An Overview, Trends and Future Mapping of Green Supply Chain Management–Perspectives in India

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Abstract

The Green Supply Chain Management is the concept that involves applications of environmental issues along with the corporate social responsibility in each and every sector incorporated in the traditional supply chain management. Moreover, it is applicable in the real sense in every corporation of all sectors including the agribusiness sector. This paper involves a gist about the scope of the GSCM in actual sense that could be practiced in the large corporations in India and about the practices adopted in the ITC Ltd along with Aditya Group. Apparently, this is an exploratory study that would trigger and encourage the implementation of GSCM in FMCG sector as well as agribusiness sector. It also advocates the applicability of GSCM in every sector so as to build confidence in all associated entities of the business corporations- customers, stakeholders, shareholders, and employees. GSCM as a whole is a novel concept that incorporates effective applications of technology such that it fulfils the oath of maintaining environmental and social integrity in an equitable manner.

Keywords: Supply Chain Management, Green Marketing, Green Purchasing, Green Supply Chain, Environmental Performance Index, Corporate Social Responsibility, Reverse Logistics.

1. Introduction

The supply chain encompasses all of those activities associated with moving goods from the raw-materials stage through to the end user, advocates for business process realised that significant productivity increases could only come from managing relationships, information, and material flow across enterprise borders. In other words SCM is the management that integrate physical flow of goods and related information, from procurement to final consumption, enhancing customer, and economic value.

2. Green Supply Chain Management

GSCM = Green purchasing + Green manufacturing/ materials management + Green Distribution / marketing + Reverse logistics (Nimawat and Namdev, 2012).

Environmental supply chain management consists of the purchasing function's involvement in activities that include reduction, recycling, reuse, and the substitution of materials. This involves the practice of monitoring and improving environmental performance in the supply chain. The SCM involving product design, material sourcing and selection, manufacturing processes, delivery of the final product and recycling of products, along with environmental thinking could be termed as GSCM. Today's main agenda is to raise environmentally responsible consumption and production to recover environmental quality, reduce poverty and bring about economic growth, with resultant improvements in health, working conditions, and sustainability. Green SCM is getting more attention as a sustainable development mode for modern enterprises and is increasingly a part of Corporate Social Responsibility (CSR) initiatives (Prabhakar, 2013).

3. Benefits of GSCM

Speaking of greening the supply chain, one might think only banning toxic chemical substance usages or reducing emission or waste to the environment. However, it is much more than just reducing usage and pollution. The GSCM principle can be applied to all departments in the organisation. The effects of GSCM expand to all areas, both tangibly and intangibly. SCM roles, including environmental and societal ones, could be benefitted by GSCM traits which in turn could be categorised as, material,

immaterial, and emotion. In the materialistic perspective, GSCM would be helpful in lowering environmental load for environment, in lowering cost prices for supplier, in lowering cost for producer, in lowering cost of ownership for customer, and in lessening consumption of resources for society. In the immaterialist perspective, GSCM would be helpful in overcoming prejudice and cynicism for environment, in lessening rejects for supplier, in easier situation of manufacturing for producer, in creating a convenient situation and jovial ambience for customer, and in complying for societal betterment. Lastly, in emotional perspective, GSCM would be helpful in motivating the stakeholder towards environment, in improving the image in suppliers' and producers' minds, in helping customers to feel good and about quality of life, and in bringing industry on the positive track for the societal good (Sorraya and Edie, 2008).

4. GSCM AND CSR

GSCM is the recent move by the corporations including the small and medium enterprises to enhance the capabilities of supply chain management (Singh, 2013). This would let the companies to gain the confidence of all stakeholders – consumers, employees, shareholders and communities, as a whole. With the advent of innovations in communication technology, the community is transforming into knowledge based society (Ananda, 2009). This has in turn, led to the creation of new business model and corporate governance.

During the 1992 Earth Summit held in Rio de Janeiro; governments and international organisations conceded upon to act on to protect the environment for the long-term economic development (Singh, 2013). In the same summit, they committed for environmentally-responsible consumption and production such that to improve environmental quality, reduce poverty clubbed with economic growth, sustainability, and improvements in health and working conditions (Singh, 2013). Moreover, organisations have been called for, to take responsibility in exercising their leadership towards the promotion of environmentally sound goods and services. Nevertheless, following the above mentioned committed issues would be challenging for the prospective organisations and the old big corporations, however executing such moves would definitely be in a positive direction based on three perspectives; reputation capital, eco-social perspective and rights-based perspective (Ananda, 2009).

Today's business corporations must recognize the importance of "*reputation capital*" to capture markets and in sustaining in them (Ananda, 2009). It could be strategized as the new business model, such that corporations could minimize the investment risks by optimizing their profits while gaining the confidence of all their stakeholders. The advocates of this perspective include corporate social responsibility in their advertising and social marketing initiatives.

The stability and sustainability in the socio-environmental sense, give way for the sustainability of the market in the long-run. To convert this kind of thought into action, new generation corporations and new-economy entrepreneurs are playing a vital role since they imbibed in them the importance of being socially responsible. Such initiatives by various corporations would ultimately lead to alleviate poverty which is the main factor for political instability. Hence, to avoid such a situation of political instability which is detrimental to business, corporations should adopt strategies emphasizing towards "*eco-social*" perspective (Ananda, 2009). Corporate Social Responsibility (CSR), from the eco-social perspective could be viewed as both a value and a strategy to ensure sustainability of business.

Since customers, employees, communities, and shareholders are affected by the business decisions of corporations, they have the right to know about corporations and their business. In general understanding, corporations may have been registered as private enterprises; however due to their business activities, they are transforming into public institutions whose survival is truly based on the customers who buy their products and shareholders who invest in their stocks. Thus, the corporate social responsibility should be focused towards "*rights-based*" perspective so as to develop confidence in their stakeholders for the sustenance of their business (Ananda, 2009).

5. RESEARCH STUDY ON GSCM

In today's world, the importance towards the environment has raised a great concern not only in the minds of few leaders of different countries or few renowned big business houses, but also among the common public (Moloy, 2010). This change has brought in an imminent and urgent situation for the business corporations to adopt eco-friendly practices along the length and breadth of their day to day business operations. These operations involve supply chain operations, which are a vital part of every business operation in bringing a product or service from procurement to the customer. Thus, observing such a huge contribution by supply chain in a business operation, business houses must consider implementing

green or eco-friendly practices at this level. This gives rise to the concept called Green Supply Chain Management (GSCM).

GSCM is the novel concept in the Indian context on which there were few studies conducted by researchers due to which the concept is spreading slowly and gradually. Moreover, the new corporations along with the old ones are realising the importance of GSCM practices so as to increase their credibility among stakeholders to sustain in business on long run. There have been a number of empirical studies about it. Some of them are presented as follows.

Srivastava (2007) has highlighted on the reverse logistics concept giving GSCM a new angle of integrated and fresh research. The literature review started from the conceptualization of GSCM, followed by classification of GSCM on the basis of the problem context in supply chain's major influential areas. It further classified GSCM on the basis of methodology and adopted approach. Various mathematical tools/techniques were used/ mapped in literature vis-a-vis the contexts of GSCM.

Goknur et al. (2010), in their study provided a critical literature review on performance measurement of supply chain. This study also followed the basic research methodology; problem related to supply chain and gave justifiable solutions for better performance management in the new times of supply chain. This study focussed on the supply chain performance management, took the required articles from the areas such as supply chain, Information Technology (IT), performance and business process management.

Rajesh Nair et al. (2010), highlighted about the green-marketing in the automobile industry focusing on Indian customer's perception towards green-cars and the need-gap analysis. It identified the improvement areas of the green-car makers which needed to be primarily focused on. Moreover, it included the best practices adopted worldwide which could also be implemented in India such that the acceptability level of green-cars could be increased to achieve a sustainable competitive advantage.

Deepak Bhagat et al. (2011) investigated about the critical factors involved in agriculture supply chain management while doing a comprehensive research of various fields of agribusiness. This study also gave the idea about various research models that showed a good understanding of logistics, networks and relationships in agriculture supply chains.

Rakesh Rajpal, B.K.Roy and Pawan Kumar (2011) studied the impact of green to the supply chain management. Moreover, various barriers and opportunities had been identified and explored from the research though Indian enterprises have increased their environmental awareness due to regulatory, competitive, and marketing pressure and drivers, yet this awareness has not been translated into GSCM practice adoption.

Moloy Ghosh (2011) has highlighted in his paper about the terms and concepts of green-marketing, which is the part of GSCM. The paper emphasized on the importance of green marketing; examines some reasons that make the organisations interested to adopt green-marketing philosophy. Moreover, it highlighted some problems that an organisation may face to implement green-marketing and its managerial implications along with few case points.

Nimawat Dheeraj and Namdev Vishal (2012) focussed on the corporate responsibility and their requirement to meet the terms with environmental policy and distribution activities. They also covered EPI (Environmental Performance Index) of India and activities like green purchasing, manufacturing, marketing, reverse logistics.

Kottala Sriyogi (2012), in his study suggested a methodology for the calculation of supply chain performance measures, their qualitative interpretation, and regular benchmarking of internal supply chain w.r.t. financial perspective. This paper emphasized that there is a strong network between the SCM and financial success of companies practicing predominant SCM.

This is purely a conceptual paper that encourages business-houses and management institutes to think about their role in attaining sustainable development through green-marketing.

6. ITC Ltd

Nowadays, consequences emerging due to global warming and hostile climatic changes are the threatening factors for the sustainable economic progress and long-term business. In order to tackle such threats, ITC has evolved and executed its plans in their corporate strategy, keeping social and national priorities in mind. Apparently, to show their commitment, ITC adopted strategies those are similar to that mentioned in the Government of India's National Action Plan on Climate Change (NAPCC) so as to dynamically face the climatic changes.

ITC continues to pursue a Triple Bottom Line approach that contributes to the creation of economic, environmental and social capital ("ITC sustainability report", 2012). Establishment of Green buildings is one of the relevant responses to these environmental challenges. The commencement of the construction of the ITC Green Centre at Gurgaon marked the plunging of ITC into green buildings movement. This in turn shows the initiative measure undertaken by ITC towards fulfilling its greener objectives. Moreover, the Green Centre at Gurgaon acquired the recognition of being the largest LEED platinum rated office space in the world in 2004. During the recertification carried out in 2012, the ITC Green Centre was identified as the highest rated green building in the world with platinum certification. Lately, the newer construction by ITC is adopting greener attributes which are also gradually being implemented in existing buildings and factories in order to meet the green norms. In this year, the cigarette factories at Bangalore and Saharanpur have also received LEED platinum rating from the Indian Green Building Council and all ITC premium luxury hotels are now LEED certified green buildings with platinum rating, more than 38% of ITC total energy consumption is from renewable resources and expected to touch 50% in coming 4-5 years.

From over 5 years ITC has been 'Solid waste recycling positive'. It also initiated a unique project-'Wealth out of Waste' (WOW), recycling programme to create awareness on the 'Reduce-Reuse-Recycle' approach. As a part of this project, ITC's approach is creating awareness among the society about the advantages of the 'Reduce-Reuse-Recycle' process on protecting the environment, improving civic amenities, public health and hygiene as well as generating cost effective raw materials for the paper, plastics, and metal and glass industries. The vitality of source segregation is emphasized by providing special bags to accumulate dry wastes like paper, plastic and metals thereby arranging for their periodic collection through outsourced agencies. ITC used waste paper and the material that is left, is sold to recycling industries. Collection of dry waste could save around 40% of the garbage handling cost, which can be used to improve civic amenities. With the initiation of the project on a small way with households, it has started spreading to schools, government offices, Corporate and other institutions. The WOW initiative with an average monthly collection has been increasing to 26000 MT in 2011-12 from 100 MT in 2007.

7. Aditya Birla Group

Being one of the Fortune 500 companies, AB group has been placed at number 1 spot in Asia Pacific and under the survey regarding 'Global Top Companies for Leaders' it secured number 4th spot, around the globe in 2011. The survey, 'Top Companies for Leaders', was conducted by the Aon Hewitt, Fortune Magazine and RBL (a strategic HR and Leadership Advisory firm), which is a detailed study on organisational leadership. Of the total revenues from various companies and organisations in the group, 53 percent is contributed by the overseas operations. It has made its mark in 36 countries covering Asia-Pacific, South-East Asia, Europe, Africa and North America ("Aditya Birla group", 2013).

The group has the presence in various fields with significant role in each field as follows:

- World's most cost-efficient aluminium and copper producers
- Leading firm in Viscose Staple Fibre
- Leading firm in carbon Black
- The fourth largest producer of insulators
- The fifth largest producer of acrylic fibre
- One of the top ten cement producers
- Among the best energy-efficient fertilizer plants
- The largest Indian MNC with manufacturing operations in USA.

In India too, it plays a vital role in various businesses and fields which keeps it as one of the top business performers. Besides business, the group concentrates on Corporate Social Responsibility by being courteous towards the society realizing its responsibility as 'Corporate Citizen' ("CSR policy report", 2013). The Group does the following to fulfil its social responsibility goals:

- The group works in 3,000 villages.
- For community Initiative and Rural Development, Aditya Birla group reaches out to seven million peoples, headed by Mrs. Rajeshree Birla. It is done annually.
- The group focuses on healthcare, education, sustainable livelihood, infrastructure, and social reform activities in India, Egypt, Philippines, Thailand, Laos, Indonesia, Korea, and Brazil.

- In addition to this AB group run schools with providing education to 45000 children, among them 18000 are receiving free education.
- Its 18 hospitals tend to increase to serve millions of villagers.
- The group partnered with the Columbia University in establishing the Columbia Global Centre's Earth Institute in Mumbai, to fulfil its commitment towards sustainable development.
- It has set up the FICCI- Aditya Birla CSR Centre for Excellence, in Delhi so as to embed the CSR commitment into its organisations as a way of life through thorough implementation.

As a CSR committed group, it is concentrating on the few recognized fields for the sustainable and inclusive development in the society. Aditya Birla Centre for Community Initiatives and Rural Development, which is headed by Mrs. Rajashree Birla, acts as an umbrella such that the group would perform its significant role indirectly or directly gaining the competitive advantage over its competitors ("CSR policy report", 2013). Below are the recognized CSR activities:

- Through Formal Schools, Balwadis, Aditya Bal Vidya Mandirs, Girl Child and Adult Education programmes; the group is contributing towards the education by sparking the desire for learning and knowledge.
- By undertaking programmes of awareness for Preventive Health, Immunization programmes for polio eradication, concentrating on Primary Health Centres, and running Mother and Child care projects, the group is fulfilling its goal of rendering quality healthcare to the people living in villages through their hospitals.
- Through programmes like formation of Self-Help Groups for women, vocational training through AB Rural Technology parks, agriculture development and better farm focus; watershed development and partnership with Industrial Training Institutes; the group is fulfilling its aim to provide sustainable and appropriate livelihood.
- The group is facilitating sustainable infrastructure development by establishing better infrastructure facilities, housing facilities, safe drinking water, sanitation and hygiene and renewable sources of energy.
- To implement their objective of social change, the group supports dowry-less marriage, widow remarriage, awareness programmes on anti-social issues, de-addiction campaigns, and programmes espousing basic moral values.

The group also has a scientific research laboratory located in Taloja, Navi Mumbai, which supports the broad diversity of the group's business through multi-disciplinary team of scientists and engineers ("Aditya Birla group", 2013). The centre is named as the Aditya Birla Science and Technology Company (ABSTC). Under the aegis of ABSTC, Corporate Technical and Energy Services (CTES), provides services across the group for technical problem solving and cost reduction by means of energy conservation, waste heat recovery, optimisation of man power and material handling systems, improved operational and maintenance practices, water conservation, electrical systems, etc ("Aditya Birla group", 2013). Moreover, CTES provides support services for heat transfer enhancement, thermography, and trouble-shooting for plant equipment. CTES is also actively involved in sharing knowledge and experiences through Group-wide benchmarking studies by organising corporate technical seminars, publishing newsletters and white papers on technical issues; and maintaining critical equipment database. The CTES as an organisational entity has the following credits to it:

- Approved energy auditor for Gujarat
- Registered member and auditor, for Gujarat Energy Development Agency and Maharashtra Energy Development Agency.
- ISO 9001:2000 certified by BSI
- National level Energy Auditor accreditation in progress
- Member of Heat Transfer Research Inc of USA

With the CSR practices and green practices by respective organisations in the group, it is building up its own core competencies to gain competitive advantage over its competitors due to which it stands as one of the Fortune 500 groups in the world.

There are some strategies to implement GSCM

8. STRATEGIES FOR GSCM

8.1 Risk-Based Strategies

The simplest strategy of GSCM with regard to inter-organisational investment resource development is one

of the risk minimization. Firms adopting this strategy are proposed to do so in response ostensibly to stakeholder requirements. Such a strategy is ideal for the organisation that retains minimal internal environmental management resources or has only recently begun to consider the introduction of a supply chain greening program. It is based on minimal inter organisational engagement (Gyaneshwar, 2011).

8.2 Efficiency-Based Strategies

A more complex and developing strategy in recent years has been the 'eco-efficiency' or 'lean-and-green' approach to GSCM. This type of strategy derives environmental performance benefits for the supply chain beyond mere regulatory compliance through the requirement for suppliers to meet operations-based efficiency targets (Gyaneshwar, 2011).

8.3 Innovation-Based Strategies

The innovation-based green supply chain management strategy is distinct from the efficiency-based approach because of its use of a supply chain environmental performance strategy that is more environmentally specific (Gyaneshwar, 2011).

8.4 Close Loop Strategies

The whole supply chain includes the reverse flow of products and materials for the purpose of material replacement, waste treatment, re-processing, re-manufacturing, repairing and/or recycling. The complete logistics system must include two parts: Forward Logistics and Reverse Logistics. However, in the present scenario, Indian enterprise managers are focussed only forward logistics being ignorant towards reverse logistics.

There are two types of reverse logistics '**asset recovery**' and '**green reverse logistics'**. The former talks about the return of actual product while the latter emphasizes on the responsibility of the supplier towards the disposal of packaging material i.e environmentally sensitive. Industries are more conscious about reducing the environmental pollution and through this process, they are winning the customers' trust, and also giving importance to packaging material, waste recycling and reuse processes.

India is huge country with population of over 1.2 billion people. Indian economy is growing exponentially and the disposable income at hand is also increasing. With more use of IT Indians have become more and more tech savvy and this has resulted in increased online shopping which accounts for the most number of product returns. Therefore, India is one of the most increasing and credible reverse logistics markets in the world.

Five years ago, Future Group started its own reverse logistics operations in all of its retail chains that include Big Bazaar. It was India's first retail chain which started such a unit and also offers expertise to other retailers. Moreover, the group has also added the product return facilities at its fashion and furniture businesses.

The challenges faced by India in reverse logistics are:

1. Meeting customer expectations
2. Managing expenses
3. Infrastructure
4. Unorganized Retail
5. Complicated rules and regulations

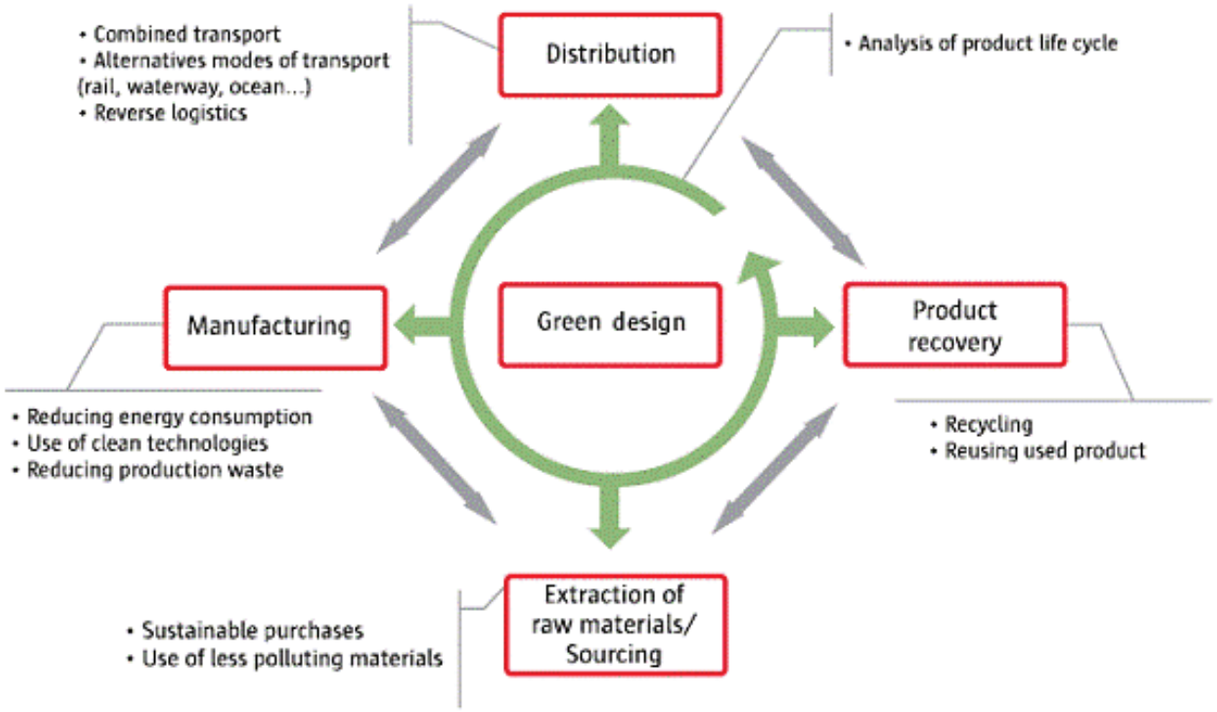
Figure 1 explains an integrated approach towards the salient approaches of green supply chain management which addresses the sustainability development aspects at large.

9. Conclusion and Discussion

Green Supply Chain management is the field that incorporates majorly environmental and sustainable issues starting from the procurement till the customers' shelf. Apparently in the present scenario the green supply chain practices focus on cost reduction and pollution prevention, due to which we are observing positive changes in organisations evolving and incorporating more proactive sustainable measures into their strategy and as everyday practice. However, organisations must also include the factor of corporate social responsibility into their kitty of strategies to build up credence about themselves in the view of customers, stakeholders, shareholders and employees; as the organisations are corporate citizens of the society at large.

Based on our review study, we understand that Fortune 500 companies are publishing sustainability reports on yearly basis so as to show their commitment to the green supply chain practices to some extent. This in turn shows that companies are slowly and gradually turning their attention to potential environmental benefits in the global supply chain. However, as per the prevailing conditions

Figure 1: Approaches of GSCM



of today's world, each and every business enterprise must adopt Green practices.

Few of the large Indian corporations are implementing green practices showing their commitment towards environment and society as a whole. In a realistic manner companies like ITC Ltd, Aditya Birla Group, Cognizant Technological Solutions etc; are following environmental standards as per ISO: 14000, promoting eco-literacy among suppliers while purchasing, adopting reverse logistic practices to minimize waste, promoting eco-friendly products, adopting cleaner technology, promoting continuous improvement in products and in their design, and cooperating with customers. This shows responsibility of a business corporation towards the fulfilment of its commitment of triple bottom line approach.

According to the literature reviewed, Indian small and medium enterprises (SMEs) have tremendous opportunities to position themselves in a better way by adopting green supply chain practices. Moreover, the top management should adopt strategies to gain public confidence by being socially responsible and to sustain in this competitive market. Adding to this; accountability, transparency, reputation of company and rights of business corporation entities – customers, employees, shareholders and stakeholders; play a vital role in building up the brand image of a company. Since cost reduction is the critical factor that may hinder a company towards adopting green practices, business corporations must effectively strategize so as to not compromise on green practices. By doing so, the companies would have competitive advantage.

There is a greater scope for further research in GSCM either it be a qualitative or quantitative or exploratory or longitudinal study so as to drive corporations in adopting it.

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