market creation</li> <li>• Investment attractiveness</li> <li>• Benefits for customers</li> <li>• Brand/reputation enhancement</li> </ul>
<p><b>Social Benefits</b></p> <ul style="list-style-type: none"> <li>• Stakeholder consultation</li> <li>• Livelihood creation</li> <li>• Community relation enhancement/ benefit</li> <li>• Specific impact on social issues of direct relevance</li> </ul>	<p><b>Innovativeness</b></p> <ul style="list-style-type: none"> <li>• Is the innovation original or is it a significant improvement over an existing solution?</li> <li>• Is it still in scarce use?</li> <li>• Does it offer economic, social and/ or environmental benefits?</li> <li>• Is it applicable to other sectors/ areas?</li> <li>• Is it commercially viable?</li> </ul>

Source: -WWF & CII- Sustainability as a driver for innovation and profit

60% and will also significantly minimize the air and water pollution

## 7. NEED FOR GREEN SCM – OPPORTUNITY FOR ORGANISATIONS

India, an elite member of the trillion dollar club, has already evolved to become one of the largest economies in the world. The unprecedented growth in rural as well as in urban sector will continue to touch newer heights. In this scenario the rise in consumption and demand for energy, increase in greenhouse emissions, and constraints on critical natural resources such as land, water and oil have hit the ecology and environment hard. These issues need to be addressed on priority and right away. There is a growing curiosity among the consumers in India regarding the protection of the environment. Consumers in today's age of technology are actively involved and informed on ecological issues and are thus changing their behaviour pattern so as to accommodate a socially responsible lifestyle. Companies that are going green will not only generate profits in the long term but will also help in conserving the ecology and reduce environmental impact. Moreover the media also creates a valuable publicity for

the companies who implement green initiatives. Positive publicity for going green can do a world of good for the company's corporate image. Hence companies that are proactively involved in going green will gain visibility and earn credibility. Implementing a green initiative program also ensures companies to meet current and future environmental regulations or legislation. Green Supply Chain Management (GSCM) is thus gaining significance due to diminishing raw materials, deterioration of environment, swarming waste lands and ever-increasing levels of pollution. In today's competitive world, it is not only about being having better business sense and profits but also about environment friendliness.

Green SCM can help organisations in the following ways:-

**Savings:** There are long term savings opportunities through green movement. Companies need to show some long term appetite by holding into the GSCM investment. At least in the short term they could reach a stage of a revenue neutral level. The corporate should not expect huge benefits upon implementing Green SCM immediately but it can definitely proclaim to become a competitive advantage for firms marketing goods with environmental characteristics.

**Lower risk:** By buying greener products or services, organisations can avoid risks which often translate into financial costs or losses. There are large numbers of cases propping up wherein the suppliers and vendors of a company are using illegal means to supply/ extract raw materials thus hitting the corporate image. In fact some of the supplier communities have very poor environmental track records. These risks can be sidelined by using and adhering to environmental friendly practices.

**Increase in revenue:** Companies are competing to improve efficiency of their business processes and reduce energy and material consumption by utilizing instruments like green supply-chain management. Industry has been the prime investor in energy efficiency, renewable energy and green building projects thus satisfying stakeholder demands, enhance brand image, and improve customer loyalty.

**Indirect yield:** - Being environmental-friendly, organisation can reduce considerable waste and protect the natural resources. It can enhance the brand image of the company and will indirectly benefit the motivational levels of the employees, suppliers and other stakeholders.

## 8. CHALLENGES

Implementing GSCM is not so easy. Organisations are likely to face certain challenges some of which include:

- ◆ Cost is professed as the biggest predicament in implementing Green SCM.
- ◆ Companies generally implement any new technology or process when it can see the results in quantifiable terms. But as GSCM is a naïve concept it has become relatively difficult to exploit any measurable data to check the value chain effectiveness.
- ◆ There is a need to have a proper technology in place to compliment business with the Green Practices.
- ◆ Lack of green architects, consultants, green developers, contractors in the region. Due to lack of green practitioners available, the organisations are apprehensive to go ahead with the investment.
- ◆ An important aspect of GSCM is integration of recycling of the products. It is a major challenge for many companies to integrate the waste (recycling) as raw materials to again be used in manufacturing unit.

- ◆ Another challenge is the fear of failure. The organisations are not confident whether the Green initiative will lead to success or a major failure.
- ◆ Lack of awareness regarding the implementation process, regulations and best practices.
- ◆ A critical factor in implementing a GSCM initiative is the support and commitment from the top level management but unfortunately due to lack of confidence on the concept and high initial investment, the top management becomes apprehensive in implementation of green practices.
- ◆ As supply chain has lot of participating stakeholders, anyone's reluctance to accept and get involved in the design process and technology affects the overall performance of the whole chain.
- ◆ Lastly, due to lack of customer awareness towards GSCM and Green products the companies are hesitant to go ahead with the implementation.

## 9. CONCLUSION

Green is a journey and not a destination. Greening the supply chain is an industry issue that will only gain importance over the years to come. Continuous time and effort is required to implement and enhance the green capabilities. The current system of operations in the organisations, not only in India but around the world, is damaging the environment and soon a day will come when the damages done to our earth will become irreversible. GSCM is foreseeable if the earth is to be kept green. There is a huge pressure on the organisations to supply products that are environmentally friendly in their sourcing, production, delivery, usage and disposal. In the coming years organisations will be investing immensely on network design, cross functional collaboration, sourcing, procurement, packaging changes and innovative methods with an emphasis on reducing carbon footprints at every stage of supply chain. As some of the industries are nearing saturation point brand building will become a top incentive of implementing green SCM. From the myriad of parameters affecting implementation of GSCM, cost of technology and complexity of processes are perceived to be as the major obstacle to implementing Green SCM, which therefore draws attention towards the need for cost effective and easy to implement solutions. Another important factor that affects manufacturing companies is the recycling of raw materials. The companies are putting a lot of effort in green production facilities. Implementation of green warehouses and distribution

initiatives has resulted into companies being more lean and efficient. As the concept is still at a very nascent stage in India the awareness about green SCM is not that visible. A framework needs to be established to create awareness and spread the knowledge regarding GSCM practices showcasing the cost and efficiency benefits for the companies. Supply chain comprises of partners and a greater and transparent collaboration among them will result into a successful and sustainable GSCM implementation. While the challenges might change but the fundamentals of doing good business will remain the same. The leaders should see the green supply chain management as a core part of the business that can result in cost competitiveness and value creation in longer duration.

## 10. RECOMMENDATIONS AND SUGGESTIONS

### 1. Biomimicry

The emerging field of biomimicry (or biomimetics) has given rise to new technologies created from biologically inspired engineering at both the macro scale and nanoscale levels. Companies need to explore this avenue for better performance and sustainability as well.

### 2. Environment friendly product and package

Companies should use environmentally-safe product components and finished goods. Usage of biodegradable material for packaging can reduce the harmful effect on the environment.

### 3. Adoption of clean technologies

With the abundance of young engineering talent and low cost of manufacturing products, India is well balanced to create a hub of clean technology products. The open areas of land can be aptly utilized for tapping solar energy. It can also take a lead in investing in LED lighting, electric automobiles and smart grids technology etc.

### 4. Green Stakeholders

It should become a necessary clause that the companies should do an audit of their suppliers and suppliers should do the same to their suppliers. A guideline regarding GSCM should be devised so that all the stakeholders comply with it.

### 5. Waste Management

Waste generated by the companies during operations should be used as an input material in some other

operations after treatment. Hazardous wastes which cannot be reused should be disposed of securely. Proper mechanism should be devised so that waste is segregated at the source to avoid contamination of non-hazardous waste with hazardous waste.

### 6. Reverse logistics

Lot of regulations and laws has been designed of late to prevent the companies from disposing waste arbitrarily. Companies are generally concerned only about the quality of the product produced but does not show the same interest in harnessing the post end of the life of the product. Therefore the time has come for the reverse logistics to take shape. The supply chain of the company should now start accepting and accommodating the products being returned for recycling or disposal. Thus there will be a closed ended loop of the supply chain starting from sourcing, making, manufacturing and recycling / disposing of the product.

### 7. E-waste

As India is becoming a leader in the IT sector, e-waste forms an important part of all the IT companies. All obsolete computers, peripherals, batteries, cartridges etc. should be returned to e-waste vendors or to the suppliers who are authorized to dispose them appropriately.

### 8. Driver not a barrier

Companies have to recognize the Green concept as a driver rather than a barrier for innovation. This will enable them to see opportunities and growth areas where others apprehend risks and increased costs.

### 9. 3 I and 2 C approach

- ◆ **Incorporate** – GSCM should become a part of corporate strategy and business goal.
- ◆ **In Toto** –The implementation and initiative should focus the entire cycle from the start till the finish (designing to recycling)
- ◆ **Intensive** – GSCM should be intensive and no compromise should be made on behalf of the upcoming opportunities.
- ◆ **Continuous** –Creating benchmark and publishing new innovations, ideas and impact of GSCM initiative. Proliferation of the findings to other divisions of the company.
- ◆ **Computable** – Success should be measured in numbers, thus defining a parameter metrics to quantify the success.

## 11. DIRECTIONS FOR FUTURE RESEARCH

The above case studies suggest that if a quantitative analysis is done on carbon emissions, waste products etc. then we can substantiate the green supply chain benefits even more. In fact we can take a case study of a big conglomerate that is willing to initiate a green supply chain scheme and can then calculate process efficiency and cost benefits. A numerical value then can be assigned to green innovation, profitability and sustainability. Also a future research can be focused on specific industries so that the findings can be generalized among the industries. A comparative study can be conducted between Indian companies following GSCM practices vis-à-vis other countries companies to have a better view point on green supply chain sustainability.

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