PRODUCING PRODUCTS THE GREEN WAY

Producing products the green way: the road for pakistan

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ABSTRACT

Economic, social and regulatory dynamics have put pressure on companies to be both lean and green at the same time. Globalization has movedproduction hubs from one geographic boundary to another and hosting countries (both developing and developed) have imposed strict regulations regarding the use of environmentally harmful processes. Over the past few years concept of sustainability has moved from periphery to the core. Green supply chain management (GrSCM) revises the current, traditional supply chain into a smart, much greener one. Consumers are increasingly made aware of using recyclable materials and organizations implementing green supply chain are becoming profitable, socially viable and environmentally friendly.

Green supply chain management helps companies to achieve 'sustainability' which is the main goal for most companies. Implementation of green supply chain is indeed a lengthy procedure which includes identifying processes, developing measurement performance systems, measuring the current supply chain, prioritizing, developing alternatives approach, and finally establishing auditing and improvement procedures.

The paper discusses the evolution of supply chain management and trends influencing future concepts, hurdles in going green and how green supply chains strategies are being implemented in Pakistan where the concept is at a nascent stage. Journey of Coca Colawill be discussed as a case to support the argument that being green and lean brings profitability.

Key words: Sustainability, green supply chain management, consumers.

INTRODUCTION

In today's world, where the population has increased to more than 7 billion, businesses are expanding. As demand increases, industry span increases and as a result, supply chain has to be more efficient. Also as we progress, average literacy rate of the world has escalated and people are getting aware and attentive towards environment. Use of environment friendly products is becoming common whereas products like polythene bags and plastics that are not biodegradable are discouraged by consumers. This changing trend is seen in all countries especially the developed countries where people have actually started to prefer companies that tend to use green methods to fabricate their products and transport them in such a way that it does not harm the environment. This makes it important for company managers and stake holders to upgrade existing traditional and functional methods to greener ones. Many companies have already transitioned towards green supply chain management and several are in the process of making this transition. Several researchers have written about the green supply chain.Anciaux and Yuan(2007) discussed the intermodal transportation with environment issues. Dube and Gawande (2011) talked about the Green Supply Management and added some case studies to defend the point of view. In the Fast Moving Consumer Goods (FMCG) Sector, we found the research of SubajitMazumder and AnandChatterjee (open article) productive in presenting a model of green supply chain management's in FMCG sector.

In this paper we will try to present a complete picture of green supply chain and the different aspects of this management technique. Various implementation strategies known as green technologies are also discussed. We will be discussing the trends that are changing over time and how these changes have influenced both consumers and producers. Looking at history of green supply chain, and keeping the Pakistani perspective, we will discuss the limitations and possibilities that exist for companies and industries working in Pakistan to revert to green supply chain management. We shall also include a study of Coca Cola and how they succeeded in implementing green supply chain management.

CHANGING TRENDS

Supply Chain is perhaps one of the most important sectors of any corporation. It is the department that employs most employees and makes revenue for the organization. In almost all organizations, supply chain is connected with the purchasing of raw materials, transporting them to the plants, dumping wastes and bringing finished products into the market.

According to Swaminathan, Jayashankar (2000)

> Supply chain management is efficient management of the end to end process starting from the design of the product or service to the time when it has been sold, consumed and finally gotten rid of by the consumer. This complete process includes product

design, procurement, planning and forecasting, production, distribution, fulfilment and after sales support. (p.3)

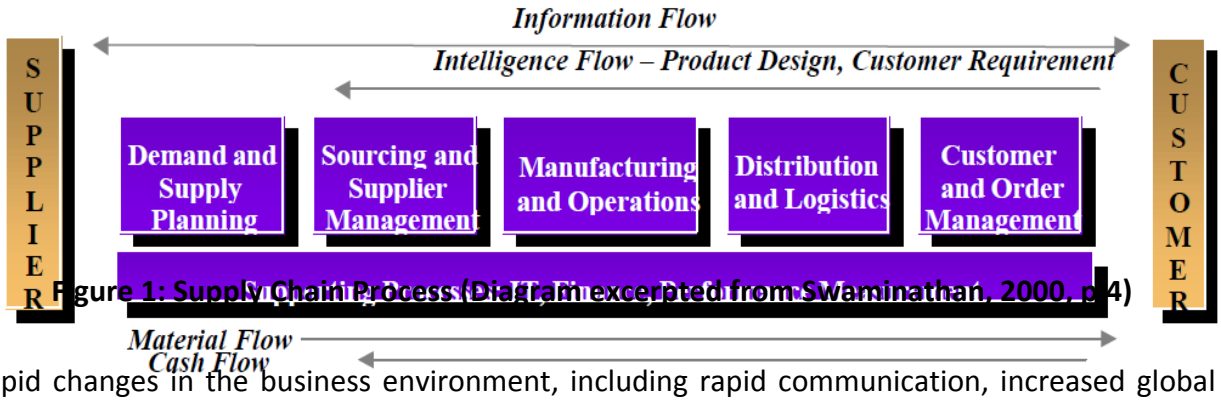

Figure 1: Supply Chain Process (Diagram excerpted from Swaminathan, 2000, p.4)

Rapid changes in the business environment, including rapid communication, increased global competition, social and environmental trends, such as climate variation, escalated population, aging,health and education, wealth accretion and allocation, sustenance, affect companies' supply chains in multiple ways, resulting in novel and developing requirements on supply chain design. Waste reduction services, emphasis on life cycle costing, asset efficiency, innovation and recycling are the well-known aspects of green supply chain.

Implemented effectively, GrSCMmotivates product and service innovation, improves asset consumption, and develops customer relationships and service levels through a common focus on reducing waste and cost. Green supply chain management (GrSCM) is not just a vague idea. It is being implemented all over the world and has done wonders for businesses. It not only gives an environmental friendly tag to the company, but it also boosts their profits. And these results are the reasons that trends are changing.

During past few years, trends have changed rapidly for multinational companies that have gone green to a large extent. They have made certain changes to their supply chains that have helped them migrate from the traditional supply chain management to the greener supply chain management. This migration is certainly not rapid, rather is done gradually but regularly.

Wal-Mart launched a business sustainability strategy in 2005 and recently set the goal of a 5% reduction in packaging in 2013. Wal-Mart was successful in saving more than 667,000 metric

tons of carbon dioxide and is how the least carbon producing company. Moreover, the company made more than $3.4billion direct savings in supply chain.Similarly, an integrated approach was applied by Nestle in 2006, to its use of product packaging that aided source cutback, salvage, recycling and less energy consumption worth $510 million.

There are many companies that are in progress of converting their supply chain management to a greener environment. The story in nutshell is that companies are vastly adopting green supply chain management because it is beneficial, and helping them to generate much higher revenue.

With climate change and global warming , the new hot topics on policy agendas of governments and tighter regulations being agreed to after the Kyoto Protocol and several COPs, United States, China, Japan, and India have had little choice in implementing mitigation strategies which put a check on carbon emissions. The European Union has implemented several measures to make transport greener and more sustainable for example, the EU charges the polluter by internalizing external costs of transport. This means, that individual modes of transport pay more than public transport. Another strategy includes of regulatory instruments combined with infrastructure and technological measures. This also suggests that companies that emit more than the threshold should pay for each cubic feet they produce. Green supply chain management also suggests correctly disposing of the gases and thus reducing air pollution. Some gases can be further captured and made to use of in other applications in the industry.

Clearly, the easiest way to judge any company's performance is through the standards it follows. The ISO14000 certification tags a company as green and environmental friendly. Hence with parameters like using paper instead of polythene, transforming diesel run engines into bio-gas engines, using lead free paints, minimizing combustion in open air and incineration of paper and recycling them instead are steps that can contribute towards the betterment and benefit of the organization.

A lot of companies are concerned that green supply chain management is more expensive than the normal supply chain. To an extent, this is correct, but most of the expenses are one time and they help companies to become sustainable in the longer run.

Alow carbon footprint is considered an excellent CSR initiative by a company. Manufacturing is a major part of supply chain management and the efficiency in usage of materials and the resources can also be a major part of becoming green. Similarly, another concept is the "design for disassembly". The machine parts and their maintenance often require oil based liquids which are often discarded in water channels. This affects the marine life and humans. This can

be minimized by properly disposing off the oil based liquids and other hazardous substances appropriately.

Green supply chain philosophy goes out of the way to recognize in today's corporate world that the area of influence of an organization persists far beyond its boundaries, while CSR focuses on area under the direct control of a particular organization. Hence GSCM calls on all partners of a particular supply chain to collaborate for creating an end-to-end Green Supply Chain to assure a sustainable and prosperous future.

One of the other advantages which implementation of Green Supply Chain serves is that it acts as a catalyst to increase innovation. Since, green supply chain management requires some parts of traditional supply chain to be modified, innovation and new technology gets involved in the supply chain management. This paves new ways and methods to research and development thus making ways broader for the innovation in supply chain. Moreover, this also allows a company to bridge gaps between research institutions of the country and enhancing the R&D sectors.

The return on investment is one important way of considering profits in relation to capital invested and in the business it's an important parameter to consider. Using methods of green supply chain management, we can safely assume that return on investment increases with time as the several supply chain expenses are minimized using green practices and the company tends to get more social acceptance and popularity among customers.

Inbound Logistics (2011) published a report in which it gave green light to 75 companies who showed great concern in converting their supply chains from traditional to sustainable ones. Following table mentions some of the most impressive companies working towards their goals.

Table 1: Companies and their green activities. (Data excerpted from Inbound Logistics, 75 Green Supply Chain partners, 2011)

DHL	In 2010, DHL transported approximately 1.7 billion carbon-neutral shipments by offering intermodal transport, carbon-neutral shipping services to mail, express, consulting services and carbon reports.
MOL	MOL's chief activities to prevent air pollution are focused on reducing exhaust gases, and substituting freon and chlorofluorocarbons in its chilling-chain apparatus with former refrigerants. MOL is currently developing an environment friendly car transporter that wills reduce its

	CO2 emissions to halve.
Transplace	Transplace has achieved industry's most prominent reduction in greenhouse gases and substantial diesel fuel savings. Transplace introduced a program in 2010, which aimed at reducing deadhead miles for private fleet transporters.2392 loads equal to 1.6 million miles were reduced. Another 5055 trucks and 3.4 miilion miles were saved by Transplace's load consolidation attempts.
Inmar	Approximately 181 million pounds of material was kept away from landfills through Inmar's re-marketing activities. In 2010 Inmar Launched its donation program through which 6 million meals for poor were created from 2 million boxes of food that would have instead been wasted.

DIRECTIONS FOR PAKISTANI COMPANIES TOWARDS GREEN TECHNOLOGIES:

Green Technologies:

Introducing green supply chain in a company can be a difficult job; managers find it challenging to introduce green practices in their supply chains. To simplify things, certain green technologies have been introduced which can be used effectively at the implementation stage. The following diagram can be used by Pakistani companies as guidance on their journey to green supply chain.

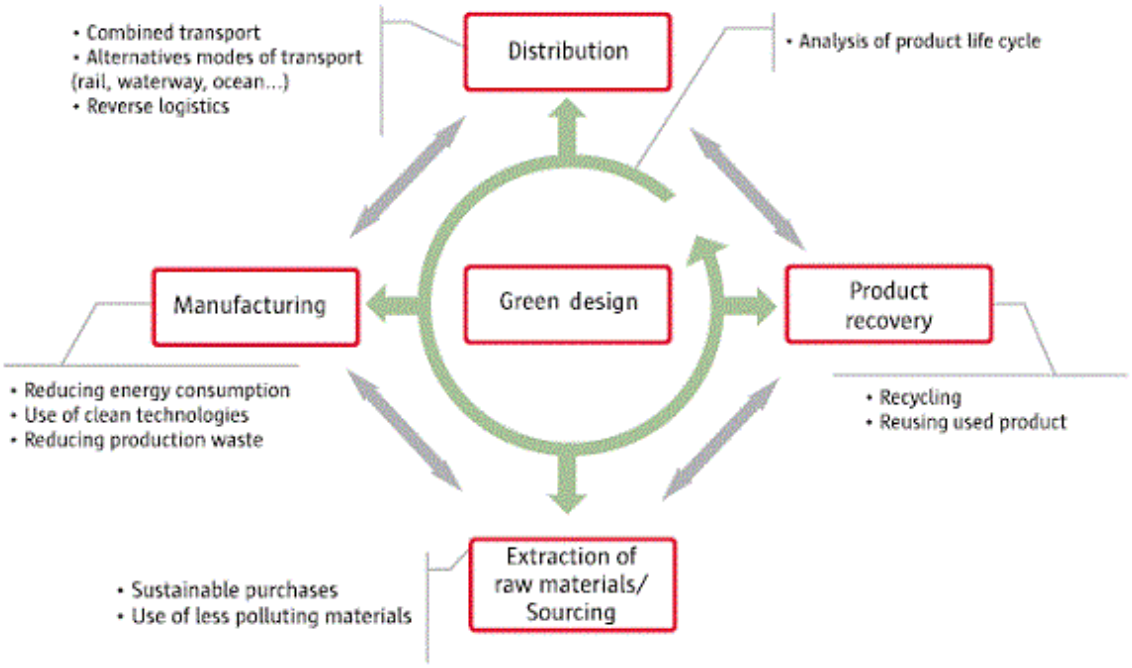

Figure 2: Green supply chain model. Source: Bearing Point Management and technology consultant, Survey Report (2008)

Green Purchasing:

Green Purchasing is defined as the purchasing of raw materials that come from environmentally stable processes. Purchased materials should meet all the standards of cost, quality and delivery set by companies plus the environmental objectives. Choosing products that are reusable, durable, more energy efficient, have a high recycled content, reduced solid waste (less packaging), are the least environmentally damaging through their life cycle all comes under the heading of green purchasing. Companies in Pakistan that have a dream to become sustainable are working hard to find suppliers that use green practices to produce their products. That is why companies tend to approach suppliers that have demonstrated a certain degree of technical competence in environmental management.

Green Design:

Advancement in science and technology is making it easier for companies to design products that are sustainable. Companies are heavily investing in their research sector to establish manufacturing practices that produce eco-friendly products. Designing products that are reusable, have longer durability and encourage environmental awareness is known as green designing. It is the systematic consideration of design issues associated with environmental safety and health over the full product life cycle during new production and process

development (Fiksel 1996).Green designing encompasses the life cycle of a product in which green practices are used in every design phase. Energy efficiency, low impact materials, quality and durability, design for reuse and recycling, renewability and robust eco design are some of the common principles which are taken in consideration when designing green products. K Srivastava (2007) writes in his paper that "green design should take into account the whole product life-cycle cost, including those during manufacturing and remanufacturing, reverse logistics and disposal."

Green Manufacturing:

Manufacturing of products by methods that consume less energy is referred as green manufacturing. Manufacturing processes are designed in such a way that least output waste is produced. Special consideration is given to raw materials that are non-toxic and recyclable.

Companies that carry out green manufacturing processes try their best to produce the least amount of defects as the presence of them will give rise to the amount of input energy used. This also benefits the companies in a longer run as minimum energy use will lead to increased profits for the organization.

Companies all over the globe are under pressure from stakeholders to be eco-efficient (Klebnikoff 1996).One of the main aim of green manufacturing is to reduce waste. Strict governmental laws have imposed great pressure on companies to take stringent actions against their waste disposal.

Deif (2011) in his paper called "A system Model for green manufacturing" outlines a green manufacturing strategy to reduce wastes. The strategy is as follows:

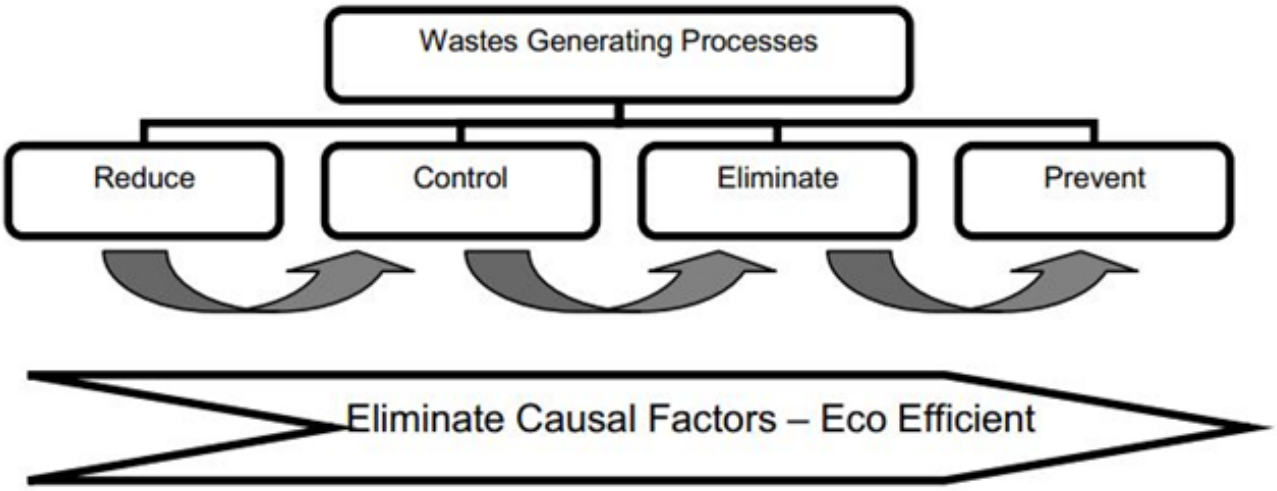

Figure 3 : Green manufacturing and wastes

Green manufacturing practices are becoming popular day by day especially in companies that have 'sustainability' as their main goal.

Green Packing:

Packaging of products is a significant process. Packaging's main function is the distribution of goods but it effects environment to a vast extent. Firms are trying to reduce their packing materials to a minimum. Huge initiatives on parts of the company are taken in which recyclable packaging technique is used. Plastic bags made from renewable resources such as recycled polyethylene are becoming common. Biodegradable and compostable materials are also focus of attention nowadays. Srivastava (2007) and Dube, Gawande (2011) quote one of the famous examples of Xerox in their papers. Xerox altered its packaging technique and established packaging-reuse centers in the UK, the Netherlands, and the US, to adjust their packaging policy. In addition, it abridged the amount of internal packaging to minimize waste.

Recently, ACCA (Association of Chartered Certified Accountants) and WWF (World wide Fund) Pakistan started a green economy forum where companies can discuss about their sustainable practices and exchange ideas with other companies for a greener future. ACCA-WWF Pakistan has also lauded the organizations that are working hard in the green sector. In 2011, it rewarded those companies that account and reveal sustainable performance. The awards aimed to inspire best practices in social and environmental reporting and to testify 'best in class' disclosure performance.

78 entries were received for the ACCA-WWF Pakistan Environmental Reporting Awards 2011 and the following were awarded:

Table 2: Awarded companies (ACCA-WWF Pakistan Environmental Reporting Awards,2011)

Best sustainability report 2011	ICI Pakistan Limited
Best environmental report 2011	Hinopak Motors Limited
Best environmental report 2011 (Unlisted companies category)	Qarshi Industries Pvt Limited

Active Participation in these types of forums will not only help Pakistani companies to achieve their sustainability goals but also to market their company as a clean and green one.

COCA COLA: FROM BLACK TO GREEN

Coca Cola perhaps has the largest and fastest supply chain going on in the entire world. An estimate shows that more than 200 countries consume Coca Cola products every day. This makes its supply chain even more intense and it can be taken as an example for our case study.

Recently, Coca-Cola took several steps to revolutionize its supply chain and took green initiatives to reduce its carbon footprints. From the water, that is a staple ingredient in almost all of the beverages to the plastic bottles in which the beverages are packaged, coke has taken initiatives to changetraditional ways to more environmentally friendly products.

The first thing was the plastic bottles. Ordinarily, the bottles came in PET (polyethylene terephthalate), a chemical that was originally made from petroleum, essentially, a large carbon composed content. This material was introduced to reduce glass bottles and transporting the bottles to a longer distance. Now, coca cola has taken another step. By making a new plastic, part of which comes from sugarcane and molasses based materials, coke is progressing to make a purely recyclable and environmental friendly bottle. These bottles, called “Plant Bottles” were widely in use in Denmark at the end of 2010. They are now being utilized in almost all of US. The bottle known as Dasani’s plant bottle claims to be 30% plant-based and 100% recyclable plastic bottle.

Not only the packing, Coca Cola was eager to save water, a major part of every beverage’s ingredient and most valuable product on earth. According to the “Coca Cola’s water and stewardship replenish report” published in January 2011, Coca Cola set the following targets in

what they called the “water stewardship goal” to maintain the sustainability of the water preservation:

1. **Reduce** water use ratio of Coke while increasing the product volume with a target to improve water efficiency by 20% by 2012.
2. **Replenish**or offset water used in finished coke beverages by participating in locally relevant projects that support communities and nature.
3. **Recycle** the water Coke uses in the manufacturing processes and return it back to environment at a level that supports the aquatic life.

Coke is partnering with organisations like WWF and WRAP, towards their goal. Coca-Cola’s main sustainable sponsorship initiativesup till now have been published in a report written by a sustainability consultancy, Good Business, revealing sustainability initiatives across weather,waste, and health.

Small level initiatives were taken by Coke to provide sustainable and clean water system to areas where there is a shortage of water and/or they don’t have access to fresh water streams.

Coke’s global collaboration with WWF is a significant part of its sustainable agriculture strategy and focuses primarily on conserving freshwater resources and nurturing improved performance for agriculturally derived ingredients.World Wide Fund For Nature - Pakistan**,** has an ongoing project named ‘Improving Sub-Watershed Management and Environmental Awareness around Ayubia National Park (G200-Western Himalayas) - Phase VI’, this $150,000 project aims to introduce improved agricultural practices and research to benefit of 27,800 local Pakistani citizens.

Coca Cola and WWF together are helping farmers and suppliers to improve their practices at the ground-level by promoting innovative growing and production methods. By supporting sustainable agriculture for key crops along the supply chain, from farm to processing mills, they are helping to conserve vital resources and ensure the long-term viability of the environment. Their partnership is focusing on the production of sugar cane, and more recently, oranges and corn – three of the high-volume agricultural ingredients used in beverages.

Coca Cola has always made efforts to make the general public aware of the advantages related to green initiatives. Recently, Coca Cola sponsored the London 2012 Olympic and Paralympic Games and launched its recycling campaign for the event. This collaboration of Coke stimulated a sustainable paradigm for upcoming sporting events.

During the London Olympics Coca Cola recycled 10.5 million bottles, returning them to Great Britain shelves in place of brand new bottles, resulting in 42 million bottles , each having 25% rPET.

Coca Cola helped the London Organizing committee of the Olympic and Paralympic games (LOCOG) by supporting the most sustainable games ever organized. The large scale bottle to bottle recycling process by Coke has been a big achievement.

Approximately 310 tonnes of carbon were saved by recycling over 10.5 million plastic bottles in just six weeks of disposal from London Olympics 2012. This was achieved through Coca Cola Continuum recycling program, a joint venture of £15 million with ECO Plastics recycling facility. Coca Cola efforts at the Olympics also incorporated work with LOCOG and WRAP to devise an innovative waste scheme that guides the shape, style and location of recycling bins at London 2012 sites.

Coca Cola also educated the visitors of Olympic Games with different recycling techniques used by it. Visitors learned the speed with which Coke can turn a plastic bottle into a brand new bottle. Nielsen research commissioned by Coca Cola shows that 70 per cent of visitors surveyed at London 2012 said, on learning this, they would now be more likely to recycle at home.

Coca Cola Pakistan is also trying to come up to the international standards set by Coke International. Coke Pakistan is taking some vital steps to minimize the use of water during beverage production process. Solar and air rinse technologies are introduced in most of the bottling plants with waste water treatment facilities. Coca Cola has also urged its bottling partners to minimize resources in all the manufacturing and production processes. For this, many partners are making their contributions by providing lightweight packaging and shrinking down emissions during Coke's delivery fleet.

Coca Cola is also coming up with innovative ideas to cut down on its logistics and distribution costs. "Pre-sell" is one such innovation, where instead of simply going up to every retailer with a truck, Coca Cola requests orders to be placed via short messaging service (sms). This new method has saved Coke Pakistan almost 30% in man-hours of delivery time.

In August 2010, Coca-Cola Export Corporations' Pakistan branch was applauded with the Environmental Excellence Award in Karachi for Coke's vision and achievement through contributions in the field of environment friendly policies. The award was also endorsed by Pakistan's Ministry of Environment, Pakistan Environment Protection Agency, Islamabad and the government of Sindh.

AWARENESS OF GREEN SUPPLY CHAIN MANAGEMENT

Green Supply Management is a newer concept and it needs to be properly channeled. In a country where literacy rate is not much, we need to properly tell people green supply chain and what it has to offer, after all the major stake holders in an organization are indeed the customers that have to choose between the products while buying. So following are certain ways of producing awareness about supply chain management.

1. Publicizing on Print and Electronic Media

The benefits of green supply chain management should be properly channelized on the print media. Special articles and success stories must be published to make people aware of the benefits of the green supply chain management. Moreover, small documentaries defining the green supply chain management and the difference between the traditional and green supply chains should be mentioned. These media activities must be in native languages and the target audience should be a normal layman citizen.

2. Public Awareness Programs

Companies can arrange some activities to attract customers and change the mentality of the people from traditional methods to greener methods. These activities may include sessions in universities, public places etc. Moreover, companies can target shopping malls and other market areas and come up with some ideas to replace common shopping accessories to greener alternatives. This will attract the customers to be more cautious towards disposing off their wastes.

3. Involving common people to supply chain network as recyclers

It might help if some company setups some small waste collecting points in key cities and asks the people to dump the required waste there. We have seen that this has been a very good trend in developed countries. It should be done in developing countries, like Pakistan, as well. The more encouragement people get, the more interested they will be and hence the supply chain will flourish!

4. Government Incentives/Benefits:

Government of various countries gives tax rebates and exemptions to companies who use sustainable methods in their production phase. Organizations revenues are highly affected by these tax exemptions, consequently escalating profit. Companies should consider this incentive

and should work hard in the sustainable sector to devise innovative methods for their green and prosperous future.

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