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Developing sustainability along an international supply chain

Case study of a textile industry SMB's collaboration with suppliers

Master's thesis in Project Management
Supervisor: Arild Aspelund
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Dept. of Industrial Economics and Technology Management



Preface

This master's thesis project is a part of the Master of Science program in Industrial Economics and Technology Management at the Norwegian University of Science and Technology, Department of Industrial Economics and Technology Management.

We would like to express our deepest gratitude to Professor Arild Aspelund for his ongoing support during the entire work on the master's thesis project. The topic of sustainability and the ways of efficient strategizing collaboration with suppliers were fascinating and exiting for us. We absolutely appreciate the way supervision was applied by the professor, which aroused our interest and desire to expand our knowledge in this field, and simultaneously provided us with the optimum level of independent work.

Furthermore, we would like to address a word of thanks to our case company and all employees who agreed to participate in our research and dedicate their time to answer our interview questions. Without them, we would not have been able to compose this master's thesis. We would like to express our special gratitude to the company's top management for collaboration, assistance in providing contacts with suppliers, and organizing all interviews. We appreciate the way the work was organized and conducted, especially the support provided during the whole process of research and the given level of autonomy in choosing the specifics of the research.

Trondheim, June 2021

Anastasia Dvorova and Paul Huynh

Abstract

For efficient sustainable supply chain management (SSCM) development, cross-functional integration and responsive marketing are vital. Their importance increases with time, as the competition is no longer about individual businesses, but rather about supply chain versus supply chain competition. This thesis contributes with strategies for small and medium-sized businesses (SMB) in the textile industry to overcome these challenges. More specifically, it resolves the research question of how a textile SMB with an international supply chain can strategize collaboration with suppliers to integrate sustainable supply chain management.

A qualitative case study of a Norwegian textile SMB was completed for this study. A total of seven employees among the focal company, two garment suppliers, and one fabric supplier was interviewed through video-calls. Semi-structured interviews were conducted, transcribed, and coded. Consolidating the coded statements across the interviews provided empirical data on the following sub-topics of sustainable supply chain management development: Drivers and barriers, trust and causal relationships, and best practices for sustainable supply chain management across strategic supply chain levels.

This master's thesis provides a novel framework for implementation of SSCM integrations aiming to answer the research question. The framework summarizes important precedences for SSCM development, provides applicable strategic practices on product-, production- and supply chain levels, as well as operational level solutions. In addition, it goes beyond the one-tier buyer-supplier relationship, revealing practices for different tiers of suppliers. Therefore, this framework can serve as practical guidelines for aggregated SSCM integration, supported by emitted drivers/barriers descriptive schemes, which is a base of strategic decisions. Due to the complexity of the research topic and thesis limitations, further research is suggested to examine and elaborate the proposed framework.

Sammendrag

For effektiv bærekraftsutvikling av verdikjeder er kryssfunksjonell integrasjon og reaktiv markedsføring avgjørende. Viktigheten øker med tiden, ettersom marked er ikke lenger konkurrerer som individuelle virksomheter, men som konkurrerende verdikjeder. Denne oppgaven bidrar med strategier for små- og mellomstore bedrifter (SMB) i tekstilindustrien for å konkurrere i dette landskapet. Mer spesifikt svarer oppgaven på forskningsspørsmålet om hvordan en tekstil-SMB med en internasjonal verdikjede kan planlegge samarbeid med leverandører for å integrere bærekraftig verdikjedestyring.

En kvalitativ casestudie av en norsk tekstil-SMB ble gjennomført for denne studien. Totalt syv ansatte fra casefirmaet, to klesplaggleverandører, og én tekstilleverandør ble intervjuet gjennom videosamtaler. Semistrukturerte intervjuer ble gjennomført, transkribert og kodet. En oppsamling av kodede uttalelser på tvers av intervjuene ga empiriske data om følgende underemner for bærekraftig utvikling av verdikjedestyring: drivere og barrierer, tillit og relasjonssammenhenger, og beste praksis for bærekraftig forsyningskjedestyring på tvers av strategiske verdikjed enivå er.

Denne masteroppgaven gir et nytt rammeverk for implementering av bærekraftig verdikjedestyring som tar sikte på å svare på forskningsspørsmålet. Rammeverket oppsummerer viktige forutsetninger for utvikling av bærekraftig verdikjedestyring, gir moderne strategiske fremgangsmåter på produkt-, produksjons- og verdikjedenivå, samt løsninger på operativt nivå. I tillegg utforsker oppgaven forhold utover kunde - leverandørforhold, og beskriver effektiv praksis ved forskjellige leverandørnivåer. Dette rammeverket kan fungere som praktiske retningslinjer i denne casen for implementering av bærekraftig verdikjedestyring. Spesifikke drivere og barrierer, og beskrivende strukturer som bygger opp basen for strategiske beslutninger er tatt i betraktning i denne casen. Grunnet kompleksitet i temaet bærekraftig verdikjedestyring, og oppgavens begrensninger, anbefales videre forskning for å undersøke og utdype det foreslåtte rammeverket.

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Acronyms

3BL triple bottom line. 6

B2B business-to-business. 1, 11

CSR corporate social responsibility. 11

KPI key performance indicator. 30, 34, 36

MNC multinational corporation. 48

MOQ minimum order quantity. 36

NGO non-governmental organization. 8, 47

NSD Norwegian Centre for Research Data. 24, 26

PLM product life cycle management. 10, 33, 41, 44, 51, 52, 54, 55

SC supply chain. 1–3, 5–14, 18, 19, 22, 23, 26, 31, 32, 35–40, 45, 46, 48–53, 55–60

SMB small medium businesses. 2, 3, 5–7, 9, 12–15, 26, 28, 45, 46, 48–50, 52, 53, 55–60

SSC sustainable supply chain. 2, 3, 5–9, 13, 15, 31, 44, 45, 47–51, 53, 56, 58–60

SSCM sustainable supply chain management. 1–3, 5–8, 10–14, 16, 19, 30, 36, 37, 41, 45–53,
55–60

Chapter 1

Introduction

For efficient [sustainable supply chain management \(SSCM\)](#) development, cross-functional integration, and responsive marketing are vital. Especially in modern times, when the competition is no longer between individual businesses, but rather about [supply chain \(SC\)](#) versus [supply chain](#) competition ([Chan et al., 2012](#); [Lambert & Cooper, 2000](#)). It is imperative for the textile industry which is characterized by high dependency on raw materials, international relocation of production facilities, and seasonality of the fashion trends.

Nevertheless, globalization and internationalization of businesses make it arduous for a fashion company to pursue [SSCM](#) strategy, both internally and dealing with other parties. Even with the concepts of life cycle assessment and lean philosophy introduced, a [SC](#) still susceptible for 'association by guilt', wherein the negative reputation of one [SC](#) actor influences the other(s) ([Molet et al., 2013](#)). More research is needed to address such challenges of sustainable [business-to-business \(B2B\)](#) marketing and responsible purchasing behavior ([Smith & Offodile, 2014](#)).

Collaboration and integration with suppliers in an international context are challenging. Regarding the textile industry, the main production facilities are located in developing countries such as China, India, or Bangladesh ([Chowdhury & Quaddus, 2020](#); [Mani et al., 2018](#)). In this context, the research on trust and openness to collaboration is valuable since a company cannot be treated more sustainably than its suppliers ([Sancha et al., 2016](#)). Thus, to gain competitive advantages through sustainability and illuminate reputation risks, a company should focus its attention not only on its own performance but also on its suppliers on all levels ([Fritz et al.,](#)

2017). Researching SSCM with a holistic perspective is important since a number of critical environmental and social issues are developed by upstream suppliers (Lee & Klassen, 2009; Tachizawa & Wong, 2015).

For an small medium businesses (SMB), the contextual factors such as company size, cultural environment, industrial specificity are crucial (Karaosman et al., 2020). During negotiation, the resource limitation and power distribution are additional challenges on the way of SSCM development. These factors drive SMBs to realize its sustainable initiatives as short-term projects, which challenge the idea of sustainable changes as ones with long-term effect (Silvius et al., 2017).

Strategies for sustainable supply chain (SSC) development in the textile industry has received substantial research focus. However, the SMBs' role in SSCM expansion and efficiency within competitive context of the SC requires more research (Lee & Klassen, 2009). Karaosman et al. (2020) proposed the framework for sustainability integration across multiple tiers of in luxury textile SMB local SC. Current master's thesis expand the study by examining SMB's collaboration and integration practices with multiple-tier suppliers beyond the country of brand origin. These papers provide tools for managers to make strategical decisions based on the broader knowledge of the vital inter-relationship aspects and contextual factors.

1.1 Research question

The research question is rooted in SSCM development, an increasingly important topic for enhanced competitiveness. Sustainability is an important distinguishing factor in highly competitive markets such as the fashion industry. Related shortcomings may be exposed and significantly impair companies' economic performance (Chan et al., 2012). This effect is important to address for western fashion brands with overseas suppliers, as suppliers may not face ramifications or competitive downfall from their actions to the same degree as buying companies do (Carrigan et al., 2017). This dynamic results in a SC characteristic where a focal company's sustainability performance is limited by their suppliers' (Sancha et al., 2016). With this topic's importance, this thesis aims to answer the following research question:

***Research question:** How can a textile SMB with an international SC strategize collaboration with suppliers to integrate SSCM?*

Contributing with answers to this research question is valuable but also challenging. There are many environmental and social issues to consider, especially for global SSCM (Freise & Seuring, 2015). Examples of this include drivers and barriers for SSCM integration, cultural differences, and disparities in the buyer's and suppliers' government regulations. Furthermore, the issues are not universal. For example, contextual SSCM factors for a industrial SC vary greatly from contextual factors for a textile SC (Karaosman et al., 2020; Rehmatulla & Smith, 2015). This thesis substantiates answers to the research question through the case study of a Norwegian textile manufacturer and its SC. This narrows the scope of the research question to the textile and fashion industry with its distinct set of contextual factors. To clarify the theoretical scope and prioritized contextual factors of this thesis, a set of sub-questions SQ01–SQ04 are defined.

To understand the environments which the focal company and its SC operates in regarding SSC development, the following question is added:

SQ01: What are the main driver and barriers on the way of SSC development for textile SMB?

Given the previously stated importance of trust and relational aspects in international SC collaborations, as well as its considerable influence on a focal company's sustainability performance, the following sub-question is posed:

SQ02: What relational aspects regarding trust, autonomy, commitment and expectations should an SMB address to develop sustainability in their international SC?

Sustainability increases complexity in projects, which increases the need for collaboration. As a result, there is a demand for context-relevant strategies to foster, integrate, and maintain collaboration (Larsson & Larsson, 2020). This thesis contributes to the development of best practices for SSCM in the international fashion industry, with its distinct drivers and barriers and other contextual factors, by answering the following questions:

SQ03: Which factors should be considered for integrating SSCM as a project versus process?

SQ04: How should an SMB strategize with different supplier tiers, should it be different depending tiers — should it be short-term or long-term collaboration?

1.2 Thesis structure

The structure of this thesis is organized by the following. In [chapter 1, Introduction](#) the background of the formation of the research question and its relevance from the practical and theoretical perspective is presented. [Chapter 2, Theoretical background](#) illustrates the germane theory required to answer the research question, including definitions of the key terms, theories, and relevant frameworks. [Chapter 3, Methodology](#) describes the research method preferred, accompanied by the description of the overall research process and evaluation of its quality. The data collected and analyzed by mentioned research method is presented in [chapter 4, Empirical Data](#). In [chapter 5, Discussion and Implications](#), the discussion is built around the implications of the analyzed data with relation to the theory. This chapter also discusses potential for future research and description of the limitations of this thesis. Lastly, [chapter 6, Conclusion](#) summarizes the main findings to conclude the main research question.

Chapter 2

Theoretical background

This chapter provides an overview of established key terms, theories, and theoretical frameworks to support clarification of the research question:

***Research question:** How can a textile **SMB** with international **SC** strategize collaboration with suppliers to integrate **SSCM**?*

The theoretical background for this thesis is categorized into the following sections: First a description of **SSCM** aspects for **small medium businesses (SMB)**s operating in the textile industry, including drivers and challenges for the sustainability adaptation. Second, a description of collaboration as a key factor of **SSCM**, including characteristics of the collaboration. In the end, the strategies and methods for **SSCM** development and reasoning of the organization sustainability activities as projects or process are provided.

2.1 **SSCM for an SMB in the textile industry**

Chopra (2019) states that "a supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer's request. The supply chain includes not only the manufacturer and suppliers, but also transporters, warehouses, retailers, and even customers themselves." This correlation between all parties of an **SC** becomes even more critical regarding sustainability development, which got the main attention in the design and operation of **SC** in recent years (**Chopra, 2019**).

Seuring and Müller (2008) defines **SSC** as "the management of material, capital, and information flows as well as cooperation among the firms along the supply chain while taking goals from all

three dimensions of sustainable development, which are derived from customers' and stakeholders' requirements". SSC development is based on three dimensions of sustainability, namely social, economic, and environmental, and focus on cooperation among SC parties (Kumar & Rahman, 2015). These three dimensions of SSC refer to the triple bottom line (3BL) introduced by (Elkington, 1999). Social sustainability refers to the effect of organizational activities on stakeholders; environmental dimension refers to the environmental friendly corporation's attitude and aligns their activities with inferential friendly strategy; economic dimension refers to the short and long-term economic value of organizational activities (Chowdhury & Quaddus, 2020).

A company can gain competitive advantages by improving its socially environmental reputation in consequence of the product sustainability (Chowdhury & Quaddus, 2020; Deng et al., 2020). In addition, various interactions among SC parties, vertical integration, downstream with customers, as well as upstream with suppliers, can facilitate product sustainability and increase the performance of the SC (Deng et al., 2020).

Vertical upstream integration plays a crucial role in the textile industry. Due to the outsourcing of the production facilities to the emerging economies, SMBs are becoming remarkably dependent on the suppliers in the meaning of overall cost position, innovation capabilities, and customer service (Van Weele, 2018). Therefore, companies have consistently invested in collaboration and development activities with their key suppliers (Van Weele, 2018). This cooperation between SC parties can increase profit and sustainability (Jamali & Rasti-Barzoki, 2017) and should be appropriately governed through SSCM.

SSCM implies *"integrating environmental thinking into supply-chain management, including product design, material sourcing, and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life"* (Srivastava, 2007). This definition has been lately elaborated align with 3BL thinking in three dimensions: social, environmental, and economical, all of which are fundamental to meet stakeholders goals in the long-term run, ensure SC performance and mitigate the potential negative effect from some parties (Carter & Rogers, 2008; Cole & Aitken, 2019).

2.1.1 Drivers and barriers of sustainability adaptation

The topic of drivers and barriers has been under research focus for several decades; however, their impact on suppliers' commitment to sustainability practices adaptation is still under scientific interest (Kumar & Rahman, 2015). In particular, significantly fewer studies were made for the textile industry (Caniato et al., 2012), and new factors appear under the influence of environmental drift and due to the industry specificity. Thus, it is essential to determine drivers and barriers for a textile SMB, willing to succeed in the strategic development of SSC and avoid deceleration in this development. Understanding of the context within the development of SSCM and collaboration activities with suppliers are taking place is crucial. Drivers influence SMB strategic decisions regarding sustainability; in contrast, barriers challenge these decisions. Therefore, knowledge regarding both of these factors institutes the base for proactive sustainability developing strategies, where SMB can masterly leverage drivers and overcome barriers to gain competitive advantages.

Drivers are determined as factors that initiate the ratification of sustainable supplier development practices and strategies (Sancha et al., 2015). There can be both companies' free will to get sustainability practices on board or external pressure; however, in both cases, all parties of the SC face numerous barriers on their way to the sustainability adaptation (Kumar & Rahman, 2015). At the same time, by appropriate leveraging of drivers and keeping the focus on barriers, a company can successfully develop its SSCM.

To summarize research made in the last years, the internal drivers are top management support, including employee involvement, middle management, and corporate culture; alignment sustainability with company strategies; risk management (reputation and environmental risk); performance management (environmental management system and quality improvement); the collaborative ability of procurement team to work with the other departments; and contextual factors such as company size and location (Bubicz et al., 2020; Cucchiella et al., 2012; Hoejmose et al., 2012; Muduli et al., 2020). Top management support and alignment sustainability with company strategies are the main undeniable internal factors (Cucchiella et al., 2012; Hoejmose et al., 2012). In contrast, Bubicz et al. (2020) emphasizes both internal and external stakeholders' pressure as an important driver for sustainability development.

Furthermore, the main internal barriers are named as lack of management commitment, resource limitation, and costs; inefficient processes, for example, performance measurement as

traditional accounting method; contextual factor, such as small company size; communication and knowledge deficiencies of purchasing team; and lack of corporate structures and processes (Cucchiella et al., 2012; Kumar & Rahman, 2015). It is emphasized that high costs of process innovations may function as a significant barrier in case of lack of government subsidiaries and customer support (Dey et al., 2019).

Regarding main external drivers, some research pointed out the increasing role of the public sector, non-governmental organizations NGOs, academic and investors; the willingness of the industry to adopt new practices, and buyers' ability to embrace new skills; and government support (Cucchiella et al., 2012; Kumar & Rahman, 2015; Sancha et al., 2015; Zhang & Yousaf, 2019). The mimetic pressure from competitors positively influences sustainable supplier development by driving a company to adopt sustainability practices for obtaining competitive advantages and influences suppliers' alacrity to collaboration (Sancha et al., 2015). In addition, the level of supplier integration is one of the drivers which influence the level of successful SSC development (Sancha et al., 2015). In contrast, Zhang and Yousaf (2019) emphasizes that in development economics, technology investment, well-planned government intervention, and customers' green preferences take a leading role for increasing sustainability in a SC, where the government subsidies can become a mediator for the investment barrier.

The main external barriers are identified as inefficient government regulations; competitive pressures; consumers' desire for a lower price; insufficient supplier commitment and cultural barriers; green-wash from media; less regulated industries (Cucchiella et al., 2012; Kumar & Rahman, 2015). Sancha et al. (2015) highlights that the coercive- and normative pressure, such as government regulations and fines, non-governmental organization (NGO) and media pressure, have no significant effect on sustainable supplier development. In contrast, Zhang and Yousaf (2019) research emphasizes the well-planned government intervention and, in the context of a high green investment cost scenario, switch from taxes to subsidies as a factor supporting the green development.

Drivers and barriers can be aligned with internal or external motivation for a company to be engaged in SSCM (Figure 2.1) (Cucchiella et al., 2012). In this case, companies can be located in different categories of the typology matrix: "Internal focusers" if internal factors more influence a company; "Reserved players" if a company perceives external enablers and faces internal barriers; "External responders" if external factors more influence a company; "Agenda setters" if

a company is affected by internal enablers and less influenced by external barriers (Cucchiella et al., 2012). Based on the contingency approach, further strategic decisions should be made regarding the superiority of certain internal and external factors (Cucchiella et al., 2012).

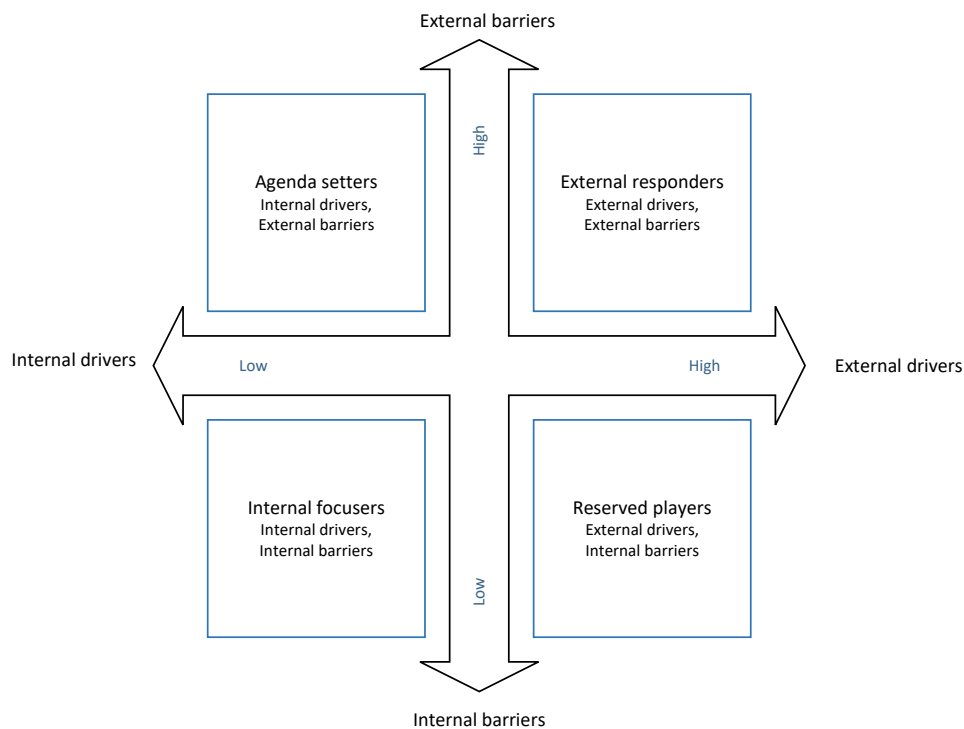


Figure 2.1: Typology of organizational responses to SSCM (Cucchiella et al., 2012).

Drivers and barriers constitute the context which **SMBs** operate within. As it was stated earlier, they can have either external or internal nature. From a practical perspective, these factors serve as a foundation for companies' future proactive sustainability strategy and influence companies' strategic decisions towards sustainability. In addition, this context is exceptional for every single **SC**. Hereby, the following sub-question is include in the research: **SQ01**: *What are the main driver and barriers on the way of **SSC** development for textile **SMB**?* The answer on the **SQ01** has practical and theoretical applicability by providing a better understanding for researchers and managers of the context within a textile industry **SMB** with international **SC** to develop its sustainability and make important strategic decisions.

2.1.2 Collaboration as an essential factor of SSCM

Collaboration in the context of SSCM is a proactive type of focal company and supplier involvement, with a long-term perspective on results and benefits (Cox, 2004). It is an overarching approach to resolve social- and environmental challenges in a SC and is, therefore, a well-fitting point of departure to discuss SSCM integration. The opposing alternative to collaboration is assessment, a reactive approach to sustainability issues primarily focusing on reducing negative impact in current SC operations (Cox, 2004).

Collaborative planning and management of inventory, marketing, and demand are critical success factors of SSCM (Kim & Rhee, 2012; Sancha et al., 2019). These factors are enhanced by a mutual commitment to the implementation of infrastructure, for example, the implementation of a product life cycle management (PLM) system between buyer and supplier. Such implementations have both financial and non-financial direct benefits in a customer-, process-, learning-, autonomy-, and growth perspective. However, collaboration projects and processes may also pose financial challenges (Kim & Rhee, 2012). According to Muduli et al. (2020), two important behavioral factors to mediate such challenges are top management support and green motivation among employees. Top management support facilitates leadership improvements, recruitment of personnel committed to sustainability, and resource allocation to a large degree in the SC. Green motivation among employees mediates stakeholder pressure and company performance (Muduli et al., 2020).

There is a lack of research substantiating challenges through qualitative data and discussing actions for mediation of the challenges in various industries, including the textile industry (Karaosman et al., 2020). Sancha et al. (2019) give examples of collaboration projects and processes which may require large involvement and investments by the focal company. These include organizing meetings to share knowledge, providing training, enacting joint efforts from buying personnel to improve performance, and sharing audit results (Sancha et al., 2019).

There is an ongoing demand for contributions to the topic of collaboration for SSCM integration due to the different conclusions related to contextual factors (Ganji et al., 2017). At the same time, extant research acknowledges that conclusions on this topic cannot be made firmly but rather with a certain degree of speculation. It appears due to the possibility of subjectivity permeating the empirical data and its interpretation, as well as being able to document benefits of collaboration only as long-term or indirect effects (Deng et al., 2020; Hoejmose et al., 2012).

Upstream and downstream influence in supply chains

Upstream and downstream influences between buyers and suppliers in a SC play an essential role for collaboration, and addressing these is key for the SC actors' success (Bubicz et al., 2020). The principal-agent theory and bullwhip effect are two key theories on up- and downstream influence for SSCM centered around repeat orders and a certain degree of inventory management (Ciliberti et al., 2011; Lee et al., 2014). Ciliberti et al. (2011) defines this describes these influences as results on a focal company's performance based on the actions of their suppliers or buyers, and vice-versa. Their research focuses on the principal-agent theory, where contracted suppliers' actions are negatively linked downstream to a focal company's performance due to conflicting goals, self-interests, and asymmetric information. The primary negative influences identified are opportunism and moral hazard. These has been found not only between the focal companies and their direct suppliers and buyers but also between higher- and lower-tier suppliers. Implementation of corporate social responsibility (CSR) codes have concluded as a way to mitigate opportunism in the SC, and consequently reduce exposure to moral hazards, such as loss of reputation (Ciliberti et al., 2011).

Implementing CSR codes is not only beneficial for mitigating opportunism; CSR codes are also a tool for upstream sustainability influence, although the contracting buyer must be aware of the limitations it imposes on suppliers (Lee et al., 2014). This limiting effect is defined as a bullwhip effect when demands for environmental performance are amplified for higher-tier suppliers (Lee et al., 2014). The bullwhip effect may be caused by practices such as inadequate lead-time demands. Short lead times cause phase lags, a characteristic where a buyer causes peaks in inventory levels at suppliers, followed by order backlogs. The lag is further amplified at subsequent higher tiers in the SC. Other causes of bullwhip effects include distortion of information, inventory rationing, and logistical delays (Lee et al., 2014).

Trust for collaboration

Trust, credibility and top management support are vital for sustainable B2B SC. In a general sense, trust acts as insurance for top managers to invest in "green" activities (Hoejmose et al., 2012). In the context of SSCM, trust may be defined as an interplay of organizational structures and activities, which cultivate a feeling of continuity in a SC relationship and an expectation that the other party can reduce risks and co-create value in a relationship (Xu et al., 2021).

These structures and activities are identified at individual, project, and company levels (Xu et al., 2021). On a company level, this may include establishing long-term contracts for suppliers, allowing them to form agreements with sub-suppliers with confidence. On a project level, it may be engaging each other to cooperate on challenges and suggestions, such as trusting a supplier to orchestrate one's resources to adapt to project changes. On an individual level, it can manifest itself as cultivated familiarity between key actors based on past experience (Karaosman et al., 2020).

Important antecedents to trust are shared values and open communication (Kadefors, 2004). One may leverage these antecedents with team-building processes and project-wide communication early in collaboration to define common interests and project goals (Ulbrich et al., 2011), although effects of partnering can vary substantially. Intuitive and emotional reactions may influence the development of trust and collaboration and displays of respect and concern. These findings have been applied to collaboration both for long-term multi-year partnerships and short-term, one-year projects. It has also been concluded that close monitoring and numerous contractual conditions indicate distrust and incite opportunism over cooperation (Kadefors, 2004). A requested research topic is the specific functions of trust in SSCM, and how focal companies with specific contextual factors may successfully balance the level of trust and autonomy towards suppliers versus supplier monitoring and assessment (Kadefors, 2004; Sancha et al., 2016).

Consolidating the reviewed research shows a need for further research on SC collaboration in the textile industry. In particular, various qualitative case researches regarding important trust factors and effective collaboration practices are needed. To address this need, this thesis includes the sub-question *SQ02: What relational aspects regarding trust, autonomy, commitment and expectations must a textile SMB address to develop sustainability in their international SC?* Answering this sub-question provides valuable principles for business relationships and sustainability development beyond internal initiatives. While the question itself is limited to the textile industry, the resolutions may apply to other industries, and such can contribute to the reviewed research.

2.1.3 Strategies and methods for developing SSCM in international context

Collaboration with suppliers is previously mentioned as an important factor for SSC. SMBs select diverse strategies for developing SSCM depending on different contextual factors such as SC complexity; industry-specific characteristics; power asymmetries; and geographical location of the focal company and its suppliers. Strategies can have an internal and external focus, and the focal company can play a leading role or/and partner's role regarding the suppliers. Based on the contingency approach and complexity of international SSCM, the development of universal, ultimate strategic guideline is challenging and research demanding (Dennis, 2017). Therefore, it is crucial to conduct more research to identify preferred and more effective practices for the textile industry SMBs with international SC.

Despite focal companies' contextual factors, some common strategies and best practices have been determined in various research. Collaboration with suppliers is crucial, as it provides environmental spillover effects in SC and improves supplier performance, especially in emerging countries (Gong et al., 2018; Li et al., 2018; Sancha et al., 2019). However, the collaborative practices (direct/proactive) should be supported with assessment practices (indirect/ reactive) (Sancha et al., 2019). By using the combination of supply chain leadership and governance mechanisms, a focal company affects supply chain structure and facilitates learning (Jia et al., 2018). In the context multilevel SC, transformational leadership style tends to be applied on the first tier and extreme upstream suppliers, and transactional leadership towards middle tier suppliers (Jia et al., 2018).

SSCM development strategies may not be limited to direct collaboration with select suppliers but must address multiple tiers in the SC (Frostenson & Prenekert, 2014; Gong et al., 2018; Jia et al., 2018). However, the majority of existent research is focused on the first tier supplier level rather than on the entire SC (Yawar & Seuring, 2017). When it comes to achieving sustainability goals, the 'whole picture view' is needed, with the collaboration along the all SC's levels (Govindan, 2017). Consequently, there is a need for a deep understanding of activities required for integration with suppliers further upstream in international context (Karaosman et al., 2020). This integration may take place on various levels, namely product, production, and supply chain levels. Examples of corresponding best practices include chemical reduction, use of certified raw materials, water management and energy efficiency, renewable energy generation,

process certification, training, and educational activities (Karaosman et al., 2020). Production of raw materials for the textile industry highly depends on natural resources. Cultivation and extraction of these resources can lead to severe environmental issues. Simultaneously, to stay competitive, companies "go global" and outsource non-core activities (Ortas et al., 2014). Ancillary, the social issues arise on the way of developing sustainable sourcing practices when a company outsources production activities in emerging countries (Karaosman et al., 2020). Therefore, the sustainability development activities on the supply chain level are becoming challenging to realize cross-countries. The supply chain level activities refer to both sustainable sourcing management and organizational commitment to sustainability. These strategies have the aim of facilitation suppliers' development and their adaptation of the best practices to improve their environmental actions, as well as for a focal company to gain competitive advantages on the international market (Li et al., 2018). Furthermore, the effect from these initiatives might be supported by the bullwhip effect at different supplier tiers (Lee et al., 2014).

A majority of the reviewed theory on SC sustainability does not explicitly study strategies across multiple supplier tiers for SSCM. The sub-question SQ04 targets this specifically. By asking *How should an SMB strategize with different supplier tiers, should it be different depending tiers — should it be short-term or long-term collaboration?* Investigating this may contribute to important guidelines for SMBs, such as how to balance between collaboration and assessment with suppliers across SC tiers. Utilizing a case study may contribute to the research of Vachon and Klassen (2006) by defining which specific technological integrations may augment both practices in this textile industry context.

Project and process

SMB's operational activities are generally characterized by resource limitations; therefore, a company needs to obtain a foundation for deciding on organization activities at the operational level. In order to answer SQ03 and SQ04 a distinction will be made between project- and process characteristics in relation to SSCM integrations. Projects exist as temporary organizations within a company and are oriented around finite goals and a set life-cycle (Lundin & Söderholm, 1995; Pinto, 2013). The life-cycle is commonly divided into five phases (planning, development, implementation, testing, launch) (Lundin & Söderholm, 1995), while the goals are usually ad-hoc, rooted in change or innovation (Pinto, 2013). With a temporary organization nature, one must consider several factors, including the degree of autonomy and authority and the project's

organizational framework in relation to the company's (Hobbs & Ménard, 1993). In terms of frameworks, Hobbs and Ménard (1993) provide three alternatives: As a fully separate entity, a partially integrated entity, or a fully integrated organization within the existing company structures. In addition to the internal factors, contextual factors characteristic of projects that must be considered are allocated budget and resources, compatibility of a project with the company management system, and level of support in the company's culture for projects (Hobbs & Ménard, 1993).

In contrast to projects' boundaries in time-frame and its defined set of goals, processes are repetitive in nature and may not be limited by a time-frame (Hussein, 2018; Pinto, 2013). An example of a structure fitting these criteria is an employee training portal with ongoing learning activities with no expiration or deadline. Processes are rooted in a company's current frameworks and generally do not challenge an organization's culture (Hobbs & Ménard, 1993).

As stated earlier in section 2.1.1, the strong driver for SSC development is aligning sustainability with company strategy. However, due to resource limitations, SMBs tend to start these initiatives as projects. This strategy can be challenged by the fact that a project is a temporary organization with the main criteria of success as a fulfillment on time and within budget (Turner & Müller, 2003). In contrast, sustainability development is a long-term initiative with commonly intangible effects. Therefore, the ratio between sustainability and project management is an issue for further research in business management, especially regarding the emerging economies, which appears to lack behind in adaptation sustainability practices (Gugler & Shi, 2009).

Lundin and Söderholm (1995) refer to a project as a temporary organization, which catalyzes changes in products and services, business processes, policies, or assets. Regarding the new product development projects, collaboration with suppliers, the willingness of each party to be engaged in the projects, mutual trust, and transparency are vital (Dain et al., 2019). Numerous studies of integration for new product development conclude that integration projects are beneficial (Lehtonen & Martinsuo, 2009). Furthermore, not only the life cycle of a project (planning, development, implementation, testing, launch) should be considered in regard to sustainability, but also a project deliverable (Brent & Labuschagne, 2006). However, this temporary project's nature can confront with long-term nature of sustainability development (Silvius et al., 2017). Therefore, studies on the topic of project or process organization sustainability activities are essential since they provided a textile industry SMB with decisive guidelines for

organization sustainability practices at the operational level. This thesis will contribute to research on this project–process dichotomy by addressing sub-question **SQ03**: *Which factors should be considered for integrating SSCM as a project versus process?* Utilizing a case study is a valuable research on this topic, as it facilitates discussion related to contextual factors which may vary widely depending on industries.

Chapter 3

Methodology

3.1 Research strategy

Bryman et al. (2019) refers research method to the practical procedure used to conduct research, and the choice of the methods is based on epistemological and ontological assumptions. Later they have introduced the term '*research strategy*' and referred it to "general approach to research adaptations" (Bryman et al., 2019). This approach is divided into *quantitative* and *qualitative* research. The quantitative research strategy emphasizes processing measurement quantifiable data, numbers, and sometimes 'words', where qualitative research strategy underlines words and images as processing data (Bryman et al., 2019). In general, quantitative research is mainly focused on testing the theory by measurement 'hard', reliable data, finding causality, generalization of the concept, and replicating with taking an objective view on the social reality (Bryman, 2016). In contrast, qualitative research is mostly focused on the generating of theories by studying processes through the perspective of participants and the intention of their behavior, which allows gathering rich and deep data (Bryman, 2016). However, this distinction is not straightforward, and according to Bryman et al. (2019) depends on the specificity of particular research, different research strategies can be applied to either test or develop theories.

The aim of the thesis is to establish the theories regarding the strategies of collaboration between a focal company and suppliers by understanding the in-depth essence of this process on a small-scale of particular case relationships and through the views of main participants. Thus, the qualitative research strategy was chosen as the most suitable.

There are several reasons to adopt the qualitative research method in current studies. The issue of sustainable development through collaboration has been studied by many researchers. They pointed out complexity and difficulty in finding a correlation between strategy applied and outcomes, as well as the indirect character of this outcome (Chowdhury & Quaddus, 2020; Sancha et al., 2019). Therefore, it might be a mistake to try to study and describe this phenomenon fully by measurements; before doing this, a deep understanding of the process is needed. In addition, the research in the field of sustainability in the SC is sufficiently young; the main growth has been taking place from 2018 (Chowdhury & Quaddus, 2020), as well as the implementation of green technologies is by nature evolutionary process. Therefore, qualitative research, which is oriented on the research of a process, rather than a static image of the context, yields to uncover possible unexpected results of the studying. A loosely structured and flexible approach to the data collection within qualitative research seems to be more advantageous to research the current topic. Last but not least, in the studying business relationship and collaboration between companies, it is essential to obtain the picture of these relationships through the view of participants, not third-party researchers, that can be achieved through qualitative research methods.

The *mixed-method* is also possible; however, to provide the accuracy in definition of the required data, the in-depth understanding of the nature of the collaboration for the sustainability solutions is a prerequisite. Therefore, it can be encouraged to implement the mixed method for further researches.

3.2 Research design

Bryman (2016) defines research design as "a framework for collection and analysis of data." The design should reflect the intended research goals and the question at hand. Given these criteria, Bryman (2016) presents five main types of research design to be evaluated.

The research design types, as experimental and quasi-experimental, are not appropriate for the given problem description. The chosen research question suggests a holistic view of a SC and the collaboration within it. The study's boundaries do not allow subjects to be assigned into specific groups for deliberate manipulation of a set of variables. A longitudinal research design is, to a similar degree, not appropriate due to the restricted time-frame of data collection. In collaboration with a focal company, only a few weeks are allocated for empirical data collection

through interviews. As such, the most appropriate approach is to collect data focusing on one present point in time. As mentioned, the collaboration is limited to a single focal company. Furthermore, this limits the number of relevant data points that can be collected, and so a large enough sample of cases for a cross-sectional research design is not feasible.

The thesis research design includes features of both a case study and comparative research design. This fits the chosen research question and data collection boundaries. The topic of collaboration and green technology in a specific SC is multi-faceted. It suggests an aim to reveal unique features of the given case. Furthermore, the acquired research data may be processed with an inductive approach, in which the data itself will suggest a theory (Bryman, 2016). The unique nature of the case limits the generalizability of the research, which is characteristic of case study research (Bryman, 2016). Although the research is centered on a focal company, the research involves an additional focus on two supplier companies. As such, the research design may be comparative if the suppliers have contrasting characteristics, which beget extensive discussion and comparison. In the end, the most fitting research design is a single-case study. This will be further justified using the five important research design components described by Yin (2017).

The first component is the study questions. Yin (2017) categorizes study questions into the forms "who," "what," "where," "how," and "why" – with the claim that case study research is appropriate for "how" and "why" questions. This thesis' problem statement focuses on the "how", "what" and "why" aspects of collaboration and SSCM strategy and implementation with the formulated research question and sub-questions found in [chapter 1, Introduction](#).

The second component is the study propositions. This component is key to this thesis, as it builds upon the results of a previous specialization thesis and is elaborated on in [chapter 2](#).

The given case and its boundaries constitute the third component. Yin (2017) sets the requirement that a case must have any of the following rationales: Critical, unusual, common, revelatory, or longitudinal. The previous specialization thesis specifies a number of circumstances which this research aims to verify. As such, the critical rationale is applicable to this case study. A single-case study is also placed on a holistic–embedded dimension. In other words, "the same single case study may involve units of analysis at more than one level" (Yin, 2017). The included two suppliers in the case function as sub-units within the single-case of the focal company.

The fourth component is linking research data to propositions. Yin (2017) emphasize a required awareness when choosing analytic techniques when interpreting the collected research data. The fifth component is closely related to these choices. For a single-case study, the fifth is identifying rival explanations to the research findings. Before conducting the data collection, one must anticipate potential rivaling theories to the chosen propositions. An example of this is rivaling theories whether projects are suitable for long-term sustainability.

3.3 Research method

Based on suitable research strategy and design determined and described in section 3.1 and section 3.2, as well as suitable approaches for data collection and process, the research method is chosen and described in the following chapters. The method chosen is *semi-structure interviews*, since the understanding of all the aspects of collaboration depends upon an individual perspective, experience, and reflections regarding the process (Bryman et al., 2019).

3.3.1 Sampling of case company

The case company was selected through convenience sampling. Bryman (2016) refers *convenience sampling* as one accessible for the researcher. The COVID-19 pandemic forced the company to suspend the sustainability project; thus, a limited number of companies were willing to participate in the research. Moreover, a company that initially agreed on the joint work on the thesis project rejected a formal agreement in February.

To find the case focal company, the so-called "cold emails" approach was used, emails without prior contacts between two parts (Kikerpill & Siibak, 2019). The implementation of this approach can be referred to *purposive sampling*, which is based on the people's willingness to be a "rich source of information" (Bryman, 2016). Since the research is focused on relationships and interaction between a focal company and its suppliers, the same *convenience and purposive sampling* is used for involving suppliers for this research.

The selection of suppliers was made based on the focal company accessibility and willingness to engage the same of their suppliers and sub-suppliers, as well as the willingness of suppliers and sub-suppliers to share valid information. Primary the *snowball sampling* was used, in which at first the interaction with primer contact for the research takes place and then it is used to

establish further contacts (Bryman, 2016). In the case of the current study, the primary contact in the focal company was used to identify and set further contacts with suppliers and their sub-suppliers. An overview of the case companies with essential characteristics as organization size, industry, and geographical context is presented in Table 3.1.

Characteristics	Focal company	First-tier supplier 1	First-tier supplier 2	Second-tier supplier
Organization size	Small enterprises: 10 to 49 employees.	Small enterprises: 10 to 49 employees.	Large enterprises: 250 employees or more.	Large enterprises: 250 employees or more.
Industry context	Apparel retailers	Garment industry (trading)	Garment industry (manufacturing)	Lamination textile
Geographical context	Norway	China	China	China

Table 3.1: Overview of case companies.

3.3.2 Sampling of interviewees

The same purposive approach guides the drawing up of the sampling of interviews. The recommended number of interviewees for collecting qualitative data varies drastically from 1 to over 300 according to Bryman (2016). Thus, the interviewees in a focal company have been selected based on their participation in sustainability projects and communication with suppliers. However, a snowball approach has also taken place, and the list of preselected interviewees have been completed with two more interviewees; they have been referred during interviews as capable to contribute significantly to the research. The simplified scheme of interactions, serving as a source of data for this research, is presented on Figure 3.1. With this, the sampling of interviewees for qualitative research reaches data saturation in the scope of the chosen case company, and according to Bryman (2016) it is a criterion of achieving data saturation.

As mentioned earlier, a case company has been found through cold emails, followed by the presentation of the research where priorities regarding interviewees are expressed. Thereby, the employees from different departments, who have participated on a regular basis in sustainability projects, and first-tier suppliers' representatives, who are the primary contacts for these projects, have been selected. The initial total number has been five people, three employees, and two suppliers' representatives. Further, two more interviewees have been included in a sample: the top management representative of a focal company and the second-tier supplier representative. Table 3.2 provides an overview of the list of interviewees for this research.

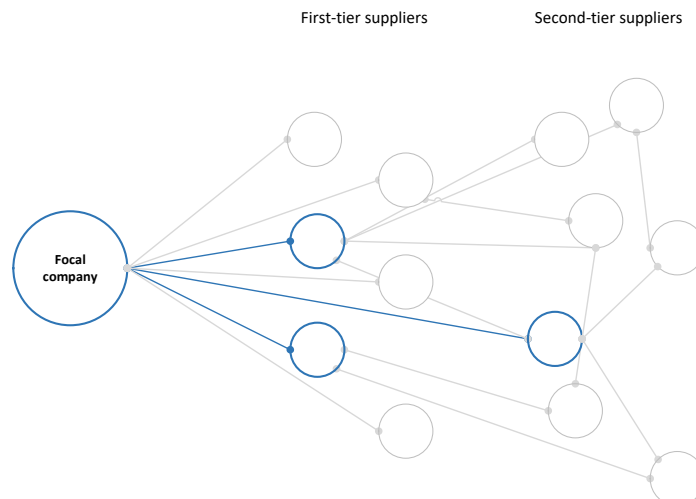


Figure 3.1: Simplified scheme of interactions.

Company	Pseudonym	Education in sustainability	Interview Length
Focal company	Anne	Some trainings	01:11:26
	Barbara	Some trainings	00:48:15
	Dana	Some trainings	00:44:32
	Bruce	Some courses	00:48:13
First-tier supplier 2	Jimmy	None	00:46:04
First-tier supplier 1	Karl	None	00:59:42
Second-tier supplier	Paco	None	01:06:22

Table 3.2: List of interviewees.

3.3.3 Interview guide development

Given the diversity of the interview subjects, the interview guide required flexibility to accommodate interviewees with different positions in their companies. The range of companies represented in the empirical data span multiple levels in the fashion SC, increasing this flexibility requirement. An important flexibility aspect is the freedom for interviewees to ramble and go off on tangents from the original questions, as it highlights what is essential to the specific interviewees. To encourage this, the ad-hoc follow-up questions have been asked and the main question is varied in order to pursue rich and detailed answers.

Contrary to the flexibility, it was important to structure the interview guide in a way that makes sure to address the chosen research questions adequately and to present the thesis topics in a consistent fashion. Ultimately, the interview guide have to be able to comply with the following

check: *"Do your questions offer a real prospect of seeing the world from your interviewees' point of view rather than imposing your own frame of reference on them?"* (Bryman, 2016, p.497) This combination of set topics couple with leeway for the interviewees' answers is fitting for a semi-structured interview (Bryman, 2016).

With these considerations in mind, an interview guide with approximately 20 questions has been created and it is included in [Appendix B, Interview guide](#). The introduction questions have been adjusted according to the interviewee's role in their company and supply chain level. The topic-specific questions have been kept similar between the interviewees to ensure the topics have been introduced in a consistent manner with little relative bias. However, some phrasings have been altered to reflect the interviewee's level in the SC. In addition, some phrasings have been adjusted to accommodate the interviewees' vocabulary.

3.3.4 Data collection

Prior to conducting the thesis interviews, a practice interview was conducted to ensure adequate audio and video quality. The practice interview also provided the benefit of refining the qualities of a successful interviewer. In particular, the following qualities of [Kvale \(1994\)](#) were of importance:

- Structuring: gives purpose for interview; rounds it off; asks whether interviewee has questions.
- Clear: asks simple, easy, short questions; no jargon.
- Gentle: lets people finish; gives them time to think; tolerates pauses.
- Remembering: relates what is said to what has previously been saying.
- Interpreting: clarifies and extends meanings of interviewees' statements, but without imposing meaning on them.
- Balanced: does not talk too much, which may make the interviewee passive, and does not talk too little, which may result in the interviewee feeling he or she is not talking along the right lines.

All interviews were conducted in Microsoft Teams video-calls, as approximately hour-long interviews. Face-to-face interviews with the focal company were not considered due to time- and economic limitations, as well as the Coronavirus pandemic, which restricted possibilities for travel. For interviewing the suppliers, video-call was preferable over telephone interviews.

Telephone interviews were less appropriate for more extended interviews, and body language was not conveyed, which was important to identify reactions such as discomfort, puzzlement, or confusion (Bryman, 2016). All interviewees had experience using Microsoft Teams to some extent, and there were only minor complications with internet connectivity.

3.3.5 Analyzing the interviews

All interviews were recorded with the interviewees' consent for subsequent transcription. The interviews were transcribed with a combination of transcription software integrated with Microsoft Word and manual transcription by ear. The transcripts were reviewed for personal- and identifiable information, which have been processed with guidance and approval from [Norwegian Centre for Research Data \(NSD\)](#) to ensure compliance with data protection legislation. The NSD approval has been included in [Appendix A, Research permit from NSD](#). All identifiable data on interviewees have been blanketly anonymized in this thesis at the focal company's request.

The transcripts covered the interview guide topics to varying degrees, and many topics beyond the original interview guided surfaced as well in line with the principles of semi-structured interviews. A coding process was shortly implemented after all transcriptions were cursorily reviewed. The codes were developed with considerations for the category, implications, topics, and further, based on the considerations listed in (Bryman, 2016, p.581). For the purpose of structuring the extensive data collected within interviews, parts of the transcripts were marked with a code; further, these codes were grouped into large categories. The majority of codes were developed during the analysis of the first two interviews, based on the thematic analysis concept (Bryman et al., 2019). Further, the last part of the collected data was coded rigorously using a previously established set of codes. The example of the coding process has been illustrated in [Figure 3.2](#). The software NVivo was used for coding throughout the analysis process, primarily with manually coding. This software assisted in the organization and better visualized the wide and convoluted web of codes and transcribed data. The categories developed during the analysis later formed the structure of [chapter 4](#), where they were grouped in concepts and presented. NVivo was also used during the writing process of the [chapter 4](#), which provides accessibility to all relevant points.

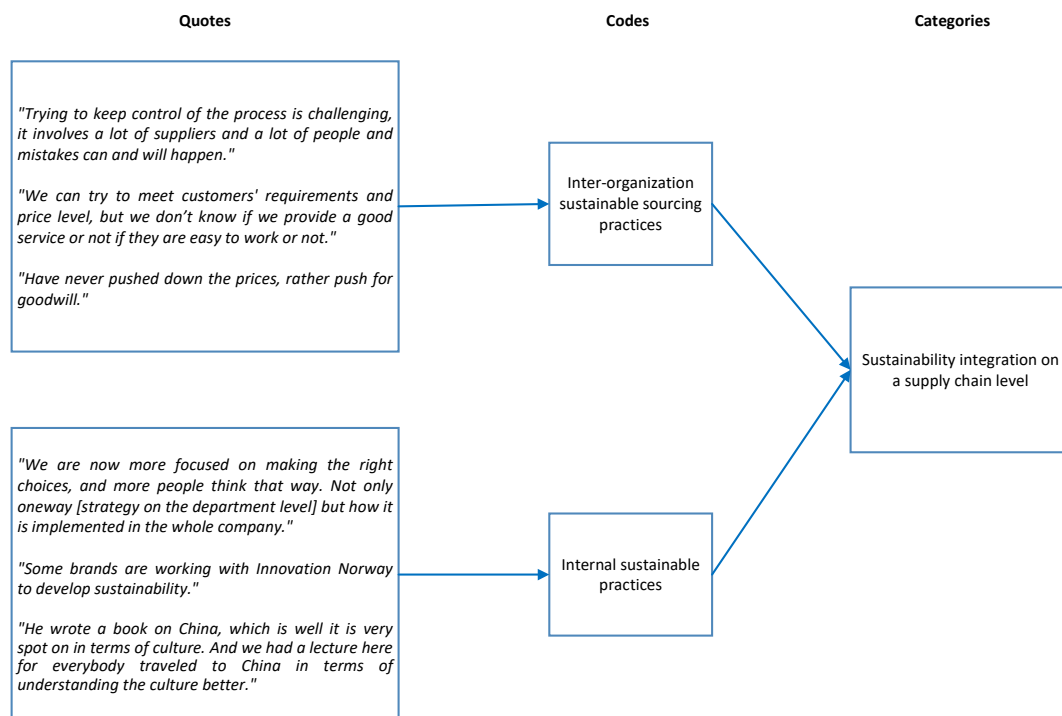


Figure 3.2: Examples of coding structure.

3.4 Evaluation of research quality

While *validity*, *reliability*, *objectivity* and *replicability* are traditionally recommended as factors to evaluate research (Yin, 2017), the factors *trustworthiness* and *authenticity* are suggested as more fitting for qualitative research (Bryman, 2016).

3.4.1 Trustworthiness

Trustworthiness is divided into the four criteria *credibility*, *transferability*, *dependability*, and *confirmability*. These factors account for the notion that the social world is not able to be observed with a single objective truth. Rather, observing the social world leads to data that is interpreted differently based on research accounts (Bryman, 2016). The research of this thesis will be evaluated on all four criteria.

Credibility

The criteria credibility addresses to what degree the research is conducted according to best practices and principles, as well as if the findings are approved by the members in the social world which has been researched (Bryman, 2016). To ensure a high level of credibility for this thesis, NSD has been consulted for best practices regarding data collection and safe storage. To accurately represent the perspectives of the research subjects, all findings presented in chapter 4, Empirical Data are solely based on word-for-word transcriptions with no conscious alteration or mixing of interviewee statements.

Transferability

Transferability reflects if a study's findings apply to other contexts beyond the study or the study context but at a different time (Bryman, 2016). Many topics related to the research questions apply to multiple industries. However, the research findings are to various degrees specific to the textile industry and, to some extent, to the Norwegian fashion market and Chinese supply context from the perspective of an SMB. Through investigation of the case company, as well as the comprehensive interviews with multiple actors in the case SC, the transferability of this thesis arguably fits across Norwegian fashion SMBs.

Dependability

Dependability is achieved when all processes of the research process are well documented. This includes problem formulation, selection of research participants, fieldwork notes, interview transcripts, data analysis decisions, and soon (Bryman, 2016). Although all interviews and email dialogue is securely stored, non-disclosure agreements have limited the possibility of auditing these records by peers. In terms of problem formulation and selection of research participants, this has been accurately described in the preceding parts of this thesis, which should leave little ambiguity in the research methodology. Dialogue with the thesis supervisor has not been recorded beyond superficial notes, and as such, can not be considered highly dependable. Ultimately, recordings for the purpose of auditing are yet to be considered common in qualitative research (Bryman, 2016).

Confirmability

Confirmability is a criterion for whether the researchers have acted in good faith with regards to the thesis objectives, not allowing personal values or theoretical biases to affect the research (Bryman, 2016). No personal stake nor relations to the focal company can be substantially argued, and the interviews have not been conducted with any intention to promote the research subjects. A possible confirmability improvement of this research may be the interview guide. The formulation of questions included keywords such as "project" and "sustainability" in phrasings which may have biased the interviewee responses towards chosen thesis frameworks and theories.

3.4.2 Authenticity

The criterion of authenticity evaluates the fair representation of research subjects, as well as the political impact of the research findings and conclusions upon these subjects (Bryman, 2016). The impact criteria are divided into the four categories *ontological*-, *educative*-, *catalytic*- and *tactical* authenticity. In terms of fairness, the research methodology is in all practical aspects identical for all the research subjects; although, the availability of research data beyond the interviews differed between the focal company and its suppliers. Furthermore, the political impact of this research has not been measured yet. With this gap, it is not appropriate to conclude a high degree of authenticity for this research. However, this emphasis on research impact is controversial, with arguments made that this criterion is more suitable for certain social research types targeted towards organization studies and education (Bryman, 2016).

Chapter 4

Empirical Data

This chapter presents context regarding the case companies, as well as the empirical data collected for the thesis research through conducted interviews.

4.1 Case company and suppliers description

The subsequent paragraphs summarize contextual information regarding the case companies. A single focal company, two first-tier garment supplier companies, and one second-tier fabric supplier, which were interviewed for the empirical data.

4.1.1 Case company

The thesis focal company is a Norwegian fashion brand targeting multiple end-user groups and fashion segments. It operates in both Norwegian and European markets. Its product portfolio includes outerwear, shirts, shoes, and more. The garments are made with a combination of wool, cotton, synthetics, and similar materials, and the focal company showcases various certifications for sustainability and compliance. It is an [SMB](#) headquartered in Norway with approximately 50 employees in total, including one employee situated in China. Regarding sustainability, the focal company has clearly defined code of conduct, and substantial information regarding sustainability, collaboration and suppliers publicly available on its web pages. A large number of its supplier relationships are long term collaborations, and it participates in a selection of third-party organizations for sustainability. Internally, the focal company has dedicated personnel for sustainability, as well as cross-department workshops. Here, representatives from sales, manufacturing, product design, etc. collaborate on sustainability initiatives.

4.1.2 Suppliers

For the case suppliers, limited empirical data has been procured beyond the conducted interviews. As such, the following info regarding the suppliers primarily stem from the interviews.

First-tier supplier 1 is primarily a trading company that recently also initiated in-house production. It employs approximately thirty workers in the workshop, and six employees in its management department. The focal company is its primary customer, similar to first-tier supplier 2. In addition, it has approximately ten minor clients across Denmark and USA. In addition to receiving some sustainability training from clients, it does its own research on topics requested from clients.

First-tier supplier 2 is a large garment manufacturer with two factories. The first factory has been operating for over ten years, and currently employs approximately 200 workers across six production lines. Its second factory was established in 2018, with 100 employees across three production lines. Although established at a much later time, the second factory's equipment is largely the same as the first, but garments with stricter quality requirements are designated to the first factory, with a more experienced workforce overall. All in all, the vast majority of its production is dedicated to the focal company. Regarding sustainability, most of its knowledge is supplied from clients such as the focal company and a majority of sustainability related requests are forwarded to further upstream suppliers.

The second tier supplier is a large fabric manufacturer with approximately 500 employees. Its product portfolio primarily consist of synthetic- and blended fabrics, and are used in garments such as waterproof clothing, sports wear for yoga and cycling, and more. It has multiple long-term customers, both in Norway and other countries. Regarding sustainability, its production is third-party certified in terms of CO₂ emission levels, and a number of its products utilize recycled material such as recycled polyester, endomembrane, and metal. In addition, the factory has installed solar rooftop panels, covering approximately 20 % of their energy consumption.

4.2 Drivers and barriers for SSC development

4.2.1 Internal drivers and barriers

Interviewees from the focal company claim that the top management support and internal focus on sustainability allow for employees to obtain a broader view of sustainability issues. Anna states that:

"Whole picture of thinking is probably a best-suited one for a small company as ours."

Sustainability initiatives are encouraged, substantial part of recent projects has been initiated by employees, and annual training occurs, focusing on sustainability. In addition, the interaction between departments is well organized, which facilitates information and knowledge sharing within the company, from both sites purchasing and marketing. Barbara states that:

"It's quite a lot of information or plans going on across the departments being in the team ... it's quite clear, all the tasks that should be done by each person and it's quite good because you really have to follow up your own tasks or your own responsibilities in the team."

There is a strong evidence of employees' involvement and understanding the *"difference between marketing stands and real actions"*. Even so, the employees recognize the lack of knowledge and need for improvement in some areas; it has no adverse effect on their striving for further developments. Current **key performance indicators (KPIs)** for employees are based on the success of sales of a new collection; however, personal success is measured more on the number of returns compared to previous numbers; the effect on suppliers, and their willingness to produce even better products next time.

Top management, in turn, understand the importance of **SSCM** for the company to stay competitive in the long term. They pursue the idea that most of the work (for sustainability development) should be done on raw materials (dyeing, energy waste, and water chemicals), and this work can provide competitive advantages later on. Thus, the focal company explores opportunities to get new technologies on board to increase product longevity and quality. However, these innovations demanded high investment; thus, most of the current solutions on the market can not be adapted due to the price and production limitations. That makes access to these solutions *"only for large brands such as Nike or Adidas"*.

The other driver for sustainability development is well-organized purchasing practices. In the case of the focal company, codes of conduct, certification of social sustainability are in place.

Furthermore, product quality is a direct market success factor. Anne stated that *"if the zipper breaks [...] we got damage to our reputation. The business customers will probably not forgive us for at least two seasons."* During the negotiation with suppliers, even for that minor issue, the power distribution shifts due to contextual factors, such as the size of two companies, that might become a barrier for development. Thus, there is evidence that the focal company *"succeeds better where the supplier is also a midsize company"*. The more prominent companies have, in some ways, more professional setups and more experience; however, the focal company employees explain that in this case, they tend not to get the customer attention level they demanded.

4.2.2 External drivers and barriers

External factors and parties influence the development of SSC significantly. The company operates in a market which leverages recycled material certifications. In this case, developing a proper lean solution and effective marketing for end-users can be challenging. Even so, the company internally is focused on sustainable production, reduction of waste, and process improvement; even if it is not the main concern of the customers and end-users. Advantages through early adoption of new technologies is not pertinent to the focal company due to the high costs of small-scale early production. Customers are concerned about company strategy and sustainable actions; however, the price issue is still dominating. In addition, the media green-washing influences consumers to focus on the 'easy problems' as to reduce animal fur or plastic and drifts them away from obtaining a big picture of the problem. That leads to ambiguity in effective sustainable practices among customers and consumers and creates confusing marketing to operate on. For instance, only 2–3 of 100 customers care about organic cotton. According to the company's previous experience, the informative initiatives towards customers have low effectiveness for increasing their awareness.

Coercive- and normative pressure from the government might be a significant driver in the global SC. In Norway, with a high level of trust in the government, companies tend to think more in a long-term manner, since *"everything will in a way work out"*. It is not the case in developing countries, where most manufacturers and raw material suppliers are located. They

get used to thinking more short-term, and long-term perspective is a subject for development and something the focal company should work on. Furthermore, most of the interviewees from the focal company state that more regulation in the textile sector from the government in Norway could facilitate sustainability practices adaptation and make a big shift in customers' preference toward sustainability.

Recent Chinese government concerns and regulations regarding reduction of environmental impact facilitate suppliers sustainable development. That vanishes small fabrics from the market and gives way for those who can compete at the sustainability level. Karl argued that *"year by year the requirements are higher and higher"*, which drives development to meet listed requirements. It should be mentioned that first-tier suppliers stated that *"all the requirements are reasonable"*. Due to the lack of knowledge, suppliers spend many resources adopting new standards or introducing new solutions. In this case, they can obtain compensations and subsidies from the local governments; however, it is not significant support on the local level.

In the textile industry, competitors' pressure can simultaneously be a barrier and a driver for sustainability development. On the one hand, it is a barrier that shifts market focus towards more green-washing practices and marketing stands. Thus, a focal company should also spend its resources on the same activities in order to stay competitive. On the other hand, competitors' activities appear as drivers, both for the focal company and its SC. By entering industrial fairs and investigating competitors' stores, the focal company becomes inspired to obtain knowledge regarding new sustainable solutions and further implement them in its production. In addition, the big brands which are ready to invest more in their sustainable development policies drive the suppliers' development. They have higher requirements for certification than the requirements from the local government. Therefore, suppliers are prepared and have the knowledge to deal with government requirements in an efficient manner. Paco states that they *"do not need to stop their factories for additional implementation"*. That also drives focal company sustainable development since their products will be produced on the same production line, and they will get the same level of fabric as competitors.

Aligned with the local government policy for renewable energy usage, competitors drive green technology adaptation. Solar panels and CO₂ emission control at second-tier supplier fabric have been made at the request of one of its customers, who has a goal for zero energy waste. Simultaneously, the Chinese government regulates energy utilization with a higher tax rate of

expanding consumption. Last but not least, the garment manufactures' side is highly dependent on human power; thus, manufacturers are checked by the government for social responsibility aspects.

Primarily, suppliers are less proactive in sustainable initiatives, despite being active in responses to requests from their customers. When the focal company provides a good package with information for suppliers regarding sustainable management solutions, it is also beneficial for itself. For example, the introduction of an integrated PLM system provides an opportunity for suppliers to plan their operational activities better and facilitates long-term collaboration. In addition, the early suppliers informing and involving in a new project give them time for better organization and reduce their resistance to changes. The knowledge about suppliers, the way they work, and challenges they face, and providing them with beneficial contract conditions, can facilitate their engagement in sustainability practices. Interviewees at both the focal company and suppliers expressed that suppliers experience a lack of knowledge, and they need control and instruction from the focal company. Furthermore, employees of the focal company claim that they do not have enough information about suppliers, and they are willing to know more to provide even better solutions. The suppliers could be better at addressing new sustainable solutions. This approach can help overcome the lack of knowledge.

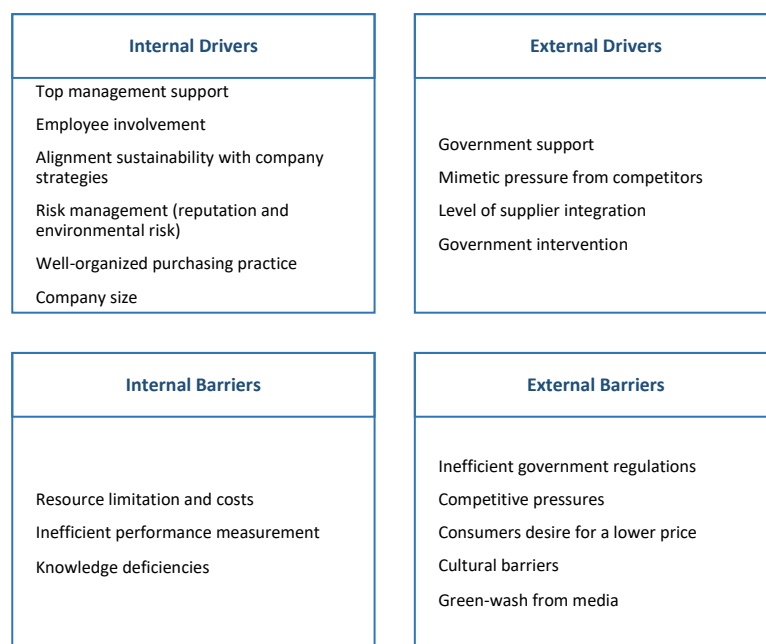


Figure 4.1: Drivers and barriers for the focal company to develop SSC.

4.2.3 Summary of dominating drivers and barriers

Company size is a contextual factor that can become both barrier and driver for sustainability adaptation. For small companies, it drives green focus and collaboration across the company's departments. Investment in IT systems has proven to be a cost-effective project; however, the company size can become a barrier for significant investments in sustainability technology and research. In this case, government support and regulations can act as a significant driver to overcome high investment barriers. In addition, culture difference is an influential driver and barrier. It provides different perspectives and broader views; however, the geographical distance and background factors create challenges in sustainability adaptation.

According to the analyzed data, a solid internal driver that helps to overcome challenges is top management support. However, the employees' assessment also based on sustainability performance should be implemented. Currently, not all KPI are directly aligned with sustainability; instead, individual values drive sustainability. The solid external barrier for sustainability adaptation is that both suppliers and retailers are more focused purely on revenue, which has an immediate and significant effect on their economic sustainability.

The long-term financial effect and delay on return on investment for sustainable technologies projects is a barrier. For example, organic cotton initiatives were developing for ten years and are still accepted only by approximately 2-3% of target end-users. The development of these solutions might be facilitated by means of initiatives from competitors, and a supplier developing sustainability for another client is a driver for the focal company. However, the issue of power distribution arises, where the focal company might lose the negotiation power with this supplier.

4.3 Trust and causal relationships in the supply chain

4.3.1 Importance of trust in sustainability projects

Multiple interviewees in the focal company and the first-tier suppliers agree that open and consistent communication is a crucial antecedent for trust. At the focal company, emphasis is given to long-term dialogue to mediate cultural- and company value differences and develop trust in the buyer-supplier relationship to initiate sustainable projects. The trust is not only

developed at the project- and company level but also at the individual level. Key actors at the focal company and the suppliers express value in personal relationships to develop trust. Whereas today the communication may be centered on ambitions and plans, it is stated that this resulted from developing personal relationships through company visits, social gatherings beyond the workplace, and more.

Trust enables discussions on long-term investments, which may not be feasible in a newly established collaboration due to cultural differences. One of these highlighted differences which has been mediated with trust is the suppliers' emphasis on short-term profits. Jimmy has expressed a mutually developed long-term perspective in the following manner when asked about requests for the implementation of new production equipment:

"Normally our customer requests new machine we slow production. For some styles, we have to use special machines, and this means that if we come up successfully with these new styles with our new machines, this means that we can get orders from our customer. Moreover, it is a win-win situation. So normally we are happy to accept requests".

In addition to the recurrence of orders related to sustainability, the order size is essential to signify trust in the SC. Barbara states that their suppliers "... know we are capable of ordering large quantities. We have had a great development the last year, so they see we have stable and fast growth in the company." Although Jimmy expresses the win-win aspect of investing in new machines to expand their capabilities, a level of commitment is required for the initial investment in terms of order sizes or other ways. Jimmy states:

"The factor that we need to buy this machine is both we have to balance the order policy and also the styles you know... The order commitment is very small, and then we have to discuss it with the customer. If they support us to buy this kind of machine with other conditions, then we have to discuss with our customer how we can do, and if we have still need to buy this machine."

The importance of minimum order quantity as a way of identifying commitment is supported in the fabric supplier as well, as it reduces the investment risk for the suppliers. Paco states that if "minimum order quantity is very low, we take more risk on that."

The importance of trust in the SC is not limited to a dyadic nature. During interviews with the fabric supplier, trust in the triad has been highlighted as a key characteristic. The interplay and open dialogue in the triad are described as essential, as the SC has a joint goal of selling garments to end-users. There is daily communication between fabric- and garment supplier, and the level of teamwork was compared, by Paco, to that of a football team:

"Well, we are just really like a football team. So goalkeeper passes the ball to the guard and then passes the ball to the forward. Just kind of thing. So our goal is the fabric, right? We were developing with the brand, and they choose a nice fabric. Moreover, the garment manufacturer will request the sample average. We ship very quickly. They give us orders follow all the colors and delivery. We follow it, and when they mention some fabric problem, they will share the news with us: Please send a picture or send information and ask us if we have any experience with this quality problem or something. So we talk with them every day. Just like one team."

The focal company places a high value on the stability of this triad, stating that fewer and more long-term supplier relationships are preferable for long-term collaboration. A result of this has been establishing staple items developed over multiple seasons and with a large **minimum order quantity (MOQ)** early in the recent sales seasons.

Trust and commitment are also key internally for the focal company's sustainability projects. Exploratory work on sustainability is being done by the focal company. Even though the required resources for this work do not directly improve **KPIs** of all personnel involved, internal trust and freedom enable the employees to pursue these projects. This exploratory work is reflected in collaboration with suppliers. Karl expresses that they approve the focal company's and other clients' requests to research new technologies:

"I will check and study by myself and then get the relatively new information to organize them by myself and try and translate maybe into Chinese or just make up a kind of list and transfer all the relative information to my stuff or the workers in our workshop."

In return, Karl expects these companies to be humble when presented with findings and knowledge. This expectation is also present in the fabric supplier. Paco describes in detail how establishing a trust to build social capital among the companies' employees and management is essential for implementing **SSCM**. The result of multiple meetings at fabric fairs and factory

visits is quoted by Paco as the capability for the focal company to say: *"OK, I give this job to you. You must take care that all our fabric is green and meets European standards. Company's job is design and sales in Europe"*. In the end, this ability to distribute responsibility and commitment for SSCM between the focal company and supplier ensured that *"everybody did a good job on his work that will be done so very simple, very easy"*.

4.3.2 Downstream influence

In this thesis downstream influence is defined as effects that an SC actor has on another actor downstream in the SC. For example, a supplier characteristic that affects the sustainability performance of the focal company. Occasions of downstream influence were described by both the focal company as well as the garment suppliers. Indirectly, the fabric supplier has downstream influence through participation in fabric fairs. Paco describes his participation as a way to *"check the quality customers need and try to talk with the salespeople."* Garment manufacturers and apparel companies attend these fairs, allowing the fabric supplier to disseminate information downstream.

A downstream influence from the fabric supplier is their carbon footprint from manufacturing. Barbara states that improvements in supplier pollution levels *"affect us directly, because we will produce so many garments at their facilities that will leave us with a better, smaller footprint"*. As such, the focal company's level of sustainability is influenced by its supplier relationships. Therefore, considerations in the focal company are made so that their major suppliers are balanced in terms of the level of a business commitment versus their carbon footprint size. This manifestation may also be leveraged for more business. Karl informed that as a supplier, there is value in pursuing sustainability certifications even before customers explicitly require them, but rather as a driver for new clients:

"Even [if] no clients need this kind of certificate, we will do it. Because this is a key to opening more doors for us, if we upgrade or renew our certifications, we will positively show them to our clients or potential clients. It will bring more possibilities for the potential cooperation."

4.3.3 Upstream influence

In this thesis upstream influence is defined as effects that a SC actor has on the sustainability performance another actor upstream in the SC. For example, a retailer characteristic that affects the SC performance of the focal company. A number of upstream sustainability causalities are due to client demands for certifications or codes of conduct for business. Karl states that the majority of sustainability requests for their manufacturing originate upstream from European and American clients, while it is up to them to implement the requests. This upstream certification demand is also given for the fabric supplier; Paco recalls previous requests from the focal company to implement various European standards for sustainability before they have been chosen as fabric suppliers to the garment manufacturer. Once this was established, he has been periodically be audited by larger clients regarding CO2 emissions and other metrics. Employees at the focal company confirms this upstream influence, highlighting their own codes of conduct, as well as personal factory visits in the past. To justify these requests, they have implemented a policy of never rejecting material due to color differences in the fabric. This policy ensures the fabric supplier that the focal company's requests are worthwhile ventures. Consequently, the focal company receives an increased willingness from suppliers to collaborate on sustainable projects.

The focal companies are subject to upstream relational influence from their customers. Despite promoting sustainability values towards customers, multiple employees at the focal company express that they *"have much pressure from the ones that are only focusing on price and the ones that are only focusing on surviving."* This is understandable for the focal company, in particular for smaller customers, as their economic sustainability is sensitive to minor differences in revenue.

4.3.4 Supply chain actors' expectations

Multiple interviewees describe expectations between SC actors as an important aspect of sustainability and project collaboration. In the focal company, expectations of long-term collaboration and stability in their supplier relationships are critical. This value is substantiated by their practice of not replacing a supplier with more environmentally sustainable ones in the short term. They would instead maintain the developed social and ethical sustainability and collaborate to pursue environmental sustainability. Suppliers reciprocated this long-term focus

for collaboration with the expectation that projects *"... will be the same each and every year"* rather than one-offs, and actively promoted by clients in their markets. This approach allowed the focal company to progress early communication beyond wishes and thoughts and towards tangible projects and initiatives. However, this approach does not apply to all suppliers equally. Large-size suppliers are less accommodating to non-standard requests from clients.

Expectations downstream from the focal company also affect sustainability. Garment returns from end-users are treated differently between retailers. As of today, used garments with damages or blemishes that are returned are disposed as waste, and its life cycle ends. Various retailers have different practices for garment returns, which give end-users different expectations. According to Anne, some end-users may expect that returned garments are repaired for reselling in other markets, which is not the actual practice for most clothing brands. On the contrary, Anne states:

"... we cannot resell it, and we try to encourage the customers to fix it themselves. And then they can get a discount on different products. We are trying to make other solutions than just taking their retired [garments] and throwing it away."

Evidently, this is a challenge of managing end-user expectations and customer experience versus sustainability ramifications and autonomy in handling returns. The focal company has made progress in setting these expectations to decrease returns by designing and marketing garments with higher durability for a higher price and decreasing their marketing focus on other integrations that the brand has firmly established. Examples of established sustainability integrations include animal welfare and the reduction of plastic consumption.

4.3.5 Summary of causal relationships in the supply chain

Trust is important sustainability projects and initiatives in the focal company's SC. Trust facilitates long-term relationships, which is required to initiate projects with predominantly long-term financial gain. Trust is developed at an individual, project, and company level in the SC. Moreover, it is actively developed internally, with the garment- and fabric suppliers, and between the suppliers themselves. Concrete actions for trust development include stability and size of purchase orders, frequent communication with an open and humble mindset among stakeholders, and non-intrusive audits and company visits. Trust helps establish proper expectations between actors in the SC. These expectations may be productive when mediated

and unsustainable if wrongful. For example, suppliers expect stability and recurring orders, as well as their sustainability features to be properly marketed towards end-users. On the other hand, some end-users have incorrect expectations regarding returns of broken or worn garments, thinking that it is inherently a sustainable practice across the fashion industry.

The actors in the SC also influence each other outside of direct collaborations. Suppliers' carbon footprints and knowledge manifest themselves downstream to the focal company. This factor must be considered, in particular when developing existing supplier relationships and sourcing new suppliers. Upstream, the focal company may introduce audits, codes of conduct, and certification demands to influence suppliers' sustainability strategies.

4.4 Strategies and best practices for SSCM

4.4.1 Sustainability integration on a product level

When it comes to sustainability issues, it is natural to look at the product first. In the textile SC context, organic raw material and chemical reduction are current trends on the market. That resulted in a better quality of products and minimization of environmental footprint and also stimulated sales; Dana explains that *"we see it as what has the real effects that we can do right now is that our product has the best quality that it can"*. However, the financial part is still controversial due to the high costs of these materials and solutions. In addition, the transfer to new materials is time-consuming. An example mentioned from both suppliers and the focal company is organic cotton. From the fabric supplier's perspective, organic cotton was introduced to their market in 2008 but required approximately ten years to reach maturity as a fabric material. They observe the same pattern for recycled polyester as well. From the focal company's perspective, recycled cotton is yet to become an attractive fabric across their market, as only 2-3 of 100 customers have shown direct interest in it.

Fabric suppliers perceived a positive attitude towards chemicals reduction certifications, such as BlueSign®. On the one hand, implementing such a certification is challenging due to high costs for an annual membership, high requirements, and strict control. On the other hand, through this procedure, relevant experience and knowledge have been acquired, which allowed comfortably pass other certifications requirements; it provides access to the list of the customers striving to obtain certified textile; get recognized for using a well-known certification. Quality

has a key focus, and its improvement positively influences the return rate. The focal company stated that quality is one of the key success factors, and even minor damages such as a broken zipper have a significant effect on the end-users further commitment to the brand.

4.4.2 Sustainability integration on a production level

Sustainability integration at the operational level is under ongoing development. Some of the best practices are already in place, while others are still under consideration. In the garment industry, the production and raw material processing are mostly outsourced, which forces a focal company to take more actions toward operational sustainability and expand SSCM on its suppliers at various levels.

The focal company explains that the introduction and implementation PLM system makes the operational processes and collaboration with suppliers straightforward since it provides easy access to all documents and allowed to check all requirements. In addition, early suppliers' involvement gives them the possibility for better planning their production and logistics and potential minimization of carbon footprint.

Furthermore, the focal company has initiated a sustainability project to reduce textile waste by designing and producing small items from sampling and leftover materials. Both focal company and garment supplier agree that it was an efficient project; however, it was time-consuming to convince the supplier in project efficiency. Also, there is some limitation of the fashion industry regarding each collection's materials and shades, which makes it possible to produce these small items only within the current collection.

Renewable energy generation gets less focus from the focal company side. Their fleet of cars and forklift trucks is electric; however, Bruce states that they "*could do better[...], but it should not be the main focus*". This statement is also relevant for the fabric supplier. They currently have solar panels installed in their factory, and around 20% of used energy is renewable. That is considered a good result in the local context and goes along with government policy for air quality improvement. The evidence of controversial opinions is observed among the focal company employees. Barbara explains that from her perspective, *suppliers should look more for renewable energy sources and decreasing CO2 footprint solutions*. However, Bruce states that the focus on raw materials sustainable production will provide competitive advantages later on.

The focal company's and suppliers' focus is also on water and energy-saving innovation in

response to the market requests and increasing attention to pollution prevention. The two cutting-edge alternatives to water, chemical, and energy-intensive wet-dyeing, currently on the market, are solution-dyeing and CO₂-dyeing. The solution-dyed means that the color is fused directly into the yarn at the first step of the production process. CO₂ dyeing technology forced the color into the fiber by high pressure rather than water, reducing water consumption.

Solution-dyeing contributes to quality improvement. However, customers' strive for this level of quality is not evident from the research made by the focal company. In addition, fabric suppliers agreed that the implementation of these technologies opens access to new customers due to existent demand. However, the trade-off exists between innovative environmentally-oriented solutions and the financial component. Both the focal company and garment suppliers report the solution as *"crazy expensive"*. Also, the solution is rigid due to the high minimum quantity average; thus, only limited items can be produced from this textile. According to the focal company, it might result in a *"just market stand more than a real improvement"*, with a high probability to end up as a one-time project. The CO₂ dyeing is determined by Jimmy as challenging, due to hazardous factors for manufactures, associated with CO₂ storage and used.

Lastly, the alternative technology plant-dyeing has been considered; however, the evidence of struggles emerged in terms of color limitation and quality, which consumers will not accept.

4.4.3 Sustainability integration on a supply chain level

Best sustainable sourcing management practices

The focal company has developed a code of conduct, with certifications of origin and process certification, and employed personnel for local audits. These resources facilitate early negotiation with potential suppliers. They carry out end-to-end fabric suppliers audits. Includes inspection before the focal company signs the agreement with the supplier, close follow-ups, production, managing complaints, and solving problems with personal meetings. Bruce explains that *"trying to keep control of the process is challenging, it involves a lot of suppliers and a lot of people and mistakes can and will happen"*, and it is a long-term commitment to collaboration. From the supplier side, collaboration with a customer is also a challenging task since customer feedback is not easily evident. Paco explains that *"we can try to meet customers' requirements and price level, but we do not know if we provide a good service or not if they are easy to work or not."*

Furthermore, the focal company tends to create good conditions for suppliers to better collaborate with them. Several interviewees explain that the 'pay more for sustainability' approach is originated from the company's management; they *"have never pushed down the prices, rather push for goodwill"*. Moreover, the company acts as a sponsor of materials and provides a time lag to fabric suppliers' better organization of production and logistics. This practice can be considered philanthropic donations since the company split the costs for certification and paid the total price for sample materials.

Best practices for internal commitment to sustainability

In recent years the focal company has invested in education activities for its employees. Annual workshops and meetings have been conducted focusing on sustainability as a substantial part of the company's strategy. This approach is highly valued by employees. Barbara states that *"we are now more focused on making the right choices, more people think that way. Not only one way [strategy on the department level], but how it is implemented in the whole company"*.

Besides annual workshops, the focal company strives to increase its knowledge regarding sustainability by attending global fairs. Here they are presented with cutting-edge technologies and information on professional industrial websites and can monitor competitor activities. The last one has a significant effect since knowledge regarding competitors is vital to stay competitive. Some brands act as inspiration to reach professional organizations — Anna states that they are aware of *"some brands working with Innovation Norway to develop sustainability"* and that these brands tend to share the same big picture way of thinking like themselves.

Lastly, the focal company organizes coaching sessions. One of these was a session regarding the Chinese culture and behavior patterns that allowed employees to get insight into suppliers' cultural backgrounds, resulting in improved collaboration.

4.4.4 Strategies and best practices summary

Leading strategic practices, which are implemented by or considered to be implemented by the focal company, are presented in [Figure 4.2](#).

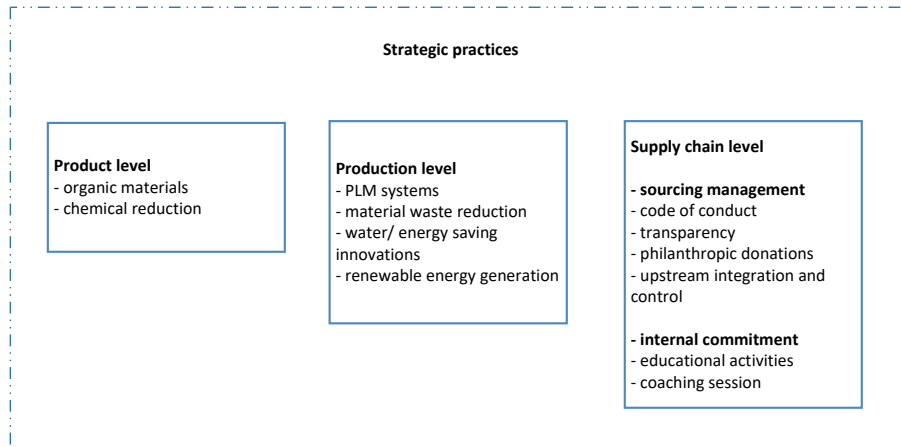


Figure 4.2: Strategic practices.

Implementation of chemicals certifications is product level practices with a positive effect on SSC development. It increases product quality and potentially improves suppliers' revenues due to the possibility of extending their customers' portfolios. At a production level, integrating PLM systems and utilizing sample material projects are deemed effective practices.

The employees focal company express a somewhat skeptical view on solutions for renewable energy generation and CO₂ footprint reduction. Instead, they endorse technologies for the sustainable production of fabrics. Solution-dyeing, CO₂-dyeing, and plant-dyeing are current alternative technologies. However, plant-dyeing has production and quality limitations according to the focal company's research, while suppliers state that CO₂-dyeing is hazardous for manufacturers. The solution-dyeing is the most environmentally beneficial alternative but has production limitations and also demands significant investments. All levels of strategies listed above are deemed costly, and there is no reassurance yet that end-users' purchasing power would support their implementation. However, the focal company is striving to research and gain knowledge in various practices. On the supply chain level, the upstream integration and assessment emphasize the need for control. However, this combination positively influences sustainability adaptation. In addition, the focal company's financial support for the sustainability projects reduces supplier resistance. In combination with the internal employees' training and educational activities, this results in effective sustainability projects. Leading strategic practices, which are implemented by or considered to be implemented by the focal company, are presented at [Figure 4.2](#).

Chapter 5

Discussion and Implications

In a context of globalization and growing interest in sustainability in the textile industry, **SMBs** are moving toward **SSC** development for strengthening competitiveness. However, in this case, they experience challenges and subsequent lagging behind in progress. To develop **SSC**, trust among different actors is crucial; however, it is challenging to be achieved in cross-cultural and inter-organizational contexts. This study provides a better understanding of a textile industry **SMB** sustainability strategical collaboration with its suppliers under competitors' pressure and resources limitations. For this purpose, the investigation was made based on the case of a focal company in Norway and its first- and second-tier suppliers in China regarding its practices and critical success factors for **SSC** development. The study provides several contributions to the theoretical underpinning in the issues of **SSCM**, and **SSC** development for **SMBs** operates in the textile industry and maintaining an international **SC**. These findings aim to provide a foundation for an **SMB's** strategic decisions by obtaining better knowledge regarding the context (drivers/barriers); key factors facilitating sustainability development (collaboration; trust, autonomy, and commitment); best practices, to be chosen strategically; as well as the ways of organizing these activities on the operational level. All of them are important for this **SMB** aimed at sustainability development in an international **SC**.

To better understand the preconditions of rewarding collaboration and **SSCM** development, this thesis investigates drivers and barriers and shows a discrepancy in drivers and barriers among actors in the case **SC** as one of the factors in **SSCM** development stagnation. **SSC** development can be driven by numerous factors and can be challenged by numerous barriers. With a perspective of the collaborative approach, the results contribute and support the typology

differentiation based on motivation factors introduced by [Cucchiella et al. \(2012\)](#). The results reinforce the correlation between [SC](#) actors possessing contrasting types of motivation for sustainability and deceleration of [SSCM](#) development. Understanding this correlation and its wise consideration advances strategical decisions and increases the efficiency of leveraging collaboration in the green [SC](#).

Regarding the importance of relational relation aspects in [SSCM](#) and sustainability projects, this thesis contributes to research topics suggested by [Hoejmose et al. \(2012\)](#). Specifically, the role and functions of trust and autonomy in [SSCM](#) development, as well as supplier's [SSCM](#) performance in relation to [SSCM](#) development. In addition, this thesis reinforces the notion of [Kadefors \(2004\)](#) that shared values and open communication are linked closely linked to trust cultivation, which is key for actor commitment to [SSCM](#) development.

In accordance with the research request of [Dennis \(2017\)](#), a cursory framework is developed substantiating whether [SSCM](#) integrations at a textile industry [SMB](#) should be implemented as a project or a process. Along with the vital preconditions for successful arrangement and promising strategic activities. The framework categorizes integrations across the strategic levels product-, production-, and supply chain level, which contributes to the work of [Karaosman et al. \(2020\)](#) regarding best practices for [SSCM](#) integrations for textile industry [SMB](#). Therefore, it serves as a guideline for [SSCM](#) development.

5.1 Accelerating SSCM progress in the textile industry

As mentioned in [section 2.1.1](#), the research on this topic has been going for several decades, but there is still evidence of stagnation in the process of green [SC](#) formation in the textile industry. Drivers and barriers have a different gradation of influence based on the internal or external motivation for [SC](#) actors to be engaged in [SSCM](#) ([Cucchiella et al., 2012](#)). The empirical data in this thesis, combined with literature research, reveal differences in motivation for [SSCM](#) development between the focal company and its suppliers as one of the factors for progress stagnation. Context observation is vital to overcome the stagnation in the meaning of existent drivers and barriers and their specific distribution.

Following [Cucchiella et al. \(2012\)](#) matrix, the focal company falls in the category of "Internal focusers", being influenced mainly by internal factors. Sustainability development is firmly

rooted in their corporate strategy, and most of the initiatives originate internally from top management or employees who see the production as a target area for improvement. In addition, a strong focus has been made on collaboration with suppliers and building efficient relationships. Aligned with the contribution from [Sancha et al. \(2015\)](#) regarding the positive correlation between the level of supplier integration and successful SSC development, the collaborative approach is evident in the focal company strategizing, with preference given to the suppliers with comparable company size. Contextual factors such as company size and cultural environment are critical enablers; the small company size facilitates sustainability development internally, and the cultural environment provides a possibility to think long-term. However, evidence of strong influence from external stakeholders' pressure highlighted by [Bubicz et al. \(2020\)](#) is not found. In this case, the stakeholders' values and self-interests have been revealed for both the focal company and their suppliers, resulting in more collaborative relationships rather than principal-agent pressure-based relationships.

The main internal barrier for the focal company SSCM development is resource limitation. According to [Dey et al. \(2019\)](#) to overcome this barrier, external drivers are essential, such as government subsidies and customer support. This aligns with results where the focal company claims the demand for a big shift in social mindsets. In contrast, other external factors, for example, competitors' mimetic pressure, [Sancha et al. \(2015\)](#), act oscillating as a driver and barrier for the focal company. The focal company derives inspiration from the competitors' activities; however, mimicking competitors, who provide marketing stands, does not bring significant sustainability progress and does not give competitive advantages in case of higher sales price than competitors.

In contrast, following [Cucchiella et al. \(2012\)](#) matrix, the suppliers are located in the category "External responders". They are mostly influenced by external factors as customers' requests, government and NGO's pressure, with the main barrier of need in assurance in customers buying power, which can cover the demand in high investments. The government's alteration taxes to subsidies, substantiated in the research made by [Zhang and Yousaf \(2019\)](#) is determined by the suppliers as a potential mediator for the investment barrier. However, it does not find support in the findings. Subsidizing production technologies as solution-dyeing does not make it viable; the garment price will still be higher and consequently not competitive on the market. The focal company prefers its suppliers to be more proactive on the matter of sustainability. The suppliers, in turn, tend to develop sustainability mostly in response to the customers' requests or/and government regulations due to the lack of relevant knowledge.



Figure 5.1: Main drivers and barriers for a focal company.

In contrast, the suppliers' competitors' mimetic pressure named by [Sancha et al. \(2015\)](#) as one of the main drivers of [SSCM](#) is not evident since competing suppliers do not mimic each other so much with regards to [SSCM](#). Aligned with the findings of [Sancha et al. \(2015\)](#), external integration with customers affects the level of suppliers [SSC](#) development. The lesser prevalence of mimetic pressure may coincide with the difference in [SC](#) tier of [multinational corporation \(MNC\)](#)s in the research of [Sancha et al. \(2015\)](#), compared to a textile fabric and garment suppliers and the market specificity. Therefore, the importance of mimetic pressures on a company correlates with their [SC](#) tier and their available client market.

The thesis results predominantly align with prior research made on the topic of drivers and barriers, and the focal company perspective corresponds to the researchers' opinions. However, with all this knowledge on board and with strong internal sustainability corporate culture, the focal companies [SSCM](#) development is still time-consuming.

In response to [SQ01](#), it can be observed on [Figure 5.1](#) and [Figure 5.2](#), that sustainable behavior of a textile industry [SMB](#) and suppliers is driven by contrasting drivers, and challenged by contrasting barriers. The discrepancy of these factors for [SMB](#) and suppliers is taking place

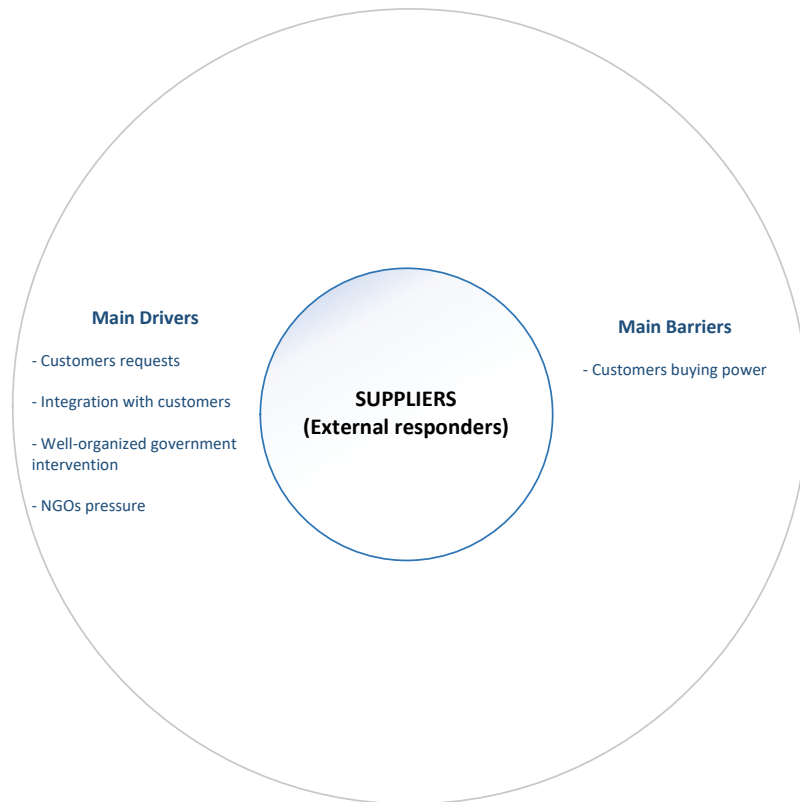


Figure 5.2: Main drivers and barriers for suppliers.

in various areas. Following the contingent approach, factors, such as cultural differences, geographic distance of production location, shape suppliers' way of approaching business in a short-term manner. In contrast, a **SMB** tends to maintain business thinking long-term. In addition, results reveal strong evidence of the desperate need for big changes in society. Without this shift, it will be challenging for **SMBs** to develop **SSC**. The main challenge is not investment cost, but the downstream parties' preference towards lower prices (Cucchiella et al., 2012; Kumar & Rahman, 2015). One of the main drivers for **SSCM** for suppliers in China is government intervention, and align with Zhang and Yousaf (2019) findings, the subsidies is suitable government intervention. In contrast, for **SMB** and further downstream in Norway, taxation of non-sustainable technologies is a stronger driver for **SSC** development.

There is evidence that for a textile industry **SMB** with international **SC**, a strong sustainability culture, and integrated supplier relationships, the level and rate of **SSCM** development correlates with the typology of a company and its suppliers' motivation toward sustainability development. That fact, to some extent, substantiates the reasons behind the stagnation in **SSC** development processes for parties engaged in a mutual integration, which have incompatible internal/external

drivers/barriers and different perspectives on SSCM development. Therefore, to succeed in SSCM development and avoid stagnation, knowledge regarding the context is essential, and it constitutes a base for strategic decisions.

5.2 Relational aspects in textile SSCM projects

Inter-organizational trust is a critical factor for consistent outcomes in a SC (Vilana & Rodríguez-Monroy, 2010). This conclusion may be applied to SSCM development as well. However, limited research has been made investigating trust in sustainability inter-organizational projects, and even less which refer to SSC projects realized by SMBs (Dey et al., 2019).

In line with the research of Xu et al. (2021), the focal company develops trust in its SC with an interplay of trust-building structures and interactions on individual-, project-, and company levels. In addition, open communication has been practiced with company visits by the focal company's management as well as employees, frequent dialogue through email and phone, and more. These practices which cultivate personal relationships are similarly important antecedents to trust (Dain et al., 2019; Kadefors, 2004).

Autonomy is another antecedent for trust, which is present in the inauguration of new suppliers for the focal company. While they impose local governance regulations upon their new suppliers, the suppliers are free to plan required implementations in their factories themselves. Facilitating this level of autonomy on SSCM integrations with a high level of importance and relative change from existing operations may justify planning these integrations as projects (Hobbs & Ménard, 1993). The focal company has local agents for physical inspections of their suppliers to ensure continued compliance. However, this resource is emphasized to a lesser extent in the interviews relative to other interactions and resources. This indicates a practice in line with the notion that excessive monitoring of a SC harms trust and limits autonomy (Kadefors, 2004).

The focal company experiences varying practices among their retailers regarding garment returns from end-users due to their leeway and independence when handling these returns. This aspect addresses the scope of future research discussed by Muduli et al. (2020) regarding commitment and autonomy for SSCM. Given the sample size and industry limitation, this thesis suggests that their positive conclusions on commitment and autonomy's effect on SSCM performance may be valid beyond their research's sample size- and industry limitations.

Consistency in structures and business interactions of the case SC are one of the key components for trust development. One of the noteworthy aspects of this SC is its cross-cultural nature; "it is shown that the nature and quality of inter-organizational trust vary greatly over different cultural and institutional environments" (Bachmann, 2010). Establishing shared values; understanding of collaboration value; and knowledge about the collaboration company helps mitigate these differences and develop trust (Dain et al., 2019; Kadefors, 2004). This is present in the SC with actors highlighting the importance of their joint goal to provide garments in the focal company's market, a shared appreciation for humbleness and collaboration in technology research, and more. This established trust has been leveraged among suppliers for commitment to SSC investments (Hoejmose et al., 2012).

The research of Hoejmose et al. (2012) is focused primarily on the buyer perspective, acknowledging that this limited the ability to investigate the performance in the supplier after implementation of SSCM. The empirical data in this thesis gives insights to this gap, with suppliers confirming that implementing SSCM increases business with existing clients in terms of increased revenue, as well as propensity to collaborate. Furthermore, Hoejmose et al. (2012) highlights a gap in research on suppliers' 'green' SC performance. The empirical data shows that implementation of the project for garment production using fabric sample material has arguably increased the suppliers' 'green' SC performance, as it may be defined as the sustainable practice of production with superfluous material (Ganji et al., 2017).

Hoejmose et al. (2012) determined the importance of trust and top management support in SSCM in a general sense. They suggested mapping the exact roles and functions of trust as future research. Current research highlights top management support and trust as drivers for the reduction of transactional costs. As the case company has cultivated a long-term relationship with its suppliers, it has increased the propensity for collaboration. This has been leveraged to implement a digital PLM-system with top management support at both the focal company and its suppliers. The system's benefits are reduced order returns, incorrect order specifications, and more predictability in production load demands. Implementation of this system required the established propensity for collaboration and the win-win perspective in the supplier, which is evident in the empirical data. Lastly, Hoejmose et al. (2012) suggest future research to investigate the influence of trust on social capital, which they speculate to be important for SSCM. Quoted statements in chapter 4 from the garment- and fabric suppliers, as well as multiple employees in the focal company positively describe social capital as important for SSCM implementation.

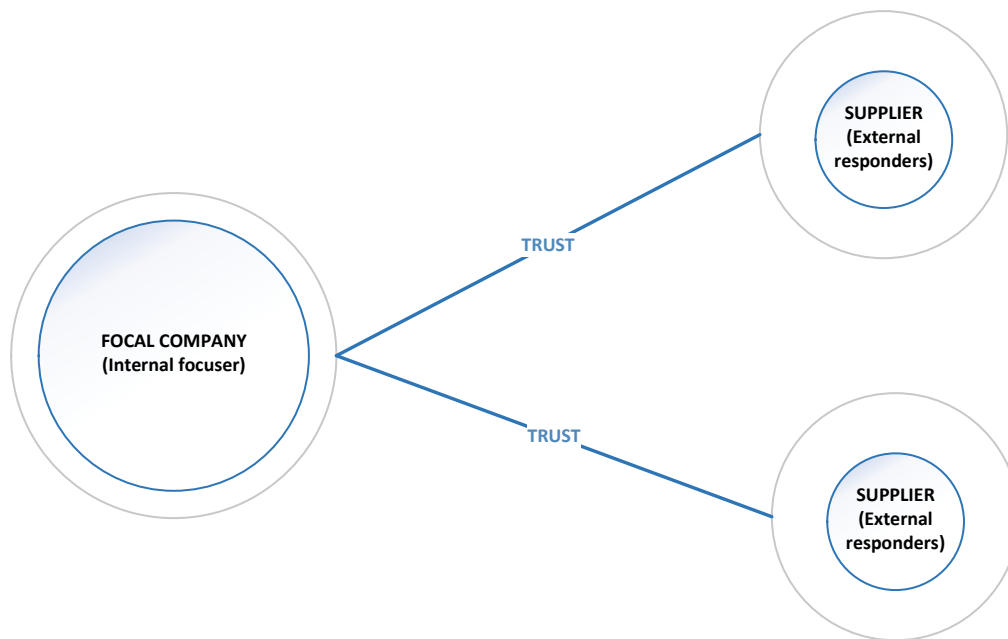


Figure 5.3: Trust between different SC actors.

The discussion reinforces that open communication and shared values towards common goals between SC actors are antecedents to trust and commitment in partnership-based SC relationships (Kadefors, 2004; Lee et al., 2014). These antecedents are significant in the early phases of collaboration for discussing and defining common interests and project goals (Ulbrich et al., 2011). In response to SQ02, developing these antecedents is key for commitment to SSCM implementation projects across a international textile SC. In this research, examples of such projects are the transitioning to a new PLM-system and altering production processes and conditions for compliance with European standards regarding the use of chemicals.

5.3 Project or process organization of developmental activities

Nowadays, much research and industry professionals highlight the importance of sustainability development for the textile industry SMBs, as a vital aspect for gaining competitive advantage and long-term endurance in the market. Therefore, there is an essential issue of how a textile industry SMB with international SC can strategize its SSCM development activities in a sufficient

manner. As reveals during the research, several prerequisites are fundamental for SMBs ambition to succeed in the development of SSC. Research of these prerequisites becomes more important for cross-country SCs and in the case of outsourced production facilities.

Collaboration with suppliers is crucial as it provides environmental spillover effects in SC and improves supplier performance, especially in developing countries (Gong et al., 2018; Li et al., 2018; Sancha et al., 2019). In addition, such internal factors as top management support and recognition of sustainability as a considerable component of the company's strategy (Larsson & Larsson, 2020) are a precondition toward efficient development of international SSC. External relation factors also play a crucial role in prosperous development, for instance, mutual willingness to collaborate between SMB and suppliers, their understanding of the importance of collaboration, and the existence of trust, autonomy and commitment between parties (Dain et al., 2019).

With this in mind, this thesis expands on the findings of Karaosman et al. (2020) with qualitative research on an international multi-level SC in the textile industry, by elaborating the guidelines for efficient organization sustainability developing activities. Based on the listed best practices for sustainability integration at the product-, process- and SC level, this thesis proposes that some of these activities are suitable to be organized as join projects with suppliers from different levels, others should be ongoing processes. The framework is shown in Figure 5.4, which serves a guideline for SMB's decisions at both strategic and operation level, as to achieve a better result a holistic approach is needed, which takes into consideration activities at different levels. In response to SQ03 and SQ04, subsequent paragraphs reveal the aspects to support either project or process organization of SSC' developmental activities.

SSCM is a complex issue (Dennis, 2017). Therefore, the subsequent paragraphs are limited to discussion on a selection of aspects of the developed framework. Limitations preventing the framework to be developed discussed in-depth is described in section 5.5, Limitations.

5.3.1 Strategic level considerations for project or process orientation of SSCM activities

Operational level of SSCM integrations are generally distributed among the SC levels. The focal companies focus more on product innovation, while upstream suppliers focus on process innovation (Karaosman et al., 2020). The case study reveals the tendency in the textile

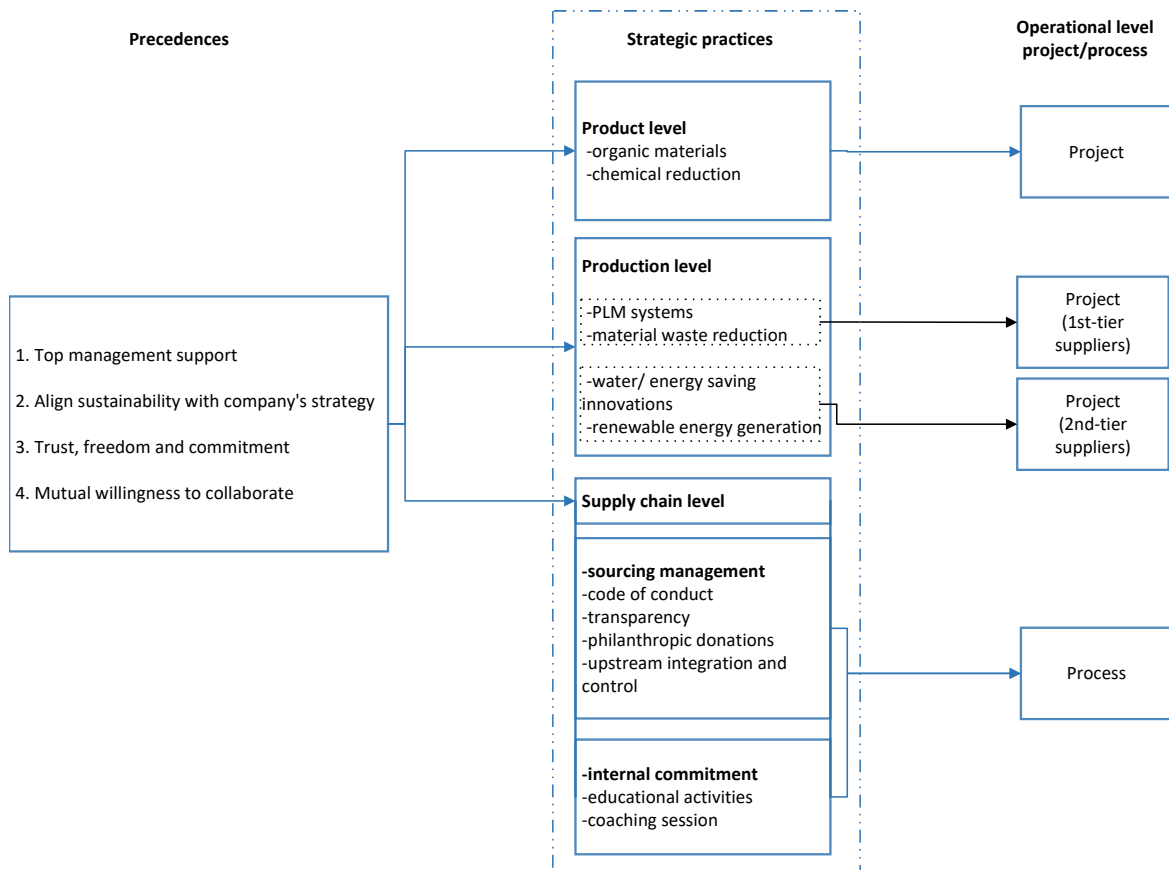


Figure 5.4: Guidelines for aggregated SSCM integrations.

industry towards particular activities on different operational levels. For product level, it is predominantly such activities as the transaction to organic materials and chemical reduction, by proper certification. For production level, the main joint activities with first-tier suppliers (garment suppliers) are implementation of mutual infrastructure, integration of PLM-system and material waste reduction (smart design with the use of leftover materials); the main joint activities with second-tier suppliers (fabric suppliers) are implementing water/energy saving innovations in the production process (various solution-dyeing technologies), and renewable energy generation (solar panels). For supply chain level, the main activities take place on sourcing management level, as proper sustainability-oriented procurement policy, as well as on company level, development internal commitment by various education and training activities. This general distribution can be expanded by suggesting that some of these integrations may initially be implemented as collaborative projects or as enduring processes.

Product level

The majority of the product level integrations refer to materials used and certifications; this transaction to the new materials and certification requirements is time-consuming and knowledge demanding. In regard to the textile industry, the constant development of new materials and fashion trends takes place, and the issue regarding the transaction constantly arises and can be solved on the side of **SMB** and a supplier independently. To solve these challenges independently necessitates a level of autonomy among the **SC** actors. In addition, implementing new materials entails a certain degree of innovation and change from existing operations. These factors correlate with recommendations to implement such product-level integrations as projects (Hobbs & Ménard, 1993; Muduli et al., 2020).

Production level

Production level activities occur within integrations with multiple-tiers suppliers and may benefit from being implemented as collaborative projects. In particular, for **SMBs**, using project frameworks may better limit the financial and time risk of the given **SSCM** integration. Several joint projects with first- and second- tier suppliers have been defined by **SMB** as beneficial during this study.

The focal company's initial batches of garments made with sample material may be described with a project framework. It has clear sustainability deliverables, time-boundaries, available resources, and stakeholders. These characteristics correlate with the ones substantiated by Pinto (2013) and Lundin and Söderholm (1995). However, there is a contradiction to the conclusions of Silvius et al. (2017), which states that the temporary nature of projects challenges long-term sustainable development.

The implementation of mutual infrastructure, namely **PLM**-system, which is an evident change from the previous way of organizing the routine, and the implementation itself is a short-term temporary activity with a clear deliverable. The same could be referred to the sustainability activities with second-tier suppliers; initiatives such as water/energy saving innovations and renewable energy generation seem to be better organized as projects.

The organization production level activities as a project can be considered beneficial. From a strategic management perspective, projects are change catalysts in the form of temporary organizations that lead to improved organizational performance. Furthermore, this improved

performance is not temporary. Brent and Labuschagne (2006) conclude that it is not just the life cycle of the project that should be considered for sustainable project management. The projects themselves have associated deliverables and consequences beyond the direct results or products that should be taken into account. Examples include a permanent change in assets, systems, behavior, policies, business processes, and so on (Lundin & Söderholm, 1995; Turner & Müller, 2003).

Supply chain level

Supply chain level activities aim to establish appropriate procurement and sourcing policies regarding sustainability and increase employee's commitment and knowledge in sustainability development. The latter goal mediates employees' resistance to change, which, in turn, facilitates the better adaptation of future sustainable projects and sufficient engagement in these projects (Muduli et al., 2020). Therefore, these types of activities seem to benefit from being organized as ongoing processes for continuous SSC development – both internally in SMB as well as externally with its suppliers (Dey et al., 2019).

Furthermore, the procurement of suppliers is firmly rooted in the focal company's existing (and evolving) culture and structures. This continuous and embedded nature supports the idea of organizing these SSCM integrations as processes (Hobbs & Ménard, 1993; Hussein, 2018). With this conclusion as a point of departure, suitable frameworks to employ may be lean methodology, change management processes, employee knowledge- and learning campaigns, and other frameworks centered around continuous improvement (Dey et al., 2019).

5.4 Practical implications

This thesis addresses a number of challenges for sustainability managers in the textile industry, with the main focus on developing strategies for collaboration with suppliers in a multi-level international SC. As mentioned in chapter 1, Introduction, there is a trend towards sustainability in textile industries, and collaboration with suppliers is increasingly important when outsourcing production to facilities in developing countries. However, guidelines for implementing SSCM practices are not clearly defined nor universal. Therefore, there is a need for urgent actions from managers. This thesis has identified specific drivers and barriers for an SMB in an international SC shown in Figure 5.1. Managers should identify their specific

barriers deterring SSCM development and identify drivers which can be leveraged to achieve better results; considering these when strategizing strengthens companies to be competitive long-term. If they fail to respond to these market changes and develop international SSCM, it could cost a company loss of business customers, loss of business reputation, and loss of production facilities (Sancha et al., 2015). Therefore, with the overview on main drivers/barriers both for the company and for its international supplier, managers can achieve strategic success for the business (Sancha et al., 2015). This will provide a company with a first-move advantage, such as reducing costs and acquiring new customers (Hoejmose et al., 2012).

This thesis proposes a conceptual framework to provide managers with a tool to take a proactive position in the practical implementation of various sustainability development practices. Its aim is to gain beneficial collaboration with suppliers from different levels, as well as advance possible collaboration with different research institutions to develop efficient strategies. Furthermore, this framework covers vital prerequisites for successful implementation of the listed strategic practices in section 5.3. Managers should verify these prerequisites and promote these factors both internally in a company and externally in relation to its suppliers. Lastly, this framework dictates whether to organize SSCM implementations as collaborative projects or continuous processes while substantiating the superiority of one type of organization over the other for the specific strategic levels. These findings have two managerial implications: one with regards to organizing SSCM initiatives, and one in terms of strategizing collaboration with suppliers on multi-level international SC with a sustainability perspective.

5.5 Limitations

The research scope has been limited by the time frame and total empirical data available. With a total time budget of six months for the thesis, the research methodology may have omitted research relevant to the chosen topics. Specifically, parts of the literature research were delayed three months as they had to accompany empirical data collection. In terms of empirical data, the single-case research of this thesis limits its representation beyond the textile industry from the perspective of an SMB with an international SC.

The empirical data has been further limited in terms of disproportionate amount of interview data among the supply chain levels. The number of interviews, and thereby data available, was skewed towards the focal company and its first tier suppliers, and all supplier interviewees

featured individuals with a high level of familiarity and developed relations with the focal company. Consequently, conclusions regarding second-tier suppliers, retailers, and end-users were relatively less definitive, in particular with regards to early-phase collaboration.

Personal biases may have affected the empirical data to a minor degree. Prior to conducting the interviews, two coordination meetings were conducted with individuals in the focal company. Further conversations with these individuals occurred after a majority of the supplier interviews. These meetings and conversations may have affected the formulation of the interview guide, as well as the engagement level during their interviews due to increased familiarity with the individuals. Ultimately, the interview transcripts showed that language and engagement across the interviews were similar, indicating a low significance of this limitation.

5.6 Further research

This master's thesis provides a point of departure for research on the potential for sustainability development through projects. More empirical research is required to validate the proposed conceptual framework and generalize the conclusion for textile industry [SMBs](#) with international [SC](#). The suggested framework should be extended by encompassing additional strategic practices. For instance, training and education material for suppliers can facilitate suppliers development and knowledge sharing or reuse of textile waste ([Karaosman et al., 2020](#)). In addition, further research could be done involving not one but several [SMBs](#) and comparison their approaches towards collaboration with suppliers for [SSC](#) development, as well as the effects of a project versus process ratio among [SSCM](#) practices. A clear correlation between the level of freedom among retailers to handle garment returns and [SSCM](#) performance is not disclosed in this thesis. Such effects may be better substantiated in future research with more downstream empirical data at the retailer and end-user levels. Furthermore, international [SC](#) with suppliers from countries different from China, which include more levels of suppliers, may be considered in future studies. The framework's focus can be a shift towards investigation further upstream suppliers, accompanied with determining specific criteria for suppliers' selection. To summarize all the above, this study contributes to gain knowledge on the listed issues and form a foundation for future research initiatives on the topic of [SMBs'](#) strategizing collaboration with its suppliers for development international [SSC](#).

Chapter 6

Conclusion

Through a qualitative case study, this master's thesis advances research in [SSCM](#) in several ways. First, it investigates extant literature and in-depth background of sustainability development strategies, with an aim to determine applicable practices for [SMBs](#) operate in the textile industry. To provide an answer for researchers and practitioners regarding the strategic approaches for collaboration with suppliers, a textile industry [SMB](#) with international [SC](#) can implement practices to integrate [SSCM](#). Certain issues are researched with respect to the industry specificity. First, the determination of main drivers and barriers is made for better understanding of the context, which assist the focal company in deciding whether to conduct strategic activities ([SQ01](#)). Second, the crucial relational aspect regarding trust, autonomy, commitment and expectations are determined as crucial for maintaining in [SMB's](#) international [SC](#) ([SQ02](#)). Third, the important factors are revealed for integration [SSCM](#) as a project or process ([SQ03](#)). Furthermore, the last issue is extended to the various tier of suppliers and duration of collaboration ([SQ04](#)).

In response to [SQ01](#), align with existing research ([Kumar & Rahman, 2015](#); [Sancha et al., 2015](#)), findings reveal that drivers and barriers for sustainability development, as well as discrepancy in drivers and barriers among [SC](#) actors promotes stagnation in development. [SMBs](#) have a prominent internal focuser role, with internal factors stimulating development and challenging it. In contrast, suppliers have a more external focus, with external factors initiating and driving development. These conclusions support the perspective of ([Cucchiella et al., 2012](#)). The drivers/barriers specificity describe a context and have a practical implementation as a base for performance of strategical decisions regarding [SSC](#) development.

Second, this thesis resolves *SQ02* and thereby contributes to research on relational preconditions for efficient supplier collaboration and international *SSC* development. Factors such as top management support, social capital, consistency in *SC* structures, and *SMB*'s engagement in sustainability were found to be key elements. This research contributes to the extant collaboration literature (Cucchiella et al., 2012; Hoejmose et al., 2012; Muduli et al., 2020) by raising the importance of mutual trust, commitment, and autonomy as factors for collaboration.

In response to *SQ03* and *SQ04*, this thesis advances the *SSCM* literature by analyzing whether to organize *SSCM* implementations at various strategic levels as projects or processes. This expands the perspective presented in the research of (Karaosman et al., 2020). In particular, this study contrasts several project management literature that substantiates a disparity between long-term sustainability and short-term project characteristics (Silvius et al., 2017). The study proposes the advantage of organization product- and production-level strategic activities as projects while organizing supply chain level activities as processes. However, due to the controversial nature of projects and sustainability by definition, there is still an ongoing dispute around the potential of sustainability development through project's organization (Karaosman et al., 2020; Muduli et al., 2020; Silvius et al., 2017), and this study contributes to the theoretical foundation for further research in this area.

This master's thesis provides a novel framework for implementation of *SSCM* integrations, thereby answering the research question. The framework summarizes important precedences for *SSCM* development, provides applicable strategic practices on product-, production- and supply chain levels, as well as operational level solutions. In addition, it goes beyond the one-tier buyer-supplier relationship, revealing practices for different tiers of suppliers. Therefore, this framework can serve as practical guidelines for aggregated *SSCM* integration, supported by emitted drivers/barriers descriptive schemes, which is a base of strategic decisions. Due to the complexity of the previously announced issue and mentioned limitations, further research can be suggested to examine and elaborate the proposed framework.

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Appendix A

Research permit from NSD

NSD NORSK SENTER FOR FORSKNINGSDATA

NSD sin vurdering

Prosjekttittel

Strategizing collaboration with suppliers to facilitate green technology adaptation in the supply chain

Referansenummer

904170

Registrert

10.03.2021 av Paul Minh Hoang Huynh - pmhuynh@stud.ntnu.no

Behandlingsansvarlig institusjon

Norges teknisk-naturvitenskapelige universitet / Fakultet for økonomi (ØK) / Institutt for industriell økonomi og teknologiledelse

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Arild Aspelund, arild.ospelund@ntnu.no, tlf: 90840017

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Paul Huynh, pmhuynh@stud.ntnu.no, tlf: +4741469538

Prosjektperiode

09.03.2021 - 11.06.2021

Status

12.04.2021 - Vurdert

Vurdering (1)

12.04.2021 - Vurdert

Det er vår vurdering at behandlingen vil være i samsvar med personvernlovgivningen, så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet den 12.04.2021 med vedlegg, samt i meldingsdialogen mellom innmelder og NSD. Behandlingen kan starte.

MELD VESENTLIGE ENDRINGER

Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde:

<https://www.nsd.no/personverntjenester/fylle-ut-meldeskjema-for-personopplysninger/melde-endringer-i->

meldeskjema

Du må vente på svar fra NSD før endringen gjennomføres.

TYPE OPPLYSNINGER OG VARIGHET

Prosjektet vil behandle alminnelige personopplysninger frem til 11.06.2021.

LOVLIG GRUNNLAG

Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 nr. 11 og 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse, som kan dokumenteres, og som den registrerte kan trekke tilbake.

For alminnelige personopplysninger vil lovlig grunnlag for behandlingen være den registrertes samtykke, jf. personvernforordningen art. 6 nr. 1 a.

PERSONVERNPRINSIPPER

NSD vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen:

- om lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke viderebehandles til nye uforenlige formål
- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet.

DE REGISTRERTES RETTIGHETER

NSD vurderer at informasjonen om behandlingen som de registrerte vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13.

Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18) og dataportabilitet (art. 20).

Vi minner om at hvis en registrert tar kontakt om sine rettigheter, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER

NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

Microsoft OneDrive er databehandler i prosjektet. NSD legger til grunn at behandlingen oppfyller kravene til bruk av databehandler, jf. art 28 og 29.

For å forsikre dere om at kravene oppfylles, må prosjektansvarlig følge interne retningslinjer/rådføre dere med behandlingsansvarlig institusjon.

OPPFØLGING AV PROSJEKTET

NSD vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Lykke til med prosjektet!

Kontaktperson hos NSD: Simon Gogl
Tlf. Personverntjenester: 55 58 21 17 (tast 1)

Appendix B

Interview guide

Interview guide

The interviews will be recorded for research purposes. All recordings and information will be anonymized and censored before publication. All recordings and information will be deleted after thesis work is ended in June.

Research question: How can a textile SMB with an international supply chain strategize collaboration with suppliers to integrate sustainable supply chain management?

Introductory questions – brief answers:

1. How long have you been working in the firm and what is your title?
2. How long have you been working in the textile industry?
3. Could you briefly describe your firm:
 - a. Approximately how many employees?
 - b. *For suppliers:* Do you have other Norwegian customers?
4. Have you received any formal training/education regarding sustainability management before or during your current role?

About collaboration:

1. Can you state the most significant sustainability project with your customer/supplier(s)?
2. Could you briefly describe your role and responsibilities in this project?
3. Why did you decide to realize this project?
4. Who suggested the sustainability project in the first place?
5. What was the project outcome?
6. Let's talk about factors that affected your collaboration with customer/supplier(s):
 - a. What approach did you use to improve collaboration?
7. Can you recall significant challenges during the project?
 - a. What do you think was the cause within the organization/outside? For example, was any of the following factors a cause of the challenges:
Norms and culture, institutional issues, governance schemes or role stability.
8. Are there any positive or negative experiences for you from this collaboration you would like to mention?

About green technology:

1. In your opinion, does the use of technology influence the level of sustainability? Which one has the most significant influence?
2. Do you know if and how your customer/supplier(s) implements new technologies?
3. To what extent does the strategy of your customer/supplier(s) for green technology affect yours?
4. Which other external factors can facilitate decisions on green technology adaptation in your firm?
5. Can you recall any challenges or restrictions related to green technology implementation? In your opinion, which factors caused these challenges/successes?
6. What outcomes have you experienced with green technology implementation?

