GREEN SCM: A MARRIAGE OF ENVIRONMENTAL MANAGEMENT AND SUPPLY CHAIN MANAGEMENT

Prashant Raman
Associate Professor, Faculty of Management Studies,
WISDOM, Banasthali University, Banasthali
E-Mail - PrashantRaman5@gmail.com
Phone - 91-9799499849

Abstract
Dealing with global resource exhaustion and increasing environmental deterioration, organizations 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, organizations have been pushed to improve their environmental performance. The answer to these challenges is to address them proactively through sustainable SCM & Logistics practices. Thus in recent times, Green Supply Chain Management (Green SCM) has gained a lot of significance among the organizations. It includes purchasing, inbound logistics, production, distribution (outbound logistics and marketing), and reverse logistics. Green SCM integrates Environmental Management and Supply Chain Management. It recognizes the inconsistent environmental impact of supply chain processes in an organization. This paper is an effort to give an insight on the green SCM concept, its need and importance and exploring the challenges and opportunities involved 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. "Sustainable economic development" was the key concept of the 2012 earth summit in Rio de Janerio, Brazil as governments and international organizations committed themselves to take action to protect the environment as an integral part of long-term economic development. [01] With global warming being recognized as one of the biggest challenges of this century, carbon emissions are increasingly becoming the centre of attention. 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 organization but profitability as well. Therefore there exists a vast scope in developing countries such as in India to adopt GSCM practices and achieve organizational excellence. It integrates environmental thinking right from the designing and management of production, distribution and consumption to end-of-life management of the product. Figure 1 show the life cycle of the GSCM activity from the conceptual stage to the recycle of the product.

Figure 1

GSCM can become a source of competitive advantage for organizations through improvement in the environmental performance. Organizations can adopt the best eco friendly practices and can create a benchmark for other non-green organizations 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 responsibility has moved from a trend to a business imperative as it helps the organizations to achieve their business goals.

Green Supply Chain Management (GSCM)

Green supply chain management is defined 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".

GSCM improves operations by employing an environmental solution. Following are the some of the gains that can be achieved out of this initiative:-

- Improves agility - It helps to mitigate risk and speeds up innovations.
- Increases adaptability - Green supply chain analysis often leads to innovative processes and

continuous improvements

- ❖ Promotes alignment - It involves negotiating policies with suppliers and customers, which results in better alignment of business processes and principles. [02]

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

2. Indian market and worldwide implementation

Wal-Mart, in 2005 launched a sweeping business sustainability strategy, and set a goal of 5% reduction in packaging by 2013. The retail giant expects the cut in packaging will save 667,000 metric tons of carbon dioxide from entering the atmosphere. Moreover, the company anticipates $3.4 billion in direct savings and roughly $11 billion in savings across the supply chain.

Nestlé employs an ongoing, company-wide sustainability program that has generated significant environmental and financial benefits. The company has halved the amount of water for disposal in their factories per ton of product. Their target is to reduce the waste for disposal on a comparable basis by 5% by 2015. In fact in 2012, 39 factories generated zero waste for disposal

Heineken committed to reduce fuel and electricity use through its "Aware of Energy" program. The company said in its 2006 sustainability report that it aimed to reduce fuel and electricity costs by 15%.

Talking about the neighboring country China, it is not only investing heavily in infrastructure, transport and logistics but at the same time has a strong drive to tackle the safety and environmental problems. The Yangtze River, the logistical backbone of Shanghai, is being developed as a 'green waterway', meaning far reaching actions in respect to emissions, pollution and dumping of waste materials.

Little far off in the heart of Abu Dhabi work has already been started on the most ambitious sustainable development in the world today. Masdar City is to become the world's first carbon-neutral, zero-waste city, designed to be a pedestrian- friendly environment. Its aim is to become the Silicon Valley for clean, green and alternative energy. Masdar City will be built on six and a half square kilometers and will grow eventually to house 1,500 businesses, 40,000 residents and 50,000 commuters, home of the Masdar Institute of Science and Technology (MIST) and the International Renewable Energy Agency (IRENA). [02]

The Dutch government wants to make the Netherlands one of the cleanest and most efficient energy countries in Europe. By the year 2020, the Netherlands aims to reduce greenhouse gas emissions by 30% compared to 1990 levels, increase the proportion of renewable energy to 20% and improve energy savings by 2% percent each year. This applies not just to road traffic, but also to inland navigation, maritime shipping and aviation. To achieve these targets, the program 'Clean and Efficient: New energy for climate policy' ('Werkprogramma Schoon en Zuining') was introduced in September 2007. This program refers, for instance, to measures for traffic and transport which encompass stimulating efficient vehicles (greening the tax system), efficient driving habits, stimulating more efficient transport modalities, and cleaner fuels for both the business sector and the private sector.

Globally, environmental sustainability has become a critical component of the business agenda and is increasingly being spoken about as a key focus area by many top executives. There are prominent concerns about population growth, energy and consequences of global warming in addition to increased understanding and sensitivity amongst media and consumers, as a result of which most global companies are focusing on sustainability. Many companies have set aggressive 'green' targets and even branded their internal initiatives (e.g. P&G, PepsiCo, Cadbury, Coca-Cola - refer Fig. 2)

Figure 2

Some of the Indian organizations are taking a leaf out of the foreign enterprises in implementing Green supply chain management.

ITC

ITC's raw materials are significantly agri-based. It uses substantial quantities of waste paper in its paper business and this is sourced locally as well as internationally. The initiatives in large-scale development of social and farm forestry plantations, watershed projects and empowerment of marginal farmers through e-choupals provide ITC with significant advantage in raw material sustainability. Vertical and horizontal integration of ITC's businesses provides it with significant opportunity and synergy in eliminating and reducing its environmental footprint through optimal utilization of materials, opportunity to recycle and reuse waste and optimizing logistics and transportation. These measures coupled with technology upgradation, extensive R&D and waste minimization through product and process improvements enables improvement in long-term availability of necessary raw materials at optimum

and competitive prices. [04]

Ranbaxy Laboratories

The pharmaceutical major started investing huge sum on upgrading of its manufacturing sites. Their target is to make them "zero discharge" sites.

L&T

Given the nature of its businesses, L&T have huge business potential in turning 'green' and gaining a competitive edge. L&T's primary sources of environmental impact are through consumption of raw materials, waste generated through processes at its plants and project sites and GHG emissions. The major raw materials consumed by L&T are steel, sand, cement, water and energy. L&T uses alternate materials and conserves natural resources, for instance through rainwater harvesting and ground water recharge, at its plants and project sites. The company is using wastes like fly ash, Ground Granulated Blast Furnace Slag (GGBS), and other additives to reduce the consumption of cements. The organization encourages usage of video conferencing for internal meetings connecting various locations so that traveling of the employees can be reduced. It adopted nearly ten per cent of green concept into its building. The ten percent included energy saving equipments, double glazed glass to reduce heat, sun shading roof and automotive switching off of light among others. L&T also meets nearly eight per cent of its electricity requirement through use of renewable energy sources like wind and solar power. [04]

TCS

TCS is taking measures to ensure that the company, and its suppliers and vendors use environment friendly components, and abide by regulations in the use of labor, pollution control, and so on. It has reduced electricity consumption by five per cent over 2006-07 through better methods of energy consumption within its Indian operations. Currently six per cent of total water usage comes from recycling waste water. The company has implemented rain-water harvesting to all new facilities. All obsolete computers in TCS India are being fed to e-waste vendors for recycling. All obsolete cartridges are returned to HP and the batteries are being sent to vendors authorized by the Pollution Control Board for disposal. Sources of GHG emissions due to TCS' operations are energy consumption (43 per cent), domestic (six per cent) and international (41per cent) travels and transporting members of the workforce (three percent).To reduce greenhouse gas emissions due to consultants travelling to client locations for meetings, TCS promotes the use of video conferencing to its clients. [04]

State Bank of India

By using eco and power friendly equipment in its 10,000 new ATMs, the banking giant has not only saved power costs and earned carbon credits, but also set the right example for others to follow. SBI has also entered into green service known as "Green Channel Counter". SBI is providing many services like; paper less banking, no deposit slip, no withdrawal form, no checks, no money transactions. All these transaction are done through SBI shopping & ATM cards. [05]

Oil and Natural Gas Company (ONGC)

India's largest oil producer, ONGC, is coming up with energy-efficient, green crematoriums that will soon replace the traditional wooden pyre across the country. ONGC's Mokshada Green Cremation initiative will save 60 to 70% of wood and a fourth of the burning time per cremation. [06]

3. Need for Green SCM - Opportunity for organizations

India is already one of the largest economies in the world, and will continue its rapid urbanization and economic development over the next few decades. The rising consumption and demand for energy, increasing green house emissions, and constraints on critical natural resources such as land, water and oil has to be addressed on priority. There is a growing interest among the consumers in India regarding protection of the environment. People these days are actively involved and informed on ecological issues and are thus changing their behavior pattern so as to accommodate a socially responsible lifestyle. Companies that successfully adopt a 'green' policy can generate profits, provide positive social impact, and reduce environmental impact. Moreover the media also notices companies that show their green stripes. Positive publicity for going green can do a world of good for the company's corporate image. Companies taking voluntary steps to become greener will gain visibility, earn credibility, and develop a reputation for leadership. Implementing a green initiative program also ensures companies to meet current and future environmental regulations or legislation.

Green SCM can help organizations in the following ways:-

Savings: - The investors and corporate companies need to view the environment as a major long-term investment opportunity; the marketers need to look at the long-term benefits from this new green movement. It will require a lot of patience with no immediate results. The corporate should not expect

huge benefits for implementing Green SCM immediately. Thus it can be assumed that firms marketing goods with environmental characteristics will have a competitive advantage. Switching to greener products or services can generate savings or be revenue neutral.

Lower risk: - By buying greener products or services, organizations can avoid risks which often translate into financial costs or losses. For example purchasing raw materials that contain toxic chemicals, sourcing paper from illegal logging practices and working with suppliers who have 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 organization can reduce considerable waste and protect the natural resources. These initiatives can lead to environmental awareness and engagement amongst employees, suppliers, and stakeholders with positive impacts on efficiency and brand image.

Figure 3

4. Challenges

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

- Cost and complexity are perceived as the biggest barriers to implementing Green SCM, which highlights the need for cost effective and easy to implement solutions.
- Most companies are still struggling with obtaining verifiable consistent data to measure value chain effectiveness and environmental responsibility;
- There is a need to have a proper technology in place to compliment business with the Green Practices.
- Integrating remanufacturing with internal operations is a key challenge of Green operations
- Another challenge is the fear of failure. The organizations 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.

5. 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. Organizations need to understand that building green capabilities is not an over - night phenomenon but is a journey in itself which requires time and effort on a continuous basis. There is a huge a pressure on the organizations these days to supply products that are environmentally friendly in their sourcing, production, delivery, usage and disposal. In the coming years organizations 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. Although sustainability programs may vary from industry to industry but the basic needs for transparency, communication and collaboration will remain the same. As some of the industries are nearing saturation point brand building will become a top incentive of implementing green SCM. There are some critical factors that will lead to a successful Green strategy

- Integrated - Align with core business strategies and objectives
- Holistic - Address sustainability from an end-to-end perspective
- Results Oriented - Focus against prioritized opportunities
- Programmatic - Mobilize the organization and provide senior management support, adequate resources and tools
- Sustained - Reinforce progress by sharing ideas & impact, with transparency of performance
- Measurable - Proper metrics need to be defined to measure success [03]

Green SCM is here to stay. Adopting a green strategy will provide long-term benefits. Those companies whose leaders approach sustainability from an inclusive strategic perspective of cost competitiveness and value creation will open the doors to a more profitable and environmentally friendly future. While the challenges might change but the fundamentals of doing good business will remain the same.

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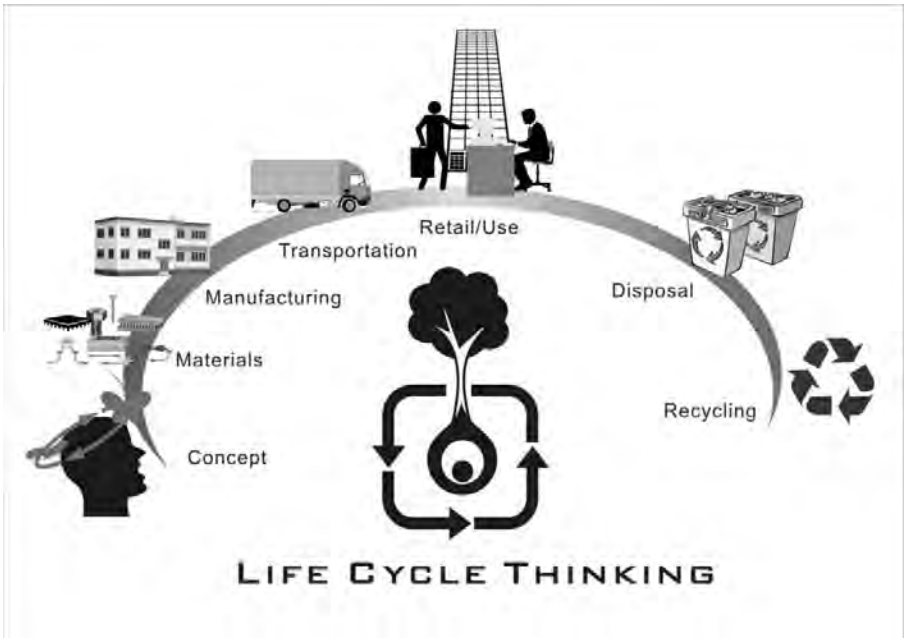
Figure 1



Source: - Dlink Energy

Figure 2

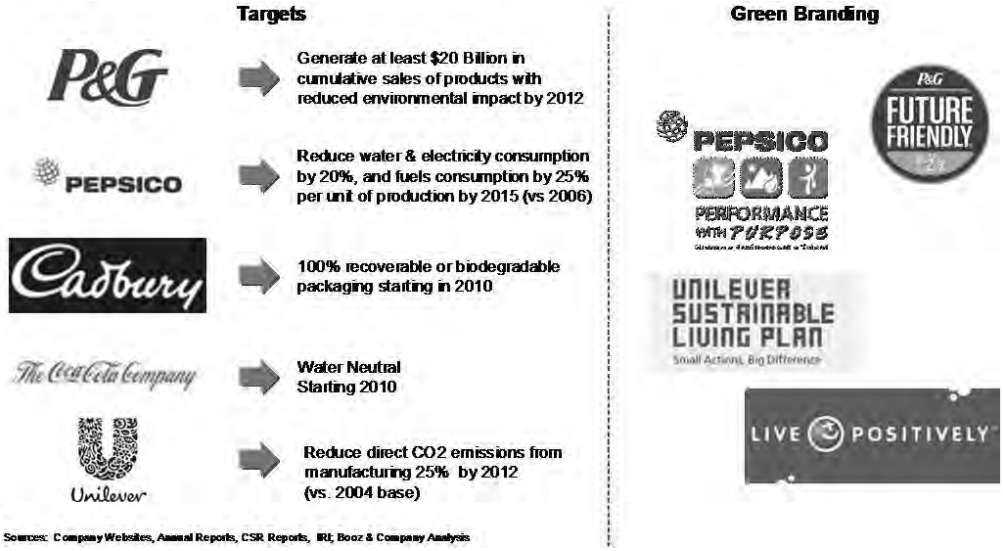


Figure 3

Business of Sustainable Innovation

Environmental Benefits

- Greenhouse gas emissions reduced
- Energy use reduced or efficiency increased
- Hazardous pollutants released in air, water or land reduced
- Solid waste reductions, materials use reduced or efficiency increased
- Supplier behaviour influenced, resulting in environmental benefits
- Natural resources protected or restored

- Cost savings
- Increased revenues or earnings
- Reduced liability or risk
- Return on investment/payback period
- New market creation
- Investment attractiveness
- Benefits for customers
- Brand/reputation enhancement

Social Benefits

- Stakeholder consultation
- Livelihood creation
- Community relation enhancement/ benefi
- Specific impact on social issues of direct relevance

Innovativeness

- Is the innovation original or is it a significant improvement over an existing solution?
- Is it still in scarce use?
- Does it offer economic, social and/ or environmental benefits?
- Is it applicable to other sectors/ areas?
- Is it commercially viable?

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