GREEN SUPPLY CHAIN MANAGEMENT
ENABLERS AND BARRIERS IN TEXTILE SUPPLY CHAINS

WHAT FACTORS ENABLE OR AGGRAVATE THE IMPLEMENTATION OF A GSCM STRATEGY FOR TEXTILE AND FASHION COMPANIES?

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Abstract

Purpose of this paper: The purpose of this paper is to provide an overview of the factors that enable or aggravate the implementation of a GSCM strategy for textile and fashion companies. Moreover, it shall be investigated how textile and fashion companies perceive their incentives of implementing GSCM and what their organizational responses regarding the perceived barriers and enablers look like.

Design/methodology/approach: The report combines a literature study on previous research in the field of supply chain management, Green Supply Chain Management and the drivers and barriers of implementing a GSCM strategy, with an empirical study consisting of an online survey, a semi-structured interview and two case studies that are based on literature review. In order to analyze the survey results, a method to calculate a company’s GSCM incentive score has been developed.

Findings: The factors that have been identified as the strongest or most important ones by many companies of the survey, as well as the interviewee and the case studies are supplier collaboration, the lack of supplier commitment, customer demand for more sustainability, customer desire for lower prices and top management commitment. Some companies also perceived the alignment of their company’s strategy as strong GSCM enabler. However, the calculation shows that the overall incentive score of most participants is in the neutral level; meaning that they in total perceive neither significant incentives nor barriers to implement GSCM. With mostly internal enablers and external barriers, more than half of the survey participants can be categorized as Agenda Setters.

Research limitations: Due to the low response rate, the sample size of this study is very small. Moreover, the results strongly depend on the personal opinion and experiences of the interviewee and the individual situations of the companies. This means that the results of this study give an indication, but are not generalizable. Therefore, another study with a different sampling method and a larger sample size is needed.

Practical implications: The outcomes of this study show that GSCM concerns every aspect of a supply chain. A company that wants to engage in GSCM needs to have good relationships with and control over its suppliers in order to ensure that they fulfill the sustainability requirements, and deal with pressure from NGOs. Additionally, the company needs to balance customer demands for low prices and sustainability, expect some (one-time) investments and sacrifice short-term profit in order to ensure sustainable production.

Originality/value: This report identifies the most important GSCM barriers and enablers for textile companies. By evaluating how companies within the textile and fashion sector perceive their incentives of implementing GSCM and investigating their organizational behavior towards barriers and enablers of GSCM, this study indicates what the current situation in the textile industry looks like; shows where improvements are necessary and gives insight for
companies that aim to engage in green practices. The development of the so called GSCM incentive score; a method to calculate a company’s perceived incentives to implement a GSCM strategy, can be useful for future studies within this field.

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Keywords
Sustainability, Supply Chain Management, Green Supply Chain Management (GSCM), textile industry, GSCM enabler, GSCM barrier
List of abbreviations

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1 Introduction

This study identifies enablers and barriers of Green Supply Chain Management (GSCM) and investigates how textile and fashion companies perceive their incentives of engaging in GSCM and can be of interest for other researchers investigating the implementation of GSCM in the textile (related) industry, as well as for (textile) companies that consider developing a green supply chain.

1.1 Background

Global Footprint Network created an index called “Earth Overshoot Day” to measure environmental sustainability of humanity. On their website, they explain: “Earth Overshoot Day marks the date when humanity’s demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year.” Figure 1 below shows a clear trend that from 1970 to 2015 resources demanded by humanity is increasing, whereas Earth Overshoot Day fell on December 23 in 1970, November 03 in 1980, October 13 in 1990, October 04 in 2000 and August 28 in 2010 calculated with the National Footprint Accounts 2015 Edition (Global Footprint Network, 2015). This trend sends out a strong warning signal that all industries and all companies within need to work toward a more environmentally sustainable method of doing business in order to reverse the current trend.

![Figure 1 Trend of Earth Overshoot Day](image)

The fashion industry accounts for 9.3% of world’s employees and 4% of worldwide exports and has a very strong environmental impact (World Trade Organization, 2008). Most textile and fashion companies nowadays depend on external partners from all over the world to produce their goods; subcontracting the different production activities from weaving or knitting to sewing and finishing and use raw materials from offshore locations. However the brand-owning companies are usually the ones held responsible for environmental and social problems caused not only by themselves directly, but also by their suppliers. In this context, supply chain management (SCM) has two main purposes; improving the competitiveness of the company and allowing it to pursue environmental responsibility (Caniato et al. 2011).
“Environmental sustainability in fashion concerns not only materials and processes, but also impacts supply chain configuration and management, both up- and down-stream, and can generate new business opportunities” (Caniato et al. 2011).

Sustainable Supply Chain Management (SSCM) integrates sustainability aspects (social, economic and environmental) into every part of the supply chain, whereas Green Supply Chain Management (GSCM) focuses on the environmental part of sustainability. Certain factors, such as management commitment and customer demand, can either work as enablers or barriers for textile and fashion companies when developing a GSCM strategy (Ahi and Searcy, 2013; Kant, 2015).

1.2 Problem background

Supply chain networks have become increasingly integrated and global over the past few decades. Especially textile and fashion supply chains mostly include many actors over different continents (Pui-Yan Ho and Choi, 2012). Having an environmentally friendly (green) supply chain means that every actor of the supply network needs to fulfill strict sustainability requirements (Caniato, 2012; Chen et al. 2012). That can be challenging for a company and requires good control and strong commitment. However, not only the development of a green supply chain is challenging, but also to keep it sustainable. There are several factors inside and outside a company or a supply chain that influence the implementation and maintenance of a green supply chain. These internal and external factors can encourage or discourage Green Supply Chain Management (GSCM) and affect different companies to different degrees, depending on the company’s nature and situation. Accordingly, the reaction towards these factors can vary strongly from company to company. Moreover, the factors enabling and aggravating Green Supply Chain Management are also different from industry to industry and the topic of sustainability only gained large significance during the past few decades. This means that this topic is highly complex and fairly new; there is no extensive literature available, not every factor influencing GSCM in the textile industry might have been identified yet, and there is no clear distinction between what organizational response is right or wrong (Caniato, 2012; Chen et al. 2012; Choi and Cheng, 2015; Diabat and Govindan, 2011).

1.3 Research gap

Besides the major research gap of studies about GSCM enablers and barriers that focus on the textile industry, two other research gaps have been identified: Studies within this field that take different organization types and regions into consideration and studies that use mixed-method approaches.

Some authors claim that even though there is extensive literature about sustainability and (green) supply chain management, there are only a few studies about GSCM enablers and barriers with focus on the textile industry, and those that exist mostly study a certain organization type or region (Caniato, 2012; Diabat et al. 2014; Kant, 2015). “There is no study focused to understand the similarities and dissimilarities of GSCM practices across the different types of organizations” (Kant, 2015). Min and Kim, 2012 see a need for studies with hybrid methodologies in this field (Min and Kim, 2012). In regard to the global and far-reaching nature of most textile supply chains and the need for more extensive and less narrow studies, a horizontal research approach that takes the global textile industry into account has
been chosen for this study. In order to fill the research gap of a study about GSCM enablers and barriers with a mixed-method or hybrid methodology, and giving the research more focus, while keeping the broad approach, this study shall combine different empirical studies.

1.4 Purpose and research questions

The main goal of this report is to find out what factors enable or aggravate the implementation of GSCM for textile and fashion companies. This shall provide an overall picture regarding incentives of adopting GSCM. The second goal is to evaluate how companies within the textile and fashion value chain perceive their incentives of implementing GSCM and investigate their organizational behavior towards barriers and enablers of GSCM. This shall give an indication what the current situation of the textile and fashion industry looks like, show where improvements should start from and provide insight for companies that aim to go on the same path.

This leads to the following research questions:

**Main research question (RQ):**

**RQ1:** What are the factors that enable or aggravate the implementation of a GSCM strategy for textile and fashion companies?

**Sub RQs:**

- **RQ2:** How do textile and fashion companies perceive their incentives of implementing a GSCM strategy?
- **RQ3:** What are the organizational responses of textile and fashion companies towards perceived barriers and enablers?

1.5 Delimitations

Although literature about GSCM enablers and barriers from other industries has been studied, this report focuses on the textile and fashion industry. Besides, the concept of Sustainable Supply Chain Management and social aspects of sustainability (such as labor conditions) have been mentioned, but the focus lies on environmental sustainability.

The most significant delimitation of this study however is its weak generalizability. Despite the fact that the perception of how strong certain barriers and enablers affect a company is individually different and the organizational responses towards it can vary from company to company, a significantly larger sample size would allow to generalize the results with more certainty.
2 Literature Review

The literature review provides the theoretical framework, consisting of two areas of research. In the first section relevant literature on Supply Chain Management (SCM) and Green Supply Chain Management (GSCM) in general and with focus on the textile and fashion industry are summarized to demonstrate the similarities and differences between SCM and GSCM. Then, the drivers and barriers of transforming SCM to GSCM that have been identified in literature are presented.

A comparative study that analyzed definitions of Green Supply Chain Management (GSCM) and Sustainable Supply Chain Management (SSCM) showed that the two concepts are largely similar, with the exception that GSCM focuses on the environmental side of sustainability (Ahi and Searcy, 2013). Since this study also concentrates on environmental aspects, the concept of GSCM is in the focus. However, literature about both concepts; GSCM and SSCM, as well as other similar programs, has been studied in order to gain a deeper understanding of the topic.

2.1 Supply Chain Management

Effective in 2005, the Council of Logistics Management (CLM) changed its name to the Council of Supply Chain Management Professionals (CSCMP) (Mhlnews.com, 2004). According to the definitions by CSCMP, supply chain management includes all logistics management activities. In addition, supply chain management also encompasses coordination and collaboration with channel partners (CSCMP, 2013). As a matter of fact, the term “supply chain management” has grown popularity over the term “logistics management” since the 1980s (Waters, 2011). This trend is in line with the interest of manufacturers and service providers to collaborate with their suppliers integrating the purchasing and supply management functions during the 1990s (Tan, 2001). However, back in 1958, Forrester had pointed out that integrating activities has been a developing theme of logistics for decades. As Waters (2011) pointed out, the pursuit of own individual benefits among supply chain partners is one of the reasons integration of the supply chain is more of an ideal than reality. Tan (2001) holds a similar stand, stating: “Technically, the value chain is too complex to achieve a full integration of all business entities within it in order to reap the benefits offered by supply chain management.” Some prefer using the term “supply chain network”, which implicates a tier-structured supply chain as illustrated in Figure 2. A tier-structured supply chain describes the fact that every focal company faces their own supplier base and customer base, while each of their supplier and customer face also their own supplier base and customer base that the focal company does not have direct contact of. The figure shows the complexity and provides an outlook of why full integration (aligning interests of all parties) of supply chain is impossible.
Apart from the objective of coordination and collaboration with channel partners of SCM, the other pillar of SCM is within the focal company which is often referred as logistics management. A survey asking companies to list their top three objectives for logistics found out that cost reduction, improved customer responsiveness, profitable growth and shorter cycle times are the most common answers (Iglesias et al, 2008). By using the Supply Chain Operation Reference (SCOR) model, how companies use logistics management to achieve their objectives can be better understood. The SCOR model breaks the operations down into 5 function processes. These functions are planning, sourcing, manufacturing, distribution and return. The planning function refers to the process of developing a plan for the sourcing, manufacturing and distribution function to follow in pursuit of balancing demand and supply. The sourcing function refers to the process of buying goods or services in order to fulfill demand through supplier management. The manufacturing function refers to the process of transforming materials sourced into finished products to fulfill demand. The distribution function refers to the process of delivering finished products to customers. The return function refers to the logistics of the returning of products either for quality reasons, recycling or customer support services (Scott, Lundgren and Thompson, 2011).

“Initially, SCM focused primarily on material flows. More recent research emphasizes additional aspects of SCM, such as risk, performance and integration. There is also a growing emphasis on information flows, internal and external networks of relationships and governance of supply networks” (Ahi and Searcy, 2013).

### 2.2 Supply Chain Management in textile and fashion industry

The textile and fashion industry can be divided into three segments, using retail price as a criterion, mass market competes in the lowest price range; prêt-à-porter in the highest and bridge in the middle, each segment has different key success factors and strategic variables. Out of the three segments, companies within mass market and bridge gain competitive advantages through supply chain management related activities, while companies within prêt-à-porter mainly competes with their designer label (De Koster and Delfmann, 2005). Short product life cycles, high impulse purchase, high volatility and low predictability of demand...
are the four characteristics typically found in the fashion industry (Christopher and Peck, 1997). Above listed characteristics combine with common strategies taken by fashion companies create an environment that is challenging for supply chain management. Apparel manufacturing, as a labor-intensive process, takes advantage of low labor cost in Far East countries. Despite the cost reduction benefit, off-shore outsourcing leads to significantly longer lead times. Average time for transforming raw materials into apparel displayed on store shelves was estimated to be 66 weeks, with only 11 weeks take up with actual production (Al-Zubaidi and Tyler, 2004) another source estimated that lead time is 390 days, with 37 days of actual production (Waters, 2011). Other strategies mentioned by Abernathy, et al (1999) are products proliferation and increasing percentage of fashion garments. Both strategies result in increasing number of SKUs, which further raise unpredictability of demand. Consequently, along with the factor of longer lead times, carrying cost became higher, stock-outs; mark downs were observed more often (Christopher and Peck, 1997). Quick Response (QR) therefore became a widely used concept in clothing industry where the aim is to replace the old practice of pre-ordering before start of season with frequent in-season reordering of apparel by retailers (Al-Zubaidi and Tyler, 2004). However, even with 100% EDI (Electronic Data Interchange) linkage between retailers and suppliers among Fortune 500 companies in the textile and clothing industry (Gilbert and Reichert, 1997), researchers have identified obstacles putting QR into practices, such as time required to develop deep trusting partnerships within the value chain, difficulty and cost of assessing performance, cost and risk of implementing QR practices and lack of knowledge to utilize POS data (Al-Zubaidi and Tyler, 2004). Emerging after QR strategy, Fast fashion is another strategy adopted by many global retailers where the aim is “adapting merchandise assortments to current and emerging trends as quickly and effectively as possible (Sull and Turconi, 2008).” Compared to other industries, “Impact of product design complexity on supply chain risk is even more significant in industries, such as fashion, where product design is a competitive advantage (Sardar and Lee, 2014).” Fast fashion strategy further enhances product complexity, reaching a point where some companies value capacity flexibility over cost benefits, provoking an emerging trend of reshoring (Sardar and Lee, 2014).

2.3 Green Supply Chain Management

Green Supply Chain Management (GSCM) can be described as Supply Chain Management with an environmental friendly or green component incorporated into every aspect of the supply chain. It covers a product’s whole life cycle from sourcing, design, product development, manufacturing, packaging, storage and transportation to disposal, recovery and post sales services including end-of-product life management. Therefore it can also be seen as “closing the loop” (Min and Kim, 2012; Ahi and Searcy, 2013; Kant, 2015).

Ahi and Searcy, 2013 analyzed several definitions of GSCM and Sustainable Supply Chain Management (SSCM) and compared them against each other. Their analysis shows that the two concepts are very similar, but that definitions for SSCM were broader, while definitions of GSCM showed an emphasis on the environmental level of sustainability. Moreover, they claim that SSCM can be regarded as an extension of GSCM. The authors eventually define SSCM as: “The creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with key inter-organizational business systems designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term” (Ahi and Searcy, 2013).
Tihomir and Goran, 2014 identify three main reasons why companies implement the environmental friendly GSCM strategy into their corporation:

- Legislation - they have to comply with the environmental regulations,
- Marketing - addressing the environmental concerns of their customers,
- Ecological awareness - mitigate the environmental impact of their production activities (Tihomir and Goran, 2014).

Environmental legislation is also mentioned in Kant’s review as one of the prime concerns for manufacturers across the world economy. He explains further that GSCM is an essential strategy to integrate environmental management practices for increasing the business profit and market share in order to increase the competitive advantage and maintain a greener supply chain (Kant, 2015). Diabat et al. 2014 explain claim that there can be social, economic and environmental benefits for traditional supply chains if they develop a Sustainable Supply Chain Management (SSCM) strategy. Employees, shareholders, business partners and the wider community can profit from those benefits. However, the authors also explain that effective integration of sustainability into industries requires action beyond the organizational boundaries (Diabat et al. 2014).

Kant, 2015 investigated the frequency with which certain focused industries published articles that contained the key word “GSCM”. The research shows that most articles were published in the automotive industry (15), the manufacturing industry (14) and the electronics industry (11). The textile and apparel industry published 5 articles, the fashion industry 4 articles and the apparel industry 2 articles. However, it is not completely clear why the fashion industry and the apparel industry are mentioned separately and not included in textile and apparel industry. Most articles about GSCM are published in Asia (especially Taiwan and China), the USA and Europe (especially the UK and the Netherlands) (Kant, 2015).

Eventually the author claims that there is currently no research with the purpose to understand similarities and differences of GSCM approaches across different types of organizations. Also a mixed methods approach and the use of a mathematical model to explain the subject lacks in his review of 177 GSCM related articles (Kant, 2015). The insight that sustainability can improve a company’s bottom line through cost savings, increased market share, and better brand images, has caused that the number of companies that have started to implement GSCM practices has grown. Subsequently, within the past two decades academia has risen strong interest in GSCM related topics. Min and Kim, 2012 explain that GSCM research is interdisciplinary by nature. However, they identify a lack of and a growing need for studies that use hybrid methodologies or mixed method approaches that combine the advantages of different research tools and address interdependent environmental issues considering the entire supply chain. Besides, the use of the empirical research approaches for manufacturing, green logistics, and reverse logistics is very rare (Min and Kim, 2012).

Companies with a green supply chain (GSC) need to have very strict partner selection and performance evaluation processes (Wu and Barnes, 2015, Chen et al. 2012). When choosing the most appropriate partners for developing a GSC, a company has to consider contemporary environmental issues, as well as traditional economic factors in order to keep profitability high (Wu and Barnes, 2015). Wu and Barnes, 2015 describe four clusters that need to be considered when operating a green supply chain (GSC): cost, pollution control, quality and resource consumption. Keeping the costs at a minimum is an important goal for any supply chain, also a GSC. Pollution control is important in order to keep the negative environmental impact due to different kinds of waste to a minimum. High product quality and good customer
service are essential also for GSCs. With the goal to minimize the negative environmental impact, the consumption of resources also needs to be minimized in a green supply chain (Wu and Barnes, 2015).

A questionnaire survey conducted during April and May 2009 investigated the level of GSCM (LGSCM) of Chinese companies and analyzed the relationships between LGSCM and the classified determinant factors. The study shows that Chinese companies were still at a preliminary stage of GSCM practices at that time. There is very limited cooperation between the environmental management and external members of the supply chain. A company’s LGSCM is deeply connected with the external pressures from regulatory, domestic clients and business competitors. As an internal factor, a company’s learning capacity strongly determines LGSCM. It is also shown that the internal factors function as intermediate variables of external pressures in influencing a company’s LGSCM. Internal training of employees to increase their involvement in GSCM practices can significantly improve a company’s environmental management capacities. Figure 3 shows how GSCM practices are influenced and controlled by external, internal and controlling factors (Lui et al. 2011).

![Figure 3 Influencing factors on GSCM practices](image)

**Figure 3 Influencing factors on GSCM practices**
Adapted from Lui et al. 2011

### 2.4 Green Supply Chain Management in textile and fashion industry

With the exception of the luxury market, the textiles and fashion industry is considered a low-value manufacturing industry, with extremely high competition. Supply chains are becoming more complex, global and faster, which is counterproductive for the ecological footprint of the industry. Under these circumstances GSCM and SSCM are seen as a promising
opportunity to create the ideal low-impact industry and profit from many benefits. However, many companies struggle moving toward sustainability in the supply chain (Pui-Yan Ho and Choi, 2012).

Especially fast fashion products are usually very trend sensitive and are therefore often disposed by the consumers after a short period of time. This disposal of fashion products causes waste and environmental problems. On the other hand, many fast fashion companies, such as Zara, H&M, and Topshop, source from local manufacturers and suppliers in order to minimize lead time. Shorter transportation distances decrease the carbon footprint and are therefore more environmentally friendly than the more traditional offshore sourcing. Moreover, fast fashion products better match supply and demand and keep inventory low. A low level of inventory and a lower forecast error reduce the amount of waste (Choi and Cheng, 2015). This means that the fast fashion model appears to be unsustainable from a consumer perspective, but might in fact be more sustainable than a traditional fashion model from a supply chain perspective. However, since GSCM considers the whole supply chain including end-of-product life management. This means that a fast fashion company with a serious GSCM approach would need to take responsibility for the disposed garments, since green supply chains are ideally cyclical in nature; keeping waste within the industrial system. This development towards a closed loop supply chain is an ideal which many companies seek to achieve in the long term (Pui-Yan Ho and Choi, 2012). The most sustainable solution would be if the company takes back their unsold and sold, used products, recycles them and uses the material for new products. That way, a product has a theoretically endless lifecycle and the fashion loop is completely closed. A less sustainable option would be selling the used and unsold products as second-hand clothes in developing countries, since the cheap import of second-hand clothing can harm the local economy (Brooks, 2015).

Wu et al. (2011) found that there are not many papers about GSCM that have focused on the textile and apparel industry and took this as a motivation to investigate GSCM practices in Taiwan’s textile and apparel industry. According to them GSCM practices include green purchasing, cooperation with customers, eco design and investment recovery. In order to fulfill their corporate social responsibility and ensure sustainable development, apparel manufacturers need to offer sustainable products (Wu et al. 2011). According to Choi and Cheng, textile and fashion companies should embrace corporate social responsibility and develop a long-term vision on managing the brand in order to maintain a strong brand (Choi and Cheng, 2015). Pui-Yan Ho and Choi, 2012 believe that fashion companies can gain competitive advantage through strategic management of environmental challenges and should strongly consider the product development process in their greening initiatives. Moreover, they need to take responsibility across the multiple life-cycles of products in order to have a green supply chain (Pui-Yan Ho and Choi, 2012).

### 2.5 Enablers and Barriers of adopting GSCM

Companies face enablers and barriers to Sustainable Supply Chain Management (SSCM) (Seuring and Müller, 2008); factors that can be internal or external to the organization (Walker and Jones, 2012). Tay et al. 2015 explain that the drivers and barriers of GSCM are results of conflicts between different stakeholders, including customers, employees, suppliers, regulators, governmental agencies, and shareholders and their reactions towards green initiatives (Tay et al. 2015). Some important GSCM drivers are organizational support, social capital and government involvement. Institutional pressures, including market pressure,
regulatory pressure and competitive pressure are essential in developing sustainable and green products in the textile and apparel industry (Wu et al. 2011).

In the following chapters internal barriers and enablers and external barriers and enablers of implementing Green Supply Chain Management (GSCM) for textile and fashion companies are identified and explained. Figure 4 gives an overview of the later explained internal enablers and barriers and external enablers and barriers.

**Internal Enablers:**
- Top management commitment
- Communication regarding green practices
- Employee involvement
- Corporate culture
- Alignment of company’s strategies
- Existing SSCM strategy
- Gaining competitive advantage
- Avoiding of reputational and environmental risks
- Company size
- Other CSR practices

**Internal Barriers:**
- Lack of management commitment
- No performance measurement methods
- Lack of financial resources/budget
- Lack of training in sustainable supply chain methods
- Current organizational structure/ functions
- Company size
- Capabilities within purchasing and supply function

**External Enablers:**
- Government policies and incentives
- Pressure from competitors
- Customer demands
- Collaboration with suppliers
- Pressure from investors
- Pressure from NGOs

**External Barriers:**
- Government regulations
- Pressure from competitors
- Poor supplier commitment
- Customer desire for lower prices
- Global aspects – language barriers and cultural barriers
- Information and Communication Technology (ICT)
- Technological constraints

*Figure 4 Barriers and enablers of implementing GSCM*
Several articles have done literature review on the drivers or barriers of adopting GSCM (Walker, Di Sisto and McBain, 2008; Diabat and Govindan, 2011; Wu, Ding and Chen, 2012; Muduli et al., 2013) and SSCM (Walker and Jones, 2012; Diabat, Kannan and Mathiyazhagan, 2014; Tay et al., 2015). Diabat and Govindan (2011) identified two factors: government regulation and legislation and reverse logistics as dominate enablers for an Indian manufacturing firm using Interpretive Structural Modeling (ISM). Using the same methodology, another five dominant enablers are identified for five Indian textile units: adoption of safety standards, adoption of green practices, community economic welfare, health and safety issues, and employment stability (Diabat, Kannan and Mathiyazhagan, 2014). Despite the different focus of adopting GSCM and SSCM, the drivers and barriers identified in the articles of Walker, Di Sisto and McBain (2008), Wu, Ding and Chen (2012), Muduli et al. (2013), Walker and Jones (2012) and Tay et al. (2015) share high resemblance. Their results are presented in the following sectors.

2.5.1 Internal enablers

Most enablers identified are surrounded with the “people” factor, whether people are committed toward implementing GSCM and whether people have the ability of implementing GSCM. Enablers which involve commitment include the commitment of top and middle management (Walker and Jones, 2012; Wu, Ding and Chen, 2012; Muduli et al., 2013; Tay et al., 2015), employee involvement (Walker, Di Sisto and McBain, 2008; Walker and Jones, 2012; Wu, Ding and Chen, 2012; Muduli et al., 2013; Tay et al., 2015), or more generally put, personal commitment of individuals (Walker, Di Sisto and McBain, 2008) and foster of culture (Walker and Jones, 2012; Muduli et al., 2013; Tay et al., 2015). In order to increase the rate of employee involvement, it is suggested management should authorize power regarding environmental issues to employees (Muduli et al., 2013). It is therefore crucial that everyone involves in the implementation of GSCM possesses professional knowledge of environmental issues (Wu, Ding and Chen, 2012). On-job-training (Wu, Ding and Chen, 2012; Muduli et al., 2013) not only can provide the human resource required but also provide a mean of cultural transformation (Muduli et al., 2013). Implementation of GSCM is a makeover of companies, affecting current processes and practices of different departments, cross-departmental communication thus enables the implementation process (Wu, Ding and Chen, 2012; Muduli et al., 2013). From a resource-based perspective, larger organizations are more likely to adopt GSCM (Tay et al., 2015) since their relative abundance of human and financial resources (Wu, Ding and Chen, 2012). Human and financial resources ensure enablers such as capabilities within purchasing and supply function (Walker and Jones, 2012; Tay et al., 2015) and long-term investment in technology (Wu, Ding and Chen, 2012; Muduli et al., 2013). Companies can evaluate the cost-benefit of adopting GSCM, based on the appraisal of performance and reward system (Wu, Ding and Chen, 2012; Muduli et al., 2013; Tay et al., 2015). The system, if well designed, can financially justifies investment on GSCM and also provide relevant information for strategic planning (Muduli et al., 2013) which is helpful for identifying GSCM goals and corresponding long-term strategies. Whether adopting GSCM aligns with the other strategies of the company (Walker and Jones, 2012; Tay et al., 2015) is a determining factor, as the ultimate objective of companies is to enhance competitiveness. Therefore gaining competitive advantages (Walker and Jones, 2012; Tay et al., 2015), reducing reputational and environmental risk (Walker and Jones, 2012; Wu, Ding and Chen, 2012; Tay et al., 2015), and desire to reduce hidden cost (Walker, Di Sisto and McBain, 2008) are undoubtedly enablers. The readiness of GSCM affects the williness of companies to implement GSCM practices (Lee, 2008), where existence of sustainable SCM strategy (Walker and Jones, 2012; Tay et al., 2015), Environmental Management System
EMS adoption (Walker and Jones, 2012; Wu, Ding and Chen, 2012; Tay et al., 2015) and other internal CSR practices influencing SCM (Walker and Jones, 2012; Tay et al., 2015) are identified as enablers.

Few empirical studies were done to understand the actual strength of enablers in the textile and fashion industry. Wu, Ding and Chen (2012) conducted an empirical research on Taiwan’s textile and apparel manufacturers and observed that organizational support (internal enablers) has the main effects on green practices such as green purchasing, cooperation with customers, eco-design and investment recovery. Caniato et al. (2012) conducted five case studies in which two of the participant companies they categorized as Green International Brands (GBIs) and the other three as Small Alternative Firms (SAFs). They concluded that all five cases positioned themselves in the green segment because of corporate values and influence of top management. Two of the SAFs stated it is also their strategy to reduce brand and retail costs. However, only two internal drivers had been considered; efficiency objectives related and other company-specific factors such as corporate values.

2.5.2 Internal barriers

Similarly, barriers identified are related with “people”, “resource” and the “alignment of strategies”. If adopting GSCM is not aligned with other SCM priorities (Walker and Jones, 2012; Tay et al., 2015), for example, a focus on cost reduction (Walker and Jones, 2012) or other financial, technical, information related goals (Tay et al., 2015), it is less likely companies will devote resources to it without commitment from top management (Walker and Jones, 2012; Wu, Ding and Chen, 2012; Tay et al., 2015). Implementing GSCM is demanding on financial and human resources (Wu, Ding and Chen, 2012; Tay et al., 2015), which smaller organizations (Walker and Jones, 2012; Tay et al., 2015) might not have sufficient resources for. Lack of information and technological systems (Wu, Ding and Chen, 2012), lack of supportive corporate structures and processes (Walker and Jones, 2012; Tay et al., 2015) and lack of environmental professional knowledge for managers (Wu, Ding and Chen, 2012) all require resources to make improvements. Other technical aspects are identified as barriers also, for example lack of understanding of how to incorporate in purchasing (Tay et al., 2015) and reliance on traditional accounting methods (Walker and Jones, 2012; Tay et al., 2015) which results in difficulties for companies to justify their investments on implementing GSCM. There is also an element of organizational reluctance (Muduli et al., 2013) which can be worsen by lack on training for entry-level employee (Walker and Jones, 2012; Tay et al., 2015). Table 1 summarises internal enablers and barriers for adopting GSCM.

<table>
<thead>
<tr>
<th>People</th>
<th>Internal enablers</th>
<th>Internal barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management commitment</td>
<td></td>
<td>Lack of top management commitment</td>
</tr>
<tr>
<td>Middle management commitment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee involvement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commitment of individuals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational</td>
<td>Foster of culture</td>
<td>Organizational reluctance</td>
</tr>
<tr>
<td>On-job-training</td>
<td></td>
<td>Lack of training</td>
</tr>
<tr>
<td>Cross-departmental communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource</td>
<td>Larger organizations</td>
<td>Smaller organizations</td>
</tr>
<tr>
<td>Knowledge of environmental issues</td>
<td></td>
<td>lack of environmental professional knowledge</td>
</tr>
<tr>
<td>Long-term investment in technology</td>
<td></td>
<td>Lack of information and technological systems</td>
</tr>
<tr>
<td>Capabilities within purchasing and supply function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategical</td>
<td>Gaining competitive advantages</td>
<td>Non-alignment with other SCM</td>
</tr>
</tbody>
</table>
Reducing environmental & reputational risk
Alignments with the other strategies
Desire to reduce hidden cost

| Administrative | Performance and reward system | Reliance on traditional accounting methods
Lack of supportive corporate structures and processes |
|---------------|--------------------------------|----------------------------------------------------|
| GSCM readiness | Existence of sustainable SCM strategy
EMS adoption
Other internal CSR practices | / |

Table 1 Internal enablers and barriers

2.5.3 External enablers

Walker and Jones, 2012 investigate barriers and enablers of SSCM by conducting case studies of companies from different sectors. Outside influences from a range of stakeholders such as shareholder pressures or customer requirements are categorized as external enablers or drivers (Walker and Jones, 2012). Tay et al. 2015 describe government, employees and consumers as the three main enabling forces of GSCM (Tay et al. 2015).

Also NGO’s, investors and customers can push companies - and thereby indirectly their suppliers as well - towards more sustainability by demanding greener products and production methods. Moreover, if a company’s competitors all implement GSCM strategies, they are likely to put pressure on that company to do so as well (Walker and Jones, 2012). Wu et al. 2011 summarize government regulations, pressure from competitors and pressure from investors, NGO’s and customers as three institutional pressures; market, regulatory and competitive pressures that can enable GSCM (Wu et al. 2011).

Companies, especially brand-owning companies that are particularly close to the public consciousness are often held responsible for the (environmental) performance of their suppliers and partners. This represents a high risk to a company’s reputation and its brand value because it must take responsibility for its suppliers in front of all the stakeholders, such as media and nongovernmental organizations (NGOs). Therefore, pressures to act more environmentally friendly can affect the whole supply chain, but act the strongest on the publically known brand-owning organizations (Caniato et al. 2011; Walker and Jones, 2012).

Green or Sustainable Supply Chain Management can enhance a company’s competitive advantage. Companies that act proactively on environmental issues can gain strategic advantage by foreseeing opportunities and problems throughout the entire chain. From a supply chain perspective, the market becomes more plausible in terms of sustainability. But a good collaboration with suppliers is essential in this situation (Tay et al. 2015; Walker and Jones, 2012). However, textile supply chains often involve developing countries, especially for production and most developing countries currently gain little internal incentives by improving their environmental performance. However, short-sighted economical, profit-oriented decisions often go at the expense of the environment in the long term. Stricter government laws can improve environmental performance in this situation (Wu and Barnes, 2015). Caniato et al. 2011 also identify government policies and incentives as an enabler, but argue that law compliance currently is not a relevant driver for textile companies because environmental legislation in the fashion industry is not as strict as in other industries and
recently only concerns elements such as air emissions or water pollution. Therefore, fashion companies that want to operate a green supply chain, usually go beyond these governmental regulations in terms of green performance (Caniato et al. 2011).

2.5.4 External barriers

External barriers include consumer desire for lower prices, competitive pressures and poor supplier commitment. Some critics claim that the adoption of GSCM initiatives is either only reactive to government regulations and incentives or “green washing” and PR exercise. However, government regulations can even hamper SSCM if they counteract sustainable developments (Tay et al. 2015; Walker and Jones, 2012).

Some authors identify poor supplier commitment as one of the most important external barriers of implementing GSCM because it is very difficult for a company to maintain a GSC if their suppliers – for example for financial reasons – cannot or do not want to take part in green initiatives (Caniato et al. 2011, Walker and Jones, 2012). Also Information and Communication Technology (ICT) and other Technological Constraints such as outdated machinery at suppliers’ facilities can make it difficult to fulfill the requirements of GSCM and communicate flawlessly. Global aspects such as language barriers and cultural barriers can impede communication as well and lead to misunderstandings and different perceptions of the given instructions (Walker and Jones, 2012).

Some external barriers such as government regulations, customer demands and pressure from competitors have also been identified as external enablers of GSCM. Although it seems contradictory that the same factor can both enable and hinder the implementation of GSCM, it depends on the purpose or background of this factor if it encourages or impedes a GSCM strategy. If the government offers incentives to companies for more sustainability, it will encourage GSCM, but if government regulations make sustainable initiatives less profitable or difficult to realize, they can be identified as barrier. Customers’ desire for lower prices is categorized as another barrier because conventional, less environmentally friendly raw materials, production methods and the production in offshore, low labor cost countries usually are less expensive than more sustainable alternatives (Seuring and Müller, 2008; Walker and Jones, 2012). On the other hand, customers have the power to enable GSCM by demanding more sustainable products and production circumstances. Pressure from competitors can act similarly: depending on if there is competition for lower prices (which is likely to hamper GSCM) or if the competitors push towards better sustainability, maybe as a response to customer demands (Walker and Jones, 2012). Table 2 summarizes internal enablers and barriers for adopting GSCM.
<table>
<thead>
<tr>
<th></th>
<th><strong>External Enablers</strong></th>
<th><strong>External Barriers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Governmental</td>
<td>Government policies and incentives</td>
<td>Government regulations</td>
</tr>
<tr>
<td>Customers</td>
<td>Customer demands for sustainability</td>
<td>Customer desire for lower prices</td>
</tr>
<tr>
<td>Suppliers</td>
<td>Collaboration with suppliers</td>
<td>Poor supplier commitment</td>
</tr>
<tr>
<td>Competitors</td>
<td>Pressure from competitors</td>
<td>Pressure from competitors</td>
</tr>
<tr>
<td>Other actors</td>
<td>Pressure from investors</td>
<td></td>
</tr>
<tr>
<td>Culture</td>
<td>Pressure from NGOs</td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>Global aspects – cultural barriers and language barriers</td>
<td>Information and Communication Technology (ICT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Technological constraints</td>
</tr>
</tbody>
</table>

*Table 2 External enablers and barriers*
3 Methodology

The theoretical framework contains information about supply chain management and Green Supply Chain Management, in general and with focus on the textile and fashion industry. Several factors that can work as drivers or barriers for a company trying to adopt a GSCM strategy have been identified in literature. These factors are also described in the literature review. The empirical study combines an online survey and a semi-structured interview where companies are asked what factors they perceive as their most important GSCM drivers and barriers. The evaluation process of the survey and the interview is explained in the methodology chapter and the results are shown in the results chapter and explained in the analysis chapter. The last part of the results chapter presents case studies about the companies H&M and Nike in which it is explained how they deal with Corporate Social Responsibility and GSCM issues.

The methodology chapter strives to provide transparent descriptions of the research process; the research strategy and design, the design of the survey questionnaire, the data collection process, the data analysis and the evaluation methods.

3.1 Research strategy and design

An exploratory research approach has been chosen for this report since only few studies about the barriers and enablers of implementing Green Supply Chain Management in textile supply chains have been conducted so far, and since this study does not aim to give final and conclusive answers to the research questions, but rather explores the topic. This approach also allows having smaller sample sizes (Brown, 2006, p.43; Singh, 2007, p.46).

The relationship between theory and research of this study is mainly deductive because the theory guides the research; meaning that the design of the empirical studies are built on the findings of the literature study. However, if the results of this study contradict with the theory, an inductive approach can be applicable and the theory may be questioned and changed according to the found results (Bryman, 2012).

Combining both, a quantitative online survey and the qualitative case studies and semi-structured interviews, a mixed-methods research strategy is applied in this report. The advantage of a mixed-methods approach in this case is that it allows having a horizontal approach for the survey: considering global textile supply chains and using the qualitative studies as explanation for the results of the survey (Bryman, 2012, p.627-630). This way, a geographic delimitation or a focus on a certain group of supply chain actors is not necessary, since the case studies and interviews investigate the topic more focused and in-depth.

3.1.1 Design of survey questionnaire

The purpose of the survey is to understand how companies within textile and fashion supply chains perceive their own tendency to implement Green Supply Chain Management (GSCM). In search of a comprehensive sample representing companies all across the supply chain, a multiple choice question was designed to gain knowledge whether the company is a supplier, manufacturer, retailer or other. However, information regarding company name, department and position of the respondent is voluntarily provided. The main part of the questionnaire is organized into four sections: Internal barriers, internal drivers, external barriers and external
drivers. In each section, participants were given five to ten factors and were asked to evaluate how strong each factor is influencing the adoption of GSCM in their company on a seven point Likert scale.

Factors in the questionnaire were identified through literature review regarding drivers and barriers of adopting Green Supply Chain Management. Currently, few studies were designed specifically to identify drivers and barriers within textile and fashion industry. Therefore a non-mandatory open question is included in the questionnaire as a feedback section for participants whether they felt the questionnaire is complete regarding the factors listed.

The survey questionnaire is created in a way that allows a deep analysis of the results; even with a small number of participants. It is for example possible to filter only the answers from suppliers, manufacturers or all answers from participants of a certain country and compare them with each other. Also the answers of every single participant can be analyzed separately.

3.2 Data collection

The process consisted of three stages, first an online survey has been conducted, followed by a semi-structured interview. As there were no respondents that fell in the category of retailers from the online survey and semi-structured interview, case studies targeted at retailers were conducted accordingly.

![Figure 5 Data collection process](image)

3.2.1 Online survey

The online survey was targeted at a wide range of organizations, covering upstream and downstream of the textile value chain; including design studios, suppliers, trading companies and manufacturers. Contact information was acquired from the exhibitors list of the 5 fairs listed below in Table 3. Except for the list of International Textile Machinery Association (ITMA), a stratified random sampling process was used. Every exhibitor on the other lists was included. A total of 1744 emails were sent, with 124 emails unable to deliver. Among the 1620 emails delivered, a total of 40 responses were received, making a 2.47 % response rate, with 23 valid samples. Google Form was used in this online survey where a link was provided in the email. However, due to restricted access to Google in China, a Word version of the questionnaire was enclosed as an alternative solution.

<table>
<thead>
<tr>
<th>Fair Name</th>
<th>Area of Practice</th>
<th>Sample Size</th>
<th>Website</th>
</tr>
</thead>
</table>


Exhibitors of ITMA were classified into 19 Chapters as shown below in Table 4. Chapter 3, 7, 11, 12, 14, 16, 17 and 18 were not considered as our targeted organizations, therefore were excluded from the sampling frame. For very ten organizations, one was selected as sample. If less than 200 exhibitors were in a chapter, 20 samples were chosen. Email information of selected samples was then searched on the internet by finding the corresponding official website of the company. When the website or email information was not available, additional samples were drawn to substitute. However, due to the limitation that chapter 6 and 13 only had 9 and 21 exhibitors respectively; only 7 and 18 samples were valid.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Description of chapters</th>
<th>Number of exhibitors</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter1</td>
<td>Machinery for spinning preparation, man-made fibre production, spinning, auxiliary machinery and accessories</td>
<td>290</td>
<td>29</td>
</tr>
<tr>
<td>Chapter2</td>
<td>Machinery for winding, texturing, twisting, auxiliary machinery and accessories</td>
<td>91</td>
<td>20</td>
</tr>
<tr>
<td>Chapter3</td>
<td>Machinery for web formation, bonding and finishing of nonwovens and felting, auxiliary machinery and accessories</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Chapter4</td>
<td>Weaving preparatory machinery, weaving, tufting machinery, auxiliary machinery and accessories</td>
<td>179</td>
<td>20</td>
</tr>
<tr>
<td>Chapter5</td>
<td>Knitting and hosiery machinery, auxiliary machinery and accessories</td>
<td>128</td>
<td>20</td>
</tr>
<tr>
<td>Chapter6</td>
<td>Embroidery machinery, auxiliary machinery and accessories</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Chapter7</td>
<td>Braiding machinery and accessories</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Chapter8</td>
<td>Washing, bleaching, dyeing, drying, finishing, cutting, rolling and folding machinery, auxiliary machinery and accessories</td>
<td>303</td>
<td>30</td>
</tr>
<tr>
<td>Chapter9</td>
<td>Printing machinery, digital printing machinery, auxiliary machinery and accessories</td>
<td>113</td>
<td>20</td>
</tr>
<tr>
<td>Chapter10</td>
<td>Garment making machinery, other textile processing machinery, auxiliary machinery and accessories</td>
<td>59</td>
<td>20</td>
</tr>
<tr>
<td>Chapter11</td>
<td>Laboratory testing and measuring equipment and accessories</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Chapter12</td>
<td>Transport, handling, logistics, storing and packing equipment and accessories</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Chapter13</td>
<td>Equipment for recycling, waste reduction and</td>
<td>21</td>
<td>18</td>
</tr>
</tbody>
</table>
### Table 4 Classification in ITMA, 2015 (ITMA, 2015)
(www.itma.com/exhibitors/sector-allocation-plan)

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Description</th>
<th>101</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Software for design, data monitoring, processing and integrated production.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Colorants and chemical auxiliaries for the textile industry.</td>
<td>101</td>
<td>20</td>
</tr>
<tr>
<td>16</td>
<td>Equipment and products to ensure machinery and plant operations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Services for the textile industry.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Research and educational institutions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Natural fibres, man-made fibres, technical fibres, natural yarns, synthetic yarns, technical yarns and recycled fibres and yarns</td>
<td>60</td>
<td>20</td>
</tr>
</tbody>
</table>

#### 3.2.2 Interview

Invitation of online survey and interview was sent together in the same email. One sample showed interest in taking part of the interview. An interview framework was sent to the interviewee one day before the Skype interview took place.

#### 3.2.3 Case study

Nike and H&M have been chosen because both are large, global companies that source from different offshore suppliers and outsource production activities (Nike, Inc. 2013; H&M, 2013). For a global fast fashion company as H&M and a global sports company as Nike sustainable business operations are not self-evident. However, both organizations have developed CSR strategies over the years and published their own CSR reports.

#### 3.3 Data analysis

##### 3.3.1 Online survey

Three methods were adopted to map the results. The first method is to evaluate the overall incentive of a company implementing GSCM. The second method served the purpose of categorizing companies according to their organizational responses towards implementing GSCM. The third method paired up similar factors in order to identify factors that serve as both barrier and enabler.

##### 3.3.1.1 Evaluating overall incentives towards implementing GSCM

Based on the questionnaire a method to evaluate the perceived incentives of implementing GSCM has been developed. A simple calculation categorizes the company's answers into five levels showing the advantages or disadvantages of applying GSCM. The survey is evaluated by analyzing each company's answers. In order to find out what each company’s potential to apply green practices is the results are analyzed per participant; not per question.
The survey questionnaire is structured into internal barriers, internal enablers and external barriers and enablers with each a different number of Likert scale questions. The Likert scale questions range from 1 (“Not at all”) to 7 (“Very strongly”). In the calculation, a question answered with 1 gets the value \(-3\), a question answered with 2 gets the value \(-2\) and so on, until value 3, for a question answered with 7 (see Table 5).

<table>
<thead>
<tr>
<th>Likert scale answer from 1-7</th>
<th>Number value for calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-3</td>
</tr>
<tr>
<td>2</td>
<td>-2</td>
</tr>
<tr>
<td>3</td>
<td>-1</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>

**Table 5 Survey answers and values for calculation**

The following equations are used to calculate the level of perceived incentives of applying GSCM for the companies that took part in the survey. The result is categorized into five levels, as shown in Figure 6.

1. Total intensity of perception from the External Enablers factors = \(\sum\text{EE}/6\)
2. Total intensity of perception from the External Barriers factors = \(\sum\text{EB}/7\)
3. Total intensity of perception from the Internal Enablers factors = \(\sum\text{IE}/10\)
4. Total intensity of perception from the Internal Barriers factors = \(\sum\text{IB}/7\)
5. External incentive = \((\sum\text{EE}/6 - \sum\text{EB}/7)/6\). Internal incentive = \((\sum\text{IE}/10 - \sum\text{IB}/7)/6\)
6. Overall incentive = \(\left[\frac{\sum\text{EE}/6 - \sum\text{EB}/7}{6} + \frac{\sum\text{IE}/10 - \sum\text{IB}/7}{6}\right]/2\)

- EE (External Enablers) section: 6 questions
- EB (External Barriers) section: 7 questions
- IE (Internal Enablers) section: 10 questions
- IB (Internal Barriers) section: 7 questions

The values for each section (internal enablers, internal barriers, external enablers, and external barriers) are summed up and then divided by the number of questions in this section. If all questions in a section receive an answer of “not at all” that would result in a minimum value of \(-3\), \((-3\times X/X=3)\), where \(X\) represents number of questions in a section. After this calculation there are four values; one for each section. (Equation 1-4) The value for external enablers is then subtracted the value of external barriers (Equation 5) and the value of internal enablers is subtracted the value of internal barriers (Equation 6); resulting in two numbers for each company; one for the external data and one for the internal data. Finally, total incentive (Equation 7) of a company is calculated by summing external incentive (Equation 5) and internal incentive (Equation 6).

With values from \(-3\) to 3 the range of the outcomes is accordingly between \(-6<X\leq6\). With the minimum being \((-3-3=-)\) \(-6\) and the maximum \((3+3=)\) 6. This range is divided into five levels. Values between \(6<X\leq4\) have the most perceived benefits of implementing GSCM. The perceived benefits of values beneath 4 and till 2 are less strong. Between \(-2<X\leq2\) the company has just as strong enablers as barriers to implement GSCM; the outcome therefore is neither positive nor negative. Values from \(-2\) or less show negative consequences of applying GSCM, with the first level ranging from \(-2<X\leq-4\) and the second negative level from \(-4<X\leq-6\). We have decided to have unequal intervals, as \(-2<X\leq2\) is a bigger section than the other
four because we find that a company with values between -2<X≤2 faces neither significant incentives nor obstacles to implement GSCM.

A company that has the impression that the barriers affect them just as much or little as the enablers will consequently have similar values on enablers and barriers. The subtraction is therefore likely to be in the neutral level between -2<X≤2. A company that perceives the enablers to be especially strong and the barriers to be weak will probably be categorized in one of the first two levels, while a company that rated the barriers stronger than the enablers is likely to end up in the lowest sections (see Figure 6).

![Figure 6 GSCM incentive score (level of perceived incentives of applying GSCM)](image)

The results show how textile companies are affected by sustainability issues and indicate how sustainable the textile industry currently is and how likely it is that the sector will become more environmentally friendly in the near future. Moreover, the points that are identified as strong barriers by many companies show what needs to be changed in order for the industry to be more sustainable.

### 3.3.1.2 Categorizing companies according to organizational response

A second way of mapping the results, as shown in Fehler! Verweisquelle konnte nicht gefunden werden, is to categorize the company’s GSCM incentive score into four categories: Agenda setters, External responders, Internal focusers and Reserved players.
Walker and Jones (2012) developed a typology which categorizes companies into four types: external responders, agenda setters, internal focusers and reserved players. They explained that: “External Responders” are more influenced by external stakeholders like customers, NGO and the government. “Agenda Setters” are motivated by internal enablers while barriers they face are mostly external. “Internally focusers” are more influenced by internal factors like employee involvement and management commitment. “Reserved Players” although perceive external enablers face internal barriers.

Coordinate of each company was calculated and mapped on Figure 3, where axis X represents enablers and axis Y represents barriers. Coordinate was calculated as formulas below:

1. \((X, Y) = (\text{EE-IE}, \text{EB-IB})\)
2. \(\text{EE} = \frac{\sum \text{EE}}{6}\)
3. \(\text{IE} = \frac{\sum \text{IE}}{10}\)
4. \(\text{EB} = \frac{\sum \text{EB}}{7}\)
5. \(\text{IB} = \frac{\sum \text{IB}}{7}\)

Data was transcribed differently than measuring incentives of companies. Here, the method was more straightforward. In the survey, participants were asked to grade each factor, either an enabler or barrier, on a Likert scale from 1 to 7, where 1 represents little influence and 7 represents strong effect. The grade received for each factor was directly taken as the score of each question. A final score were calculated separately for each section of the survey. As there were four sections, “Internal Barriers”, “Internal Enablers”, “External Barriers” and “External Enablers”, there would be four final scores for every participant. Score of each section were calculated by the sum of grades divided by the number of questions in the section, where in “Internal Barriers”, “Internal Enablers”, “External Barriers” and “External Enablers”, there were 7, 10, 7 and 6 questions respectively.

This evaluation method does not aim to determine how strong the incentives are for companies to adopt GSCM. Instead, it tries to identify the source of force that characterizes
the decision of adopting GSCM. That is to say, even if organizations share the same coordinates, their incentives are not necessarily the same. The following example clearly illustrates this feature. Given a coordinate of (0, 0), Organization A may have a score of 7 for both EE and IE, 1 for both EB and IB, Organization B, on the other hand, may have a score of 1 for both EE and IE, 7 for both EB and IB.

3.3.1.3 Identification of strong factors
Participants of the online survey were asked to evaluate a total of 30 factors (see Appendix I) on a 7-point Likert scale. It was asked how each factor affects the adoption of GSCM in their company. There are 7 factors in the section of internal barriers, 10 factors in internal enablers, 7 factors in external barriers and 6 factors in external enablers. If more than half of the participants graded a factor 5 or higher, it is considered as a strong factor.

3.3.1.4 Identification of contradicting factors
In the survey, the same factor may appear in both enablers and barriers section. There are six pairs of such factors in the survey as listed in Table 6 below. If a participant graded a pair 5 or higher on a Likert scale, it is considered as contradicting answer. If a certain pair is perceived as a contradicting answer for more than half of the participants, it is considered a contradicting factor.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lack of management commitment</td>
<td>Top management commitment</td>
</tr>
<tr>
<td>2. Company size</td>
<td>Company size</td>
</tr>
<tr>
<td>3. Government regulations</td>
<td>Government policies and incentives</td>
</tr>
<tr>
<td>4. Pressure from competitors</td>
<td>Pressure from competitors</td>
</tr>
<tr>
<td>5. Poor supplier commitment</td>
<td>Collaboration with suppliers</td>
</tr>
<tr>
<td>6. Customer desire for lower prices</td>
<td>Customer demands</td>
</tr>
</tbody>
</table>

Table 6 Pairs of similar factors

3.3.2 Interview
The interview has been conducted in a semi-structured manner because it leaves room for spontaneous and individual answers, but at the same time allows a certain degree of standardization (Bryman, 2012). The semi-structured interview has been conducted with the Senior Manager for Marketing and Business Development; because of the long distance between Pakistan and Sweden, it has been held via Skype and was recorded. The interviewee has also participated in the survey. One day before the interview, the interviewee has been provided with an interview framework that served as guideline, containing mainly open questions which should explain on a deeper level than the survey questions, which enablers and barriers that already have been identified in the survey especially affect the company’s implementation of a Green Supply Chain Management strategy. For confidential reasons the personal information of the interviewee and the name of the company are not disclosed in this report.
3.3.3 Case study

Besides the companies’ own CSR reports secondary data has been studied in order to increase the objectivity. The information has been analyzed with the goal to deepen the understanding of how textile companies perceive their incentives of implementing a GSCM strategy and to find out why and how certain factors influence a company’s GSCM implementation more than others. Besides, the case studies add the organization type retailers, which were not part of the survey sample.

3.4 Quality criteria and assessment of research

“Reliability, replication, and validity are criteria for assessing the quality of social research” (Bryman, 2012).

Considering the validity of a study, it has to be distinguished between measurement validity, internal validity and external validity. Measurement or construct validity applies mainly to quantitative research and investigates if a measure of a concept really reflects the concept that it is supposed to reflect. Internal validity parallels credibility and assesses if the researchers’ observations and the theoretical concepts match. To retain this, the survey questionnaire, the interview framework and the focus of the case studies have been adjusted to the previously studied theoretical framework. External validity concerns the generalizability of a research (Bryman, 2012). Due to the small absolute sample size the generalizability of this study is very limited. However, the qualitative semi-structured interview and the two case studies provide rich descriptions and explanations. In order to increase the replicability of the research, a detailed description of the methodology is given.

External reliability refers to the replicability and consistency of a study over time, which is at issue in connection with quantitative research (Bryman, 2012). In this research, incentives for adopting GSCM and organizational behaviors towards adopting GSCM were evaluated using quantitative methods. Quantitative data was acquired by asking participants the volume of influence they “perceive” of 14 barriers and 16 enablers affecting their adoption of GSCM on a 7-point Likert scale. This survey was therefore inherently subjective. Nevertheless, participants of the survey were mostly owners or managers of a firm, providing a consistency of positions. Internal reliability refers to that when there is more than one observer, members of the research team agree about what they see and hear. Qualitative data acquired by interview was completed by one observer, therefore are exempt to internal reliability. The two case studies were completed by two observers, who agreed beforehand to focus on two issues, the relationship between the case study company and their suppliers and the relationship between the case study company and their customers (Bryman, 2012).
4 Results

This chapter shows the most important findings of the data collection in relation to the purpose and research questions. At first the results of the survey are presented, followed by a description of the interview. The last chapter contains case studies based on literature review that illustrate how the fashion companies H&M and Nike work with environmental sustainability and how they react to certain significant, influential factors such as the lack of supplier commitment or customer demand for sustainability on the one hand, but a strong customer desire for lower prices on the other hand.

4.1 Online survey

4.1.1 Evaluation of GSCM incentives

The GSCM incentive score (Figure 6) divides the GSCM incentive into five levels. The survey analysis shows that all participants identify their incentives of a GSCM strategy to be between -2.27 and 1.87. That means that all respondents, except one answer that has a slightly more negative score of -2.27, are in the neutral level between -2 and 2. Figure 8 shows the total score of the perceived incentives.

![Figure 8 GSCM incentive score](image)

Of the companies that already have adopted green practices, most identify their incentive to be between -0.07 and 1.87. Two respondents perceived less incentives; with a score of -0.58 and -2.27. The scores of the companies that did not adopt green practices were in general more negative; with values between 0.16 and -1.69 (see Figure 9).
Filtering between companies that have their headquarters in developed countries and in developing countries, the scores do not show significant differences. Figure 10 shows that the scores for companies with the headquarter in developed countries are between -1.69 and 1.81, while the values for organizations of developing countries have scores between 0.09 and 1.87, with one company’s score being -2.27. The division of the participants’ countries into developed and developing countries for this research is shown below in Table 7.

<table>
<thead>
<tr>
<th>Developed countries</th>
<th>Developing countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switzerland</td>
<td>Morocco</td>
</tr>
<tr>
<td>Italy</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Germany</td>
<td>Egypt</td>
</tr>
<tr>
<td>Belgium</td>
<td>Taiwan</td>
</tr>
<tr>
<td>Portugal</td>
<td>Turkey</td>
</tr>
<tr>
<td>Iceland</td>
<td>China</td>
</tr>
<tr>
<td>Spain</td>
<td>Lithuania</td>
</tr>
<tr>
<td>France</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
</tr>
</tbody>
</table>

Table 7 Developed and developing countries
Also the differentiation between organization types (Figure 11) does not show significant differences. The scores of designers, manufacturers, suppliers and vertical companies are between -2.27 and 1.87.

4.1.2 Typology of companies

Using the second way of mapping the results, as explained in Fehler! Verweisquelle konnte nicht gefunden werden., the companies can be divided into Agenda setters, External responders, Internal focusers and Reserved players. Figure 12 shows that 11 participants are Agenda setters, 3 participants can be identified as External responders, 2 participants as Internal focusers and 2 participants as Reserved players, while 5 participants did not show an obvious organizational response and therefore remain unidentified.
Figure 12 Organizational response

<table>
<thead>
<tr>
<th></th>
<th>Design</th>
<th>Supplier</th>
<th>Manufacturer</th>
<th>Vertical Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developed</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Developing</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>3</td>
<td>5</td>
<td>11</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 8 Breakdown of samples

Figure 13 to Figure 15 show the results using this categorization into Agenda setters, External responders, Internal focusers and Reserved players and distinguishing between the adoption of green practices, the countries and the organization type.
Figure 13 Adoption of GSCM

Figure 14 Country of headquarter
A total of 23 samples were collected and mapped on the typology developed by Walker and Jones (2012). Organizational responses to green supply chain management of companies are classified into External responders, Agenda setters, Internal focusers and Reserved players. 12 companies are classified as Agenda setters, 5 as External responders, 2 as Reserved Players and 2 as Internal focusers. The remaining 2 companies could not be classified. Results are further differentiated by whether GSCM or green practices are adopted, whether headquarter is based in a developing or developed country and organization type as shown in Figure 13, Figure 14, Figure 15 and respectively. Table 8 above provides the breakdown of the samples. It can be seen that manufacturers and companies that had adopted GSCM or green practices are mostly “Agenda setters”, suggesting they are motivated by internal enablers while barriers they face are mostly external. hat are motivated by internal enablers while barriers they face are mostly external.

4.1.3 Identification of Strong Factors

A total of 23 samples were collected, therefore factors which over 12 participants graded 5, 6 or 7 are identified as strong factors. Results are shown in Table 9. Out of 30 factors, 6 factors are identified as strong; 0 from internal barriers and 2 each from internal enablers, external barriers and external enablers. These factors are Top management commitment, Alignment of company’s strategies, Poor supplier commitment, Customer desire for lower prices, Customer demands and Collaborations with suppliers.

<table>
<thead>
<tr>
<th>Type</th>
<th>Factor</th>
<th>Number of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Internal enablers</td>
<td>Top management commitment</td>
<td>13</td>
</tr>
<tr>
<td>2. Internal enablers</td>
<td>Alignment of company’s strategy</td>
<td>13</td>
</tr>
<tr>
<td>3. External barriers</td>
<td>Poor supplier commitment</td>
<td>13</td>
</tr>
</tbody>
</table>
4. External barriers  
Customer desire for lower prices  
19

5. External enablers  
Customer demands  
15

6. External enablers  
Collaborations with suppliers  
14

Table 9 Identified strong factors

4.1.4 Identification of Contradicting Factors

A total of 23 samples were collected, therefore paired factors that received 12 contradicting samples are identified as contradicting factors. Results are shown in Table 10. Only one pair is identified as contradicting factors, which are “Customer desire for lower prices” and “Customer demands” where 15 participants graded a score of over 5 for both factors, indicating that they perceive “Customer desire for lower prices” is a strong barrier while “Customer demands” is a strong enabler” for implementing green supply chain management.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Enablers</th>
<th>Number of Contradicting Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lack of management commitment</td>
<td>Top management commitment</td>
<td>3</td>
</tr>
<tr>
<td>2. Company size</td>
<td>Company size</td>
<td>5</td>
</tr>
<tr>
<td>3. Government regulations</td>
<td>Government policies and incentives</td>
<td>6</td>
</tr>
<tr>
<td>4. Pressure from competitors</td>
<td>Pressure from competitors</td>
<td>5</td>
</tr>
<tr>
<td>5. Poor supplier commitment</td>
<td>Collaborations with suppliers</td>
<td>8</td>
</tr>
<tr>
<td>6. Customer desire for lower prices</td>
<td>Customer demands</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 10 Number of collected contradicting samples

4.2 Interview

After a short introduction of the interviewers and their educational background, the interviewee gave a description of his company. For more than three decades the company has been producing fabrics and finished garments – mainly jeans – with a completely vertical set-up. Their production activities include every step from raw material processing to finishing fashion garments. With 35,000 employees and another factory in Bangladesh the interviewee describes their capacity as “a huge set-up”. Many of their customers are known, global companies, including Zara and H&M.

The manager claims that they are very strict when it comes to false labor, discrimination, toxic substances in the garments, or other issues and that they are “advanced in sustainability and environmental control and have a green supply chain”. Further he explains that “many of the bigger companies are very picky and only [source from] the big-scale producers. The main reason behind it is a full[y] sustainable garment production because in Europe everybody is really focusing on the supply chain… How the garment is produced, where it is produced, which chemicals are on, and what the work environment at the factory is like. In this regard
[...] we have social orders from customers and independent bodies [such as] BVQI\(^1\), SGS\(^2\), Intertek\(^3\) and other NGOs such as Greenpeace”. That is why the interviewee, as head of the marketing team at his company, has to make sure that the garments fulfill the ethical and environmental requirements. Having a sustainable supply chain means that every part, starting from the raw materials, needs to be sustainable and meet the demands of a sustainable production. For instance, it must be ensured that their suppliers for the indigo dyes have a sustainable supply chain as well. He explains that even though dyeing jeans with indigo dyes has a strong, negative impact on the environment, there are no laws for the waste disposal in Pakistan and at some companies the waste would just go into the sea without any processing and harm the sea life. At his company however, they make sure that they get the indigo dyes from well-known, reliable chemical suppliers, some of them are located in Italy and Turkey. The chemicals that the suppliers use must be according to the standards. Moreover, the company has a waste water treatment plant that cleans the water before it goes into the drain. After this treatment the water is not drinkable, but clean enough for fish to survive in it. Intertek’s REACH certificate program concerns the EU REACH Regulation (Registration, Evaluation and Authorization of Chemical Substances – EC1907/2006) and requires that all chemicals that are in contact with the garments are non-toxic and non-hazardous (Intertek Group plc).

A green supply chain goes that far in detail that the company needs to ensure that the suppliers of the zippers dyed the polyester fabric for the zippers without non-toxic chemicals. Another environmental effort concerns not the garments itself, but the factories. The company has installed LED lights and water-saving toilets in order to reduce the ecological footprint as much as possible. Normally, many of the company’s goods from suppliers (for example raw materials and zippers) are coming by air, but in order to decrease air pollution and reduce waste, the company tells their suppliers to use fewer cartons and send the goods in one shipment rather than in two, if possible.

The interviewee explains that his company has a separate department for sustainability issues. The Social Compliance Department is split into three groups: one group is taking care of the certificates; one group is responsible for the ethical production and another for the sustainable (environmental) production.

The strongest internal barrier for the organization is the low level of education many of the employees in Pakistan have. They receive some training before they start working for the company and the company also needs to explain them the concept of sustainability and the sustainability-related things they need to take care of. The biggest challenge the company faces external is the lack of supplier commitment. Many of their suppliers are much smaller than them and it can be hard for them to follow the strict environmental regulations. However, if one supplier does not fulfill all the requirements, the company cannot meet their customers’ demands either. This dilemma puts much pressure on the company. The reason this company is engaged in green practices is on the one hand the Muslim religion, which make them care about their environment and on the other hand the pressure from the buyer side. Although daily communication with the suppliers is not necessary, the company makes random check-ins to ensure that they meet the requirements. Those check-ins are the best way to measure performance (of the suppliers) in the eyes of the manager.

\(^1\) Bureau Veritas Certification Pakistan (Formerly BVQI) performs Commercial inspections on behalf of producers, manufactureres, traders, financial institutions and other private clients (Bureau Veritas)

\(^2\) SGS is the world’s leading inspection, verification, testing and certification company (SGS SA, 2016)

\(^3\) Intertek is a worldwide textile testing institution (Intertek Group plc)
The green supply chain requires high investments. There is usually no Return on Investment on these investments since they are fixed costs. The only return is that the company can get good customers. Since there are no strict environmental regulations for the textile industry in Pakistan, the interviewee was not able to describe a government policy that encourages Pakistani companies to implement GSCM. Another significant problem to establish green practices in the (Pakistani) textile industry is the unwillingness to change. The interviewee explains that many people who have been working in the textile industry for many years do not want to accept the change and act more environmentally friendly.

4.3 Case studies

The following part describes the sustainability efforts of the two global fashion companies H&M and Nike. The case studies contribute together with the survey and the interviews to a better understanding of how textile and fashion companies handle environmental issues; what encourages them and what obstacles they face.

As mentioned earlier customer demand for lower prices has been identified as a strong external barrier by many participants, but on the other hand consumer demand for sustainability has been regarded as important external enabler. The fact that some participants perceived both factors concurrently seems contradictory. Collaboration with suppliers is enabling for many companies and a lack of supplier commitment has been perceived as one of the strongest barriers by some respondents. Therefore, the case studies particularly focus on the companies’ relationships with customers and suppliers.

4.3.1 H&M

The following case study was based upon H&M’s 14 sustainability reports available for download on their official website, covering from 2002 to 2015. In 1998 H&M started monitoring their first-tier suppliers, whom they have direct relations with. Throughout the years, H&M has expanded the scope to fabric suppliers and cotton growers. In recent years, sustainability efforts focus on increasing coverage of current scope and expand their scope once more, aiming at closing the loop of their supply chain.

4.3.1.1 Strategies and sustainability

In 2014, CEO of H&M mentioned in an interview that: “Good sustainability work will require big investments. We will have to be prepared to sacrifice short-term profits for long-term success.” In H&M, efforts on sustainability are project based. Most projects that are in place today, can trace its origin back to 2002. The Mill Development Programme which by 2015 covers fabric and yarn mills producing 51% of H&M’s products, started off as a project called Supplier Environmental Motivation Strategy (SEMS) with only four vertical mills participated. H&M’s first use of organic cotton was in 2004, mixing 5% of organic cotton in one style which only contains 5 tonnes of organic cotton in total. In 2015, 14.3% of the cotton consumed by H&M came from organic cotton. In 2011, H&M introduced Joint Audit Assessment Programme (JAP) in China in collaboration with 20 factories which they aim to apply this program to all their strategic suppliers with an advanced in-house sustainability organization. All these examples show that H&M conducts trial runs in a small scale before entering the next phase which is implementing projects in a larger scope and scale.
H&M had stated repeatedly in its sustainability reports that: “It is usually easier to control what happens in our own operations, but often this is not where the most critical impacts take place. Teaming up with others is therefore key to make the difference that matters the most.” Since H&M does not own any factories, H&M’s most direct impact on garment manufacturers is using its purchasing power as an incentive to encourage first-tier suppliers to comply with H&M’s code of conduct. From 2011, H&M started to identify strategic suppliers, with the introduction of Index Code of Conduct (ICoC) system. This is part of H&M’s new supplier relationship management strategy launched in 2011 to create long term strategic business relationships. As for suppliers that are upstream to garment manufacturers and end customers, H&M works with initiatives or NGOs such as Better Cotton Initiative (BCI), World Wild Fund (WWF), Bangladesh Partnership for Cleaner Textile (PaCT), Solidaridad, Clevercare and Sustainable Apparel Coalition (SAC) in order to increase their influence.

H&M maintains a supplier base around 750 to 850 suppliers despite the expansion of stores worldwide at a rate of 10% to 15% each year, thus creating economies of scale. Interestingly, number of staff conducting audits grew four times from 30 inspectors in 2002, to around 130 personnel in 2015. The role of these auditors also transformed from monitoring suppliers and detection of infringements of the Code of Conduct into a more supporting role, helping suppliers complying with the Code of Conduct.

![Number of stores in comparison with suppliers](image)

**Figure 16 Number of stores and suppliers of H&M**

### 4.3.1.2 Suppliers and sustainability

H&M started to audit factories in 1998; one year after the Code of Conduct was published. In 2005, H&M started implementing the Full Audit Programme (FAP) which evaluates compliance in five main subjects: Young Workers/Child Labour, Workers’ Rights, Health and Safety, Factory Conditions and Environment. Double record-keeping is an issue which the implementation of FAP aims to address by changing the focus from using a policing approach detecting violations to a pursuit of good management practice. As written in H&M’s CSR report 2005: “Although what we do, i.e. the actual components of an audit – visual inspection of factory premises, document review, and management and worker interviews – remain the same, the difference between our traditional monitoring method and FAP lies in how we do it.” Year 2011 was another turning point as H&M changed its method of grading suppliers...
from categorizing them into five levels (Satisfactory, Insufficient, Temporary, Rejected and Permanently Rejected) to using Code of Conduct Index (ICoC) which evaluates compliance on a scale of 0% to 100%. ICoC was developed on the basis of the Management System Scorecard after H&M concluded in their 2009 report that a strong correlation was identified between well-functioning management systems and a higher compliance level. The quantitative feature of ICoC also provided H&M the possibility to rank suppliers and production units. Moreover, rewarding suppliers with larger and stable orders accordingly to their compliance performance became feasible. H&M also proposed a new concept called “supplier ownership”. Supplier ownership is where suppliers recognize the benefits of good social and environmental performance. In other words, instead of external pressure, internal incentives become the drivers for suppliers to comply with Code of Conduct. H&M concludes that this transformation is the key to guarantee lasting improvements. In order to achieve this goal, H&M introduced Joint Audit Assessment Programme (JAP) to their strategic suppliers where audit is conducted by both parties together using the same methodology as FAP. In 2016, H&M plans to replace ICoC with Sustainability Index (SI) and FAP, JAP with Sustainable Impact Partnership Programme (SIPP). SI and SIPP was developed based on the Higg Index, taking Management System and Leading practice into account in addition to Compliance.

![Figure 17 Development of programs](image)

Although H&M does not have direct business relationships with fabric and yarn suppliers, it initiated a project in 2002 called Supplier Environmental Motivation Strategy (SEMS) which the purpose was to identify suppliers’ motivation of adopting environmental friendly practices. Based on the result, H&M ran a trial of Cleaner Production (CP) programme with six Indian fabric suppliers in 2004. Aligning environmental friendly practices and cost saving, the focus of CP was reducing consumption of energy, water and chemicals. Partnering up with UN’s Cleaner Production Centre, BECO Group and the Wuppertal Institute, a tool covering around forty measures was developed and provided to participated mills, from which they choose which measures are most applicable from them to implement. In 2007, three indicators: biological oxygen demand (BOD), chemical oxygen demand (COD) and total suspended solids (TSS) were selected as the performance indicators of handling waste water and pollution. In contrast with CP which was conducted in voluntary basis, H&M also took another route to set minimum requirements of wastewater for fabrics suppliers. Targeted at suppliers through H&M’s 16 production offices around the world, the Mill development programme became a routine programme in 2010 where mills are audited using Limited Audit Programme method. To gain more control and transparency, starting from 2012, H&M requires first-tier suppliers to provide information on the fabric mill for each order. By 2015,
fabric and yarn mills that are involved in making about 51% of H&M’s products have been integrated; however, most remaining mills that have not been integrated had never been exposed to any demands or compliance standards from brands. Therefore, challenges lies in education and developing mutual understanding for the requirements of environmental practices.

Cotton is the most used raw material of H&M. H&M set the goal that by year 2020, all cotton purchased should be from more sustainable sources which encompass organic cotton, better cotton and recycled cotton. The percentage in 2015, disclosed in H&M’s sustainability report, was 31.4% of total cotton used and 20% of all material used. H&M had been involved with Better Cotton Initiative (BCI) since its very beginning. BCI develops and promotes good farm practices, allowing more cotton to be grown while reducing water and chemical use. Through BCI, H&M supports farmer training financially.

4.3.1.3 Customers and sustainability
The result of Life Cycle Assessments (LCAs), based on H&M’s total use of cotton, organic cotton, polyester and viscose in 2011/2012, indicates that carbon footprint and water footprint caused by consumers represents 26% and 8% respectively in comparison with raw materials, fabric production, garment production, packaging, transport and sale. In, 2012, H&M collaborated with Ginetex to develop a wash care label, named “Clevercare”, which suggest more environmentally friendly instructions. Also in 2012, collaborating with I:Collect, H&M started to collect used clothing from customers regardless of brands in selected stores, therefore engages consumers in closing the loop of the fashion industry. H&M earlier efforts in sustainability related to customers were limited to green labelling, providing customers with more sustainable product options. For example, the adoption of EU Flower in 2004, Organic cotton in 2005. In 2013, H&M expanded the option base by creating the “Conscious” hang tag. MADE-BY created a tool called Environmental Benchmark of Fibres where fibres were classified into 5 classes, A to E, based on environmental impact. Any product consisting of at least 50% of materials listed in Class A and B are labelled with as “Conscious”.

4.3.1.4 Innovations and sustainability
The main operation of H&M is design and retailing, which according to the LCAs results, represents 10% carbon footprint and 0% water footprint of the products H&M is selling. H&M takes a proactive role by participating in investments like development of alternative materials and manufacturing processes. The focus of H&M in recent years is methods to create a closed-loop supply chain. Efforts include investing in textile recycling technologies, developing new business model, and crowd-sourcing innovation ideas through H&M Foundation’s Global Change Award.

Using the Three Dimensional Concurrent Engineering (3DCE) framework, sustainability efforts of H&M were classified into Product, Process and Supply Chain, as shown in Table 11 (H&M, 2002-2015).

<table>
<thead>
<tr>
<th>Product</th>
<th>Process</th>
<th>Supply Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water-based PU with Bayer</td>
<td>Water management systems with Jeanologia</td>
<td>Clean Shipping Project</td>
</tr>
<tr>
<td>Better cotton with BCI</td>
<td>Textile-to-textile recycling</td>
<td>H&amp;M Foundation</td>
</tr>
<tr>
<td>Technologies with Worn Again</td>
<td>Global Change Award</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------</td>
<td></td>
</tr>
<tr>
<td>Recycled polyester from PET bottles</td>
<td>Fossil Free Sweden</td>
<td></td>
</tr>
<tr>
<td>Recycled PE plastic shopping bags</td>
<td>Circular business model with Ellen MacArthur Foundation</td>
<td></td>
</tr>
<tr>
<td>Water-based adhesives with chemical manufacturers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11 Overview of H&M’s sustainability efforts

4.3.2 Nike

For the following case study Nike’s first CSR report from FY2001 and their last CSR report from FY2012/13 have been reviewed. Additionally, secondary sources from other authors have been studied in order to increase the objectivity.

4.3.2.1 The development of Nike’s CSR strategy

Nike is an American multinational sports company that was founded in 1964. By the end of 2013 Nike had approximately 48,000 employees, including seasonal and part-time employees and approximately more than 2.5 million people working at various stages throughout their supply chain, including more than 1 million in the factories they contract directly (Nike, Inc. 2013).

Since Nike has made negative headlines with poor labor conditions in the 1990’s, the organization has strived to increase their sustainability. They published their first CSR report in 2001, when not many fashion companies even had CSR strategies (Nike, Inc. 2013). At that time there were hardly any standards or regulations regarding sustainability or Corporate Social Responsibility (CSR) in the fashion industry, which explains Nike’s insecurity in some points of their first CSR report. Chairman and CEO Philip Knight claimed: “I’m not sure how we measure good performance in corporate responsibility. I’m not convinced anybody does” (Nike, Inc. 2001).

Corporate Responsibility at Nike is handled like any other business operation and integrated into every part of the company and taught to employees of all departments. For example after launching a new environmental policy, Nike sent 100 persons from every part of the organization to a sustainability learning program (Nike, Inc. 2001).

Despite many developments and improvements over the last decade, Nike has many goals for the future to become even more environmentally sustainable. When it comes to suppliers and consumers, they want to improve the environmental performance of their suppliers and engage consumers in the potential for a different way of consuming, since the company is convinced that consumption is not the problem, but the current form of consumption is. Nike is also planning to educate employees, customers, and business partners about sustainability and promote their practices throughout the supply chain and seek business partnerships with suppliers who operate in a way that agrees with their values (Nike, Inc. 2001).

In Figure 18 Nike’s system-change initiatives (Nike, Inc. 2013) an overview of Nike’s system-change initiatives is shown. After mentioning and describing the system barrier, Nike
explains the strategy and sums up what has already been done in order to overcome the barrier.

The following statement sums up Nike’s thoughts on sustainability: “We believe free, fair and sustainable trade encourages growth, investment and innovation and serves the interests of workers and consumers globally” (Nike, Inc. 2013).

### 4.3.2.2 Nike’s engagement with suppliers and other institutions

An outsourced manufacturing model, like Nike has, is common across the apparel and footwear industries and an important factor when it comes to sustainability issues because the model brings complexities related to lack of direct control over factories that might supply several brands and incomplete information about performance and impacts. Nevertheless, the organization is convinced that their interconnected supply chain can make a positive impact since it allows them to increase expectations and standards across the sector, in areas such as labor practices and environmental protection. Nike has collaborated for several years with other companies in the industry. In 2012, Nike has for example made a minority investment in DyeCoo Textile Systems B.V., a Dutch company that has developed the first commercially available waterless textile dyeing machines. But Nike has also cooperated with other companies through organizations such as the Sustainable Apparel Coalition, with multi-stakeholder groups including the Fair Labor Association, and with organizations such as the International Labor Organization and the International Finance Corporation. Nike says that it is difficult to transform the entire systems and requires long-term investment and effort, but that they are committed to the process because it is essential to their vision of a sustainable business (Nike, Inc. 2001; Nike, Inc. 2013).
As for many survey participants, the lack of supplier commitment is an important external barrier for Nike. Nike does not own the manufacturing facilities, so it is crucial that contract factories take responsibility to achieve success. Nike’s immediate goal in this matter is to improve their data collection systems. Eventually, their objective is to have every Nike-contracted footwear factory actively measuring and reducing solid waste. The changes take a significant amount of time and commitment for the factories, which is why Nike did not give them ultimate orders, but engaged them in the process. Many of their contract firms have already begun to integrate the management of sustainability issues into their business operations. In some cases they cooperated with experienced consulting firms. The Fair Labor Association (FLA) for example is a monitoring coalition of apparel and footwear companies, NGOs and human and labor rights organizations with the goal to fight sweatshops and child labor. The FLA was first established as the Apparel Industry Partnership in 1996, and Nike was a founding member.

In order to prepare for the ISO 14001 certification, Nike organized a series of nine two-day workshops over a period of 12 months where representatives from each factory attended. But Nike still has a lot of work ahead; besides from continuing the implementation of management systems throughout the footwear supply chain, they are developing an implementation plan for the apparel supply chain. Identifying strengths and weaknesses in the implementation process and developing ways to achieve improvements in operations and performance is an ongoing process. In their CSR report the company admits some weaknesses of their system. In factories in Indonesia a Global Alliance assessment project found extensive harassment issues, but the monitoring system did not find those issues. The sports company claims that their worst experience and biggest mistake was 1995 in Pakistan, where they ordered soccer balls and discovered cases of child labor in 1995. Even though Nike’s factories are not allowed to hire anyone under the age of 18 and the company claims to be doing everything they can eradicate child labor they predict that cases will occur anyway (Nike, Inc. 2001).

The Rana Plaza garment factory in Bangladesh collapsed in 2013 and 1,129 people were killed and more than 2,500 injured. This disaster was the worst in the history of the garment industry and showed that many workers in the industry still face unacceptable conditions, despite decades of work by many institutions and individuals. Nike has never sourced from Rana Plaza, but from four contract factories in Bangladesh. All four factories have undergone fire, safety and structural audits and those findings have been independently verified by an outside firm. However, Nike admits that there is still much work to be done in Bangladesh and Nike states to remain part of those conversations by continuing dialogue and engagement with stakeholders. But they also emphasize that responsibility for long-lasting, systemic change should be shared by governments, manufacturers, NGOs, brands, unions and factory workers (Nike, Inc. 2013).

In their FY2013 report Nike admits that 55 incidents of excessive overtime were reported although they assess contracted factories to review their ability to meet Nike’s high standards of social and environmental performance both before and during collaboration with Nike. As mentioned earlier the company cooperates (amongst others) with the Fair Labor Association (FLA) in order to improve the working conditions at the factories. The Fair Labor Association conducted a report of a workplace assessment. In the report they evaluate a facility’s performance in upholding fair labor standards through effective management practices throughout the entire employment life cycle using FLA’s Sustainable Compliance methodology (SCI). The report identifies violations and risks of noncompliance and includes
a description of the root causes of violations, recommendations for sustainable and immediate improvement, and the corrective action plan for each risk or violation as submitted by the company (Fair Labor Association, 2015; Nike, Inc. 2013).

Figure 19 shows Nike’s performance score in a Chinese factory. The percentage indicates how well the factory fulfilled the fair labor requirements. The worst performances were made in the areas of industrial relations, grievance system and termination and worker retrenchment.

<table>
<thead>
<tr>
<th>Management Functions</th>
<th>Recruitment, Hiring &amp; Personnel Development</th>
<th>Compensation</th>
<th>Hours of Work</th>
<th>Industrial Relations</th>
<th>Grievance System</th>
<th>Workplace Conduct &amp; Discipline</th>
<th>Termination &amp; Worker Retrenchment</th>
<th>Health &amp; Safety</th>
<th>Environmental Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy</td>
<td>81%</td>
<td>100%</td>
<td>100%</td>
<td>91.78%</td>
<td>100%</td>
<td>100%</td>
<td>96.67%</td>
<td>100%</td>
<td>90.32%</td>
</tr>
<tr>
<td>Procedure</td>
<td>89%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>92.5%</td>
<td>100%</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>Responsibility &amp; Accountability</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Review Process</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Training</td>
<td>92.86%</td>
<td>100%</td>
<td>66.67%</td>
<td>50%</td>
<td>33.33%</td>
<td>50%</td>
<td>33.33%</td>
<td>95.38%</td>
<td>100%</td>
</tr>
<tr>
<td>Implementation</td>
<td>91.65%</td>
<td>93.15%</td>
<td>74.19%</td>
<td>91.32%</td>
<td>87.5%</td>
<td>82.86%</td>
<td>100%</td>
<td>92.83%</td>
<td>90.91%</td>
</tr>
<tr>
<td>Communication</td>
<td>83.33%</td>
<td>87.5%</td>
<td>75%</td>
<td>50%</td>
<td>50%</td>
<td>75%</td>
<td>50%</td>
<td>83.33%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Figure 19 Nike’s performance score in a Chinese factory
Adapted from Fair Labor Association, 2015

4.3.2.3 Nike’s approach towards resource scarcity and hazardous chemicals

Nike collects footwear returned from distribution centers and retailers, as well as used products from consumers in the frame of a project that they call’’ Reuse-A-Shoe”. These shoes are then reduced by grinding down to granules of rubber and other materials and made into new products. The company considers the collection to be the hardest task because it requires a change in consumer behavior. However, Nike is in a position to positively influence the business practices of other industries. Nike’s partner, the Cathay Recycling Development Corporation (CRDC), is building a firm economic base in China for recycled waste materials. In 2001 more than 50% of rubber waste from Nike’s 17 contracted factories in China has been ground and reused.

It has not yet been possible for Nike to shift to organically-produced cotton for our entire product line because current supply would not meet the demand of the global sports company. But by increasing the usage as the market and economy allow, Nike supports pioneer farmers who are switching to organic practices and the organic cotton industry (Nike, Inc. 2001).

In their latest CSR report from FY2012/13 Nike states: “We believe business has a critical role to play in meeting the challenges of a changing world – addressing climate change, preserving the earth’s constrained resources, enhancing global economic opportunity – not by reducing growth but by redefining it. To do this we believe businesses must embrace sustainability as an innovation opportunity and governments should act to create the right policies and incentives to accelerate change at scale” (Nike, Inc. 2013). The organization is convinced that sustainability and business growth are complementary. Their strategy is to create value through innovation and thereby reducing the impact on the environment. Breakthrough technologies like NIKE Flyknit, which significantly reduces waste compared to traditional footwear manufacturing, and ColorDry, which eliminates water and process chemicals from dyeing while decreasing energy consumption and improving productivity quality are some of their latest innovations. Nike explains further: “Early on, we learned that...”
rather than just managing our reputation by reacting to criticism about our supply chain, we could create real opportunities for change by creating an environment of industry collaboration, partnership and transparency. We still believe transparency is essential for industry change”. From only approaching sustainability reactively as a reputation management issue, Nike has evolved to embracing it as a key driver of innovation and an important source of competitive advantage. Nike claims that they are trying to integrate sustainability into every business aspect; materials, design and manufacturing. Materials and manufacturing have the strongest impact on people and environment, and a potential for sustainable innovation. Innovation fuels Nike’s success and challenges them at the same time. Their athletes, consumers and investors expect and always have expected Nike to be innovative (Nike, Inc. 2013).

Their definition of a sustainable supply chain is “one that is lean with regard to our manufacturing philosophy; green in our approach to design, product creation and sourcing; equitable in our commitment to balance people and profit; and empowered by building a workforce that knows and can advocate for its rights”. Nike’s recent footprinting work revealed that 73% of the water needed to make the products is used at the beginning of the value chain, in the raw materials stage; mostly because cotton is very water-intensive to grow. Rising costs for energy, materials and labor and severe weather events, such as flooding in Thailand, put stress on textile supply chains. In 2012 NIKE released a Materials Sustainability Index to the Sustainable Apparel Coalition (SAC) (Nike, Inc. 2013).

In the future NIKE wants to deliver profitable growth through sustainable manufacturing and sourcing. To do so, the company plans to make their lean production system a standard practice at all their factories. Using the so called Sourcing and Manufacturing Sustainability Index the company assesses factories based on sustainability, cost, quality, and on-time delivery. They believe that their lean manufacturing system is an enabler of sustained, improved business performance where employees are engaged and enabled to continuously improve. Nike states: “[Lean manufacturing has helped to deepen the] understanding of the cultural differences between management and workers’ priorities and perceptions, as well as the need to enhance communication and engagement with workers directly on problem solving” (Nike, Inc. 2001; Nike, Inc. 2013).

Although the company claims to take a leadership role whenever it has direct influence, it emphasizes the importance of collaboration with other supply chain participants for example in order to improve working conditions within the global textile supply chain. One way Nike is working on those improvements is through collaborating with the Fair Labor Association to develop the Sustainable Compliance Initiative. This initiative, still in development, provides tools to improve the quality, consistency and efficiency of efforts in the industry to comply with government laws or regulations and company standards (Nike, Inc. 2013).

In 2013 an article about Nike’s sustainability effort has been published in Harvard Business Review. Nike mentions this review in their latest CSR report, saying: “To share our experience in this area with others, in 2013 we engaged with professors at Harvard Business School who produced Governance and Sustainability at NIKE – a case study about our journey. This publication […] describes how we transformed from a company that reacted to external pressures while working to minimize reputation risks to one that views sustainability as among our leading innovation opportunities; catalyzing strategic partnerships to bring sustainable innovation to scale.” The article talks amongst other things about the company’s plan to join the Greenpeace initiative “Roadmap to Zero”, an initiative to eliminate the
discharge of toxic chemicals into the water supply by 2020. Nike's executive team has to decide which sustainability targets to propose to Nike's CEO and the corporate responsibility committee of Nike's board of directors. The team needs to decide whether to recommend Nike to withdraw other sustainability goals to meet the zero toxics challenge, change its commitment to zero toxics, or find another solution. The company's target-setting process will become more complex when Nike signs on to the Roadmap to Zero. (Paine et al. 2013). Also Kaye, 2012 acknowledges the company's efforts to develop less harmful solvents for making and dyeing synthetic leather; saying that "[…] Nike is becoming a leader in green chemistry" (Kaye, 2012).

4.3.2.4 Nike’s engagement with consumers and their marketing approach

In their CSR reports the company often states that it wants to educate its customers about sustainability and innovation (Nike, Inc. 2010; Nike, Inc. 2013). One example of how Nike engages its stakeholders in these subjects is by showing them the impact that the 16,000 various materials used to manufacture its products have on the environment. A tour of the Nike Material Index (NMI) allows users to compare organic with conventional cotton, learn about recycled polyester and the numerous components that make a pair of athletic shoes. While customers design their version of green athletic wear, they learn how Nike assesses the overall sustainability performance of the materials based on energy, chemistry, water and waste. The important point about this function is that it reminds consumers about the challenges that occur when great performance and sustainability shall be combined (Kaye, 2012).

Innova
tion is a key factor to Nike and essential to sustainability for them. The company states: “the two are linked, leading to new discovery, better products and superior performance” (Nike, Inc. 2013). Reena, 2009 has investigated Nike’s sustainability efforts in relation to their marketing approach. Despite nearly two decades of CSR developments the company does not market their products as eco-friendly. For instance the sole of Nike’s new Air Jordan shoe is made with ground-up bits of old Nike sneakers, but they are not selling it as an eco-friendly shoe because it might decrease the sales. Nike learned that a design that is not in line with their innovative high-tech image is unappreciated by their consumers. In 2005 the company launched its first line of environmentally friendly shoes, called "Considered". However, the walking boots made with brown hemp fibers did not sell well and were taken off the shelves within a year. Critics called the $110 shoes "Air Hobbits" because of their very earthy look. The author concludes: “The lesson for Nike was that its green innovations should continue, but its customers should not be able to tell”. According to the motto "Do more and say less" (Reena, 2009).

The veteran writer Leon Kaye has reviewed Nike’s CSR report from 2011 and concluded: “[…] quite possibly one of the most compelling and engaging I have ever come across.” Although the author mentions some of the issues such as excessive overtime and hazardous chemical management that the report admits, Kaye positively acknowledges the demonstrations and accessible language used in the report to engage readers and the way sustainability is presented in the report. Moreover, the writer is impressed by Nike’s approach towards innovation and education (Kaye, 2012).

Hunstig, 2015 investigated for the media brand Sportswear International if Nike and other footwear and apparel brands are as sustainable as they claim to be. The financial institution Morgan Stanley Research has identified Nike as leader in environmental sustainability. Using
a Sole Sustainability Index (SSI), the performance of some of the largest branded apparel and
footwear businesses have been analyzed. The index summarizes existing data and compares
the companies’ performance in terms of environmental issues (examining water, waste and
raw materials, specifically cotton and leather), social matters (supply chain management and
community engagement) and governance (how sustainability is integrated into the business
strategy and how shareholder-friendly the corporate governance structure is). Nike and the
organization PVH had the highest score on social topics and Nike, VF Corp., and
Hanesbrands had the highest overall ranks on the Sole Sustainability Index.
5 Analysis

The analysis chapter compares the results of the literature review, the interview, the case studies and the survey with each other and shows the most important similarities and differences.

5.1 Internal enablers

Internal enablers identified in literature review and internal enablers that were included in the online survey are summarized in Table 12. Except “Administrative” factors, the online survey covered all the other aspects of internal enablers. Among the 10 internal enable factors, “Top management commitment” and “Alignment of company’s strategies” were identified as strong factors. This is supported by the findings from the interview and case studies in a sense that “top management” is in charge of setting “strategies” which represent a long term decision of a company; whereas the interviewee, H&M and Nike all expressed the importance of a long term view that regards implementing GSCM as a long term investment and that short term profit can be sacrificed.

Because the focus of the interview and case studies was mainly on relationships focal companies have with their suppliers and customers, this research is unable to support other factors identified in current literature with only one exception that, in the case study of Nike, it indicated that Nike started engaging in green practices to avoid reputational damage.

<table>
<thead>
<tr>
<th>People</th>
<th>Survey questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management commitment</td>
<td>Top management commitment</td>
</tr>
<tr>
<td>Middle management commitment</td>
<td>Employee involvement</td>
</tr>
<tr>
<td>Employee involvement</td>
<td></td>
</tr>
<tr>
<td>Commitment of individuals</td>
<td></td>
</tr>
</tbody>
</table>

| Organizational                  |                                    |
| Foster of culture               | Corporate culture                  |
| On-job-training                 | Communication regarding green       |
| Cross-departmental communication| practices                           |

| Resource                        |                                    |
| Larger organizations            | Company size                        |
| Knowledge of environmental issues|                                      |
| Long-term investment in technology|                                     |
| Capabilities within purchasing and supply function| |

| Strategical                     |                                    |
| Gaining competitive advantages  | Gaining competitive advantages     |
| Reducing environmental & reputational risk | Avoidance of reputational and |
| Alignments with the other strategies | environmental risks               |
| Desire to reduce hidden cost    | Alignment of company’s strategies  |

| Administrative                  |                                    |
| Performance and reward system   | /                                    |

| GSCM readiness                  |                                    |
| Existence of sustainable SCM strategy | SCM strategy                  |
| EMS adoption                    | Other CSR practices                |
| Other internal CSR practices    |                                      |

<table>
<thead>
<tr>
<th>Factors identified in literature review</th>
<th>Survey questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td></td>
</tr>
<tr>
<td>Top management commitment</td>
<td>Top management commitment</td>
</tr>
<tr>
<td>Middle management commitment</td>
<td>Employee involvement</td>
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<tr>
<td>Employee involvement</td>
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</tr>
<tr>
<td>Commitment of individuals</td>
<td></td>
</tr>
<tr>
<td>Organizational</td>
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</tr>
<tr>
<td>Foster of culture</td>
<td>Corporate culture</td>
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<td>On-job-training</td>
<td>Communication regarding green practices</td>
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<td>Cross-departmental communication</td>
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</tr>
<tr>
<td>Resource</td>
<td></td>
</tr>
<tr>
<td>Larger organizations</td>
<td>Company size</td>
</tr>
<tr>
<td>Knowledge of environmental issues</td>
<td></td>
</tr>
<tr>
<td>Long-term investment in technology</td>
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</tr>
<tr>
<td>Capabilities within purchasing and supply function</td>
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<tr>
<td>Strategical</td>
<td></td>
</tr>
<tr>
<td>Gaining competitive advantages</td>
<td>Gaining competitive advantages</td>
</tr>
<tr>
<td>Reducing environmental &amp; reputational risk</td>
<td>Avoidance of reputational and</td>
</tr>
<tr>
<td>Alignments with the other strategies</td>
<td>environmental risks</td>
</tr>
<tr>
<td>Desire to reduce hidden cost</td>
<td>Alignment of company’s strategies</td>
</tr>
<tr>
<td>Administrative</td>
<td></td>
</tr>
<tr>
<td>Performance and reward system</td>
<td>/</td>
</tr>
<tr>
<td>GSCM readiness</td>
<td></td>
</tr>
<tr>
<td>Existence of sustainable SCM strategy</td>
<td>SCM strategy</td>
</tr>
<tr>
<td>EMS adoption</td>
<td>Other CSR practices</td>
</tr>
<tr>
<td>Other internal CSR practices</td>
<td></td>
</tr>
</tbody>
</table>

Table 12 Comparison of internal enablers in LR and online survey
5.2 Internal barriers

None of the factors in the internal barriers section were identified as strong through the online survey. Nevertheless, in the interview, the participant indicated that the low level of education of employees is the strongest internal barrier they perceive, therefore, they devoted many resources into training in order to convey sustainability concepts and explain the underlying importance of their routine work in connection with sustainability. H&M on the other hand, developed many quantifiable measurements to evaluate sustainability performance, for example, ICoC used to measure Code of Conduct compliance level of suppliers; BOD, COD, and TSS as performance indicators of handling waste water and pollution. These efforts indicated that lack of training and inexistence of suitable performance measurement may be internal barriers; however it is possible to overcome them in their cases.

<table>
<thead>
<tr>
<th>Factors identified in literature review</th>
<th>Survey questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>Lack of top management commitment</td>
</tr>
<tr>
<td>Organizational</td>
<td>Lack of training</td>
</tr>
<tr>
<td>Organization</td>
<td>Lack of training in sustainable supply chain methods</td>
</tr>
<tr>
<td>Resource</td>
<td>Company size</td>
</tr>
<tr>
<td>Smaller organizations</td>
<td>Lack of financial resources/budgets</td>
</tr>
<tr>
<td>Lack of environmental professional knowledge</td>
<td></td>
</tr>
<tr>
<td>Lack of information and technological systems</td>
<td></td>
</tr>
<tr>
<td>Strategic</td>
<td>Non-alignment with other SCM priorities</td>
</tr>
<tr>
<td>Administrative</td>
<td>Performance measurement: justifying costs of adopting green practices</td>
</tr>
<tr>
<td>Reliance on traditional accounting methods</td>
<td>Current organizational structure/functions</td>
</tr>
<tr>
<td>Lack of supportive corporate structures and processes</td>
<td></td>
</tr>
</tbody>
</table>

Table 13 Comparison of internal barriers in LR and online survey

5.3 External enablers

The online survey covered all external enablers that were identified in literature. Tay et al. 2015 describe government and consumers as the main external enabling forces of GSCM (Tay et al. 2015). Also Caniato et al. 2011 identify government policies and incentives as an enabler, but argue that law compliance at the moment is not a relevant driver for textile companies. Fashion companies that want to operate a green supply chain often go beyond governmental regulations in terms of green performance (Caniato et al. 2011). That is also the case for the interviewee’s company and the case studies H&M and Nike. The interviewee even argued that the non-existing government policies and incentives regarding environmental sustainability in the fashion industry in Pakistan make it harder for them to communicate their requirements to suppliers and employees.

Some authors stressed that good collaboration with suppliers is essential (Tay et al. 2015; Walker and Jones, 2012). In the online survey “Collaboration with suppliers” could be identified as one of the two strong factors in the section of external enablers. Also the case studies and the interviewee emphasize the importance of good collaboration with suppliers. H&M invests in trust building and Nike seeks help from independent organizations in order to ensure that their suppliers fulfill their requirements. The other factor that has been identified as strong in the survey is “Customer demands”. The companies Nike and H&M however do not seem to support this. Nike even decided not to market its products as eco-friendly in order
not to collide with customer expectations. The interviewee on the other hand indirectly perceives “Customer demands” as strong enabling factor since the only gain his company has from implementing GSCM is the chance of getting important, global customers.

<table>
<thead>
<tr>
<th>Factors identified in literature review</th>
<th>Survey questions</th>
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<tbody>
<tr>
<td>Governmental</td>
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<td>Government policies and incentives</td>
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<td>Customers</td>
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<td>Suppliers</td>
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<td>Competitors</td>
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<td>Pressure from competitors</td>
<td>Pressure from competitors</td>
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<td>Other actors</td>
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<td>Pressure from investors</td>
<td>Pressure investors</td>
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<td>Pressure from NGOs</td>
<td>Pressure from NGOs</td>
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Table 14 Comparison of external enablers in LR and online survey

5.4 External barriers

The online survey identified two of the external barriers described in literature as strong factors: “Customer desire for lower prices” and “Poor supplier commitment. This goes in accordance with the findings of the literature study, since some authors identified poor supplier commitment as one of the most important external barriers of implementing GSCM because it is very difficult for a company to maintain a GSC if their suppliers – for example for financial reasons – cannot or do not want to take part in green initiatives (Caniato et al. 2011, Walker and Jones, 2012). Also the case studies and the interviewee explain how difficult it can be to get the suppliers to collaborate in sustainability matters and accordingly put much effort in improving the relationships with and the control over their suppliers. “Customer desire for lower prices” on the other hand has not directly been identified as strong factor, neither by the interviewee nor the case studies.

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<thead>
<tr>
<th>Factors identified in literature review</th>
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<td>Customer desire for lower prices</td>
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<td>Poor supplier commitment</td>
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<td>Pressure from competitors</td>
<td>Pressure from competitors</td>
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<td>Culture</td>
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<td>Global aspects – cultural barriers and language barriers</td>
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<tr>
<td>Technology</td>
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<td>Information and Communication Technology (ICT) Technological constraints</td>
<td>Information and Communication Technology (ICT) Technological constraints</td>
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Table 15 Comparison of external barriers in LR and online survey
6 Discussion

This chapter discusses implications of the barriers and enablers that have been identified in this research and compared in the previous analysis chapter.

Some of the survey participants and the interviewee, as well as the Nike case study perceive “lack of supplier commitment” as strong GSCM barrier. It was also revealed in H&M’s sustainability reports that a lot of effort was done on trust building with suppliers. This emphasizes the importance of collaboration and good supplier relationships. As the interviewee explained, it can be difficult for a company to ensure that their suppliers receive sustainable products (materials) from their suppliers and that everything was produced in an environmentally and socially sustainable way. Besides the importance of supplier collaboration and trust, this stresses the significance of transparency. Transparency can also help with the pressure from NGO’s such as Greenpeace because they wish to know about an organization’s production circumstances and put pressure on the company to act more sustainable. If an organization is non-transparent, that could lead to skepticism on the NGO’s side.

The fact that “customer desire for lower prices” was identified as a strong GSCM barrier, while on the other hand, “customer demand for more sustainability” was identified as a strong enabler towards the implementation of GSCM, shows the dilemma of companies to fulfill customer demands, but at the same time act environmentally friendly and stay profitable. How to reach the balance of environmental sustainability, social sustainability and economical sustainability is an ultimate challenge for companies. As the concerns of different stakeholders are dynamic, so is the balance. In H&M’s sustainability report of 2007, it was mentioned that: “Customers are becoming more aware of environmental and social issues and question where the products they buy come from and how they are made. We work towards improving the factory conditions in our supply chain and strive to limit the negative impact we have on the environment.” H&M’s customers affect H&M’s decisions, which H&M in turn affects their suppliers. H&M and its suppliers, being independent entities, the integration of value chain was pursued through various projects and supplier selection. Projects were designed to encourage and support suppliers to adopt GSCM. Instead of selecting suppliers solely based on price offers, sustainability efforts of suppliers were weighed in as a criterion to ensure mutual objectives of building a green value chain. It can be therefore be argued that a higher purchase price offered by retailers may be a supporting factor however not a necessary factor to implement GSCM. Nike strives to implement sustainability aspects into every step of their supply chain, but they do not market their products as eco-friendly since they made the experience that their customers expect innovative products, rather than obviously “green” ones. Above two examples demonstrate the potential influence consumers have on companies.

However, it is important to note that maintaining the balance of the environmental, social and economical sustainability does not guarantee a sustainable business. The fast fashion business model is being criticized for the quantity of clothes produced (Bain, 2016). As balance is dynamic, change of customer behavior may lead to a more sustainable industry. Another possibility is the development of textile recycling technology. Although it does not affect the balance, it lessens the dependence on virgin materials, thus decreases environmental impact. Also Nike regards the development of new technologies and products as strong GSCM enabler, although it could not be identified in literature. The company describes innovation as creator of new business opportunities and driver of sustainability.
7 Conclusion

This chapter sums up the findings of this research and provides answers to the three research questions accordingly. Finally, the contributions of this research are stated and suggestions for future research are given.

Due to the 2.47% low response rate, no hard conclusions can be drawn from the online survey. Nevertheless, the collected 23 samples show a strong tendency. When measuring the GSCM incentives, 22 samples are in the “Neutral” zone, suggesting these companies face neither significant incentives nor obstacles to implement GSCM. 12 out of 23 samples are classified as Agenda setters, indicating companies perceive internal incentives and the need to overcome external barriers. 15 out of 23 samples graded “Customer desire for lower prices” as a strong barrier while graded “Customer demands” as a strong enabler.

Similarities can be found from the interview and two case studies on H&M and Nike, that all three companies view implementing GSCM as a long term investment, which may not be economically sustainable in the short run. In the case studies, many efforts were made on establishing mutual trust with suppliers. Only when trust is built, can traceability and transparency of value chain be increased.

The research questions can be answered as following:

<table>
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<th>Research question:</th>
<th>Answered by:</th>
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<tr>
<td>RQ1</td>
<td>Discussed/investigated in LR. Tested and confirmed/denied in survey, interview and case studies</td>
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<td>RQ2</td>
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<td>RQ3</td>
<td>Answered by survey, case study and interview</td>
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Table 16 Answering of RQs

RQ1: What are the factors that enable or aggravate the implementation of a GSCM strategy for textile and fashion companies?

The different factors that enable (internal and external enablers) or aggravate (internal and external barriers) have been identified in the literature review. In the online survey six out of 30 factors identified in literature are identified as strong: Top management commitment, Alignment of company's strategies, Poor supplier commitment, Customer desire for lower prices, Collaborations with suppliers and Customer demand for sustainability. That shows that the main factors that affect the implementation of GSCM are supplier relationships and customer demands. With the example of the Nike case study, innovation could be identified as another enabling factor that has not been identified in literature. In contrast to the literature study, government regulations and incentives have not been identified as strong factors by the case study and the interviewee and the interviewee is of the opinion that the absence of government regulations and incentives regarding green practices in the Pakistani textile industry rather impede GSCM implementation.
RQ2: How do textile and fashion companies perceive their incentives of implementing a GSCM strategy?
Many of the survey participants, as well as the interviewee and the case studies identify the lack of supplier commitment and the importance of supplier collaboration as important factors. For many the demand of customers for more sustainability, but also lower prices, is contradictory and challenging. Transparency seems to be important when it comes to dealing with the pressure from NGOs.

However, the survey results show that despite perceiving some strong enablers and barriers, the overall GSCM incentive score of most companies is in the neutral level (see Figure 8 GSCM incentive score), meaning that they in total average perceive neither strong incentives nor disadvantages to implement GSCM.

RQ3: What are the organizational responses of textile and fashion companies towards perceived barriers and enablers?
The perceived barriers and enablers are handled differently by different companies. H&M for instance puts a lot of effort in trust building with their suppliers, while Nike assigns independent organizations, such as the Fair Labor Association with the supervision of their (suppliers’) factories. While Nike regularly publishes CSR reports and other information about their sustainability efforts for stakeholders (for example NGOs and interested customers) to read, they do not market their products as eco-friendly because it might contradict with their customers’ desire for innovative sports products. With the headquarter in Pakistan, the interviewee explained that his company has no governmental regulations when it comes to environmental sustainability. But despite high investments, the company still strives for a greener supply chain in order to fulfill their customers’ requirements and gain large companies as customers.

7.1 Contribution
This study gives an overview of the factors that enable or aggravate the implementation of a GSCM strategy for textile and fashion companies. In contrast to the few existing studies on this topic, this report uses a mixed-methods approach that combines a survey, a semi-structured interview and two case studies, and targets global textile supply chains, instead of focusing on a certain organization type or region.

Moreover, a literature study about previous research on this topic gives insight into supply chain management and Green Supply Chain Management (GSCM); in general and with regard to the textile industry. Combined with the empirical study, the report provides new knowledge about the most significant GSCM drivers and barriers for textile companies and describes the difficulties and chances that companies face with increased sustainability awareness. The study also indicates what a company that is planning to implement a GSCM strategy needs to consider; such as balancing the customer demand for sustainability and low prices, building strong, trustful relationships with suppliers and being transparent when dealing with NGOs.

7.2 Future research suggestions
Due to the small sample size, the results are not generalizable, but depend on the company’s and interviewee’s personal experiences and opinions. Moreover, the textile industry is a fast
changing industry, so the results of similar studies in the future might look differently. This study gives however a good indication what important barriers and enablers of GSCM can be for textile companies. But in order to find out if these drivers and barriers affect textile companies in general, a similar study with a significantly larger sample size needs to be performed. The reason the sample size of this study is so small is because of the low response rate of 2.47%. Designing a different methodology with a different sampling method in order to increase the response rate therefore is advisable.

In overview suggested areas for future research can be the following:

- A similar study with a different (sampling) methodology, in order to increase the response rate and receive a larger sample size
- Research on the differences between organization types (more upstream or downstream of the value chain)
- A longitudinal research on how the perceived GSCM enablers and barriers of certain companies change over time
- Companies that do not engage in green practices or GSCM, what would they require to get engaged?
References


Appendix I - Interview questions

GSCM enablers and barriers in textile supply chains

- Can you tell us about your job? How close is it related to GSCM?
- What activities does your position as a marketing and business development manager include, especially when it comes to GSCM/sustainability?
- For how many years has your company been engaged in green practices?
- Can you describe specifically the green practices your company is engaged in? *For example: Green purchasing, Cooperation with customers, Eco-Design, Investment recovery
- According to what requirements does Soorty select its suppliers (for raw materials, dyeing, garment manufacturing, etc. or if they outsource something)? Do you have a code of conduct that your suppliers need to follow?
- Do Soorty’s employees receive training/education in sustainability matters?
- What is the biggest challenge your company has faced internally when implementing GSCM?
- What is the biggest challenge your company has faced externally when implementing GSCM?
- What is the major reason your company decided to engage in green practices?
- What do you find the most enabling about GSCM and why?
- From a financial perspective: do you feel that GSCM is disadvantageous or advantageous for Soorty?
- Can you describe one government policy that encourages Pakistani companies to implement GSCM?
- We noticed from the survey that customer demand for sustainability seems to be high, but so does customer desire for lower prices. How do you balance that as a company?
- Do you have any solutions or other alternatives to measure performance?
- Does your company have a department responsible for all those sustainability issues or does every department is responsible for assuring its own sustainability standards?
Appendix II - Overview of survey answers
23 responses

View all responses

Summary

[Image]

Basic Information

Company Name (optional)

Department and position (optional)

CEO
Vice president
Management
SALES DEPARTMENT
COMMERCIAL DEPARTMENT
R&D
Head designer and owner
Sales manager

INTERNATIONAL MARKET
Marketing/Sr. Manager Marketing & Business Development
MARKETING & SALES / MARKETING & EXPORT SALES DIRECTOR
OWNER
Owner
Commercial manager

Organization type (multiple answers accepted)

- Design (textile, pattern, garments, etc.) - 6 (26.1%)
- Recyclers (Equipments, services, etc.) - 2 (8.7%)
- Retailers - 0 (0%)
- Manufacturer (Yams, Fabrics, Technical textiles, clothing, etc.) - 14 (60.9%)
- Supplier (Machinery, Fibers, Chemicals, etc.) - 7 (30.4%)
- Trading Company (Buying offices, converters, etc.) - 1 (4.3%)
- Other - 1 (4.3%)

Is your company already implementing GSCM or has adopted any other green practices?

- Yes - 14 (60.9%)
- No - 9 (39.1%)
What country is your company (HQ) based in?

- Switzerland
- Italy
- Japan
- TURKEY
- ITALY
- PORTUGAL
- Germany
- Belgium
- Italy
- Iceland
- CHINA
- Spain
- Pakistan
- LT
- EGYPT
- TAIWAN
- Spain
- FRANCE
- Morocco
- Italy
- CEE - ITALY

Part 1 Internal Barriers

Lack of management commitment

Not at all: 1 6 26.1%
2 4 17.4%
Perception of incentives & barriers for adopting Green Supply Chain Management (GSCM) - Google Forms

No performance measurement method

![Bar Chart]

Not at all: 1 2 8.7%
2 7 30.4%
3 2 8.7%
4 6 26.1%
5 4 17.4%
6 2 8.7%
Very Strongly: 7 0 0%

Lack of financial resources/budget

![Bar Chart]

Not at all: 1 2 8.7%
2 4 17.4%
3 2 8.7%
4 6 26.1%
5 1 4.3%
Perception of incentives & barriers for adopting Green Supply Chain Management (GSCM) - Google Forms

Lack of training in sustainable supply chain methods

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Current organizational structure/functions

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Company size

Not at all: 1 2 8.7%
2 3 13%
3 6 26.1%
4 3 13%
5 3 13%
6 4 17.4%
Very Strongly: 7 2 8.7%

Capabilities within purchasing and supply function

Not at all: 1 0 0%
2 2 8.7%
3 6 26.1%
4 5 21.7%
5 6 26.1%
6 3 13%
Very Strongly: 7 1 4.3%

Part 2 Internal Enablers
Top management commitment

- Not at all: 1 3 13%
- 2 1 4.3%
- 3 3 13%
- 4 3 13%
- 5 4 17.4%
- 6 4 17.4%
- Very Strongly: 7 5 21.7%

Communication regarding green practices

- Not at all: 1 1 4.3%
- 2 1 4.3%
- 3 4 17.4%
- 4 5 21.7%
- 5 6 26.1%
- 6 5 21.7%
- Very Strongly: 7 1 4.3%

Employee involvement
Corporate culture

Not at all: 1 0 0%
2 2 8.7%
3 4 17.4%
4 6 26.1%
5 4 17.4%
6 5 21.7%
Very Strongly: 7 2 8.7%

Alignment of company's strategies
Perception of incentives & barriers for adopting Green Supply Chain Management (GSCM) - Google Forms

Existing Sustainable supply chain management (SSCM) strategy

Gaining competitive advantages
Perception of incentives & barriers for adopting Green Supply Chain Management (GSCM) - Google Forms

Avoiding of reputational and environmental risks

Company size
Perception of incentives & barriers for adopting Green Supply Chain Management (GSCM) - Google Forms

Not at all: 1 3 13%
2 0 0%
3 5 21.7%
4 9 39.1%
5 3 13%
6 2 8.7%
Very Strongly: 7 1 4.3%

Other CSR (Corporate Social Responsibility) practices

Part 3 External Barriers

Government regulations
Not at all: 1 3 13%
2 5 21.7%
3 5 21.7%
4 2 8.7%
5 4 17.4%
6 3 13%
Very strongly: 7 1 4.3%

Pressure from competitors

Not at all: 1 2 8.7%
2 3 13%
3 4 17.4%
4 5 21.7%
5 3 13%
6 3 13%
Very strongly: 7 3 13%

Poor supplier commitment

Not at all: 1 3 13%
2 2 8.7%
Perception of incentives & barriers for adopting Green Supply Chain Management (GSCM)

**Customer desire for lower prices**

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**Global aspects - language barriers and cultural barriers**

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Perception of incentives & barriers for adopting Green Supply Chain Management (GSCM) - Google Forms

Information and Communication Technology (ICT)

Not at all: 1 1 4.3%
2 4 17.4%
3 4 17.4%
4 4 17.4%
5 4 17.4%
6 4 17.4%

Very strongly: 7 2 8.7%

Technological constraints

Not at all: 1 0 0%
2 3 13%
3 2 8.7%
4 8 34.8%
5 4 17.4%
6 5 21.7%

Very strongly: 7 1 4.3%
Part 4 External Enablers

Government policies and incentives

- Not at all: 1 2 8.7%
- 2 3 13%
- 3 4 17.4%
- 4 5 21.7%
- 5 7 30.4%
- 6 2 8.7%

Very strongly: 7 0 0%

Pressure from competitors

- Not at all: 1 1 4.3%
- 2 5 21.7%
- 3 4 17.4%
- 4 5 21.7%
- 5 3 13%
- 6 4 17.4%

Very strongly: 7 1 4.3%
Customer demands

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Very strongly: 7 | 4 | 17.4%

Collaborations with suppliers

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Very strongly: 7 | 0 | 0%

Pressure from investors
Perception of incentives & barriers for adopting Green Supply Chain Management (GSCM) - Google Forms

Pressure from NGOs

Not at all: 1 5 21.7%
2 3 13%
3 5 21.7%
4 4 17.4%
5 3 13%
6 3 13%
Very strongly: 7 0 0%

Please specify other barriers or enablers for your company.(optional)

Thank you for your support!

https://docs.google.com/forms/d/1XtnleAYp5pVrMLZMDGrYPmj1XwtOFW/s7xHWHnK49bk/viewanalytics
Number of daily responses

8
6
4
2
0

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