Does Green Matter? A Study of Perception of Manufacturers and Consumers of a Developing Country about Green Supply Chains

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Abstract

Green Supply Chain Management (GrSCM) has received increased attention from both academia and industry in recent years in the industrial nations. It focuses on reducing the adverse impact of business processes on the environment. These business processes include product design, material sourcing and selection, manufacturing processes, product delivery and end-of-life management of the product. The research studying interactions between environment and businesses in Pakistan has been scarce. This study is conducted to set a platform for GrSCM research in Pakistan as it aims to investigate the perceptions of the manufacturers and consumers regarding their understanding about GrSCM *and green products. A qualitative research design including in-depth interviews from senior managers of three manufacturing firms and a focus group of customers has been conducted for this purpose. A list of critical factors of GrSCM has been developed based on survey of the literature. The comparison between the GrSCM literature, manufacturer perception about GrSCM and consumer perception about green products lead towards the conclusions regarding; how consumers perceive green products? Do they really demand such products? Do the manufacturers think there is a need for GrSCM? How do they think GrSCM can lead to competitiveness and better economic performance? Basic understanding regarding these issues leads to the future direction for research and practice in this area.*

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1. Introduction

Green supply chain management (GrSCM) has gained increasing attention within both academia and industry. The continuous environmental deterioration over the last few decades has drastically increased the consumer awareness of environmental problems (Min & Galle, 2001). Due to this rising global awareness of environmental protection, logistics and supply chain managers have to balance the efforts to reduce costs and innovate while maintaining good environmental and ecological performance (Pagell, Yang, Krumwiede, & Sheu, 2004; Roehrich, Hoejmose, & Overland, 2017). Businesses need to pursue social, economic, and environmental sustainability goals (Walker & Jones, 2012) along with their financial bottom line.

GrSCM has evolved as a methodology that may strike a balance between these often conflicting competitive requirements (Narasimhan & Carter, 1998). It attempts to explain the interplay between traditional SCM and the natural environment. In recent years, the breadth of literature on GrSCM has increased tremendously. It now covers diverse areas such as: GrSCM strategies (Laari, Töyli, & Ojala, 2017), GrSCM enablers (Dubey, Gunasekaran, Papadopoulos, & Childe, 2015), pressures influencing GrSCM (Kauppi & Hannibal, 2017; Roehrich et al., 2017; Sayed, Hendry, & Zorzini Bell, 2017), supplier partnerships for sustainability (Sayed et al., 2017), green behaviors (Li, Shao, & Zhang, 2018), and relationship between GrSCM and performance (Hong, Zhang, & Ding, 2018; Laari, Töyli, Solakivi, & Ojala, 2016; Jabbour, Brust, Jabbour, & Latan, 2017; Luthra, Garg, & Haleem, 2016; Vanalle, Ganga, Godinho Filho, & Lucato, 2017; Vijayvargy, Thakkar, & Agarwal, 2017).

This study is conducted to set a platform for GrSCM research from a developing country's perspective. A number of studies have highlighted the importance of research in this area in developing countries (Dubey et al., 2015; Vanalle et al., 2017; Vijayvargy et al., 2017). This is due to the fact that implementation of these practices in developing countries is still limited and these countries face greater barriers to sustainability (Hong et al., 2018). It is also important to study this phenomenon from a developing country's perspective because the research has indicated that these countries especially the under-developed ones require substantially different business

models due to the existence of numerous barriers (Bendul, Rosca, & Pivovarova, 2017). While studies have been conducted in the area of GrSCM in developing countries, Vijayvargy et al. (2017) conceded that developing countries are likely to differ on the basis of characteristics such as market size and sales volume etc. Thus, the studies conducted in countries such as Brazil, China, and India may not be generalizable to Pakistan. They also identified a need to study the role of different types of pressures in GrSCM practices adoption. In this respect, research has indicated that stakeholder pressure especially from the customers has increased in recent times (Laari et al., 2016; Jabbour et al., 2017).

This study investigates the perception of both the manufacturers and consumers regarding the green products and GrSCM. Using a qualitative research design that includes in-depth interviews from senior managers of three manufacturing firms and a focus group of customers, this study explores the current state of GrSCM in Pakistan. It investigates how manufacturers and consumers perceive green products. Do the manufacturers think there is a need for GrSCM? How do they think GrSCM can lead to competitiveness and better economic performance? Do the consumers really demand green products?

2. Literature Review

2.1 Defining the Green Supply Chain Management (GrSCM)

Regulatory, competitive, or societal pressures encourage firms to develop approaches towards managing environment that result in the development of *green* practices (Sayed et al., 2017). Importance of environment has increased for businesses in recent times (McIntyre, Smith, Henham, & Pretlove, 1998). Green supply chain management has emerged as an effective management tool and philosophy for proactive and leading manufacturing organizations. GrSCM is rooted both in environment management and supply chain management literature. Although sufficient literature exists about various aspects and facets of GrSCM but it still lacks consensus on the scope and definition of GrSCM (Zhu & Sarkis, 2004). Many researchers have defined green supply chain in various manners using different terms. Table 1 shows the nomenclature being used for green supply chain.

GrSCM focuses on reducing the adverse impact of business processes on the environment. So irrespective of the nomenclature adopted, the bottom line remains the same, i.e. "environment". Since a supply chain (SC) consists of many entities, all these entities also have a role in *greening*

the SC. For example the suppliers can recycle or re-use the parts or sub-assemblies, manufacturers can prefer those designs that are more easily dis-assembled, and the distributors or other downstream entities can ensure that packaging and transportation is environment friendly (Van Hoek, 1999).

Table 1
Green Supply Chain Nomenclature

Terminology	Study
Green supply chain management	(Laari et al., 2017; Luthra et al., 2016; Vijayvargy et al., 2017)
Closed loop supply chain	(Beamon, 1999; Dyckhoff, Lackes, & Reese, 2004; Van Hoek, 1999; Zhu, Sarkis, & Lai, 2008)
Sustainable supply chain	(Bendul et al., 2017; Hong et al., 2018; Maysara, & Marta, 2017)
Environmental supply chain	(Beamon, 2005; Hall, 2000)
Supply chain environmental management	(Lippman, 2001; Sharfman, Shaft, & Anex Jr, 2009)
Ethical supply chain	(Beamon, 2005; Roberts, 2003)
Integrated supply chain	(Preuss, 2001; Vachon & Klassen, 2006; Zhu & Sarkis, 2006)
Socially responsible supply chain	(Salam, 2009)

This study classified the existing GrSCM literature into three broad categories: The inbound functions; green operations/ production; and the outbound functions. The *inbound* functions mainly focus on green purchasing/ procurement, while *green operations/ production* involves green design, green manufacturing (reduce; recycle; remanufacturing: re-use, product and material recovery), and the *outbound* function relates to all the operational aspects related to product packaging, green marketing and reverse logistics.

2.1.1 Inbound Functions

Conventionally the scope of the "procurement" function had been limited to merely providing support to supply chain management with little relevance to the organization's strategic business goals (Green, Morton, & New, 1998). Increased global competition during the last decade or so has resulted in enhanced focus on achieving low cost, high quality, and product

reliability simultaneously (Roehrich et al., 2017). This has heightened the need for enhanced supplier relationships that results in better quality of purchased materials with decreased inspection. Min and Galle (2001) defined Green purchasing as "an environmentally conscious purchasing practice that reduces sources of waste and promotes recycling and reclamation of the purchased materials without adversely affecting the performance requirements of such materials". According to Rao and Holt (2005) green procurement responds to concerns like minimization of material inputs through reduction in wastages, selection of environmental friendly raw materials, and reduction in the use of hazardous materials.

2.1.2 Green Operations/ Production Phase

A number of areas have been focused in the production phase of a green supply chain including design for environment, cleaner production process, green manufacturing and remanufacturing, and management of hazardous waste (Rao & Holt, 2005; Srivastava, 2007). The green production focuses on the use of environmental friendly raw materials. It ensures that the products produced by an organization are environmentally designed and are friendly to nature. The green production practices also ensure production optimization by the adoption of lean and green production practices for waste and pollution reduction (King & Lenox, 2001).

2.1.2.1 Green Design

Green-design refers to the improvement in products and process that result in environmental risk mitigation (Sayed et al., 2017). It is considered a major area through which ecological footprint of a product can be reduced by modification of product design (Fang & Zhang, 2018). Madu, Kuei, and Madu (2002) offered an organizational framework for the environment friendly design. The purpose was not to evaluate the product on its functionality characteristics alone, but also on the ecological burden that the product carries. In order to achieve this, the inputs from the product design teams as well as other stakeholders are integrated into the framework for green design.

2.1.2.2 Green Manufacturing and Remanufacturing

Green manufacturing refers to techniques used in attempt to minimize the usage of unused materials and thus reduces the energy and resource consumption of production processes (Srivastava, 2007) . It has been shown to be very effective in alleviating the strain on natural environment (Chien & Shih, 2007).

Remanufacturing is described as the activities related to bringing a used product to like-new condition (Ijomah, 2010). The activities include sorting, inspection, disassembly, cleaning, reprocessing and reassembly of components of a product. According to (Linton & Johnston, 2000), cost of products produced by remanufacturing is about 25 percent less than the cost of new products. *Recycling* is done to reclaim material content of used and non-functional products (Srivastava, 2007). Recycled materials have a lower carbon footprint and hence have a significant advantage over new raw materials (Ravi, 2011).The objective of *repair* is to bring a non-functioning used product to a working condition, while *refurbishing* is done to raise a used functioning product to a certain quality standard (Srivastava, 2007).

2.1.3 Outbound Functions

Outbound functions of GrSCM are the firm practices that deal with the customers in environmentally sustainable manner. These include the operational aspects related to green marketing, product packaging and reverse logistics (Rao & Holt, 2005). There is strong evidence to support the customer preference for products that are labeled as "green" as compared to those products which are not (Rokka & Uusitalo, 2008). Product packaging serves the role of easy product handling and preventing the potential damages to the product but on the other hand most of the glass, metal, paper or plastic packaging is a heavy contributor to solid waste stream. Use of techniques like reverse logistics and waste exchange in the outbound function can result in savings in costs and increase in competitiveness (Rao & Holt, 2005).

2.2 Link between GrSCM and Performance

Many researchers have supported the notion of GrSCM leading to improved environmental performance (Hong et al., 2018; Laari et al., 2016; Luthra et al., 2016; Vijayvargy et al., 2017). Paulraj, Chen, and Blome (2017) reported that some researchers believe that GrSCM initiatives increase the costs of the firm and hence result in competitive disadvantage. However, an increasing number of studies have shown that firm's responsiveness towards environmental objectives influences the firm's performance positively through raising the morale of employees, enhancing customer goodwill, and improving relationships with stakeholders such as government agencies and investors.

2.3 Consumer Perception about Green Products

The second objective of this research is to inquire about consumer perception towards products classified as "green". Min and Galle (2001) reported a dramatic increase in the consumer awareness about green products due to recent degradation of natural environment (Srivastava, 2007). This study uses the environmental factors that contribute to the perception formation of the consumer about green products. The factors contributing to consumer perception, as tested by D'Souza, Taghian, Lamb, and Peretiatkos (2006), include: corporate perception, environmental regulation, price and quality perception, product dimensions, product labels, and consumers' past experience with the product.

3. Methodology

This study is exploratory in nature and is aimed at assessing the perception of the manufacturers as well as the consumers about GrSCM and green products in a developing country like Pakistan. This study uses two well-known qualitative research methodologies i.e. multi-case approach, and focus groups.

A case study method is preferred over other methods as case method evaluates the real time circumstances without being prone to manipulation (Soltani & Wilkinson, 2010) . This paper uses multiple case studies in order to investigate the perception of manufacturers in Pakistan regarding GrSCM. Multiple cases approach has a potential for making major scientific discoveries as it provides comparison between the cases as opposed to within the same unit of analysis (Jensen & Rodgers, 2001). This study uses three case studies to investigate the GrSCM practices in Pakistan. Companies chosen for the study are well established companies holding leading positions in their respective industries. They belong to the class of companies that lead the way for the others. The case studies are developed through extensive interviews from the supply chain managers of these organizations.

On the other hand a focus group was conducted to check the perception of consumers regarding green products. Focus group is a tool to generate data using discussions between focus group participants. It differs from the typical group interviews methodology used for conveniently generating data from different respondents, as focus group capitalizes on the group interaction for data. This results in useful exploration of respondents' perceptions and experiences as it not only invokes what the participants

think, but also how they think and why they think so. The data gathered through focus groups is superior in many cases as it allows the respondents to explore and clarify their views in the group discussions, which may not be the case in one to one interview or survey.

4. Research Findings

The findings of this research study are presented in the following two sections. The first section describes the practices related to GrSCM of the three case companies in Pakistan. The second section presents the findings of the focus group conducted to explore the perceptions of consumers about green products.

4.1 Case Analyses

Case 1: A Multi-National Foods and Beverages Company

The first case company is an ISO 9000 and 14000 certified multinational company that is the world leader in convenient foods and beverages. This study focuses at the Snacks division of the company and the following section describes its GrSCM conceptualization and practices.

Inbound Functions

The more conventional term of Environment Management System (EMS) is replaced by Performance with Purpose (PWP) with an environment sustainability focus. The company only works with a selected number of suppliers. It has a very strict environmental regulatory policy, so in the supplier selection process the environmental criteria is a must, the company makes sure that the production at supplier premises takes into account the environmental issues seriously. As a part of its supplier quality assurance (SQA) initiative, the company guides its suppliers in using better environment practices, but no effort of formal supplier collaborations for joint learning is initiated in the snacks division as yet.

Production/Operations Phase

In the production phase, the environmental friendliness of raw materials is a major concern for the company. Environmental design considerations such as biodegradability of the final product are ensured while optimizing the production process to reduce solid waste and emissions. The cooking oil is reused internally through some method while ensuring the same product quality. However, potato waste like starch is sold to outside vendors who use it in nonfood items only. The snacks division has started using solar energy as a part of the company's PWP initiative, thus contributing to the energy optimization. Similar care is taken while using water resources. In

the recent years, the company has successfully reduced the water usage per ton on raw materials from 15 to 10 liters of water while achieving the same product quality. Wastages during the production are carefully watched and are recycled internally. The company is currently working on a new initiative regarding wastage control, it is called the "Zero Wastage" policy and the entire workforce within the company from the top management to the lower tiers is playing its part for a successful implementation of this policy.

Outbound Functions

The company considers product packaging an important aspect of their GrSCM practices. Most of the packaging material used is recyclable and reusable but the company does not have a mechanism to communicate information on environmental friendly products and/or production methods. Only the expired products are currently recovered, although the company also plans to start recollecting the packaging carton and recycle them in future. Eco labeling using different signs and symbols is done on the final product. The company has outsourced its transportation to third party logistics (3PL) service providers for its snacks division. In order to protect the environment from carbon emissions, the company uses vehicles with smaller engines as its snack products are not very heavy.

Competitiveness

The company is very environmental conscious and has a better performing environmental management system (EMS). It considers green practices at the inbound, production and outbound levels to be effective in improving efficiency and productivity of its operations. Cost saving is perceived to be one of the biggest advantage of such green practices. The company also believes that such environmental initiatives have helped in improving its product quality.

Economic Performance

The company recognizes that GrSCM has the potential to make the company explore new market opportunities. Although the product price may increase causing lower profit margin, but benefits of increased sales and market share in the long run may have a much significant effect on the overall economic performance related measures.

Case 2: A Local Food Company

The second case company is the oldest food company in Pakistan with a product range spread over nine categories encompassing 140 products. It is

the first food company in Pakistan to achieve ISO 9001 accreditation in 1998. It has fully integrated operations with its own growing and processing facilities at one location. The following section describes the GrSCM conceptualization and practices of this company.

Inbound Functions

The company has a formal EMS with a greater focus on waste reduction techniques. The company does not organize any awareness seminars involving various suppliers. However, a number of meetings with individual suppliers are held during each fiscal year to guide the suppliers in improving their processes and reduce wastages. Although the company does not play any direct role in bringing together suppliers in the same industry to share their know-how and problems, yet they appreciate such initiatives taken by any of their suppliers, and actively participate in such seminars. There are no environmental criteria for supplier selection. The company is not concerned about the presence of any EMS at its supplier's premises. The company only ensures that the suppliers use hygienic production techniques while producing the raw material/ packaging material for the company.

Production /Operations Phase

Generally there are no established environmental criteria during the production phase. Although environment friendly raw materials are used in the production, but the environmental design considerations are not taken into account. As most of the products are made from fresh fruits, biodegradability is a naturally built-in feature in the products. Optimizing the production process to reduce solid waste is considered an important factor for cost reduction. There is no internal process of recycling the wastages produced during the production process. These wastages are sold to poultry farms that use them as feed. The company has a water filtration plant. The water used in production is filtered and is reused in order to efficiently utilize the water resources. Few of the old machines have been replaced by the new energy efficient machines resulting in a decrease of energy consumption.

Outbound Function

Most of the packaging material used is recyclable and reusable like glass and paper, but plastic components are a bit of concern. The company has recently started working on improving the packaging in order to better manage the environment-friendly waste management. The company has

started negotiation with one of its packaging suppliers who claims to have made an enzyme for polythene made packaging material that ultimately decays and completely dissolves the packaging into the soil after its useful life. But this project seems to have slow progress as such an initiative is considered to be a cost adding factor. The company recovers its expired products using reverse logistics mechanism, but the empty jars and other packaging materials are not taken back from the customers.

As a part of the environmental concern, eco labeling using different signs and symbols is done on the final product. Transportation is outsourced to third party logistics (3PL) service providers; therefore the use of eco-friendly transportation is not directly related to the company. The company also does not play any role in promoting the use of eco-friendly vehicles by its 3PL service provider. The company has recently increased the number of its warehouses, resulting in the reduction of the numbers of vehicle trips and extra mileage travelled by the carrier.

Competitiveness

Although green practices at the inbound, production and outbound levels are not focused as such but improved efficiency, productivity and cost saving are considered to be the advantages of GrSCM that lead to competitive advantage. The company does not consider improvement in the product as a major benefit of GrSCM. Cost cutting and process optimization are regarded as true benefits of GrSCM.

Economic Performance

Using GrSCM for development of new market opportunities is considered farfetched in the current scenario. The company believes that green practices require investments that will increase the product price and cut down the profit margin. It believes that creating niche markets would take time as local consumer awareness level for green products is very low. Increased sales and market share may be achieved but will require major investment in GrSCM.

Case 3: A Leading Chemical Manufacturer

The third case company is a leading chemical manufacturer in Pakistan. It is a subsidiary of a world renowned (ISO 9000 and 14000 certified) German manufacturer of textile chemicals. The following section describes the GrSCM conceptualization and practices of this company.

Inbound Functions

In contrast to its parent company, the case company does not have a formal EMS system. Most of the raw materials are purchased from the German parent company having well established EMS systems. The company neither organizes any awareness seminars nor plays any guiding role in setting up an EMS system for their local suppliers. Normally there are no environmental criteria for supplier selection. However in some cases when the customer asks for such requirements, the company makes sure that raw materials are procured from environmentally certified suppliers.

Production/Operations Phase

The supply chain manager revealed that the chemical production has very significant environment after effects; so keeping in view such issues, the company has substituted the use of *Sulfuric acid* with *Citric acid* in all the products. Sulfuric acid is a highly corrosive strong mineral acid that is very dangerous for all living beings especially when such acids are drained in canal waters which is then used in farming. Optimization of the production process to reduce solid waste is done by producing larger batches normally fulfilling the whole month's forecasted demand. All the wastages are recycled internally.

Outbound Functions

The company packs its products in big tanks containing 1000 liters of product. These tanks are recollected from the customer and are reused till their useful life. The company recovers its expired products only on customer requests. Such expired chemicals are recycled by mixing them with other chemicals to improve their efficiency. Proper eco labeling is also done on the packaging tanks providing the users with all the necessary information regarding the use and dumping of such chemicals. The company has outsourced its transportation to third party logistics (3PL) service providers so using eco-friendly transportation is not directly related to the company. The company does not play any role in promoting the use of eco-friendly vehicles by its 3PL service providers.

Competitiveness

Although green practices at the inbound, production, and outbound levels are not focused as such but improved efficiency, productivity and cost saving are considered to be the advantages of GrSCM that lead to competitive edge. The company believes that improving the product quality

may not be an advantage, rather cost cutting and process optimization are regarded as true benefits of GrSCM.

Economic Performance

GrSCM for new market opportunities is considered only a remote possibility in the near future. The company believes that green practices require investments that will increase the product cost and reduce profit margin. The company regards major investment in GrSCM to be the only option available in order to create niche markets for green products, as the current awareness level of local consumer regarding green products is considered too low.

4.2 Consumer Focus Group

Responses in Table 2 of consumers clearly indicated that they expect the companies to be more responsible towards the protection of environment. The perception with respect to priority given to environmental safety shows the positive environmental orientation of the respondents. Although the primary goal of the corporations is to make profits but when it comes to environmental protection the Pakistani consumers believe that companies should aim to reduce pollution rather than merely increase the profits. However, the government has also been identified as having the responsibility for safeguarding the environment.

Respondents do not appear to consider that the current government regulations are adequately protecting the environment and believe that Pakistan Government is playing a very superficial role in execution of the environmental laws and regulations. The unanimous opinion of the respondents highlighted the lack of implementation of environmental regulations.

Product packaging being recyclable, reusable, biodegradable, capable of being repeatedly used, replenished, or sustainable does not seem to attract customers in making the purchase decisions as they are not too concerned about these issues. Most of the respondents believe that consumers have already established brand loyalty towards mainstream products, therefore the green packaging element of the products may not affect their purchase decisions. However, sustainability of the packaging material is something that the consumers feel a "must be" part of the product and using extra packing material beyond the functional requirement is considered to be a good thing irrespective of its recyclability or reusability.

Table 2
Focus Group Results

Total perception about green products	Responses
Labels	
Labels are easy to read	NO
Labels are accurate	NO
Packaging & ingredients	
Recyclable/reusable	YES
Biodegradable	NO
Harmful to wildlife	NO
Not tested on animals	YES
Regulatory protection	
Government safeguards the environment	NO
Legislation adequately regulates environmental protection	NO
Corporate perception	
Companies should give priority to reducing pollution even if jobs are at risk	YES
Companies should aim to reduce pollution than increase profit	YES
Product perception	
Green products are not as good as alternatives	NO
Green products are more expensive	YES
Past experience	
Rely on past experience rather than information on labels	YES

Based on the information provided, the consumers do not give much importance to the factors such as using better and energy efficient production techniques. Consumers are least concerned about the lower levels of energy used in manufacturing a green product. Nevertheless, there is a concern regarding the amount of pollution produced during the manufacturing processes. The consumers agreed to the point that manufacturing process must produce less pollution and proper disposal of the waste should be planned in order to protect the environment from pollution hazards.

Table 3(cont.)
Case Summary Table

GrSCM activities	Activity detail	Case company 1	Case company 2	Case company 3
Inbound	Holding awareness seminars for suppliers and contractors	*Not practiced; work with individual suppliers only*	*Not practiced; Bi annual meetings only with selected suppliers*	*Not practiced*
	Guiding suppliers to set up their own environmental programs	*Yes; with selected suppliers*	*Not practiced*	*Supplier plays this role*
	Bringing together suppliers in the same industry to share their know-how and problems	*Not practiced*	*Not practiced*	*Not practiced*
	Informing suppliers about the benefits of cleaner production and technologies	*Yes; with big suppliers only*	*Not practiced*	*Major supplier has a better EMS*
	Urging/pressuring suppliers to take environmental actions	*Yes*	*Not too much emphasized*	*Only if customer has such requirement*
	Choice of suppliers by environmental criteria	*Yes; a serious concern*	*No; traditional criterion only*	*No; but customer specific arrangements are made for such requirement*

Table 3 (Cont.)
Case Summary Table

GrSCM activities	Activity detail	Case company 1	Case company 2	Case company 3
Production	Environmentally-friendly raw materials	*Yes; ensured seriously*	*Is not a MUST BE part of production planning*	*Yes; due to hazardous nature of raw materials*
	Substitution of environmentally questionable materials	*Not practiced*	*Not practiced*	*Yes; such initiatives are taken as company policy*
	Taking environmental criteria into consideration	*Yes; strict policy*	*Not a priority*	*Not a priority*
	Environmental design considerations	*Yes; ensured seriously*	*Not considered an integral product design feature*	*Yes; environmental safety is taken care off*
	Optimization of process to reduce solid waste and emissions	*Yes*	*Yes*	*Yes; but loopholes exist*
	Use of cleaner technology processes to make savings in energy, water, and waste	*Yes*	*Yes*	*Yes*
	Internal recycling of materials within the production phase	*No; due to product nature*	*No recycling within production phase*	*No recycling within production phase*
	Incorporating environmental total quality management principles such as worker empowerment	*No*	*No*	*No*

Table 3 (Cont.)
Case Summary Table

GrSCM activities	Activity detail	Case company 1	Case company 2	Case company 3
Outbound	Environment-friendly waste management	*Not practiced*	*Not practiced*	*Not practiced*
	Environmental improvement of packaging	*Yes*	*Yes; a new initiative is under discussion*	*Yes; recently new & improved packaging is introduced*
	Taking back packaging	*No*	*No*	*Yes*
	Eco-labeling	*Yes*	*Yes*	*Yes*
	Recovery of company's end-of-life products	*Yes; expired product case only*	*Yes; expired product case only*	*Yes; expired product case only*
	Providing consumers with information on environmental friendly products and/or production methods	*No*	*No*	*No*
	Use of environmentally-friendly transportation	*No*	*No*	*No*
Competitiveness	Improved efficiency	*Yes*	*Yes*	*Yes*
	Quality improvement	*Yes*	*Yes; with increased cost*	*Yes; with increased cost*
	Productivity improvement	*Yes*	*Yes*	*Yes*
	Cost savings	*Yes*	*No*	*No*

Table 3 (Cont.)
Case Summary Table

GrSCM activities	Activity detail	Case company 1	Case company 2	Case company 3
Economic performance	New market opportunities	*Yes*	*May be*	*No*
	Product price increase	*No*	*Yes*	*Yes*
	Profit margin	*Increased margin*	*Reduced margin*	*Reduced margin*
	Sales	*Increased sales expected*	*Increased sales expected*	*Expected to decrease with high product price*
	Market share	*Increased share*	*Increased share*	*Decreased share*

Most of the respondents indicated that they do not read product labels. They do not seem to rely on the information given on labels as they doubt the information being completely accurate. Secondly, most of the respondents do not agree that the labels are easy to understand keeping in view the overall literacy rate in Pakistan. They believe that the words, signs, and symbols used in the labels are adopted from the west and these should be locally contextualized. The only positively taken message from product labeling is that the ingredients have not been tested on animals and are not harmful to wildlife. This has a very positive impact on the minds of consumers. Consumers' perception towards environmental friendly products i.e. harmless to animal and plant life or produce less pollution, is very positive. Communicating such product information to the consumers can influence their purchase decisions as they seemed to be inclined towards product's friendliness towards wildlife.

The respondents' past experiences with green products appear to be negative resulting in a perception that green products that are remanufactured, repaired, or refurbished are generally more expensive and lower in quality in comparison with alternative products. However, they also indicated that they are willing to pay premium prices for green products (5 to 10 % more) even if the products are lower in quality as compared to mainstream products only in case if the green nature of the product is well communicated to the customers through labels or other marketing channels.

5. Discussion and Conclusion

Environment, society, and economy are the three pillars of sustainability. Enhanced sustainability contributes to long-term financial returns and competitiveness. Thus, using a strategic approach towards achieving sustainability is critical for firms (Shibin, Gunasekaran, & Dubey, 2017). Given the current deteriorating state of Pakistani environment, this study explores perceptions of producers and consumers towards environmental sustainability. The idea is to understand the current state of awareness between manufacturers and consumers towards the factors that lead to sustainability. Evaluation of customer perception is an important component of this research due to the fact that a number of studies have shown that customer pressure is an antecedent to the implementation of green practices (Jabbour et al., 2017; Luthra et al., 2016). Thus, the general idea is to gauge the customer's understanding about the green practices in order to know whether the customers can influence manufacturing firms to make green products and develop green processes.

The case method provides valuable in-depth insights into the current level of green practices employed in the selected companies. Although case method is not prone to generalization, selection of best-in-class firms does provide an understanding of the general understanding about sustainable/green practices amongst the manufacturing firms. The results demonstrate that although the managers in three case companies believe that greening the inbound function and green production significantly lead to greening outbound function, as well as to competitiveness and economic performance of the firm, the companies do not have a well-established environmental management system due to lack of overall environmental concerns.

In an attempt to green the inbound functions, the integration of the suppliers into a green supply chain is not being focused in any case company.

The suppliers are not urged or pressurized to have their own environmental management system, nor do the companies play any guiding role in this regard. This is a critical hurdle in GrSCM adoption as highlighted by Roehrich et al. (2017) who suggested that the implementation of GrSCM practices even with the first-tier suppliers is not enough. It needs to go into higher tiers of the supply chain. Pakistani industry needs to work on this area of green practices. On the positive side, case firms are benefitting from lower quantities of solid and liquid waste due to improved green operations within the production phase, leading to improved resource utilization and enhancement in economic performance. Due to outsourced logistics, the outbound activities are least green in all the three case companies. Product packaging in the outbound is the only area that is getting attention currently.

This paper also explores the consumer perception regarding the use of green products. The results of the focus group reveal that the consumers in Pakistan have a high level of concern about environmental impact on wildlife. They expect the manufacturing companies to use greener production processes and minimize the damaging impact on the environment. The consumers however demonstrated less confidence on the effectiveness of the government's regulations and its implementation. The presence of consumer perception that green products are more expensive is similar to the other studies done in some developed countries. Government pressure has also been highlighted as an important contributor towards forcing the firms towards implementing the green practices (Campbell, 2007; Walton, Handfield, & Melnyk, 1998). The results of this study thus resonated with previous research in this aspect.

This study is one of the earliest studies conducted in Pakistan in the area of green supply chain practices. This research is exploratory in nature. The findings of this study though useful in providing some insights on the current state of GrSCM in a developing country like Pakistan, lack in their ability to be generalized. An extensive empirical study may thus provide the necessary statistical foundations for these results to be generalized for all the manufacturing companies. Secondly, the study is also limited to companies in Pakistan only. Similar studies in other developing countries may result is providing common themes about manufacturer and consumer perceptions about GrSCM. These themes may then provide useful foundation for the strategists to design environmental friendly corporate business strategies, as well as for the formulators of government's environmental regulations to make more effective policies.

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