



Advanced Materials Manufacturing & Characterization

journal home page: www.ijammc-griet.com



Improving Green Supply Chain Management Productivity Towards Ecologically Sustainable Business Practices in Indian Manufacturing

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ABSTRACT

According to a report published by FICCI, food processing industry in India is one of the world's largest producers as well as consumer of food products, with the sector playing an important role in contributing to the development of the economy. Food and food products are the largest consumption category in India, with a market size of USD 181 billion. Domestically, the spending on food and food products amounts to nearly 21% of the gross domestic product of the country and constitutes the largest portion of the Indian consumer spending more than a 31% share of wallet. The Indian domestic food market is expected to grow by nearly 40% of the current market size by 2015, to touch USD 258 billion by 2016.

However, despite of continual efforts and initiatives of the Government to provide the required stimulus to the sector, processing activity is still at a nascent stage in India with low penetration. At the same time, though India is a key producer of food products, having an adequate production base for inputs, productivity levels are very low in the country. While India remains a top producer of food, production yield levels are among the lowest amongst the BRIC countries. Also, the Indian export market, at USD13.7 billion, has a share of only 1.4% of the world food trade. This paper highlights the significance of green supply chain management practices towards ecologically sustainable business practices

Keywords: Packaging engineering and redesign, logistics optimization, sustainable supply chains, modern information and telecommunications technology tools

Introduction

Food processing industry in India is increasingly seen as a potential source for driving the rural economy as it brings about synergy between the consumer, industry and agriculture. A well developed food processing industry is expected to increase farm gate prices, reduce wastages, ensure value addition, promote crop

diversification, generate employment opportunities as well as export earnings. In order to facilitate and exploit the growth potential of the sector, the government on its part has initiated extensive reforms.

Some of the key measures undertaken by the Government include:

- ** Amendment of the Agriculture Produce Marketing Committee Act,
- ** Rationalization of food laws,
- ** Implementation of the National Horticulture mission, etc.

The Government has also outlined a plan to address the low scale of processing activity in the country by setting up the mega food parks, with integrated facilities for procurement, processing, storage and transport. To promote private sector activity and invite foreign investments in the sector the Government allows 100% FDI in the food processing & cold chain infrastructure. The recent budget has announced several policy measures, especially for the cold chain infrastructure, to encourage private sector activity across the entire value chain.

Green supply chain management (GSCM) practices comprise green design, reducing energy consumption, reusing / recycling material and packaging, reverse logistics and environmental collaboration in the supply chain. An effective supply chain procurement process is essential to the success of every company. It's important to continuously examine practices used to ensure they're the most effective way to maximize efficiency.

According to recent FICCI survey on skill demand in food processing industry, it has been observed that a majority percentage of organizations are dissatisfied with the skills of the available trained

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• Doi: <http://dx.doi.org/10.11127/ijammc.2016.04.12> Copyright@GRIET Publications. All rights reserved.

manpower, 58% of the respondents were dissatisfied with technical skills and knowledge needed for the job. Also 72% showed discontent with employees' ability to use appropriate and modern tools, equipment, and technologies specific to their jobs.

Considering the criticality of the situation and the need to appropriately address the challenges faced by the sector, FICCI through its internal research identified major factors hampering the growth of food processing sector and holding it back. These are listed herewith as stated below:--

- ** Comprehensive national level policy on food processing sector
- ** Availability of trained manpower
- ** Processing plants with cost effective technologies
- ** Cost effective food machinery & packaging technologies
- ** Constraints in raw material production
- ** Inadequate infrastructural facilities
- ** Access to Credit
- ** Market Intelligence
- ** Inconsistency in central and state policies
- ** Lack of Applied research
- ** Adequate value addition
- ** Lack of specific plan to attract private sector investment across the value chain
- ** Food safety Laws
- ** Weights & measures Act & Packaging commodity rules
- ** Taxation

Objectives of Ecologically Sustainable Business Practices

Following the green or ecological pressures from customers, stakeholders, and governments, a number of operational guidelines, standards and legislative frameworks have been put in place to minimize environmental impact.

- encouraging an internationally common approach to environmental management;
- strengthening companies' abilities to measure and improve environmental performance, through continual system audits, and;
- Improving international trade and removing trade barriers.

Areas of Green SCM

- Packaging engineering and redesign. A range of retailers, consumer packaged goods (CPG) and food manufacturers have actively engaged partners to redesign packaging to reduce the use of materials and, in some cases, logistics costs. These companies use sourcing optimization tools and product lifecycle management (PLM) applications to aid in the process.
- Materials substitution. Both manufacturers and end consumers such as telecom providers are working with suppliers to identify substitute materials like recycled plastics that are environmentally friendly and durable. For example, a titanium fastener may cost more initially, but provides significantly longer durability than steel while delivering the same performance characteristics at a lighter weight. Sourcing optimization tools, supply management suites, product lifecycle management tools and supplier collaboration applications all play a part in materials substitution.

- Certification. Companies -- especially those selling into the EU -- are required to certify that their products meet specific environmental criteria (e.g., are lead-free or not a hazardous substance). Supplier information management (SIM) solutions help companies survey and manage the certification process in their supply chains by documenting that both tier one and sub-tier suppliers avoid the use of banned materials or production processes.

- Logistics optimization. By strategically locating distribution facilities and warehouses and reducing LTL (less than truckload) small parcel and air freight shipments, manufacturers can reduce their environmental footprint and also prop up the bottom line.

Various Roles of Logistics and Transport Sector in Reducing Emissions

For green supply chain various roles that the logistics and transport sector plays in reducing emissions are:--

- ** Effects of ISO 14001 certification on the promotion of green supply chain management (GSCM)
- ** Research on interest and implementation of green supply chain initiatives
- ** A quantitative picture of current sustainable supply chain practices and plans
- ** A measurement and quantification of how companies are managing the complexities of supply chain demands, distribution costs and environmental concerns
- ** Key drivers of sustainable supply chains
- ** A new integrated supply chain model that takes into account sustainability parameters such as CO2 emissions reduction, reduced energy consumption
- ** Better traceability and reduced traffic congestion
- ** Best practices for companies looking to green their supply chains
- ** An outline of the supply chain green initiatives currently implemented or planned in manufacturing, warehousing and distribution
- ** Survey of sustainable packaging policies
- ** A look at the growing role of procurement organizations within sustainability efforts institutions of higher learning

9 Best Practices for Solid Supply Chain Efficiency

[1] Properly Staff the Supply Chain: Optimal supply chain organizational methods vary by company, but may include a centralized operation or containing the process within departments. Regardless, it's essential to ensure the supply chain is properly staffed, as is educating and improving the supply chain management skill level of the staff.

[2] Appoint a Governing Body: Providing supply chain strategy a sense of direction and help to align in with the overall organizational goals by establishing a supply chain council. This can help the supply chain organization get the recognition it deserves and remove barriers standing the way of success.

[3] Invest in Technology: Assessing processes to look for deficiencies, and then search for technology that can meet those

needs instead of adopting processes to fit the technology. Technology should produce useful data that can be accessed easily.

[4] Forge Alliances with Top Suppliers: Working closely with suppliers to keep the lines of communication open and continuously work together to reach shared performance goals. The communication should run in both directions which make problems easier to solve and make use of talent and expertise of the supplier.

[5] Focus on Strategic Sourcing and Total Cost of Ownership: Strategic sourcing is essential to maintain a successful supply chain procurement process. Allowing internal customers to participate in the decision-making process to ensure the availability of supplies and reduce total costs of ownership – operating, training, maintenance, warehouse and other related expenses.

[6] Let Supply Chain Team Manage Contracts: A failure to communicate contract terms and monitor compliance often causes companies to spend more than necessary, so move contract management to the supply chain group to simplify the process and make it more efficient and easier to monitor the contracts.

[7] Optimize Inventory Levels: Constantly review inventory levels to ensure they're kept at optimal levels, as holding more inventory than necessary can result in significant costs. Better planning and forecasting can help keep inventories aligned with the company's needs.

[8] Implement Risk Management Policies: Prepare for the unexpected by establishing proper levels of control to manage and minimize risk. Periodically review these policies to ensure they remain efficient. Among the areas mitigation strategies should weigh are: calculating the financial impact, determining risks and their likelihood of occurring and setting a priority for monitoring the risks.

[9] Incorporating Green Initiatives and Social Responsibility: These days, it's essential to do everything possible to reduce carbon footprint. Additionally, people expect companies to adhere to a certain level of social responsibility with policies that can be measured. Companies that don't are at risk of enduring major criticism.

Wal - Mart- A Novel Example of Effective SCM

According to MWPVL International, a supply chain and logistics consulting company, in 1987, Wal-Mart had its own satellite system that allowed voice and data communication between all segments of the company. By 1989, Wal-Mart saw the benefits of its supply chain management when its distribution costs were 1.7% of its sales, or less than half Kmart's cost and just under a third of what Sears was spending at the time, according to Arkansas Business. Wal-Mart's SCM process is not based entirely on technology. The company has a sprawling network of nearly 160 distribution centres covering almost 120 million square feet and all within 130 miles of the stores it supplies. Wal-Mart's SCM process is not based entirely on technology. The company has a sprawling network of nearly 160 distribution centres covering almost 120 million square feet and all within 130 miles of the stores it supplies. The retailer also instituted cross-docking at its warehouses, a method that moves inventory directly from arriving or departing trucks. Products are taken from an arriving truck and packed in a

truck bound for a store without lengthy storage in the warehouse, said inventory management software company Trade Gecko. The result is lower costs for inventory storage, reduced transportation costs and products spend less time in transit. Wal-Mart also uses its own trucking fleet and drivers, maintaining high minimum standards for its thousands of drivers, including three years and 250,000 miles of driving experience and no preventable accidents in three years, according to Truckers Logic For Wal-Mart, its SCM methods yield lower costs for products and inventory, better control over selection in its stores and the ultimate result of lower prices that can be passed to customers. The operations portion of a supply chain focuses on demand planning, forecasting and inventory management. Forecasts estimate consumer demand for a product based on historical data, external drivers such as sales and promotions and changes in trends or competition. Demand planning is used to create accurate forecasts, a critical step toward effective inventory management. Forecasts are compared to inventory levels to ensure warehouses have enough, but not too much, inventory to meet demand. Moving the product from warehouses or manufacturing plants to stores and ultimately to customers is the distribution function of the supply chain Wal-Mart had always focused on improving sales, constantly reducing costs, adopting efficient distribution and logistics management systems and using innovative information technology (IT) tools. According to analysts, Wal-Mart was able to achieve a leadership status in the retail industry because of its efficient supply chain management practices. Reducing carbon in the life cycle of a company's products reduces energy use, greater efficiency and, with the rising cost of energy, lowers costs, making business stronger and more competitive. This helps suppliers to reduce their energy use, costs and carbon footprint.

Conclusions

Increasing competition and low profitability has forced manufacturers to go beyond their own factory gates and search for improvements in the interaction with their suppliers and customers along their supply chains. In a highly challenging and competitive environment such as today, where supply chain is a popular tool for improving the organizational competitiveness, an efficient and effective supply chain strategy is a must for manufacturers and their component manufacturers so as to meet changing consumer demands. Many sectors of our economy have been benefited in a big way from modern information and telecommunications technology tools. Information alone can increase overall efficiency of industrial operations to provide more benefit even as compared to the technologies delivered. Technological innovations and competition have led to improvements in supply chain management for food products. Business organisations have realised the need to upgrade their supply chain management from a purely functional role to a strategic role to comply with current environmental legislations and maintain an enduring competitive advantage, through technological innovation and improved eco-efficiency

References

- [1] Arena, U., Mastellone, M., & Perugini, F. Life cycle assessment of a plastic packaging recycling system. *International Journal of Life Cycle Assessment*, 8(2003) 92–98.
- [2] Baines, T., Brown, S., Benedettini, O., & Ball, P. . Examining green production and its role within the competitive strategy of manufacturers. *J. of Industrial Engineering and Management*, 5(1), 2012, 53-87.
- [3] Beamon, B.M. , Sustainability and the Future of Supply Chain Management. *Operations and Supply Chain Management*, 1(1),2008, 4-18.
- [4] Christopher, M., Peck, H., & Towill, D. , A taxonomy for selecting global supply chain strategies. *The Int. J. of Logistics Management*, 17(2), 2006, 277-287.
- [5] Corbett, C.J., & Klassen, R.D. , Extending the horizons: Environmental excellence as key to improving operations. *Manufacturing & Service Operations Management*,8(1), 2006, 5-22.
- [6] Doifode S. K., Matani A. G. (2013), Advanced Environment Protection Techniques by Industries: Potential For Corporate Social Responsibility Activities, *Int. J. of Civil Engineering*, 3(2), 2013, 36-42.
- [7] Dr . A.G. Matani , Information technology improving retail marketing in agriculture, *Int. Conf. on Marketing and Society* , Indian Institute of Management ,Kozhikode, 8-10th April 2007, 185-186.
- [8] Dr. A.G.Matani, Managing new product innovations, *Industrial Engineering J.*, 1(2) ,1999,,21-23.
- [9] Dr. Ashok G. Matani , Dr. S.K. Doifode, Effective industrial waste utilization technologies towards cleaner environment, *Int. J. of Chemical and Physical Sciences*, 4(1),2015,536-540.
- [10] Dr . A. G. Matani , Strategies for better waste management in industrial estates, *J. of Industrial Pollution Control*, 2006, 22(1),2006, 67-72.
- [11] Dr. A. G. Matani, M. S. Tripathi, Pallavi Matani,, Information technology tools improving supply chain management productivity in food processing industries, *Int. J. of Advanced Engineering Technology*, (1),2012, 237-238.
- [12] Dr. A. G. Matani, Impact of the development on the economics of developing countries. Information technology towards improving supply chain management in Indian economy , *IET Conference on Wireless, Mobile and Multimedia Networks*, 2008,106–108.
- [13] Dr. A.G. Matani , Effective energy conservation techniques in industries, *Int. J. of Mechanical Engineering*, 2(2), 2014, 21-25.
- [14] Dr. A. G. Matani, M. S. Tripathi, Dr. S. K. Doifode , S. D. Gowardhan, IT applications improving green supply chain efficiency of businesses and industries, *Int. J. of Research in IT & Management*, 5(7), July 2015, 37-40.
- [15] Dr. A. G. Matani, M. S. Tripathi, Dr. S. K. Doifode , S. D. Gowardhan, Green Supply Chain Management in Food Industries , *Int. J. of Engineering and Technical Research (IJETR)*, Vol.3, No.7, July 2015, 261-263.
- [16] Eltayeb, T.K., Zailani, S., Ramayah, T. , Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes, *Resources, Conservation and Recycling* 55, 2011, 495- 506.
- [17] K.Vishwanath Allamraju ,K. Srikanth , Review And Scope Of Scavenging micro Energy using Piezoelectric materials, *Advanced Materials Manufacturing & Characterization*, 4(2), 2014, 96-101
- [19] Plambeck, L.E. , The greening of Wal-Mart’s supply chain. *Supply Chain Management Review*, 33(5),2007, pp.18-25.
- [20] Ruiz-Benítez, R., & Cambra-Fierr, J.,Reverse logistics practices in the Spanish SMEs context. *J. of Operations and Supply Chain Management*, 4(1),2011, 84-93.
- [21] Shang, K.C., & Sun, L.F. , Taxonomy in logistics management: A resource-based perspective. *Int. J. of Management*, 21(2),2004, pp. 149-165.
- [22] S.U.Bokade, D.N.Raut, B.E.Narkhede, Investigations on service and effectiveness of reverse logistics of consumables and materials, *Proceedings of 2nd International Conference of Industrial Engineering*, 20-22 Nov.2013, pp.94-98
- [23] V.Saikumar, , V.Venkatesh, P.Sivaiah, Multi-Objective Optimization in CNC Milling Process of Al-Cu-Zn Alloy Matrix Composite by Using Taguchi-Grey Relational Analysis Technique, *Advanced Materials Manufacturing & Characterization* ,5(1), 2015, 56-60.