ADOPTION OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES IN PAKISTAN TEXTILE INDUSTRY

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Abstract

Environmental sustainability in recent years has become a growing concern for businesses worldwide. Increased environmental awareness, pressure from key stakeholders, internal and external environmental factors have been the driving force for organizations to adopt green supply chain management practices. The purpose of the study is to identify drivers to adoption of green supply chain management practices and explore how have the green practices been adopted in the apparel industry of Pakistan. The textile sector of Pakistan has not been extensively investigated in literature in terms of green supply chain management.

As the purpose of the study is exploratory, therefore, qualitative research methodology has been used in which multiple case studies have been evaluated. Five green supply chain management practices were identified from literature, namely: green purchasing, cooperation with customers, internal environment management, green logistics and eco-design. Data has been collected from three textile companies based in Punjab. The analysis was done in two phases; within case and cross-case. It was observed that only the companies selling to the international market have adopted green supply chain management practices of green purchasing, co-operation with customers, internal environment management and eco-design. As far as green logistics is concerned, the only initiative taken in the local market is the use of biodegradable bags and that too for specific orders. Hence, it can be inferred that green logistics is in the initial stages of adoption in Pakistan and it will take time for the companies to adopt green logistics.

A unique insight found in this study relates to driver behind adoption of green practices. While emerging economies like India and China are strongly driven by government rules and regulation to adopt green practices, in the case of Pakistan, international customers and internal organization factors mainly drive these practices. Future researchers can widen the scope of the study by exploring more practices like green manufacturing and by increasing the sample size. Moreover, they can use the same framework and observe it in a different industry.

Keywords: Emerging Economies, Green supply chain management, Green supply chain management practices, Adoption.

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Chapter 1

Introduction

This chapter establishes the structure of the research study by shedding light on the background of the research problem and introducing the proposed research objectives. The scope of the research study has been briefly discussed in this chapter followed by the methodology. Lastly, the chapter is concluded by presenting the relevance and contribution of the study to the existing body of knowledge.

Sustainability is a new emerging concept. It has lately been of great interest to both the researchers and the practitioners. Numerous researchers have started exploring various aspects of sustainability. Sustainability extends the traditional role of a supply chain by adding environmental, social and economic responsibilities throughout the supply chain (Taghikhah, Voinov, & Shukla, 2019). Green supply chain management (GSCM) stems its roots from the concept of sustainability. GSCM is the environmental component of sustainability, which requires the organization to be environmentally cautious in terms of the final product it is delivering, the processes it is using and also the raw material that it is sourcing from its vendors. GSCM also requires the suppliers and other stakeholders to be environmentally careful in terms of the practices they are performing.

Over the past few decades, internal organization factors as well as pressures from external environment and increased awareness of key stakeholders about environmental sustainability have placed significant burden on organizations to adopt practices of green supply chain management (Zhu, Sarkis, & Lai, 2007). Huge corporations like Nike, Disney, Levi Strauss, Benetton, Adidas and C&A, etc. have all been accused of violating green supply chain management practices. These organizations have been caught off-guard polluting the environment and mistreating the employees by depriving them of their basic rights (Seuring & Muller, 2008). After such an outrage exploitation of resources and human labor, organizations have been bound by legislations to adopt green supply chain management practices (Beske, Koplin, & Seuring, 2008).

The world has become a global village and globalization has largely increased the transparency of business organizations. Companies, which are under a constant pressure to survive competition, tend to switch to cheaper alternatives and start exploiting resources of less developed economies. However, as the companies expand globally, they become more visible to the public eye. Given, the increasing rate of exploitation and depletion of resources, the focus has shifted from supply chain management to GSCM (Taghikhah, Voinov, & Shukla, 2019). With globalization, customer awareness has been greatly enhanced and customers require companies to adopt green supply chain practices (GSCMP). In order, to adopt these practices, companies need to extend their relationship with their customers and suppliers.

Figure 1 Green Supply Chain Management Practices Source: (LEAN AND GREEN SCM TRANSFORMATION, 2016)

Faced with environmental concerns, the organizations are expected to add the "green factor" to their supply chains. Adding the "green factor" requires organizations to be environmentally conscious when making supply chain decisions. Environmental practices must be considered at each stage of the product lifecycle. It includes all sort of activities related to the manufacturing and sale of a product/service. In the past, environmental factors were considered as operational factors but now the trend is changing and these factors have emerged as an integral part of the whole supply chain (Klassen & Curtis P., 1993; Preuss, 2002).

Various green supply chain management practices (GSCMP) have been identified in literature such as green purchasing, co-operation with customers and suppliers, green technology systems, green sourcing, recycling, etc. Figure 1 presents a snapshot of the different practices discussed in literature. These practices demand that organizations work in close collaboration with their customers and suppliers to develop an environmentally sustainable supply chain. Adoption of GSCMP reduces waste, improves the consumption of natural resources, prevents its exploitation and also leads to improved business performance (Jr, Zelbst, Meacham, & Bhadauria, 2012).

Developed economies are the initiators and forth runners in the adoption of green supply chain management practices. This enriches their competitive advantage, as well as adds value in their supply chain. On the contrary, developing economies are lagging behind in adoption of green practices. This owes largely to the lack of environmental awareness (SODA, Sachdeva, & Garg, 2015).

In the textile industry, the case of green supply chain management is specifically critical. Textile operations are being off-shored from developed economies to developing economies, namely; China, Bangladesh, India, Cambodia, Vietnam and other South Asian countries which largely take advantage of the low cost. Textile sector must follow a set of complex processes, which comprise of dyeing, drying and finishing, leading to immense chemical and carbon emission. Secondly, the production of cotton and fiber require use of environmental damaging pesticides and huge quantity of water (a natural resource). Textile sector is thought of being amongst the highest environmental pollution-creating sector (Caniato, Caridi, Crippa, & Moretto, 2012).

Figure 1 Green Supply Chain in the textile industry

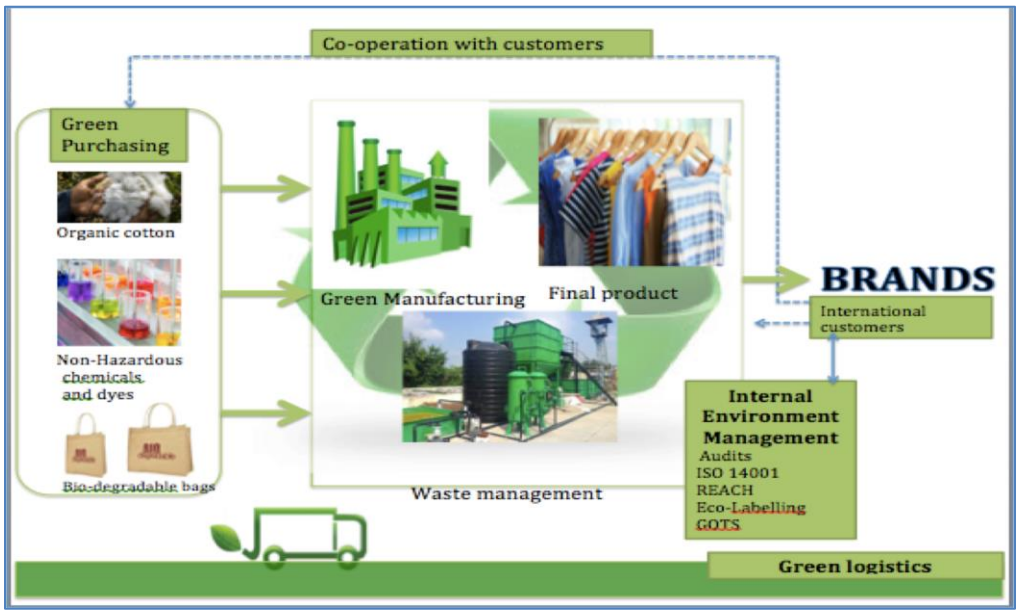


Figure 2 depicts the GSCMP of a textile company in Pakistan. Green purchasing refers to purchasing organic material, biodegradable bags and non-hazardous chemical and dyes from the suppliers. Green manufacturing is the processing of the organic material bought from the suppliers; waste disposed from manufacturing requires proper

treatment before disposal to comply with internal environment management (IEM) practice. Green logistics is used for both inbound and outbound transportation. Finally, eco-design refers to all the environmental practices adopted by the company to go green.

Textile and apparel sector are an important revenue-generating industry for both developed and developing economies. Pakistan is the 8th largest Asian exporter of textile (Textile Industries, 2018). It contributes to 62% of the total exports of Pakistan with revenue being generated of US$ 15119 million in the fiscal year 2016-2017 (Pakistan Economic Survey 2016-17). Similarly, in India and Sri Lanka textile, exports constitute to 15% and 40% of the total exports. In the FY 2018, Bangladesh textile industry contributed 84% to its export revenue creating employment for approximately 4.5 million people (Akter, 2019). Indian textile industry contributed 4% to its GDP. China is the largest producer of ready-made garment with Bangladesh following the lead.

Table 1 Textile Export Contribution

Countries	**Textile export contribution to GDP (US $ billion)**		
Year	2002	2010	2018
Pakistan	7.018	11.8	13.53
India	11.645	24.642	39.2
Bangladesh	5.314	16.118	32
China	61.184	206.691	276.73

Source: World Trade organization

Despite the relevance and importance of the textile and apparel supply chain; it has been given little significance in literature. Little is known about the adoption of GSCMP in the textile industry (Majumdar & Kumar Sinha, 2019). Therefore, the purpose of this study is to identify the green supply chain management practices, its drivers and the ways of adopting these practices in the textile industry of Pakistan.

The study explores the green practices being adopted in Pakistan. Thirty-five research articles specifically related to various GSCMP were identified from literature. Analysis of these research articles (refer to appendix A and B) show that green

purchasing, green manufacturing, co-operation with customers, eco-design and IEM are the six most widely studied practices. As green manufacturing is a cost intensive practice and requires change in machines and manufacturing processes (Subramanian & Gunasekaran, 2015), it was not considered in the research and the rest five were explored in the textile industry of Pakistan. From further research, it was observed that throughout the literature, drivers, barriers and its impact on firms' financial and economic performance has been vastly studied, that too mostly in the manufacturing sector of developed economies. By using a multiple case study methodology, the research study aims to fill the gap in literature by providing insights on the green supply chain management practices already adopted in Pakistan, their drivers and their ways of adopting these practices. This study presents a unique proposition by identifying ways of adopting GSCMP. Multiple case study methodology has been used to construct a better picture of GSCMP being adopted by exhibiting a comparison of three different businesses operating in Pakistan.

The study contributes to the existing literature by developing a theory in a new context. The results of the study will provide theoretical and managerial implications. The rich nature of the theory would help practitioners identify the relevant green practices in the textile/apparel industry of Pakistan and compare it with the other developing economies in the world.

1.1 Research Objectives

The research study has the following objectives:

- To identify the key factors leading to adoption of green supply chain management practices.
- To explore green supply chain practices being adopted in textile sector of Pakistan.
- To understand the ways of adopting Green Supply Chain Management Practices in the textile sector of Pakistan.

1.2 Research Questions

On the basis of the above identified research objectives, the following research questions have been devised:

- What Green Supply Chain Management Practices are relevant for textile companies in Pakistan?
- Why textile companies in Pakistan are adopting Green Supply Chain Management Practices?
- How Green Supply Chain Management Practices are being practiced in the textile sector of Pakistan?

Chapter 2

Literature review

This chapter of the research presents a brief description of the literature available on Green supply chain management with special focus on the green practices, their drivers and their ways of adoption. The purpose of this chapter is to synthesize with what is already known about the research topic. A conceptual framework has been drawn from the literature and is presented at the end of the chapter. Following the conceptual framework is the research gap, which has also been drawn after extensive review of literature.

Emerging economies are "low income, rapid-growth countries using economic liberalization as their primary engine of growth" (Hokisson, Eden, Lau, & Wright, 2000). Both developing and transitional economies fall under the category of Emerging Economies. Countries like Pakistan, India, China, Africa, Morocco, Philippines and Latin America are all examples of Emerging Economies. These are the countries that do not have the resources and the exposure of fully developed economies but have characteristics of both developed and developing economies. Therefore, they are termed as emerging economies (Hokisson, Eden, Lau, & Wright, 2000).

The macro economic and financial growth of these economies has been very unstable. They are highly vulnerable to external environmental factors making investment difficult for both local and international financers. The legal framework is even worse, there are constant riots and political instability in emerging economies, which discourage foreign direct investment (Hitt, Levitas, Dacin, & Arrgle, 2000).

Emerging Economies significantly differ from developed economies in terms of resources. Emerging economies lack the capability, skills and resources of developed economies. Un-skilled labor, lack of expertise, lack of knowledge, limited technological advancement and lack of capital are the most known features of Emerging Economies (Wright, Igor, Hoskisson, & W. Peng, 2005).

2.1 Supply Chain Management (SCM)

Today, organizations compete on the basis of their supply chains. Adopting an efficient supply chain strategy is becoming a need for survival (M. Lambert, 2008; Cadden, Marshall, & Cao, 2013).

Different definitions of the word supply chain management (SCM) exist in literature. There is no single agreed upon definition as to what supply chain is; situation based definitions are created (T. Mentzer, et al., 2001). Literature is filled with words such as integrated purchasing strategy, integrated logistics, supplier-vendor relationship management, etc. (Choon Tan, 2001). Lambert (2008), in his research article identifies three themes that the researchers in the previous literature have adopted to explain the concept of SCM. According to him, the literature for the definition of SCM sorrounds around:

1. Buying and selling activities of manufacturers.
2. Transportation and logistics function of supplier and vendor.
3. The activities that add value to the final product, reduce cost and increase customer satisfaction.

Christopher (2016) in his book defines SCM as "the management of upstream and downstream relationships with suppliers and customers in order to deliver superior customer value at less cost to the supply chain as a whole." SCM practices are activities that businesses follow to effectively manage their supply chains (Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006).

The textile industry was the early adapter that initiated SCM practices and Wal-Mart, Whirlpool, West Co., Becton Dickinson, Baxter, and Georgia- Pacific Corp were the first ones in the manufacturing industry to follow the footsteps (R. Lummus & J. Vokurka, 1999).

GSCM is a new emerging field in Pakistan and there is dearth of work on GSCM in the context of Pakistan. Therefore, different hidden dimensions need to be unveiled and new fields need to be explored. CPEC has brought along with it the concept of integration; developing relationships between the stakeholders and the business activities in the production process (Khan & Marwat, 2016).

2.2 Green Supply Chain Management (GSCM)

Green Supply Chain Management stems its roots from the integration of environmental factors into Supply Chain Management. It adds the "green component" in supply chain, making the supply chain environmentally sustainable (Srivastava, 2007).

There are 22 different definitions available in literature of GSCM and most widely used definition is the one presented by Srivastava in 2007 (Ahi & Searcy, 2013; Oliveira et al, 2018). Srivastava (2007) defines GSCM as "integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life". Green supply chain definitions vary in scope from green purchasing to incorporating suppliers, manufacturers, and customers in the greater value chain. These definitions vary with the researchers purpose of the study (Zhu & Sarkis, 2004).

Environmental pressures from stakeholders, legislation, and internal environment have forced organizations to be environmentally sustainable (Zhang & Yang, 2016). Companies are now moving from reactive to proactive approach of environmental waste management.

2.3 Green Supply Chain Management Practices (GSCMP)

GSCMP should cover all aspects of the supply chain starting from suppliers, moving to integration of life cycle management through the manufacturer and customer (Rao & Holt, 2005). There are multi dimensions available in literature on GSCMP but for the purpose of this study, five practices have been chosen from literature, namely; green purchasing, co-operation with customers, eco-design, internal environment management and green logistic. These practices have been repeatedly studied in the literature and the reason for choosing these is to identify them in the textile industry of Pakistan.

2.3.1 Green Purchasing

Green purchasing is cooperating with suppliers to work on product/services that have environmental friendly processes and do not harm the environment (Khan & Qianli, 2017). Carter and Carter (1998, p. 23) define green purchasing as "supply chain activities that involve recycling, reuse and reduction of material".

Min & Galle (2001), in their research study identified the drivers/ pressures of adopting green purchasing practices and its impact on vendor selection, waste management and compliance with legislation. The research study concluded that the use of green purchasing for waste management further improves business performance without interruption in the system.

Carter et.al. (2000) were amongst the early researchers who used quantitative research methods to determine the impact of green purchasing on organizational performance. The research study identified a positive change in both economic and environmental performance of the organization. Similarly, Zhu & Sarkis, 2004, developed a framework for measuring the adoption of green purchasing. The measures included specifying suppliers the environmental requirements for purchased items, purchasing recycled packaging, complying with ISO 14001, incorporating suppliers with the goal of organization of reducing waste and being environmentally sustainable. Furthermore, they used the previously built measures of green purchasing to identify its impact on organizational performance in the Chinese automotive context. The researcher concluded that green purchasing has less or no impact on organizational performance as in developing economies there is no support provided by the regulatory authority to make purchases green (Zhu, Sarkis, & Lai, 2007). Similarly, Azevedo, Carvalho, & Machado (2011), using the same constructs and some more from previous literature, saw the impact of Green Purchasing on organization performance.

Customer's awareness about organizational practices started in the 1980's and it was predicted that in the 21st century, the concerns of the customers regarding green purchasing of the organization would be heightened (Carter, Smeltzer, & Narasimhan, 2000). In a survey conducted in 2000, it was seen that 70% of the customers were concerned about organizational practices and it affected their shopping behavior. Organizations adopt green purchasing practices to maintain customers by meeting their demands and also to develop strong relation with the suppliers. It can also be concluded from the research article that another reason for adopting green purchasing practices is strict statutes and government legislations (Min & Galle, 2001). This was confirmed in a conference held in 2015 where it was also discussed that organizations adopt environmental purchasing to cope up with the legislations and to survive the strong wave

of customer demanding environmental friendly goods (Chun, Ho Joong, & Yong-Hwan, 2015). Another reason seen in literature for adoption of green purchasing is economic and financial performance of the firm. It remains one of the top priorities in emerging economies (Zsidisin & P Siferd, 2001; Tritos, Adebanjo, & Tan, 2013).

El Tayeb with his co-authors, piloted a research study in the manufacturing sector of Malaysia and it reached to the conclusion that organizations adopt green purchasing due to four main motives; customer pressure, regulations, firm ownership and expected firm benefits (ElTayeb, Zailani, & Jayaraman, 2010). However, it was negated in a qualitative research study in 2012, carried out on 5 textile companies. Using multiple case study methods, the drivers were explored and an in-depth analysis concluded that legislations are not driving forces for both small sized and huge corporations (Caniatoet al, 2012).

To encourage adoption of green purchasing, changes in products such as the use of bio degradable bags, changes in purchasing order processes and suppliers are required (Chin, Izzati Ab Malik, & Dawei, 2015). Green purchasing should start from the sourcing level of supply chain. In order to enable green purchasing as a cost reduction strategy, organizations should involve employees in separating recyclable and reusable material from waste. By doing so, the source reduction would be more realistic. This strategy would enable green purchasing practices in the context of cleaner product and cleaner processes leading to overall benefit of the firm and the environment. The organization should also set up workshops for its suppliers and employees, to train them about green purchasing practices (Min & Galle, 2001).

2.3.2 Co-operation with Customers

Customers are key stakeholders in the supply chain of any organization and are one of the main driving forces for companies to adopt GSCMP (Khan & Qianli, 2017). Co-operation with customers is needed for green packaging, cleaner production processes and eco-design (Zhu & Sarkis, 2004). Jr, Zelbst, Meacham, & Bhadauria (2012), define co-operation with customers as working closely with customer to enable products that have cleaner packaging and production processes. Organizations usually tend to develop long-term relationship with their customers to enable environmental sustainability and global competitiveness (Zhu, Sarkis, & Lai, 2007; Jr, Zelbst, Meacham, & Bhadauria, 2012). Co-operation with customers requires exchange of technical information between

a company and its customer to improve their environmental performance (De Sousa Jabbour, de OliveiraFrascareli, & Chiappetta Jabbour, 2015). Customer co-operation can also be used to change product design and specification (Lippmann, 1999). In other words, customers can influence organizational practices, therefore, it is important to get customers' feedback to address the problem of environmental sustainability (Harms, Erik G., & Stefan, 2013). Strong relation with customers aids in cleaner production and these practices are seen to be adopted in leading enterprises. Co-operation with customer also leads to improved financial, economic and environmental performance (Jr & RA, 2005; Zhu, Sarkis, & Lai, 2007). Corporate transparency can enable green practice of co-operation with customers (Jr & RA, 2005; Zhu, Sarkis, & Lai, 2007). Wang, Wang, & Zhang (2018) study supports existing literature by concluding that customers have a strong influence on adoption of both internal and external GSCMP. Furthermore, co-operation with customers improves overall organization's performance. However, the level of co-operation varies with the organization size.

2.3.3 Internal Environment Management

In an internal environment management practice, the organization is required to comply with the various environmental legislations (ISO 14001 certification) and auditing programs (Zhu & Sarkis, 2004). Complying with various legislations not only helps in satisfying customers but also fulfills international criteria set for organization aiming to be global. It enables competitiveness and global reach (Chowdhury, Upadhyay, Austin, & Belal, 2016). Internal Environment practices are means of improving organization performance (Carter, Ellram, & Ready, 1998).

Zhu and Sarkis (2007) in a case study tested the impact of IEM on organizational performance and noted that internal environmental practice is the most widely adopted practice in emerging economies like China. The study shows that companies adopt IEM by investing in water treatment and other noise and emission management plants. The study also saw that being certified for various legislations like ISO 14001 and OHSMS 18001. It further concluded that organizations that take a proactive approach are more inclined to adopt IEM because of internal organization drivers. Proactive approach means making goods and service that are environmentally sound and enable recyling, reuse of

material, material reduced and reduced wastage of resources (Min & Galle, 2001).

IEM practice requires commitment and support from senior level management and mid-level managers. It looks for motivation of adoption of the practice from within the organization (Zhu & Sarkis, 2004). Support and commitment from top and middle management facilitates successful implementation of IEM (Jr, Zelbst, Meacham, & Bhadauria, 2012).

In a recent study, it was found that cost drivers and customer awareness encourages adoption of IEM practice. However, customer demands are more impactful than the cost drivers. In the same study, it was noted that, because organizations can reduce cost and improve environmental health at the same time, they are more likely to adopt internal environment management as a practice. However, the impact of these drivers is directly proportional to the size of the organization (Wang Z. , Wang, Zhang, & Zhao, 2018).

Other drivers of IEM found in literature are employee motivation, organization mission and vision and investor demands and specifications (Dhull & Narwal, 2016).

2.3.4 Green Logistics

Green Logistics requires suppliers to be responsible in terms of the packaging, pallets and the means of transportation used when delivering supplies. It also requires organizations to have energy efficient systems in warehouse and consider environmental factors in transport related matters (Holt & Ghobadian, 2009). Organizations when making logistic decision should cater to external environmental problems created by transportation activities such as air pollution, noise pollution and climate change (What is Green Logistics?, 2010).

Logistics is one of the most visible component of the supply chain. CO2 emission by the logistics activities is causing damage to the environment. Changing means of transportation can aid in making the logistics green. Usage of water transportation maximizes efficiency and reduces emission of harmful gases (Dekker, Bloemhof, & Mallidis, 2012). Some operational changes in the organization can functionalize green logistics. Authorizing backhauling would reduce underutilization of the resources with significant reduction in cost. Changing mode of transportation like discussed above also

assists in channeling green logistics. Furthermore, modifying existing delivery schedule and using routing method to find cleaner routes can achieve environmental sustainability. These changes with worked out calculations were proposed to a Spanish food distribution company and the financial calculations were positive enough to yield a profit. A model was proposed which balanced out both, cost and pollution (Ubeda, Arcelus, & Faulin, 2011). United Parcel Service (UPS), a global logistic service providing company uses route planning software and internet matching system to reduce travel time distance and adopt environmental friendly routes (Lin C.-Y. , 2008).

Caniato et al (2012) in their research study highlighted the significance of adopting green logistics practices in the textile industry. Adopting green logistics enables problem optimization, resource sharing and cleaner environment. Vehicle routing is seen as one example of optimizing logistics. According to the author, organizations can make their logistics green by collaborating and partnering with stakeholders (Caniato et al,2012). Azevedo et al (2011), in their research article consider green logistics as a value adding activity and by comparison of multi case studies, it concluded that logistics can be used to achieve environmental sustainability.

The whole supply chain is affected by decisions of environmental sustainability. Logistics is a part of the supply chain, therefore it is also affected by environmental drivers and decisions. Environmental, social and economic factors create hindrance in adoption of green logistic practices (El-Berishy, Rügge, & Scholz-Reiter, 2013). Murphy & Poist (2000), in their study compared different strategies and suggested universal logistics practices that enable adoption of green logistics. It can be concluded from the research, that reducing consumption, recycling material and re-using material are universal methods of adopting cleaner and greener logistic practices (Murphy & Poist, 2000). The authors supported their research by comparing US and non- US firms in another study in 2003. It was concluded in the research that similar global logistics decisions could enable the practice (Murphy & Poist, 2003).

Reduced cost of transportation, government initiatives, economies of time (quick and reliable delivery), damage free service and above all constant pressure from the customers are some of the motives of adopting green logistics (Rodrigue, Brian, & Claude, 2008). Drivers that seem to work on Taiwanese logistics service providing

companies are; motivation from the internal organization, technological advancement, uncertainty of the external environment, knowledge about green practices and government support. Some logistics companies in Taiwan have already started using eco-friendly practices to avoid damage to the environment, for example, T-join and HCT transportation use bio-diesel as fuel (Lin C.-Y. , 2008). In Hong Kong, pressure from stakeholders is seen to be influential in adopting Green Logistics practices (Wong & Fryxell, 2004).

2.3.5 Eco Design

Eco design practice requires that the producers design products that enable recycling, re-use, recovery of material as well as, reduced consumption of energy and raw materials (Zhu & Sarkis, 2004). Eco design is a critical practice for organizations to survive and it acts as a shield in the market against environmental pressures from customers/markets (Khan & Qianli, 2017).

The internal drive of the organization, its vision and customer demands are key drivers for implementation of eco-design green practices. The implementation is less influenced by factors like employee's insistence and personal choice (Buzuku, Farfan, & Kraslawski, 2018).

Eco-Design can be a potential source of competitive advantage. Advantage can be taken by being the first ones to improve eco-design by enabling better utilization of resources, recycling and reducing waste, etc. (Lin, Kim-Hua, & Yong, 2013). For green eco-design, collaboration with customers and other stakeholders is also needed (Zhu & Sarkis, 2004). Adoption of Green eco-design practice can reduce 80% damage that it is currently causing to the environment by its products and processes (Khan & Qianli, 2017). There is evidence in literature that emerging economies are proactively adopting eco-design as an internal organizational practice leading to greener supply chain (Zhu, Sarkis, & Lai, 2007).

Eco-design has a positive relation with firm performance. It yields an increase in organizations financial performance. Evidence has been seen in emerging economies like China and Vietnam (Zhu, Sarkis, & Lai, 2007; Lin, Kim-Hua, & Yong, 2013). Eco-design, furthermore, improves the brand image and reduces end product cost to the customers (Mu, Peng, & MacLachlan, 2009).

There are special legislations designed in Europe that require organizations to produce eco-friendly designs. Restriction of Hazardous Substances (ROHS) prohibits use of toxic and harmful chemicals. Use of six hazardous chemicals has been banned under this legislation. This, combined with a couple of more legislations have made organizations critical in their choice of suppliers, materials and processes. Even in Asian Emerging Economies, legislation like Cleaner Production Law (derived from US Law) and Green House Gas (GHS) emission standards exhibit significant influence on organizations to opt for green eco-design practices (Tseng, Chiu, Tan, & Siriban-Manalang, 2013).

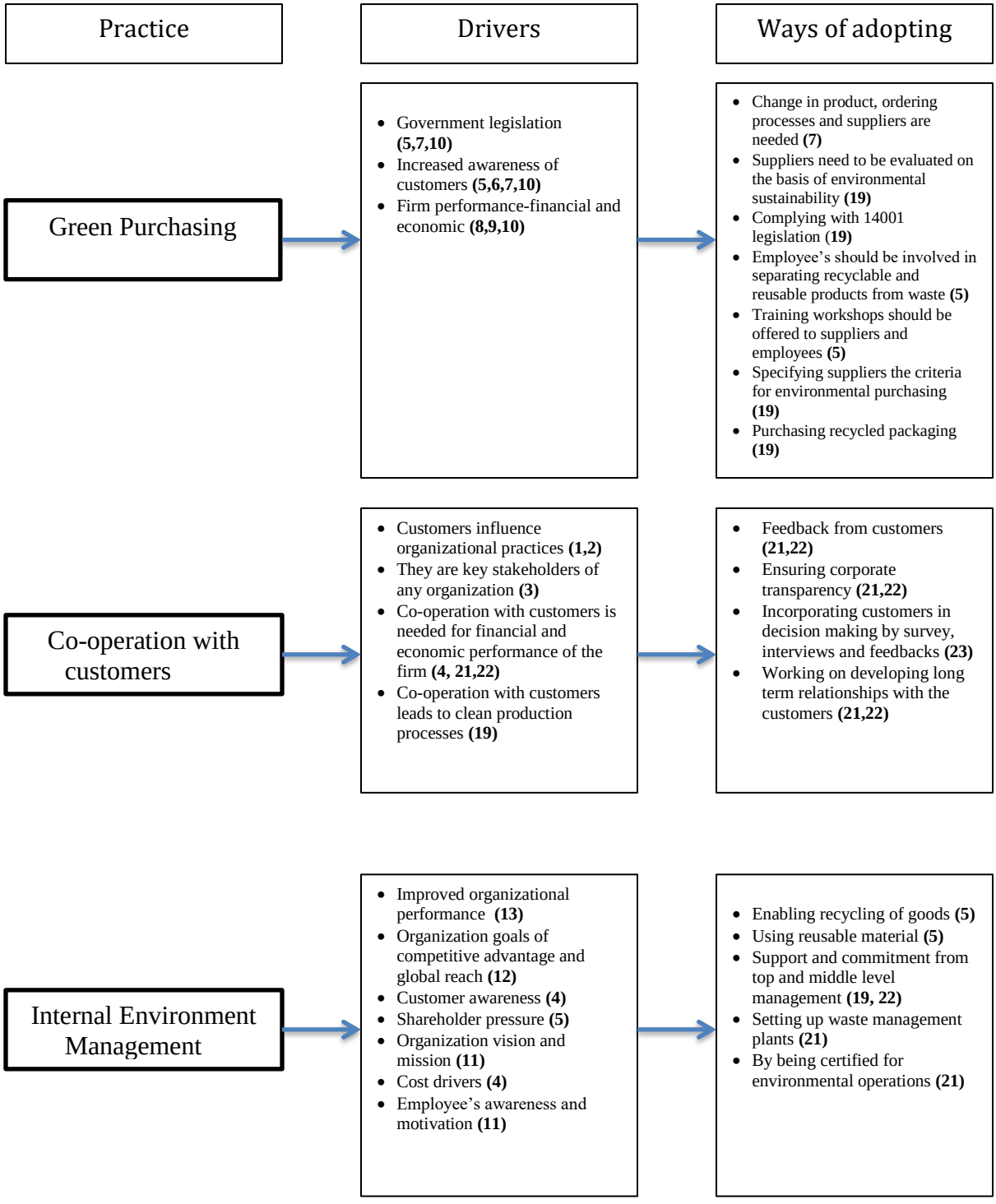
In a study conducted in China, it was seen that in emerging economies, only normative and mimetic drivers encourage organizations to enhance their eco-design practices. Normative and mimetic drivers are elements such as increased knowledge of customers about environmental sustainability and policies adopted by developed countries to reduce wastage of resources, enable energy efficient systems, etc. Coercive power does not work in these kinds of decisions (Zhu & Geng, 2013).

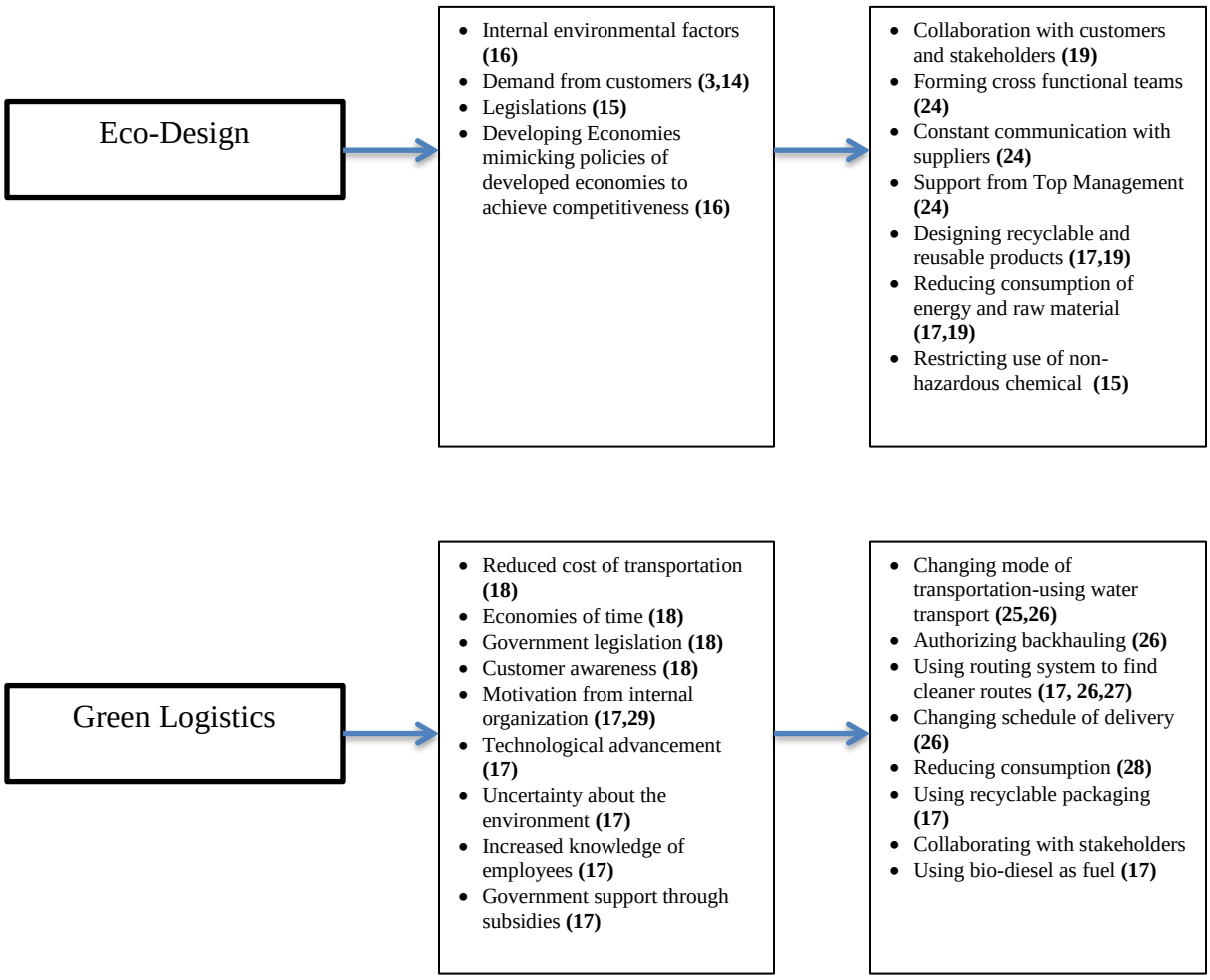
Support from top management is required to enable a learning based environment so that awareness can be raised about environmental issues. Environmental education is required. Achieving eco-design can be a set of complex processes; therefore, integrating cross-functional teams can be an important task to gain a synergetic effect. Apart from this, constant communication with the suppliers and change in organizational policies are needed to adopt eco-design practice (Hu & Hsu, 2010).

2.4 Conceptual Framework

The conceptual framework for practices, drivers and ways of adopting has been drawn from Literature reviewed in the previous section.

Figure. 3 Conceptual framework





Key:- 1: Harms, Erik G., & Stefan (2013); **2:** Lippmann (1999); **3:** Khan & Qianli (2017); **4:** Wang Z. , Wang , Zhang, & Zhao (2018); **5:** Min & Galle (2001); **6:** Carter, Smeltzer, & Narasimhan (2000); **7:** Chun, Ho Joong, & Yong-Hwan (2015); **8:** Zsidisin & P Siferd (2001); **9:** Tritos, Adebanjo, & Tan (2013);**10:** ElTayeb, Zailani, & Jayaraman (2010); **11:** Dhull & Narwal (2016); **12:** Chowdhury, Upadhyay, Austin, & Belal (2016); **13:** Carter, Ellram, & Ready (1998); **14:** Buzuku, Farfan, & Kraslawski (2018) ; **15:** Tseng, Chiu, Tan, & Siriban-Manalang, (2013);**16:** Zhu & Geng (2013); **17:** Lin C.-Y. (2008); **18:** Rodrigue, Brian, & Claude (2008); **19:** Zhu & Sarkis (2004); **20:** Chin, Izzati Ab Malik, & Dawei (2015); **21:** Zhu, Sarkis, & Lai (2007); **22:** Jr, Zelbst, Meacham, & Bhadauria (2012); **23:** De Sousa Jabbour, de OliveiraFrascareli, & Chiappetta Jabbour (2015); **24:** Hu & Hsu, (2010); **25:** Dekker, Bloemhof, & Mallidis (2012); **26:** Ubeda, Arcelus, & Faulin (2011); **27:** Caniato, Caridi, Crippa, & Moretto (2012); **28:** MURPHY & POIST (2000); **29:** (Wong & Frvxell (2004)

2.5 Research Gap

Previously, a vast amount of literature is available on benefits, drivers, and impact of GSCM practices on performance. However, most of the literature is concentrated in the automotive, electronics and manufacturing sector of developed economies (Oliveira, Espindola, Silva, Silva, & Rocha, 2018; Caniato et al, 2012; Zhu, Sarkis, & Lai, 2007). Considering that GSCM practices vary across industries and economies (Zhu, Sarkis, & Lai, 2008; Soda, Sachdeva, & Garg, 2015), very little is known about the adoption of GSCM practices in the textile sector and in particular, in developing economies (Mitra & Datta, 2014; Majumdar & Kumar Sinha, 2019). To date, the research on GSCM practices in the textile sector in developing economies is limited to barriers and drivers of green supply chain management practices (Diabat, Kannan, & Mathiyazhagan, 2014; Caniato et al, 2012). Adoption of GSCM practices in developing economies is still at its infancy (Majumdar & Sinha, 2019; Luthra & Mangla, 2018). There is little understanding on how green supply chain practices can be adopted (Silvestre, 2016). Hence, it is important to understand whether the GSCM practices have been adopted or not in the context of Pakistan apparel/textile industry. And if they have been adopted, why and how have they been adopted/operationalized. This research study aims to fill the gap in literature by exploring the adoption of GSCM practices in the textile sector of Pakistan through the use of multiple case studies.

Chapter 3

Methodology

Based on the research questions posed in chapter 2, the main objective of this research is to explore how wide spread is green supply chain practice in textile companies in Pakistan, how have organizations adopted green practices and what drives them to adopt these practices. Given the research objective to enrich the existing body of knowledge on GSCM practices, a subjective perspective of the participants is considered for data collection and data analysis. An interpretive research philosophy leading to qualitative research method has been used for data collection and data analysis (Stake, 1995).

According to Yin (2009), multiple case study is the most suitable method to be adopted when the research purpose is exploratory, the study follows interpretivist research philosophy and research questions pose 'how?' and 'why?' statements. As it is explicit from the research questions and research objectives, that the empirical study is purely exploratory, therefore multiple case study method was used. Yin (2009, p. 18) defines case study as " an empirical inquiry that investigates a contemporary phenomenon in depth and within its real life context when the boundaries between phenomenon are not clearly evident". The case study methodology was chosen because of its appropriateness to study the adoption of green supply chain management practices within the natural setting of the textile companies and enrich the data collection with interesting, unique and contrasting evidence of adoption, hence, leading to new insights and anomalies. It provides the research a margin to validate data through within case and cross case analyses (Baxter & Jack, 2008).

3.1 Research Method

Sample consists of three textile companies in the vicinity of Lahore and Sheikhupura. The reason for choosing Lahore and Sheikhupura was that all major textile groups are located there. Lahore and Sheikhupura are rich in textile and textile related products. Yin (2014) supports the notion that a minimum of two cases is required for a multiple case study. Creswell (2012) emphasizes that the maximum number of cases selected should be no more than four. Based on the recommendation and research strategy and design 3

cases have been selected. According to Eisenhardt (1989), theoretical sampling is preferred for multiple case studies as it provides new insight until the data saturation point. And it also extends the existing theory and is replicable (Eisenhardt, 1989). Therefore, theoretical and purposive sampling technique has been used to select cases.

Purposive sampling is a non-probability sampling technique in which a deliberate choice of the sample is based on the requirement of the research study (Etikan, 2016). Cases have been selected on the basis of their suitability to explore the GSCM practices being adopted and their ability to meet the objective of replication.

As mentioned earlier, three cases have been selected and the common point between all three of them is that they all sell to both local and international markets. All these three cases are big corporations and are familiar with the concept of green supply chain. The purpose of the research was to find how widespread is green supply chain practice in textile companies in across Pakistan, how can organizations adopt green practices and what drives them to adopt these practices. All the three cases selected are either involved or moving towards green practices as classified by Zhu & Sarkis (2004).

The names of the companies selected have been concealed and are labeled as X, Y, Z. All three companies are affiliates of large textile groups, selling to both, domestic and international market. Company Z was established in 1951 and it exports 95% of its fiber to international brands, while the rest of the 5% is sold in the local market. Initially, company Z started with weaving but over the years has also included operations of spinning, processing, stitching and power generation. Its production facilities are located in Faisalabad, Sheikhupura, Ferozewatan and Lahore.

Similarly, Company X was listed as a public limited company in 1969 and in the fiscal year 2018, 92% of its revenue was generated from the international market while the rest was generated from retail operated locally (2019). Company X is one of the leading groups in Pakistan. It is the pioneer of green supply chain practices in Pakistan. Company X textile mill is a vertically integrated composite unit that produces cotton yarn, fabric and home textile products. It has weaving and stitching facilities. Furthermore, the group is also into power generation.

Company Y was established in 1988. 90% of its fabric is sold to international brands like Levis, Ralph Lauren, H&M, and Next, etc. and the rest 10% is sold in the local market. The company's operations include; weaving, dyeing & finishing and power generation. Table 2 explains the main characteristics of the cases selected.

Table 2 Data Sample

Company	Establishment	Main Market	Main Product	Exports (%)	Number of interviews	Green Supply chain management practice
X	1969	USA, Europe, Middle East, Africa, and Asia pacific	Home textiles, power generation and apparel	92 %	3	Green purchasing, cooperation with customers, Internal environment management, Green logistics and Eco-design
Y	1988	Europe, America and Pakistan (Levis, Ralph Lauren, H& M, and Next etc)	Garment and fiber	90%	2	Green purchasing, cooperation with customers, Internal environment management, Green logistics and Eco-design
Z	1951	US, Europe and Asia (Levi's, Next, Tommy Hilfiger, and Hugo Boss)	Garment and home textile	95%	4	Green purchasing, cooperation with customers, Internal environment management, Green logistics and Eco-design

The following criteria was used for the selection of the three cases:

- They should be selling to both local and international market.
- They should be vertically integrated units.
- Their export unit should contribute to more than 50% of their revenues.
- The participating companies should be from the textile sector.
- The companies should be located in the vicinity of Lahore and Sheikhupura.

The above-mentioned criteria was drawn from the research objectives. The companies were selected after a careful analysis of published reports available from All Pakistan

Textile Mills Association (APTMA). Formal means of communication were used to approach these companies (See appendix 1). Personal reference of the author was also used for the cause.

The cases selected were sent a cover letter on the university letterhead (appendix 1), project summary (appendix 2) and interview guide (appendix 3). All of the three companies were contacted through email and phone.

Semi-structured interviews because of their flexible nature are usually most suitable for qualitative research (Bryman & Bell, 2011). Therefore, the data was collected through semi-structured interviews taken from the supply chain experts in the field. Top and middle management was interviewed. A total of ten interviews were conducted from the selected companies. Each respondent was required to sign a consent form (appendix 4) before the start of the interview.

Before the interview, an interview guide was devised which had open ended semi-structured questions. The questions were placed under five different GSCM practices and the aim of the questions was to get answers of how the practices have been adopt and what drives the companies to adopt GSCMP.

The researcher personally visited all the three companies and face-to-face interviews were conducted. The medium of language used during the interview was English. The interviews were recorded with the consent of the interviewee and were later transcribed in the same order as it were conducted.

3.2 Data Analysis

One of the most widely used way to analyze qualitative data is coding. Coding can be done both, manually and with QDA software like Nvivo (Myers, 2009). Codes are tags or labels assigned to data for effective analysis (Miles & Huberman, 1994, p. 56). An open coding technique was used for the research study. Descriptive codes were identified from the transcript and two main themes were generated. First order codes identified the drivers of GSCMP and second order codes identified the ways of adopting GSCMP.

After a careful analysis of the interview transcripts and codes, different dimensions were identified under two main themes: Ways of adopting (how) and Drivers (why). Each identified dimension under a specific theme was defined to have a clear view and

meaning. Furthermore, each dimension under a specific theme was corroborated with relevant and illustrative quotes (see Appendix A, B) from the interview transcripts as reference, so as to provide an authentic proof of the occurrence of mentioned dimensions, as shown in Tables 3, 4 and 5.

In order to obtain a detailed and complete scenario of how (operationalized/ways) GSCMP had occurred in the three companies, the green practices adopted had been identified. After the identification of practices ('what'), it was easy to understand the different ways ('how') that the companies had adopted.

The Practices identified what the case company had adopted, or in what area of business the company adopted these practices. In terms of practices ('what'), 5 dimensions were identified, defined and mentioned in Table 3:

Table 3: Identified "Practices"

Label	Explanation
Green Purchasing	Refers to cooperating with suppliers to produce environmentally friend products.
Co-operation with Customers	Refers to interactions with existing or new customers with the aim to enable green supply chain
Internal Environment Management	Refers to complying with various legislations and auditory programs
Green Logistics	Refers to be careful in terms of the packaging and mode of transportation used when delivering supplies
Eco-Design	Refers to designing product and processes in a way that enables an eco-friendly environment.

The ways relate to the different ways of adopting GSCMP; that is, how did the three companies approach different practices? In terms of ways ('how'), different dimensions were identified, defined and mentioned as listed in Table 4:

Table 4: Identified "Ways"

Label	Explanation
Recycled Products	Refers to second hand, used products related to textile, packaging, and handling of products etc. (synthetic oil, recycled fiber)
Organic material	Refers to the change in the material being used. Use is made of organic cotton, non-hazardous chemicals and dyes and biodegradable material.
Change in the purchase order process	Refers to change in the supplier selection criteria, the ordering process and the payment procedure.
Involving customers in cleaner production processes	Refers to be in a constant communication with the suppliers to be a part of the initiatives that they take and also with the motive to involve them in cleaner design process. This enables corporate transparency and is done by taking feedback, offering customer frequent visits, audits and also by visiting customer facilities and attending worldwide exhibitions.

Certifications	Refers to the organization being certified for ISO 14001 certification, Eco label, Global Recycling Standard, CRS, Fair trade USA, Fair trade America, REACH and also setting up a separate department which is responsible for the legislation and auditory programs
Hiring and training	Refers to hiring new employees and offering training to the concerned for the purpose of enabling GSCMP
Waste Management	Refers to setting up an effluent treatment plant and disposing waste after proper treatment
Using rechargeable fork lifters	Refers to making use of electrically charged fork lifters to prevent damage to the environment
Project on carbon foot print	Refers to taking an initiative of monitoring carbon footprints
Operational efficiency	Refers to making use of inverters, energy efficient machines and also generating electricity

After having identified the practices and the ways, the drivers were also identified. The drivers (reasons) relate to different motivations and involvement of firm in diverse set of strategies; that is, why does the Company approach to different practices? In terms of drivers' reasons ('why'), different reasons had been identified, defined and mentioned in Table 5:

Table 5: Identified "Drivers for adopting GSCMP"

Label	Explanation
Compliance with Regulations	Refers to the firm's need to comply with demanded international and regional standards.
Business efficiency	It is defined as a "firm's desire to enhance overall firm operations through involvement in latest green production and processing".
Organization responsibility	Refers to internal drive of the company to save the planet and stand out as a social corporate citizen.
Customer Demands	It's customer demands to comply with GSCMP and to keep the business running it is important to meet their demands. Furthermore, adopting GSCMP increases business opportunities as well.

Analysis was done in two phases; within case and cross case. Within case analysis was done to understand the different perspective of the respondents within the same company. However, cross case analysis was done to find similarities and differences between the companies, hence, leading to interesting, contrasting and unique insights.

For within case analysis, each company was studied individually and their ways of adopting GSCMP and drivers were identified. Table 6 below shows the ways in which Company X has adopted GSCMP. The company has adopted green purchasing practice by making use of recycled products, organic material and also by attaining various certifications. It is co-operating with its customers by involving them in cleaner

production processes. For IEM, it is managing waste and complying with various certifications. For Green logistics the company is using bio-degradable packaging and for Eco-Design, changes in the organizational processes have been made.

Table 6 Ways of adopting

Ways / Practice	Recycled Products	Organic material	Change in the purchase order process	Involving customers in cleaner production processes	Certification	Hiring and training	Waste Management	Project on carbon foot print	Operational efficiency
Green Purchasing	☐	☐	☐	☐	☐				
Co-operation with customers				☐					
Internal Environment Management		☐	☐	☐	☐	☐	☐	☐	
Green Logistics		☐				☐			☐
Eco-design	☐	☐	☐	☐		☐	☐	☐	☐

Table 7 shows the ways in which GSCMP have been adopted in company Y. For all the five practices, a change in the organizational processes was required. The table marks the relevant changes against each Practice.

Table 7 Ways of adopting GSCMP in company Y

Ways / Practice	Recycled Products	Organic Purchase	Change in the purchase order process	Involving customers in cleaner production processes	Certification	Top Management involvement	Waste Management	Training	Operational efficiency
Green Purchasing	☐	☐	☐	☐	☐				
Co-operation with customers				☐		☐			
Internal Environment Management					☐		☐		
Green Logistics		☐						☐	☐
Eco-design	☐		☐	☐	☐	☐			☐

Table 8 shows how GSCMP were adopted in company Z. The practices have been marked against their ways of adopting. For green purchasing, change in both, product and processes have been made, the company is co-operating with it customers by incorporating them in cleaner production processes, for IEM it is obtaining various

certifications, for green logistics it is using environmental packaging and for Eco-design, changes have been made through out the organization.

Table 8: Ways of adopting GSCMP in company Z

Ways / Practice	Recycled Products	Organic Purchase	Change in the purchase order process	Involving customers in cleaner production processes	Certification	Top Management involvement	Hiring and training	Waste Management	Operational efficiency
Green Purchasing		✓	✓	✓	✓		✓		
Co-operation with customers				✓					
Internal Environment Management			✓	✓	✓		✓	✓	
Green Logistics		✓							✓
Eco-design	✓	✓	✓			✓	✓	✓	✓

Drivers were same across the three companies as shown in Table 5. Findings of the three cases have been discussed in detail in Chapter 4.

After the within case analysis, cross-case analysis was done where the findings of individual companies were collectively analyzed to find similarities and differences between the three companies. Unique and contrasting insights were found and these insights have been discussed in detail in Chapter 5.

Secondary data collected from news articles, company website, All Pakistan Textile Mill Association, Chambers of Commerce ,etc, was also used to support primary data.

3.3 Ethical Consideration and Research Quality

The research study was conducted in an ethical behavior. No un-ethical practice was followed during data collection and analysis. Personal biases of the interviewer were avoided and interviewee's privacy was respected. Each participant was required to sign a consent form (appendix 4) before the interview. Interviews were recorded with the permission of the respondents. Furthermore, the identity of the respondents was concealed for confidentiality purpose.

Physical access into the organization was required. For that a cover letter on the university letterhead (appendix 1) and project summary (appendix 2) was sent to the three companies describing the research purpose and ensuring confidentiality. It was also

guaranteed that the data would only be used for research purpose and will be discarded afterwards.

Peer review and existing literature was used to establish the credibility of the research. For peer review, feedback from the supervisor and the members of the faculty was taken on the result and discussion section. Moreover, data collected from companies was obtained from multiple respondents and was cross-checked with other sources in order to reduce the key informant bias.

Chapter 4

With in Case Presentation

4.1 Company X Overview

Company X is one of the largest producer and exporter of textile in Pakistan. It started its operations in 1969 in Calcutta with a spinning unit initiating its leadership in the industry. Today, company X, is a vertically integrated composite unit that produces cotton yarn, fabric and home textile products. It has weaving and stitching facilities as well. The company exports to 35 destinations around the world. In 2018, 92% of the revenue of the company was generated from exports.

The dyeing unit, having a capacity of 6 billion meters of finished fabric, per month ,exports 99% of its products and the rest 1% is sold to the local brands that further sell in the international market. The group sells in the local market aswell but the proportion compared to international sales is very low. The only medium of reaching out to its local customers is through its retail division.

Company X is a part of a diversified group, which includes power generation and diary as well. However, the focus of this research study is solely on the textile mills. The group has an annual turnover of approximately US $ 1 billion. Its main customers are H&M, GAP, Zara, Mango, Tommy Hilfiger etc., all located in Europe and USA. The main markets that it covers are the USA, Europe, Middle East, Africa, and Asia pacific.

4.1.1 Identified Ways of Adopting the GSCMP

Green Purchasing

The company has adopted green purchasing practice by making use of recycled products, organic material and also by attaining various certifications.

Organic material refers to purchasing organic cotton, non-hazardous chemicals and dyes , and biodegradable packaging. Recycled product refers to purchasing recycled polyester and biodegradable shopping bags. The company specifies to its suppliers that the packaging material should be biodegradable, the polyester it is purchasing should be recycled, the cotton it is purchasing should be organic and the chemicals that it is using should be sustainable. For example, GM Marketing mentioned about developing biodegradable optical brightening agents:

> "the OBA residues are discharged in the water and they pollute the sea and harm the marine life so now we are finding an OBA, rather we have found one which is sustainable." – GM Marketing (CX)

The customers propose a list of restricted material and supplies. To ensure that the suppliers are meeting to the need of green purchasing, a contractual obligation is taken before entering into a contractual agreement. Company X buys from suppliers who are certified for environmental supplies and blacklists suppliers who do not comply with the need of green purchasing. It requires it suppliers to be meeting global organic standards. Vendors who do not comply with organic standards are blacklisted.

There has been a change in the vendor selection criteria and order procedure. On every purchase, a transaction certificate is generated to trace the purchase that has been made. The transaction is recorded in the ERP system for transparency throughout the organization.

According to the interviewees, the customers usually make a premium payment to the suppliers to ensure that the effort that the suppliers are putting in growing organic stuff is appreciated.

Co-operation with Customers

The company co-operates with its customers by involving them in cleaner production processes. Company X is in constant communication with its customers. It calls them to visit its facility to input ideas during the design phase. The company also co-operates with its customers by meeting their requirement for various certifications as GM compliance explained;

> "Our customers keep taking initiatives and keep involving us in these things. Because you know our customers are mostly from Europe and USA so they are a step ahead of us as far as these environmental issues are concerned." –GM Compliance (CX)

The company also attends various international exhibitions to understand the latest trends in the market.

Internal Environment Management

To comply with various regulatory and auditory programs, the company has a separate compliance department. Regulatory training is offered after every 3 months to the concerned employees and suppliers. A separate team has been built for the purpose. An interviewee also mentioned about hiring an environmental engineer for the same task.

The company has initiated a project on carbon footprint in which its purpose is to regularly monitor emission of carbon.

The company is certified for various auditory and regulatory programs. The respondents had to say the following:

> "We are trying to do everything to go green. We have got ISO certifications; we've got ISO 14001 certification which is an environmental standard. We are eco-label certified which again is environment related compliance standard. We are now going for recycling that is GRS and CRS." – GM Compliance (CX)

> "We are ISO 14001 Certified, we are GOT certified, we are OEKO-TEX STeP certified, we are OEKO-TEX 100 certified so these are all the certifications which cover environmental, social, health and safety." – Manager Procurement (CX)

IEM also requires support and commitment from the top management. The government of Pakistan requires company X to manage waste efficiently, set up an Effluent Treatment Plant and emit waste after proper treatment.

Green Logistics

Company X uses electrically charged fork lifters and biodegradable packaging to prevent the environment from damage. GM Compliance of company X feels that "there is a need to create awareness in suppliers". Senior manager Process Control simply mentioned; "it has not been initiated in the company" and did not answer any questions regarding green logistics.

Eco-Design

GM Compliance repeatedly mentioned the carbon footprint project as a way to adopt green supply chain management practices. The company is using both, post and pre-consumer waste and an Effluent Treatment Plant has been setup for water treatment. For post-consumer waste, the company uses shredded fiber to reproduce garments, it also uses PET bottle to produce. It is encouraging use of recyclable products and raw materials. PET bottles are used to make polyester and for post-consumer waste worn out garments are sent back for shedding and reuse.

To prevent power shutdowns and resources from being depleted, it has setup its own power plants and uses machines that utilize less energy. Additionally, it also uses inverters with every machine and uses bio-mask for steam generation. GM Marketing further mentioned that, "the company is re-engineering its processes to be environmental compliant".

Having identified the main practices through the main ways of adopting GSCMP, we also need to identify why the firm tends to adopt the way it does.

4.1.2 Identified Drivers (Reasons) for adopting GSCMP

Compliance with Regulations

It refers to the company's need to comply with various standards due to government pressure. According to interviews taken in company X, the government influence is minimal. The government does have National Environmental Quality (NEQ) Standards and requires the company to manage waste and attain various certificates but it does not specify ways of managing waste or making the practices green. The government also does regular audits.

Customer Demand

Based on interviews, this research found different drivers of GSCMP. Among all, the most important is customer demand. Most of the customers of company X are based in Europe and USA with increased level of environmental awareness and legislation pressure. They require company X to adopt practices for green supply chain. Therefore, to maintain customers and seek new business opportunities, the company is required to comply with the various certifications.

Company X is very gelled in with its customers. For this reason, the customers not only mention the certification they require but also the raw material they want. For example, GM Marketing mentioned about customer's demand of using "hemp fiber".

Organizational Responsibility

Company X is an internally driven organization as GM Compliance mentioned, "we are adopting it in full letter and spirit". It sees as its core responsibility to save the planet for the future generation. The company visions itself as a social corporate entity. Customer demands and organization responsibility are the two strongest drivers for adopting GSCMP.

Business Efficiency

The international customers have specified that in 2020, they will only buy from companies that have adopted GSCMP. Company X, being a proactive company, is preparing itself for the future by taking various green initiatives.

Secondly, adopting GSCMP gives company X an edge over its competitors and improves its brand image. According to the interviews, the customers are more inclined to buy from company X than other companies. This is due to its adaptability to green practices.

The company also sees it as a mean of profitability and reduced cost in the long run. For now, it is just increasing their costs.

Another important driver found in company X is that it wants set a benchmark in the industry and be the market leader. The reason for it adopting GSCMP in full letter and spirit is its desire to stand out in the market, set industry standards and lead the market. All the four interviews in company X mentioned about being the market leader as a strong driver.

> "We are a very responsible corporate citizen…we being a responsible company are very proactive, we try to follow the latest standards as far as the environment is concerned." - GM Compliance (CX)
>
> "Primarily it is customer driven but we do our brainstorming as well to mark a benchmark." - Senior Manager Process Control (CX)
>
> "Major is customer requirement, but we are also a responsible corporate citizen and want to benchmark in the industry." - Manager Procurement
>
> "one of our main aim is to lead the market… we have noticed that we with two to three batches of green, we suddenly leave our major competition behind." – GM Marketing

Pakistan is a country where the frequency of power shutdown is very high. To prevent power shutdown, company X has set up its own power generation plants. It uses environmental friendly means to generate power and also the practices that it making use of consume less energy and natural resources.

4.2 Company Y Overview

Company Y commenced its textile operations in 1987, making it one of the oldest textile manufacturing companies in Pakistan. It initially started off as a weaving unit but after years of extensive expansion, it has emerged as a vertically integrated unit with expertise in weaving, dyeing and finishing. Today, it is amongst one of the largest vertically integrated textile units in Pakistan. It sells to both, local and international market. It produces three types of fabric; grey, white and dyed.

The company has a diverse customer base with sales in both local and international market. 90% of its fabric is exported to well-known brands in the US and Europe, the rest 10% is sold to the local (Pakistan) brands. The company sells in 20 different countries, employees 1800 individuals and has a yearly capacity of 90 million meters. Its main customers are Mango, Next, Levis, Marks & Spencer, H&M, Zara, etc., and it follows standards of Global Organic Textile (GOTS), Better initiative cotton and OEKO-Tex.

4.2.1 Identified Ways of Adopting the GSCMP

Green Purchasing

Green Purchasing in company Y refers to purchasing organic cotton, biodegradable packaging and non-hazardous chemicals and dyes from the suppliers.

For chemicals and dyes, a list is provided to the suppliers against which the chemicals are tested and received. The suppliers are required to provide the purchasing and expiry dates of the chemicals, along with which an agreement is signed which clearly mentions about providing an "SDS (a 16 section document, informing of all dangers that the chemical can have)". Both for cotton and dyes, non-compliant suppliers have been removed in the past.

There has also been a change in the purchasing order process; the company is focusing on paperless purchasing. General manager marketing of company Y explained; "An online purchase order is generated to minimize use of paper". Secondly, there has also been a change of specifications to the suppliers as the respondent says;

> "Previously, we were only buying normal cotton but now we demand organic cotton from the suppliers". – GM Marketing (CY)

The company, itself , tests every product bought from the suppliers. The customers make additional payment to the suppliers following green purchasing standards.

Co-operation with Customers

Company Y co-operates with its customers by not only offering quality products but also green products. The company is in constant communication with its customers. In this case, customers refer to international brands.

The company holds weekly meeting with all the senior management and the research team to discuss the latest trends that are running in the market. The company also visits international forum to broaden the spectrum of green products and offer variety to its customers. One of the interviewee said,

> "Whatever the kind of new concepts come in, we keep on applying them." - GM Production (CY)

The company feels that the top management support is a very crucial factor in the practice. The respondents kept on repeating,

> "the support of our top management is the essential key to success". – GM Production (CY)

Internal Environment Management

IEM in company Y refers to complying with various legislations and standards. The company is compliant with GOTS, OEKO TEX, GRS, ISO 14001, Eco-label, OSC and REACH certified.

GOTS is a standard for purchase and sale of organic cotton. GRS is a recycling standard in which the company is authenticated for using recycled fiber and other material. Eco-label refers to the tags on the garment to be environmental friendly and REACH is an international standard for non-hazardous chemicals and dyes. All these standards are international standards and are demanded by international customers.

The company has also set up an effluent water treatment plant because the government is taxing the company for water and is keeping a check on its waste management.

The compliance department is responsible for all these certifications. A cross-functional team comprising of chemical and environmental engineers have been built for the purpose as the interviewee explains,

> "There's chemical management team, environment team to look after effects on environment." – GM Production (CY)

Green Logistics

In company Y, green logistics refers to changing delivery schedule of material from and to the suppliers, changing chemical concentration to enable more containers in lesser trips. This not only saves costs but also enhances their efficiency. Secondly, the company is also using electrically charged fork lifters with in the vicinity to lessen the damage caused to the environment.

However, on the packaging there was contradiction between the interviewees, GM Marketing mentioned about using "wooden pallets because it is environmentally friendly" but GM Production simply refused.

Eco-Design

Company Y has taken various initiatives to adopt GSCMP of eco-design. It is making use of both pre- and post- consumer waste. The customers send back worn out garments for recycling. For pre-consumer waste, the company is reusing its water and other resources. Water wasted from one machine, after proper treatment, is used in another machine. The cotton used for manufacturing of garments is also recyclable.

Company Y has shortened the length of its processes. It uses good quality of material to minimize process time. Also it has removed unnecessary steps from the process to minimize the amount of energy used. The company also has a caustic recovering unit, in which 50%-60% of caustic is recovered.

To further keep the environment clean, the company has switched to paperless processing. It has built various teams to work on sustainability. One of the respondents stated,

> "for utilities, we have an engineer manager who brings new projects for energy saving. R&D looks for environmentally friendly chemicals."- GM Production (CY)

4.2.2 Identified Drivers (Reasons) for adopting GSCMP

The drivers (reasons) relate to different motivations and involvement of the firm in a diverse set of strategies; that is, why does Company Y approaches to different practices?

Customer Demands

Company Y mostly sells in international markets and its major customers are international brands selling in USA and Europe. These customers require the company to be compliant with various legations. However, the company feels that the customer pressure is not much right now, it is thought that in the future, international brands will only buy from suppliers compliant with GSCMP.

Adopting these practices helps the company in maintaining existing customers and seeking new business opportunity.

Compliance with Regulation

Compliance with regulation refers to government pressure on the company. According to the interviews in company Y, the previous government did not pressurize the company but the company is expecting pressure from the current government. The current government has started taking some initiatives such as tax on extra water used, the present government also demands proper management of waste disposed, therefore, all the respondents mentioned it as driver:

> "Actually, current government may be concerned about it but previous had other ambitions…. The government is taxing wastewater disposition. They require that there should be proper water treatment therefore we have set up an effluent treatment plant. Now these checks are increasing."- GM Production (CY)
>
> "Yes only for the pallets… the government comes over here at our premises for the fumigation check of the pallets." – GM Marketing (CY)

The government also requires proper fumigation of the deliveries sent to the international market.

Business Efficiency

The company sees it as a means of saving cost, as previously discussed adopting GSCMP has reduced the processing and manufacturing time of the products, which has reduced costs significantly.

Adopting GSCMP does not give the company any sort of competitive advantage; currently the customers are only interested in low cost. However, the customers have specified that in 2020, they will only buy from companies that have adopted GSCMP and the company is adopting the practice to grasp more business in the future. The interviewee while talking about customer demands said;

> "They prefer to save cost right now but after 2020 or 2021, they will buy from careful suppliers." – GM Production (CY)

Organization Responsibility

It is the vision of the company to save the planet for the future generations. GM Production repeatedly mentioned that "as Muslims it's our responsibility to save the planet" and also that "it is the vision of the owner of the company to prevent resources from being wasted".

4.3 Company Z Overview

Company Z is a product of a diversified group that has its roots in all major sectors, namely; textile, cement, banking, insurance, power generation, hotel business, agriculture, dairy and paper products. The group is ranked amongst the top 5 business houses in the country.

Company Z commenced in 1951 and is one of the largest vertically integrated textile companies in Pakistan. The company's production facilities comprise of spinning, weaving, processing, stitching and power generation. It has a production facility of 740 looms, 270,000 spindles and a dyeing capacity of 7 million meters, making it the largest composite textile setup in Pakistan.

The company sells to both, local and international market. However, it is largely dependent on exports with its major customers being in Europe, USA and Australia. It's main customers are Levis, Next, IKEA, Tommy Hilfiger and Hugo Boss. As it is an export-oriented firm, 3/4th of its revenue comes from exports. The company's total exports for the year 2018 were US $ 353.03 million.

The company is into various environmentally sustainable projects. Company Z is the only company in Pakistan that has invested in building a green plant. The plant has been a vital element in the success of the company. It is particularly useful as it fulfills the environmental requirement of foreign buyers and offers more foreign business opportunities to the company.

4.3.1 Identified Ways of Adopting the GSCMP:

Green Purchasing

Green purchasing in company Z refers to purchasing organic cotton, biodegradable bags and non-hazardous chemicals and dyes.

Manager of Procurement in company Z mentioned about using "D2W". D2W refers to biodegradable plastics and biodegradable material. The company also purchases organic cotton from its suppliers. It only selects suppliers who are certified for organic cotton and biodegradable material.

In company Z, interviews were taken from both the local and export unit. In the local unit, the only material purchased green are the biodegradable bags but that too, are only for some articles as GM Marketing said; "those are for few collections, not for all".

However, the export unit not only makes use of biodegradable bags but also organic cotton and non-hazardous chemicals and dyes.

Over the years, the specifications to the suppliers have also changed. Previously, the company only demanded normal cotton but as the demand from the international customers is increasing, the suppliers are bound to supply organic material. To ensure what the suppliers are delivering is green, regular lab tests are conducted.

The supplier selection is based on certifications, suppliers approved for BCI and GOTS are selected. However, other factors like cost and quality are also considered. The company is into building a long-term relationship with its suppliers but removes suppliers who are not compliant to green purchasing demands, as one of the respondent claimed;

> "We simply skip suppliers who do not fulfill our needs of green purchasing." -Assistant Manager Weaving (CZ)

Co-operation with customers

Company Z includes customers in clean production process by taking feedback from them, calling them for frequent visits and also by attending international exhibition to take ideas from customers regarding the future trends and inculcate them in their own practices.

The company has a separate R&D department which works specifically on customer needs and develops samples, which are sustainable. These samples are then taken to Europe to showcase at various exhibitions. One of the respondents at company Z explains;

> "There's an event where we showcase our new designs to customers and make them think that their supplier is thinking about their needs."- GM Marketing (CZ)

Internal Environment Management

Company Z is certified for various legislations and auditory programs. It is ISO 14001, REACH, GOTS, BCI and IKEA certified. All these certificates are a demand of the international customers.

The company has a separate compliance department that is responsible for all the certifications. Suppliers and employees are provided training to comply with these legislations. Furthermore, the company is required to produce less fluff, use environmental machines and manage its waste effectively.

Green Logistics

For green logistics, company Z is using temperature controlled logistics, environmental packaging (bio-degradable) and electrically charged forklifts. Properly functional transportation exhuming less smoke is a part of the contract.

For the packaging material, starch oriented chemicals and "d2w plastic" is used. Manager Procurement at company Z mentioned about its recent "import of FSE (organic) material from Australia", which is now being used for the packaging of the cartons. Assistant Manager Weaving at company Z mentioned about using "bamboo pallets" as they are recyclable and biodegradable.

Eco-Design

For eco-design, company Z has invested in the foundation of a green building. A green building uses solar power for day-to-day operations. Assistant Manager Weaving explains, "Solar tubes are basically given the shape of a dorm. It collects sunlight distributes this light in areas like sheds". The company schedules a major chunk of its daily tasks during the sunlight and for the remaining tasks; sunlight that has been stored during the daytime is used. All the processes in the unit are solely dependent on solar power (day light). This not only saves cost for the company, but also makes it both, operationally and environmentally efficient.

The company is also into recycling. It is making using of pre-consumer waste. The oils it is using are synthetic, which means that they can be used twice or thrice. A respondent on use of pre-consumer waste explains; "now due to green house building, we are using lubricants and synthetic oils which are totally recyclable". The company is also recycling the water that it disposes off. The wasted water is used in induction. The company also does not use exhaust fans, it saves energy by using windmills for the purpose.

The goods that it produces are produced in a worker friendly environment. Each employee is given a separate safety kit and is advised to shed the area that they are working in, in order to avoid over production of fluff and hairiness in the fabric. The hygiene of the workers is also taken care. Workers are offered high nutrition diet; they are given sugar balls to lessen the effect of the chemicals.

The company is into power generation business. The waste generated from the power generation is properly disposed off.

4.3.2 Identified Drivers for Adopting GSCMP

Different drivers have been identified against each practice. In this section, the drivers will be discussed against the practices. The drivers (reasons) relate to different motivations and involvement of firm in diverse set of strategies; that is, why does Company Z approach to different practices?

Compliance with Regulation

Compliance with regulation in company Z refers to government rules and regulation to adopt green supply chain management practices. In company Z, interviews were taken from both the local unit and the export unit. The local unit also sells through international retails. GM Marketing from the local unit mentioned that when it is selling in the international market, international rules do apply. The government of UAE did require the company to sell in biodegradable packaging as the respondent says; "Bio-degradable bags was a requirement of UAE government". As for the local government, only one of the respondent agreed to government driving the company to adopt these practices. However, the rest feel that the government might pressurize in the future.

Organization Responsibility

All the respondents in company Z agreed to adopting GSCMP as an internal drive of the organization. The company feels that it is their core responsibility to protect the environment.

Business Efficiency

The respondents mentioned adopting GSCMP as a motive to reduce cost and increase competitiveness. The Supply chain head explained*;* "We need products that are cost effective, the overheads should be less so we try to use electricity and the equipment that utilizes less energy and the raw materials that we try to use, we try to consume less raw materials so our overall cost is less".

Assistant Weaving Manager also mentioned it as a "growth strategy". The company feels that adopting these practices, which they label as certifications, improves their brand image. Once they adopt these practices, more international customers are persuaded to offer the company new business. It improves the name of the company in the international market and gets them more business.

Customer Demand

Adopting GSCMP is basically a demand of the international customers therefore the local unit has not adopted much of these practices. As for the export unit, the main drive for the company adopting GSCMP is the customers demand. The company has its major customers in UK, USA and Australia and all these customers are giant international corporations like IKEA, H&M, Nike, Levis etc. These international brands drive the company to adopt GSCMP. One of the respondent mentioned 'IKEA' as one of the strongest customer to drive the company to adopt GSCMP.

Chapter 5

Cross Case Findings and Discussion

After a careful presentation of within case analysis, a cross case analysis is drawn. This chapter shows the practices adopted in the three companies, their ways of adopting and their drivers. The purpose of this chapter is to compare the practices across the three companies, identify their commonalities and differences.

5.1 Identified ways of Adopting the GSCMP

Company X, Y and Z have all adopted the five practices of GSCM that has been considered in this research study. However, their ways of adopting these practices are different from each other but there are some commonalities as well.

Green Purchasing

For green purchasing, adoption of green purchasing, changes in products, such as use of bio-degradable bags, changes in purchasing order process and suppliers are required (Chin, Izzati Ab Malik, & Dawei, 2015). Similar was seen across the three companies.

In adopting green purchasing, company X is seen more proactive than company Y and Z. Company X has been into taking various initiatives like “infusion of seeds in paper bags” and using “hemp fiber” (it uses less water than cotton) which other two have not adapted till date. Suppliers of both Company X and Company Y are contractually obligated to deliver green products. All three companies are using organic cotton, non-hazardous chemicals and dyes and are purchasing from certified suppliers but for further assurance, product testing is also being carried out. It has also been observed that there was a change in purchase order process in all three companies. However, the change in the purchase order process varied from company to company.

Company X has launched an ERP system, in which new components are added regularly to update the purchasing system with the new green purchasing process. This has led to transparency and paperless purchasing in the organization. Secondly, the company issues a transaction certificate on the purchase of every green product. The transaction certificate assures that the suppliers are certified for organic products and the products that they are selling are green.

Company Y has also switched to paperless purchasing. A purchase order is generated before any transaction processing. The company claims to be the only one in the industry that demands an SDS list from its suppliers as the respondent said;

> "when we ask for SDS from supplier, they say that no one else asks for it. There are so many top brands like company X and company Z but when we ask for SDS, they (supplier) don't provide it saying no one else demands for it". – GM Production (CY)

The company also claims to be the only one in the industry purchasing the finest fibers, as the respondent again says; "our fabric runs directly in the machine but other brands have to stretch it twice before running it in the machine". The company Y very carefully selects its fabric. Despite other competitors buying from the same supplier; company Y is very different in its choice of material. In support of this, GM Production (CY) stated that;

> "the supplier always argues that your competitor (company X) also buys from us, but it never complains."- GM Production (CY)

Company Z introduced the concept of D2W plastic in Pakistan. The Procurement Manager at company Z said that "previously no such thing existed in Pakistan but now it does so it educates its suppliers accordingly". The company uses starch-oriented chemicals, which no other company mentioned about using. However, GM Marketing of company X did mention about using "sustainable bleaching dyes".

Suppliers are usually paid extra for these sorts of material but non-compliant are removed. Company X, Y and Z are firm in building long term relationship with its suppliers, but not at the cost of quality. Suppliers are selected against an environmental criteria as done in China (Zhu & Sarkis, 2004). The three companies are also educating their suppliers regarding green purchasing activities as proposed by Min and Galle (2001).

Co-operation with customers

All the three companies have adopted co-operation with customers by meeting customer's demands of green products and environmental certifications. The companies involve customers in cleaner production and processes by being in a constant communication with them and also by calling them for frequent visits – a finding which

concurs with previous studies conducted in different countries (De Sousa Jabbour, de OliveiraFrascareli, & Chiappetta Jabbour, 2015; Zhu, Sarkis, & Lai, 2007; Jr, Zelbst, Meacham, & Bhadauria, 2012). However, the previous studies did not mention about offering frequent visits to the customers. The companies additionally attend international exhibitions in order to grasp new ideas on sustainability, as one of the respondents said that sustainability is being sold as a commodity in the international market. The companies bring back the ideas to discuss it with their customers and implement these ideas on them.

All the three companies have a separate R&D department. Respondents from company Y mentioned, "holding a weekly meeting to discuss new concepts". Respondents from company X mentioned that they are so "gelled in with their customers, that the customers not only tell about the certification but also specifically about the product they require" but company Y and Z only mentioned about the demand for certification from the customers. Company Y furthermore realizes that management involvement is also important for cooperation with customers.

Internal Environment Management

There are different environmental certifications that companies in China are certified for (Zhu, Sarkis, & Lai, 2007). Company X and Y according to them are the only two companies in the textile sector of Pakistan who have been certified for OEKO-TEX. Company X and Y are also Eco-label certified. Other than this, all three companies are certified for GOTS, REACH, ISO 14001, BCI etc. Each company has a compliance department, which is responsible to deal with various legislation criteria. Respondents from company X and Z additionally mentioned about offering compliance training to the concerned employees. The customers do the compliance verification, there are international auditing bodies, which verify the certifications and ensure transparency.

IEM across countries has been adopted by invested in waste management plants (Zhu, Sarkis, & Lai, 2007) and also by enabling recycling and reuse (Min & Galle, 2001). All the three companies are using recyclable products, have a waste management committee and an Effluent Treatment plant (ETP). In 2018, Company Z inaugurated the country's biggest ETP with a capacity of 400 m3/h.

Company X is working on monitoring carbon footprint and has hired an environmental engineer for the initiation of the project. Furthermore, it is developing a software which will monitor carbon emission stacks as General Manager Compliance (CX) explains:

> "…the latest thing that we are doing is the carbon foot printing. It is something very new…Now we have made a department (sustainability and compliance department). We have recently hired a girl who is an environmental engineer…We are now going to develop a software and we are going to maintain the regular monitoring of carbon footprint. You know carbon footprint is the all emissions that are being emitted in the environment."

Green Logistics

Green logistics is at the initial stages and it will take years for the industry to adopt this practice. As the customers do not drive green logistics, the companies have not taken many initiatives with this regard. The only initiative widely practiced across the three companies is use of "electrically charged fork lifters" and "biodegradable packaging". But even biodegradable packaging depends upon the demand of the customer.

Out of the three companies, company Y has taken the most initiatives for adopting green logistics. Company Y has changed its delivery and is also using "concentrated chemicals" to reduce the number of vehicles and trips to and from the facility. Similar changes were also previously proposed by Ubeda, Arcelus, & Faulin (2011). Furthermore, company Y is using "starch-oriented chemicals" and "FSE" material pallets for packaging.

Company X claims that, for logistics, it hires a third party contractor; therefore it does not have much control on the contractor. However, it does try to take whatever initiatives possible as GM compliancy (CX) said;

> "We are trying to ensure what every little is in our capacity but what is beyond our control is beyond our control". –GM Compliance (CX)

Both company X and Z, are using good conditioned and temperature controlled logistics.

Literature also proposes use of bio-fuel (Lin C.-Y. , 2008) but that as mentioned earlier these changes have not been made in the textile industry of Pakistan.

Eco-Design

All three of the companies (X, Y and Z) are using pre-consumer waste, which includes using left over fiber, water after treatment, synthetic oil and lubricants. Company X and Y are also using post-consumer waste. Secondly, they all are hiring new employees, focusing on building environmental team, using minimum resources, using recyclable and reusable products, having an effluent treatment plant and are working in labs to save costs and protect the environment. Company Y and Z believe that its management involvement is very important for adoption of eco-design.

Company Z has the largest ETP in the industry. It is currently working on switching to paperless processing, however, company X and Y have already switched to paperless processing. Company Z has a green building, which, at present, no other textile company in the industry has;

> "we are the only one in the industry who are using solar energy to run our operations." – Assistant Weaving Manager (CZ)

It uses "sunlight for 10% of its processing and with this initiative it has saved 1277116 KWH energy from July 2017-June 2018". Company X is working on a carbon footprint project with main drive being protection of the environment. It is also using bio husk for power generation. It is also the only one in the industry using hemp fiber because according to one of the respondent hemp fiber utilizes less water than cotton and is sustainable. Company Y has significantly reduced its processing time by removing non-value adding activities and also by using good quality material, which again it claims to be the only one in the industry, doing that.

All the three companies are into power generation. Company Z has been the trendsetter in the country for its power generating techniques. The turbines at company Z use waste heat recovery for not only power generation but also supplying steam air conditioning to the production unit (BusinessRecorder, 2009).

After a careful analysis of the three companies, it can be concluded that adoption of GSCMP in Pakistan is at its initial stages. Similar findings of infancy of GSCM practices in other emerging economies like India has been reported in literature (Mitra & Datta, 2014). In the context of Pakistan, it is important to note that these practices are only

limited to the export units of these companies; the local units have not adopted these practices.

Green logistics, out of the five practices studied, is seen as least adopted practice and green purchasing and IEM being the most widely practiced. In a study conducted in Taiwan, it was also seen that green purchasing is the most widely adopted practice (Chien & Shih, 2007). Similar is seen in the textile industry of Pakistan.

5.2 Identified Drivers for Adopting GSCMP

Four basic drivers have been identified in the three companies. These drivers have been discussed in detail in the previous section. In this chapter, a comparative analysis of the drivers across the company X, Y and Z is done.

Requirement of the Government to Comply with Regulations

All the three companies realize that there is an environmental drive from the current government. However, the influence of the government is not strong in either case. According to the respondents in company X, there are NEQ standards which the company has to comply with and the government regularly monitors its stack emission. According to respondents in company Y, previously there was no sustainability drive from the government, but the current government has started taking initiatives with this regard. Company Y and Z both realize that there would be a stronger drive from the government in the future.

> "There is not a specific legislation I guess but yes there is an environmental protection agency which visits us, which does surprise audits …" – GM Process Control (CX)
>
> "Government has also just started to take initiatives to some point."- GM Production (CY)
>
> "…the government might pressurize us in the future" – GM Marketing (CZ)

Organization Responsibility to Save the Resources

All the three companies agreed to having adopted GSCMP as its organizational responsibility to save the planet for the future generations. All the three companies have taken initiatives with this regard. Company X and Y were more driven by this cause than company Z. Company Z saw it more as an increase in cost, company X and Y persuaded

it “in full letter and spirit” as a vision of the company to be recognized a responsible corporate entity.

Enhance Business Efficiency

Company X, Y and Z are all strongly internally driven to adopt GSCMP. They see it as a mean of improving brand image and enhancing its skills and capabilities. Company X and Z also see it as a competitive advantage but respondents from company Y simply refused it to be a driver and foresighted it as a cause in the future.

Reduced cost is a driver for all but only company Y is currently attaining the goal and company X and z are seeing it as a long term objective but all three are driven by reduced cost to adopt GSCMP. Company X out of the three companies is more strongly internally driven with the aim to mark a benchmark in the industry and lead the market.

> “….we do our brainstorming as well to mark a benchmark.” - GM Process Control (CX)

Meeting Demands of Customers

A major chunk of interviews were taken from the export unit of the three companies. The customers were mainly from developed economies like the UK and the USA. These developed economies demand certification for sustainability from their customers and to maintain these customers the companies are strongly driven to adopt these practices. The companies have been given a deadline of 2020 where the customers will only buy from companies that are environmentally cautious by all means. Therefore, as a survival strategy the companies have to be certified for various green practices. It can be clearly in the previous section that the reason for not taking many initiatives in green logistics is due to lack of customer demands and it can be simply analyzed that customer demand is the strongest driver out of the four for all the three companies.

After discussing all the drivers individually, it can be concluded that demand from customers has the strongest influence on companies adopting GSCMP. Internal drivers such as management involvement and company’s vision to grow also have a significant influence. The results from this study coincide with another case study conducted in 2012 on the textile industry where it was concluded that international companies are usually more driven from internal organizational factors and customer demands (Caniatoet al, 2012). These results were further confirmed by Krause et.al (2000), Harms et.al (2013),

Buzuku, Farfan, & Kraslawski, (2018) and Wang, Wang, Zhang, & Zhao (2018). However, the results negate with a study conducted in 2012 on the textile sector of Taiwan where it was concluded that customers demand or market pressure does not drive the textile companies to adopt companies to adopt GSCMP (Wu, Ding, & Chen, 2012).

Wu, Ding, & Chen (2012) and Zhu, Sarkis, & Lai (2007) concluded that government rules and regulations moderately drive companies to adopt GSCMP. Similar results were observed in a recent study carried out in 2018 in the Indian economy (Luthra & Mangla, 2018). The results of this research study conflicts with Wu, Ding, & Chen (2012) and Luthra & Mangla (2018), as it can be seen in the finding section that government rules and regulations are not a strong driving force for any of the three companies to adopt GSCMP in Pakistan.

Chapter 6

Conclusion

Increased environmental awareness has been the key driving force for companies to adopt GSCMP. The awareness has led to a worldwide adoption of GSCMP (Govindan, Barve, & Muduli, 2016). Companies are adopting these practices to protect the environment and conserve the resources. Various practices have been adopted in different industries, globally. However for this study, five most widely adopted practices have been identified from the literature and used for further analysis.

In this study, the drivers and the ways of adopting GSCMP had been investigated in the textile industry of Pakistan. The textile industry of Emerging Economies like Pakistan has been largely ignored in literature in terms of GSCMP (Mitra & Datta, 2014; Majumdar & Kumar Sinha, 2019), but ,it can be seen from the results and discussion, that the companies have adopted these practices to an extent.

Three large vertically integrated textile companies have been studied using the framework comprising of drivers and ways of adoption. The cases were analyzed in two stages; within company and cross company.

After a thorough investigation of the cases, a unique and contrasting insight has been identified in the textile industry of Pakistan. In the literature, it can be seen that in emerging economies like India (Mitra & Datta, 2014) and China (Zhu, Sarkis, & Lai, 2007), companies are strongly driven by the government rules and regulations. However, in the case of Pakistan, government rules and regulations are not a strong driver for companies to adopt GSCMP. It is the demand of the international customers that drives the companies to adopt these practices (Wang, Wang, & Zhang, 2018). As more than 90% of the revenue for these three companies is generated through exports, it is important for them to adopt GSCMP or they would lose business. However, in addition to customer drive, it is presumed that government rules and regulation might be a strong driver and would greatly influence companies to adopt GSCMP in the future.

There is lack of awareness in the local market because of which the textile companies of Pakistan have not widely adopted these practices. Both internal vision of the company and international customer demand have driven the companies to adopt GSCMP, but the

adoption is still at infancy. It has not been adopted in the local market because the government of Pakistan and the local customers are not aware of the benefits of GSCM.

As mentioned earlier, the adoption of GSCM in Pakistan is at the initial stages as is in India (Mitra & Datta, 2014). This study confirms that adoption of GSCMP, in emerging economies like Pakistan, is still at infancy (Majumdar & Sinha, 2019; Luthra & Mangla, 2018). The practices being most widely adopted are namely; green purchasing, co-operation with customers, IEM and eco-design. However, green logistics has not been much adopted. The reason for not widely adopting green logistics is because the international customers do not demand for it. The international customers are not interested in the local mode of transportation used but as far as the packaging is concerned, it is according to the international standards.

6.1 Implication and contribution

This research study provides both practical and theoretical implications.

6.1.1 Practical Implication

From research, it has been seen that the local companies have not adopted GSCMP as yet. Even in companies X, Y and Z, only the exports units had adopted GSCMP and for the local units, old practices were being followed. However, the companies did see the current government being a strong driver in adopting GSCMP in the near future. It can be seen in the country that the use of plastic has already been banned and campaigns of go green are at peak. Due to this ban on plastic, many companies are suffering from huge losses and the only survival strategy they have is to adopt GSCMP. Furthermore, the world is becoming a global village and competitiveness is increasing day by day. In order, to enter the International market, the companies have to adopt GSCMP. The International customers have given a deadline of 2020, that in 2020 they will only buy from suppliers who have adopted GSCMP.

For a practitioner, the three companies provide a good example of what the drivers of GSCMP are and how they can be adopted throughout the textile industry of Pakistan. The results may help companies to identify important practices of GSCM, their drivers and their ways of adoption. It would create ease for companies to adopt GSCMP in their work environment and make it a part of their operations. As discussed, adopting GSCMP is a

need of the future. The companies in order to survive and remain competitive need to adopt these practices. The examples of the three cases, suggest that GSCM can help companies survive the global pressure without significantly increasing their cost. It leads to huge savings in the long run. However, for government of Pakistan, as it has taken an initiative of going green, it should provide the local industries subsidies as is done in China and other emerging economies.

6.1.2 Theoretical Implication

This research study is among one of the few studies investigating GSCM practices in the context of emerging economy, namely, Pakistan. This research study responds to the novel call made by Diabat, Kannan, & Mathiyazhagan (2014) and Caniato et al (2012) to further explore GSCMP in the textile industry of emerging economies. It also addresses the concern of Silvestre (2016) and Majumdar & Kumar Sinha (2019) regarding insignificant awareness on adoption of GSCMP. The concept is new in the country and according to the knowledge of the author, it is an area that needs to be explored further. Drivers have been identified and widely discussed in the literature however; ways of adoption yet need further exploration (Silvestre, 2016). The current study highlights drivers of adopting GSCMP in the in the textile industry. It additionally addresses the concerns of previous authors by presenting ways of adopting five different GSCMP. It significantly creates awareness regarding adopting GSCMP by providing an example of three different textile companies that have already adopted GSCMP. Due to lack of previous literature available on GSCMP in emerging economies, the findings are still relatively exploratory. Future researchers can further explore the drivers and the ways of adopting GSCMP in different companies of the industry. A longitudinal and quantitative study across Pakistan with a larger sample size is needed to test the findings of the current study in the future.

6.2 Limitations and Future Recommendation

This research study has its own set of limitations. Due to limitation of time and resources, only three companies and five practices have been studied. The companies were selected on the basis of purposive and convenience sampling. However, a result from three companies is not sufficient enough to be generalized across the textile industry. Another

limitation of the study is that the three cases studied are of large, vertically integrated companies that are largely depending on exports as means of generating revenue. The study ignores small and medium-sized enterprises (SMEs). Further research needs to investigate the same in SMEs to know what is being practiced at large.

The same framework could be used to analyze different textile companies and also more practices could be added into the framework to identify how and why the practices have been adopted across the textile industry. Furthermore, different aspects of GSCMP can also be explored. Drivers and ways of adopting GSCMP are only two areas explored in this study. If researched more, new insights would be revealed. Moreover, a longitudinal study across Pakistan with a larger sample size would also provide a better picture of what is happening in developing economies such as Pakistan across industries.

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Appendix 1: Cover Letter

Islamabad, 11-02-2019

Introduction Letter

Dear Sir/Madam,

The NUST Business School (NBS) at the National University of Sciences and Technology (NUST) is a leading academic and research institute specializing in International Business & Marketing, Finance, Human Resources, and Logistics & Supply Chain Management. One of our current research project focuses on exploring the adoption of Green Supply Chain Management Practices in firms from Emerging Economies.

The main aim of this project is to study how and why firms from emerging economies adapted green supply chain management practices working with Western firms. More specifically, this research will focus on studying textiles and apparel firms in Pakistan.

After a careful and detailed search for relevant Pakistani firms, we have identified your firm as of great interest and potential in this area. We appreciate your company's track record in adopting green supply chain management practices while handling both domestic and international clientele and suppliers, and especially your collaboration with Western customers and partners.

Accordingly, it will be of great interest for us, should it be possible to learn from your experience for this research. We will appreciate your kind permission for allowing us to send our MS thesis student, Ms. Maham Nadeem, to visit your facility for an interview with your production, procurement, supply chain and marketing and sales units.

We look forward hearing from you and hope you will be interested in sharing your rich experiences. By doing so, you will be contributing to this important research project.

Kind regards

Yours faithfully,

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Appendix 2 Project Summary

Adoption of Green Supply Chain Management Practices in Emerging Economies: A Case of Pakistan Textile industry

Over the past few decades, internal organization factors as well as pressures from external environment (legal framework) and increased awareness of key stakeholders (specifically customers) about environmental sustainability has placed significant burden on organizations to adopt practices of green supply chain management.

Green supply chain management is defined as integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life.

Developed economies are the initiators and forth runners in the adoption of green supply chain management practices. This enhances their competitive advantage as well as adds value in their supply chain. On the contrary, developing economies are lagging behind. To date, they are exploiting natural resources. This owes largely to lack of environmental awareness.

The purpose of this research study is to understand the extend to which green supply chain have been adopted in textile sector of emerging economies like Pakistan. It aims to do so by investigating the following questions:

- What are the Green Supply Chain Management Practices being practiced in Emerging Economies?
- How can Emerging Economies adopt Green Supply Chain Management Practices?
- Why they adopt Green Supply Chain Management Practices the way they do?

The case of Green Supply Chain Management Practices in the textile industry is specifically critical because of the complex processes it uses. It is thought of being amongst one of the highest pollution-creating sector. Secondly, it is an important revenue generating industry. Pakistan is ranked as the 8th largest exporter of textile.

This research study is qualitative in design. The research questions will be answered using in-depth interviews from selected textile companies. It is in this regard, given your firm's professional experience and background in this industry, that I would like to study and examine your firms supply chain. The supply chain would be studied in terms of environmental initiatives that you've taken.

Hence, I would appreciate your co-operation in terms of facilitating an interview with the concerned officials. I look forward to hearing back from you and hope you find my research of interest.

Appendix 3 Interview Guide

Date: _____ Respondent: _____

Title: _____ Case Company: _____

Introduction: (5-10 minutes)

Background information about the interviewer and institution.

1. Explain the purpose of the research: To understand the regarding adoption of green supply chain management practices in emerging economies.
2. Involvement in the research:
    - Interview (70-90 minutes)
    - Follow up emails
    - External and Internal reports/ documents
    - Customers/suppliers websites and related information
3. Discuss about anonymity: All information will remain strictly confidential. The information gained from respondents at one interview will not be shared with other respondents in the same and/or anywhere else. Further, all the case companies, their clients, market, regions and individual names will be changes to hide the identities.
4. Ask the permission to begin recording the interview and write notes during the interview. Moreover, a consent/agreement form will be signed form the interviewee(s) to participate in the interview.
5. Outline the sequence of interview. The interview is semi structured and uses both open and closed ended questions:
    - In the start, I will ask short informative questions about your firm's overall green purchasing practices.
    - In the second part, I will ask you to please describe your relationship, ties and cooperation with your customers as well as suppliers that occurred or occurring.
    - In the third part I will ask about the Internal Environmental Managemnet that is changed and changing based on gaining experience and learning while working with foreign clients and suppliers.

- In the fourth part I will investigate about the Green Logistics focus on responsible practices related to use of resources, transportation, packaging and supplies.
- In the last section, I will ask about the issues related to Eco Design and SUSTAINABILITY including the product and process design, recycling, reuse, recovery as well as reduction in consumption of energy and materials.
- In the last section, I will ask about the overall adoption of green supply chain.
- In case you cannot understand specific question or issues we can discuss and clarify it mutually.

1. Company profile:

I would like you to ask a few questions about you and your firm's background. Please tell us about your background, role and responsibility. How long you been with the organization?

Can you Please tell us about your company and its operations?

- Establishment----------
- Sector----------
- Nature of Products----------
- Operation and process----------
- Main markets and regions
- Main Customers (size/national/international) ----------
- Main Suppliers----------
- Overall company Size----------

SECTION 1 -<u>Green Purchasing</u>

1. **Has your company adopted Green Purchasing? What has motivated you to adopted it and how have you adopted it?**

1.1 What criteria the clients use in assigning order(s) to your company?

1.2 Please tell us about the changes in the ordering procedures criteria/specifications from your main clients.

1.3 How do you organize and address the changes in orders with respect to criteria and specifications.

1.4 Do your clients provide specifications to you or have joint operations to produce environmentally friendly products?

1.5 Have you initiated green purchasing drive in your organization? Why?
(Governmental rule and regulations, customer requirements, company internal drive (save the planet, sustainability), growth strategy and efficiencies (cut costs) etc.

1.6 How do you choose your suppliers?

<u>Co-operation with customers</u>

2. **How does your company co-operate with its customers and what motivates it to co-operate?**

2.1 Why do you think co-operation with customers is needed in your company? Does it enable competitiveness or improve your financial worth?

2.2 How do you tend to build relationship with your customers?

2.3 What do you do to retain your customers? Do you offer any incentives to your customers?

2.4 Are there any environmental drives from customers that motivate you to use recyclable and reusable packaging?

2.5 Is there any mechanism in place to involve customers in cleaner production processes, product design or packing? If so how?

2.6 Does your company have the necessary
capabilities and willingness of determining customers' future needs? Give an example please.

Internal Environment Management (IEM)

3. **Has your company adopted GSCMP of IEM? Why has it adopted the practice and how has the company adopted this practice?**

3.1 Does the governmental regulate your supply chain activities? How?

3.2 Is there any legislation, which bounds organizations to be environmentally cautious in their supply chain practices? Give examples.

3.3 What encourages your organization to adopt IEM GSCMP? (cost drivers, customer awareness, organizational goal, shareholder pressure etc.)

3.4 How do you achieve the goal of IEM? (Enabling recycling of goods or using reusable material etc.)

Green Logistics

4. **Has your company adopted green logistics? What motivated your company to adopt this practice and how have you adopted this practice?**

4.1 Are the suppliers aware of green logistics practice? Are they responsible in terms of the means of transportation and resources they use?

4.2 What do you do to ensure that the suppliers are not wasting resourcing and using efficient means of packaging (pallets)?

4.3 Are their standards in place to set routes that cause minimum damage to the environment?

4.4 What do you do to ensure optimal routes? Why do you this it is important?

4.5 What about international deliveries? What mode of transportation do you use to deliver to international customers and receive supplies from foreign markets?

4.6 How often do you find suppliers who are willing to incorporate environmental factors into their practices or are already practicing GSCMP?

4.7 What drives or motivates you to use green logistics? Is it pressure from the stakeholders, govt. pressure, economies of time, advanced technology or any other reason?

Eco Design

5. **Has your company adopted Eco-design as a GSCMP? What has driven the organization to adopt this practice and how has the company adopted this practice?**

5.1 Are you products recyclable or reusable by any means?

5.2 What do you do to reduce consumption of energy and raw materials?
5.3 What motivates you to save energy and other resources from being wasted? Are there internal organization factors or is it the external environment that drives you?

5.4 What do you do to educate your customers? Or you do not do anything at all?

5.5 How do you operationalize eco-design? What activities have you been following to initiate and operationalize eco-design? Are cross-functional teams build to work on different projects?

Appendix 4 Consent Form

Research study on adoption of green supply chain management practices in emerging economies: a case of Pakistan textile industry

You are invited to participate in a research project on learning about green supply chain management practices in textile industry of emerging economies like Pakistan, the drivers and how they adopt these practices.

Your involvement would be limited to:

a) Interview
b) Follow up email or phone calls (if needed)
c) Voluntary sharing of documents

All information will remain confidential. Information gained from respondents at one interview will not be shared with respondents at another. Further, in the write-up, all corporate identities would also be concealed. However, all the interviews will be recorded as a pre-requisite of the project. The recorded interviews will be transcribed and used only by the researcher directly involved in this research project.

After transcription, all interview records will be stored safely by the researcher. The company will get a short report presenting a summary of the researchers main findings for review and further comments.

As a token of gratitude, the researcher commits to send a copy of full dissertation to participating companies, once it will be approved and successfully defended.

Please sign below if you agree with the above guidelines for your participation in this study.

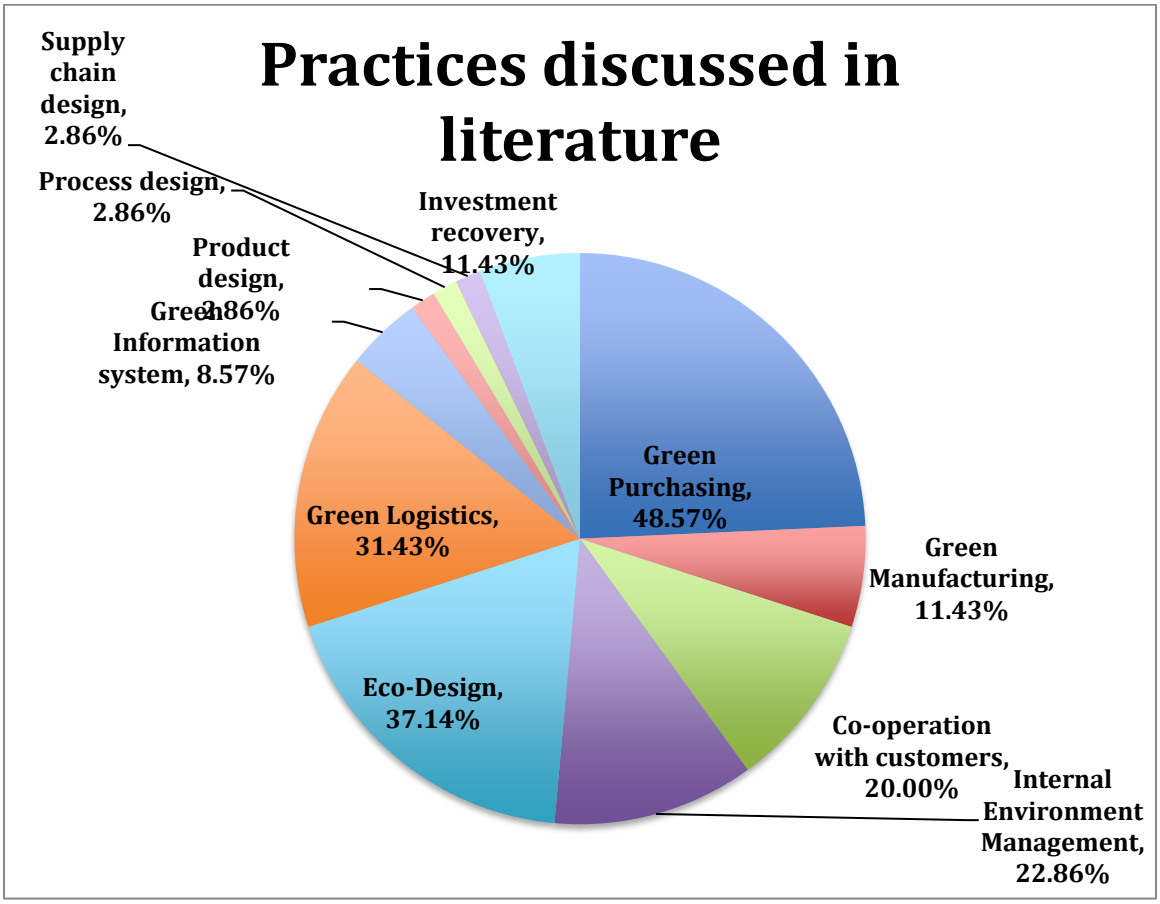
The extra copy of the consent form is for you to keep.

_____

Respondent Signature/Designation/Date

Appendix A Stats

Figure 2 Practices discussed in literature



Appendix B Stats

Figure 5 Methodology used in Literature

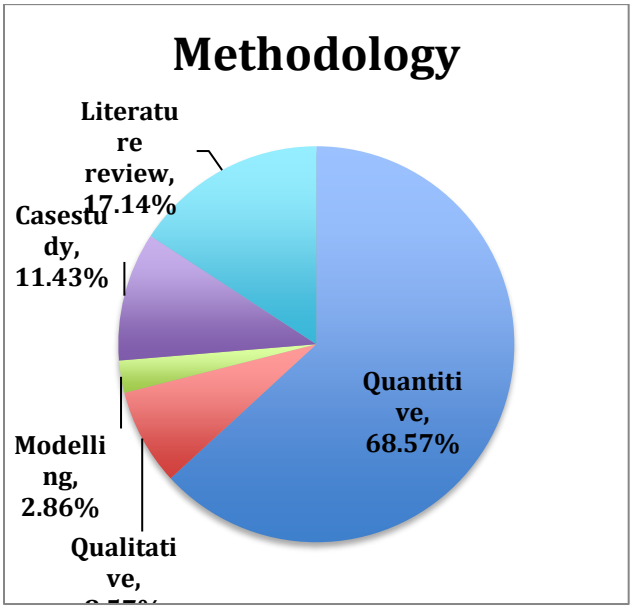


Figure 4 Industries discussed in Literature

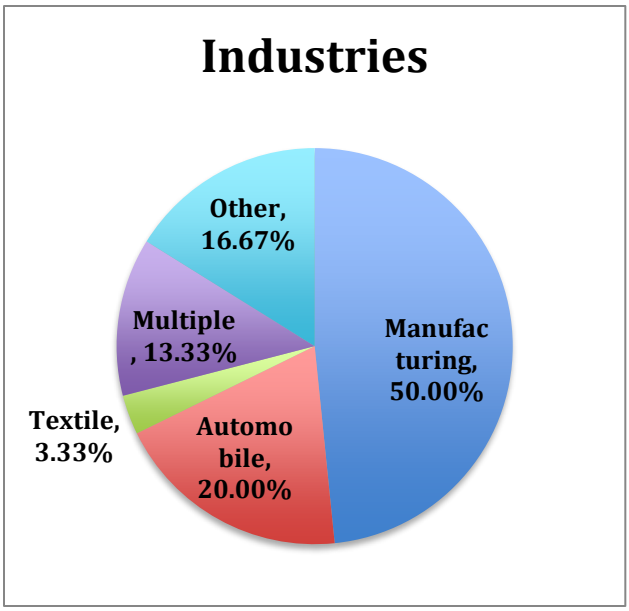
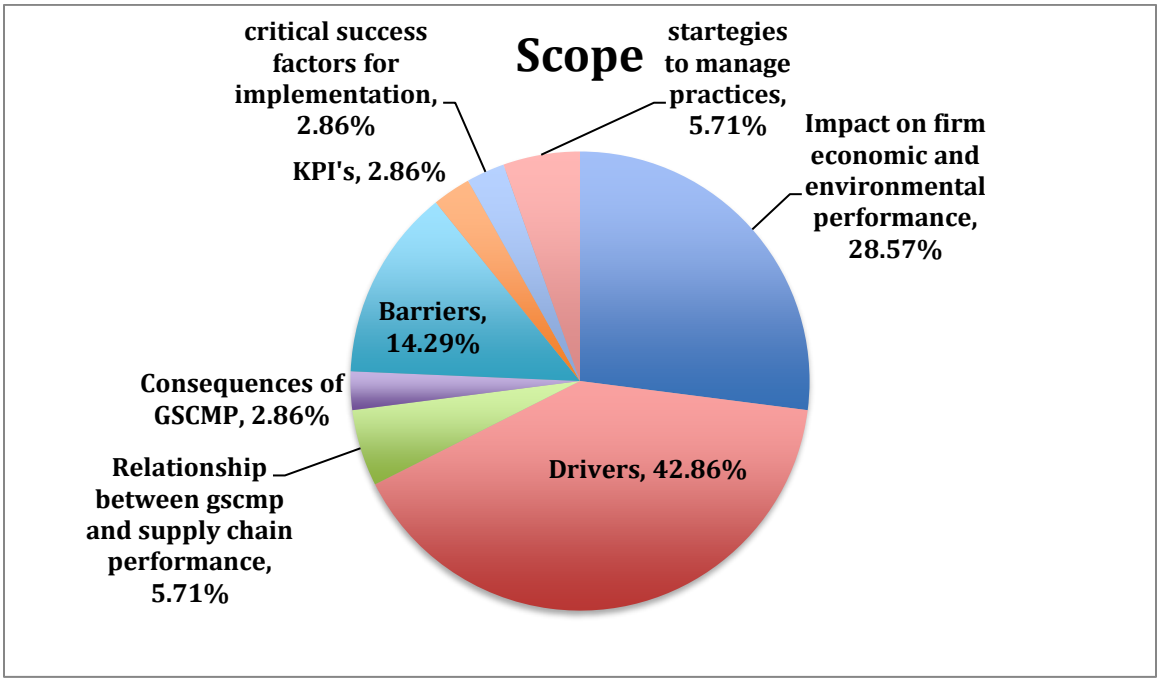


Figure 6 Scope of work identified in literature



Appendix C List of Abbreviation

Abbreviation	Full Form
GSCMP	Green Supply Chain Management Practices
GSCM	Green Supply Chain Management
IEM	Internal Environment Management
SCM	Supply Chain Management
CX	Company X
CY	Company Y
CZ	Company Z
ERP	Enterprise Resource Planning
GOTS	Global Organic Textile Standard
IS0	International Organization for Standardization
NEQs	National Environment Quality Standards
OBA	Optical Bleaching Agent
UPS	Universal Parcel Service