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Transparency in supply chains to ensure sustainability – Case Study from Food Industry

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ABSTRACT

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This thesis aims at examining the sustainability and transparency of a supply chain in food industry. Especially the role of transparency in promoting sustainability is under examination. Moreover, practices are provided to illustrate the implementation of sustainability into the companies. The growing importance of sustainable supply chain management and the criticality of food safety has led to the importance of transparency, and previous research has not widely addressed this context. The study applies qualitative multiple case study method, where altogether six actors from Finnish food industry are interviewed. The interviewees present five Finnish food industry companies from different tier-levels of a supply chain. The interviewees are from the procurement departments. The findings reveal various practices, such as supplier selection, supplier collaboration, supplier monitoring and the use of certificates and labels, that ensure sustainability and promote transparency. Ultimately, transparency tools, such as certifications and labels, are required to ensure the sustainability of the supply chains. The results between different companies in this study do not differ remarkably, and food safety is the most important motivator for sustainability within the case companies. Also, the barriers for sustainability and transparency are rather similar among the case companies, dishonesty by suppliers representing the main concern. More research should be put on the holistic sustainability integration to the supply chain as well as for the benefits of the IT systems use on ensuring sustainability and transparency.

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Pro gradun tavoitteena on tutkia elintarvikealan hankintaketjun vastuullisuutta ja läpinäkyvyyttä. Erityisesti tutkimuksessa tarkastellaan läpinäkyvyyden roolia vastuullisuuden varmistamiseksi. Lisäksi tutkimus tarjoaa käytänteitä vastuullisuuden sisällyttämisestä yrityksen toimintaan. Hankintaketjun vastuullinen hallinta ja elintarviketurvallisuuden tärkeys ovat johtaneet läpinäkyvyyden tärkeyden kasvuun, eikä tutkimusta tällä alueella ole juurikaan aikaisemmin tehty. Tutkimus toteutettiin laadullisena monitapaustutkimuksena, johon haastateltiin yhteensä kuutta toimijaa Suomen elintarviketeollisuuden alalta. Haastateltavat edustavat viittä eri elintarviketeollisuuden yritystä Suomessa eri hankintaketjun portailta. Haastateltavat ovat yritysten hankintaosastoilta. Tutkimuksen tulokset osoittavat useita eri käytänteitä, kuten toimittajavalinta, toimittaja yhteistyö, toimittajien valvonta ja sertifikaattien ja merkkien käyttö, jotka varmistavat vastuullisuutta ja edistävät läpinäkyvyyttä. Läpinäkyvyyden käytänteet, kuten sertifikaatit ja merkit, ovat edellytys vastuullisuuden varmistamiseksi hankintaketjuissa. Tulokset yritysten välillä eivät eroa merkittävästi toisistaan, ja elintarviketurvallisuus nähdään tärkeimpänä motivaationa vastuullisuuteen yrityksissä. Lisäksi vastuullisuuden ja läpinäkyvyyden esteet ovat melko samanlaisia case yritysten välillä, joista toimittajien epärehellisyys nähdään suurimpana haasteena. Lisää tutkimusta tarvitaan vastuullisuuden kokonaisvaltaiseen integraatioon, kuin myös informaatioteknologioiden hyödyistä läpinäkyvyyteen ja vastuullisuuteen.

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My deepest gratitude I want to express for my mother. She is my greatest support and the person I always look up to. Without her I would not be where I am now.

"Learning never exhausts the mind."
-Leonardo da Vinci

Helsinki, 31.7.2017
Aada Suomela

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1 INTRODUCTION

The purpose of this study is to examine the sustainability of the supply chains in food industry. Special emphasis is on supply chain transparency's effects on ensuring sustainability of the supply chains. The objective is to reveal practices and tools that enable sustainable development and transparency in the supply chains. The empirical part of the study is conducted through interviews from food industry's representatives. The introduction consists of the background of the study, research question, objectives and delimitation, research methodology, theoretical framework, key definitions and demonstrates the organisation of the study.

1.1 Background of the study

Undeniably, sustainability is a strategic imperative. Since the public interest toward sustainability is becoming somewhat significant corporates are forced to increasingly focus on sustainability. (Galpin & Whittington 2012) In an exceptionally propitious position to impact both positively and negatively are supply chain managers; decisions such as supplier selection, reducing packaging and using more fuel-efficient logistics have remarkable impact on sustainability issues and while reducing costs also improve corporate reputation (Carter & Easton 2011; Carter & Rogers 2008). Moving towards the broader adoption and development of sustainability a focus on supply chains is central, since the supply chain covers the lifecycle of a product form the beginning of raw materials processing to the end-customer delivery (Linton, Klassen & Jayaraman 2007). At worst, a truly sustainable supply chain would do no net harm to natural or social systems while at the same time generates profit over an extended time period. A truly sustainable supply chain could remain in business forever, customers willing. (Pagell & Wu 2009)

In general, the supply chain management is the management and coordination of a complex activity network included in the delivery process of a finished product to the end-user (Hervani, Helms & Sarkis 2005). Global supply chains of food products include remarkably different economic and sociocultural conditions on their way from developing countries to end-consumers' industrialized markets (Gold, Kunz & Reiner 2016). Challenges such as exceptional population growth reveal a critical need for restructuring the current food supply chains, with the high priority on its environmental and social essence in addition to economic viability (Chkanikova 2015). The complexity brings out the questions of transparency and

obviously, companies without the ability to track their own suppliers cannot provide anything to the discussion of the workers' conditions (Doorey 2011).

The recent scandals in the agri-business industry reveal the disclosure of shortages, such as product quality concerns, farming and working conditions, child labour or the small farmers' compensations and has caused high public pressure on supply chain actors. Food crises have escalated the consciousness of consumers toward the public health of the production, processing and distribution of food. Factors like quality, safety and environmental compliance are increasingly included in consumers' buying decisions. As a result, the food industry managers are forced to respond these changes of consumer demands by progressively increasing sustainability in the processes and products. By improved sustainability the creation of added value means creating transparency, considering that consumers must be reassured by showing that higher prices are the result of measures to increase sustainability. (Bastian & Zentes 2013; Wognum et al. 2011)

Appropriately, supply chain transparency could have a considerable control effect on ethical and quality compliance. Theoretically, transparency is situation with no information asymmetries. Information asymmetries are central causes of supply chains' agency risks, such as unfavourable selection and moral hazard. Efficiently avoiding agency problems should be fundamental value for ensuring quality- and ethical-related necessities in the supply chains as well as for stable relationships in supply chain. Encouragement for supply chain partner's opportunistic behaviour is diminished by transparency resulting the serious conflicts in transparent supply chains being minimal. (Bastian & Zentes 2013) Stakeholders must be communicated about sustainability of the companies, processes and products to assist decision making and impact buying manner. Hence, transparency of food supply chains is a must. (Wognum et al. 2011)

Reflecting to the background, this study is relevant since the food safety is extremely important for everyone, regardless of one's values or preferences. Problems in food safety, such as dangerous ingredients or inadequate storing conditions can cause a life-threatening risk. Despite that food safety is one aspect of sustainability in this study, it addresses the relevance of overall sustainability and hence, transparency of the supply chains. Figure 1 illustrates the growing importance of sustainable supply chain management as a field of research. In period of ten years (2007-2017) there were 454 documents within "sustainable supply chain management" search in Scopus database.

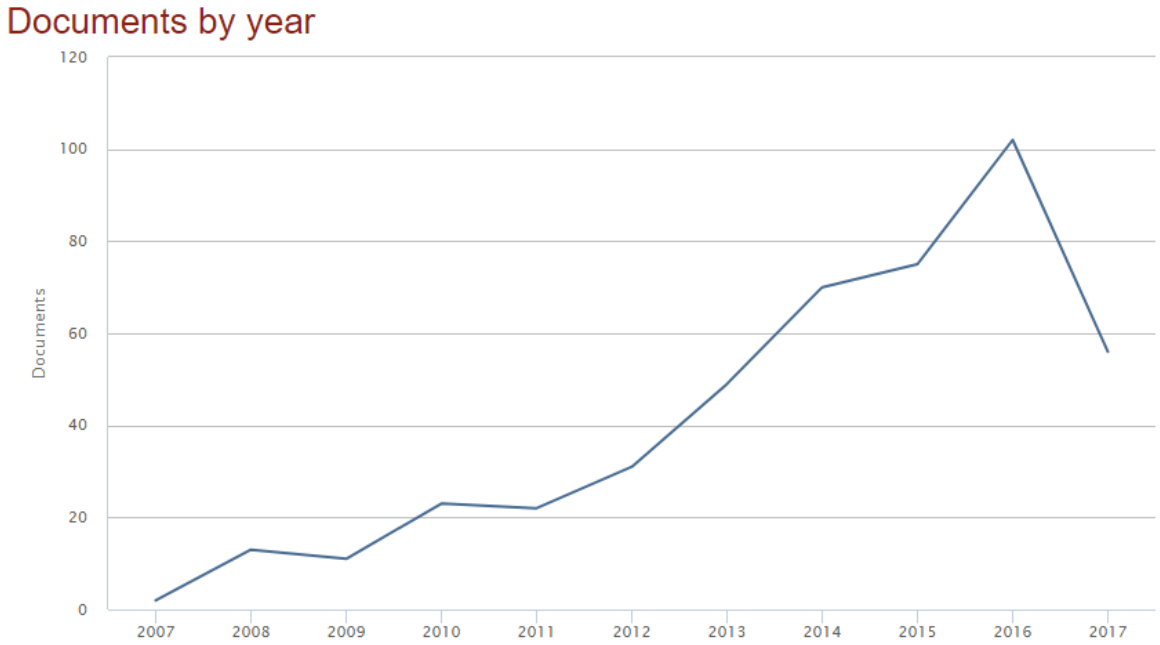

Figure 1. *Documents by year for "sustainable supply chain management" (Scopus)*

This study addresses the research gap of transparent supply chains in food industry. Since the multiple scandals in food industry altogether the examination of truly sustainable and transparent food supply chains is missing. Additionally, transparency is not often researched within sustainability context so this study provides new aspect to the connection of transparency and sustainability. This study provides practices of making the supply chains more transparent resulting in more sustainable supply chains.

1.2 Research objectives, questions and delimitation

Reflecting to the background of the study, the objective of this study is to reveal how companies operating in food industry ensure their sustainability and what are the practices to enhance transparency and sustainability. The research question characterises the aims and objectives of a research (Kähkönen 2011) and the background of the study has led to the following research questions.

The main research question is:

How can companies ensure sustainability and transparency in the supply chains of food industry?

The sub-questions are:

How sustainability is recognised in the supply chains?
How can supply chain management increase transparency in the supply chains?
How does transparency affect the sustainability of the supply chains?

The research is limited only to Finnish food industry. Additionally, the limited number of studied events naturally affect the generality of findings. Considering the three aspects of sustainability (environmental, social and economic) economic aspect is left out of consideration due to the limited space and time.

1.3 Research methodology

When conducting a qualitative research, case study is one of the research strategies that can be chosen (Kähkönen 2011). In this study, a qualitative research method is used and more precisely case study. The cases are from different actors in Finnish food industry and represent various tier-levels from supply chain. The main data collection method is interview. The interview structure is presented in appendix 1. Chapter 4 discusses more deeply the methodology, data collection and data description.

1.4 Theoretical framework

An examination of existing theory is the starting point for all research no matter how poorly developed the body of knowledge is (Stuart, McCutcheon, Handfield, McLachlin & Samson 2011). Figure 2 illustrates the theoretical framework of the study. The starting point for the research is the growing demand for sustainability and the imperative for food safety. In this study, the sustainability is examined from the transparency viewpoint, incorporating aspects of traceability, certifications and labels and the role of information systems. Sustainability is examined through supplier and sub-supplier management and environmental and social aspects. To be able to answer the main research question it is necessary to understand what is meant first by sustainability in supply chains and second by transparency in supply chains. Additionally, the characteristics of the food industry are examined under sustainability and transparency.

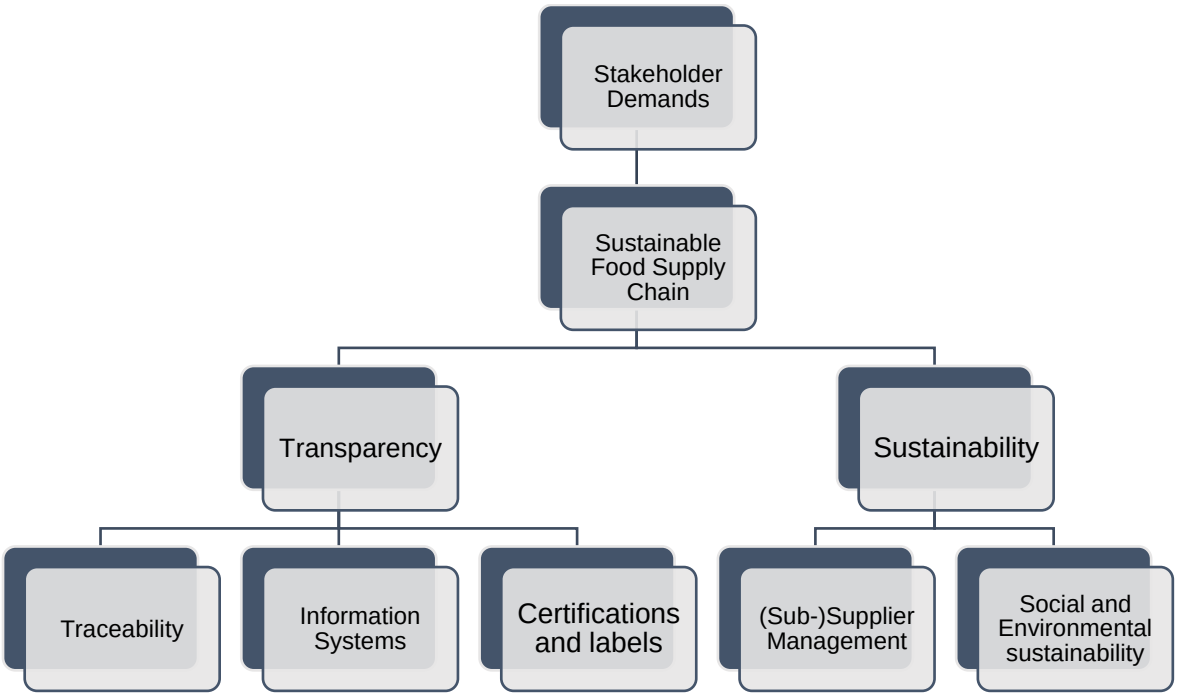

Figure 2. *Theoretical Framework of the Study*

1.5 Key definitions

To better understand the key concepts of the study they are briefly defined below. Further parts of the study will discuss more comprehensively the concepts.

Sustainability

Sustainable practices, regardless the business activity, are a function of two combined assumptions: first, enhancement of ecological health followed by ethical standards to promote social justice, and increase economic vitality. Second, priorisation order is where environment comes first, second is society and third is economics. The aim of sustainability is to balance resource production, usage and consumption over time and ensure intergenerational equity. (Markman & Krause 2016)

Stakeholder

The stakeholders of a firm can be divided into external and internal stakeholders. Internal stakeholders are such as entrepreneur, owners, employees and managers and external

stakeholders are such as customers, suppliers, governmental bodies, non-governmental organisations and media. (Heikkurinen & Forsman-Hugg 2011)

Sustainable Supply Chain Management (SSCM)

SSCM can be defined as the material-, information- and capital flows management in addition to cooperation among companies along the supply chain while also considering the goals from the three sustainable dimensions, economic, environmental and social, derived from the requirements of customers and stakeholders. To stay within the supply chain, the social and environmental criteria must be fulfilled by the members in sustainable supply chains. Moreover, competitiveness is expected to be maintained through meeting both customer needs and related economic criteria. (Seuring & Müller 2008)

Supply Chain Transparency (SCT)

Revelation of information (Mol 2015). Requirements of transparency by forcing corporations to publicly report on performance indicators might inspire corporate managers to improve their performance, since the indicators may reflect poor financial or ethical management of the company (Doorey 2011). SCT act as an indicator of supply chain data's quality, availability, accessibility, actuality and accuracy (Bastian & Zentes 2013).

Traceability

A system that enables to follow a product and the processes it goes through. A good traceability system provides more transparency by offering specific information to stakeholders. (Wognum et al. 2011) The aims of traceability are to record supply chain information flows and offer a system for firms to recognise the operators of supply chain (Stranieri, Cavaliere & Banterle 2017).

1.6 Organisation of the study

The outline of the study is as follows. The study is built upon theoretical part and empirical part. First chapter is the introduction to the subject and research in general. Chapter 2 and 3 discusses in-depth the literature review and theoretical framework. Chapter 4 and 5 comprise the empirical part of the study and finally chapter 6 concludes the research.

2 THE RELEVANCE OF SUSTAINABLE SUPPLY CHAIN MANAGEMENT

Sustainable development defines as “to meet the needs and aspirations of the present without compromising the ability to meet those of the future” according to the Brundtland report (1987). The basis of the mainstream sustainability thinking lies in three dimensions: environmental, social and economic sustainability. Figure 3 illustrates the core idea of sustainable development. (The IUCN Report 2006). “Sustain”, the word, implies “to keep in existence or maintain”, meaning support or permanence over long period of time (Markman & Krause 2016). The true challenge today is the question of running a viable business while preserving the natural environment of future (Wu & Pagell 2011) and accordingly, simultaneously focusing on the concepts of sustain and develop (Ahi & Searcy 2015).

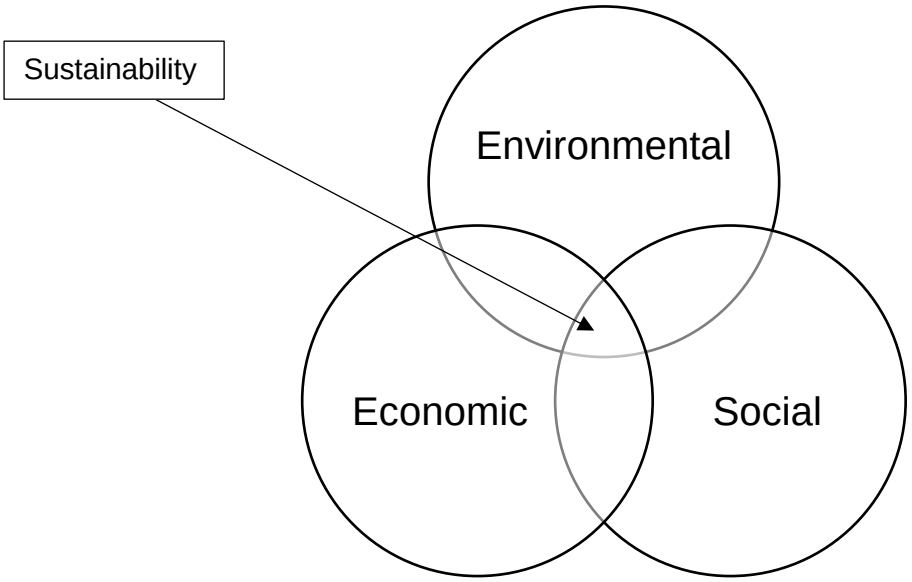

Figure 3. *Sustainable Development (The IUCN Report 2006)*

Too often the research on sustainability concentrates on the perspective of existing firms maintaining or increasing their profits, while considering the ways of reducing their harm. The nature of those research prioritizes the profits over other sustainability outcomes involving the survival of society and the environment addressing trade-offs, and thus cannot lead to genuinely sustainable supply chains. Additionally, while research on sustainable supply chain is seemingly aimed at the entire chain and all the stakeholders, in reality it is mostly conducted from the focal firm perspective. Referred to as instrumental logic, the previous research has seen sustainability as an instrument or construct to achieve economic performance rather than addressing how can a supply chain become sustainable. (Montabon, Pagell & Wu 2016)

Montabon et al. (2016) present an opposite for instrumental logic, the ecologically dominant logic. The ecologically dominant logic aims at creating a supply chain that is truly sustainable, rather than reducing the harm from a single firm. Unavoidable confrontation of trade-offs results in the priority of protecting the environment, then society and only after that consider profits. Montabon et al. (2016) indicates that a new logic is needed to conduct research because the prevalent logic of sustainability only leads to same results, that are not sustainable. The ecologically dominant logic underlies the belief of economic system being extremely compliant to both the environmental and social systems. In the end, the survival of society is dependent on completely functioning environmental ecologies and where economic systems of the overall social system play only a part. (Markman & Krause 2016) Nevertheless, an important fact to address in sustainable development is that people's basic needs must be fulfilled before they can actively participate to bio-physical concerns of environment (Vallance, Perkins & Dixon 2011). Figure 4 illustrates the idea of Montabon et al. (2016) and provides alternative to the figure 3.

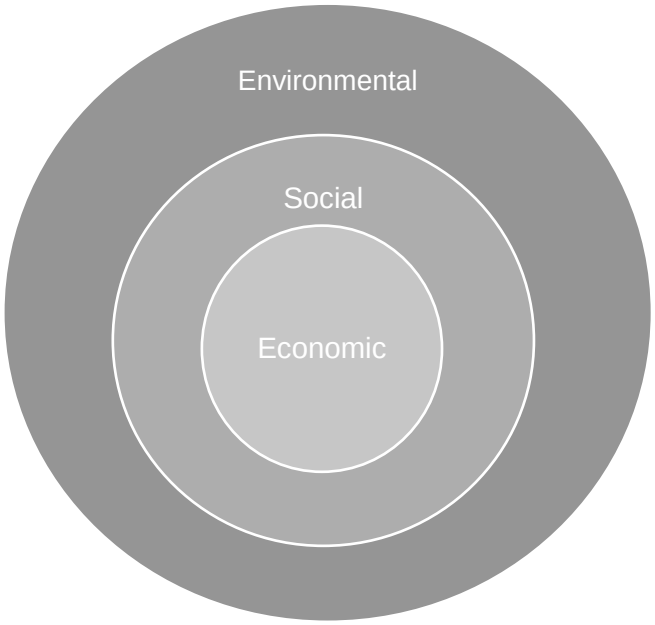

Figure 4. *Ecologically dominant logic (Montabon et al. 2016; Griggs et al. 2013)*

Likewise, Markman and Krause (2016) provide viewpoints on "what sustainability is not". They state that only if activities in supply chain are regenerative to the environment can sustainability be conceptualised and operationalised as a continuous variable. Thus, it is not sustainability only to reduce environmental harm. Greenwashing, a term that arises in

this context, is an attempt to appear environmentally conscious or to try to restore a firm's position after being tangled in unethical conduct. However, unethical conduct reduction cannot be seen as sustainable. Next Markman and Krause (2016) mention that it is not sustainability to reduce trade-offs, but addressing the trade-offs by prioritising the environment first. Finally, in their paper they state that corporate social responsibility, referring to actions often associated with such as donations or building local schools and hospitals, do not necessarily suffice in the long-term. As an example, a company extracting resources on certain area, building a local school will barely be enough to regenerate those resources at the pace of their extraction. Certainly, corporate social responsibility and charity are important, but to entitle business operations as sustainable it may not be sufficient. (Markman & Krause 2016) Similarly, McWilliams and Siegel (2001) declare that a company avoiding discriminating against women and minorities is not acting socially responsibly, rather hardly abiding by the law.

Table 1 provides an overview of how sustainable practices (in supply chains) are defined by various authors and helps to understand the diversity in sustainability thinking.

Table 1. *Definitions of Sustainable Practices (in Supply Chains)*

Source of definition	**Definition**
Markman & Krause 2016	*"Sustainable practices are based on two principles: (1) they must enhance ecological health, follow ethical standards to advance social justice, and improve economic vitality; and (2) they must prioritize the environment first, society second, and economics third."*
Montabon et al. 2016	*"Ecologically dominant logic is explicit in its priorities when trade-offs are encountered and is aimed at creating a truly sustainable supply chain, not at reducing the harm from a single focal firm. (…) the priority is to protect the environment, then society and only then to consider profits."*
Pagell & Shevchenko 2014	*"…SSCM is the designing, organizing, coordinating, and controlling of supply chains to become truly sustainable with the minimum ex-*

	pectation of a truly sustainable supply chain being to maintain economic viability, while doing no harm to social or environmental systems."
Ahi & Searcy 2013	*"(SSCM)The creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with key inter-organizational business systems designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term."*
Wognum et al. 2011	*"sustainability consists of three dimensions: the environmental dimension (Planet), the social dimension (People), and the economic dimension (Profit)."*
Svensson 2007	*"…SSCM requires a broadened approach of SCM. It should emphasize economic, ecological and social aspects of business practices and theory."*

Pagell and Shevchenko (2014) declare that the creation of truly sustainable supply chain is not "a nice to have" anymore, rather a must. While the planet's natural resources are gradually diminishing, many stakeholders require action for multiple issues from climate change to socially satisfactory conditions for work (Pagell and Shevchenko 2014). Ahi and Searcy (2013) base their definition on the research literature review and see the SSCM as an extension to GSCM (green supply chain management, explained later in this paper). Ahi and Searcy (2013) state that the urgency to address the triple bottom line of environmental, social and economic considerations is clearly underlined in their definition. They also identify business sustainability characteristics (economic, environmental, social, stakeholder, volunteer, resilience and long-term focuses) and supply chain management characteristics (flow, coordination, stakeholder, relationship, value, efficiency and performance focus) and constructed their definition of SSCM to include all those key characteristics.

Wognum et al. (2011) state that the products of the future must be easily recyclable and built from long-lasting non-hazardous materials. In addition, products must be made in socially satisfactory conditions, while enabling the workers with share in profits and engage in decision making. Svensson (2007) argues that the genuine understanding of SSCM requires a widened approach beyond the traditional restricted point of origin and end boundaries in supply chain descriptions. Namely, the interpretation of supply chains of recycling or waste of the product, and supply chains of second-hand or brand-new products, belonging to different supply chains and making distinction between these supply chains is unfortunate that alters the genuine SSCM understanding. Additionally, it feeds short-sighted literature views. (Svensson 2007)

After presenting the prevalent idea of sustainability in supply chains, the following sub-chapters will present sustainability practices, sustainable supplier management and finally the distinction between social and environmental aspects of sustainability.

2.1 Incorporating Sustainability into the Supply Chain Management

The uncertainties and vagueness surrounding the definition of sustainability often cause complications when trying to apply the sustainability principles in practice. Earlier sustainability actions tended to have an environmental focus, but today a triple bottom line (environment, economic, social) approach to sustainability is increasingly adopted. A high degree of complexity can be predicted as this approach includes more interacting factors. (Ahi & Searcy 2013)

What motivates companies to incorporate sustainability into the supply chains can be divided into external and internal motivators. Internally, key motivators are value-driven motives and support by top management, followed by wish for risk management and long-term orientation by the corporation. Externally companies are mostly motivated by expectations of customers and community to adopt SSCM practices. Additionally, there are barriers that hinder the SSCM implementation. Internally absence of awareness and understanding while also negative attitude act as strong barriers to SSCM adaptation. Supplier incapability to deliver wanted services and products and higher prices constrain externally the SSCM implementation. Furthermore, the lack of government commitment to sustainability may hinder the implementation of SSCM practices. (Sajjad, Eweje and Tappin 2015)

Sustainability goals from supply chain perspective have a critical impact on component selection, sourcing of materials, packaging, production, distribution and recycling. However, considering only the sustainability issues and flows that the core of supply chain management incorporates is not enough. Issues and flows that spread beyond the core, such as product design, by-product manufacturing, life extension of products and product end-of-life must be integrated in sustainability as well. A total cost viewpoint must involve the effects of depletion of resources and the by-product (pollutants and waste) generation that are neither used nor captured. (Closs, Speier & Meacham 2011; Linton et al. 2007) Ultimately, company is as sustainable as its supply chain is (Krause et al. 2009).

Akhavan and Beckmann (2017) suggest a framework for analysing how sustainability applications result in clarification sustainable sourcing and supply management (SustSSM) strategies and practices. They present six categories of sustainable sourcing and supply management practices that can help companies to incorporate sustainability into sourcing strategies; “1. Internal integration and governance 2. Supplier screening with focus on social issues 3. Supplier screening with focus on environmental issues 4. Supplier development with focus on social issues 5. Supplier development with focus on environmental issues 6. External governance, inter-organisational collaboration and collective initiatives.” (Akhavan & Beckmann 2017)

The first category, internal integration and governance, is about embracing the development of codes of conducts, policies and guidelines that are often adjusted to international norm principles. The second category requires a system for reassuring compliance of social issues. For instance, reporting elements (such as self-documentation by the supplier) and monitoring elements (such as on-site visits) are possible construct elements for social screening systems. The third category is like the second expect the focus is on environmental issues. To monitor the supplier’s performance in environmental aspect can include activities like supplier information gathering through questionnaires and public records about environmental conditions. The fourth category attempts to enhance the supply base’s social sustainability, especially when a long-term business relationship is the goal, by activities such as teaching suppliers to meet environmental, quality and labor standards in general (Pagell & Wu 2009). Likewise, the fifth category focuses on improving the supplier’s eco-performance. The sixth category is about shared activities outside the direct supply chain (Pagell & Wu 2009). (Akhavan & Beckmann 2017)

Carter and Rogers (2008) suggest supporting aspects to the triple bottom line (see figure 3) to be risk management, transparency, strategy and culture. Within the context of their framework of supporting aspects, risk management is defined “as the ability of a firm to understand and manage its economic, environmental and social risks in the supply chain”. As a part of sustainability, corporations are increasingly noticing risk management’s central role in it. Properly assessing and managing the risk is a critical requirement for sustainable supply chain, since a firm that is capable to plan for, diminish, discover, respond to and recover from variety of global risks is a sign of sustainable supply chain. (Closs et al. 2011; Carter & Rogers 2008) Transparency addresses the fact that the secrecy of corporate wrongdoings maintenance has become risky and difficult. From the strategy and culture point of view sustainable corporations have not simply overlaid sustainability actions with corporate strategy but changed their company’s culture and mindset as well. Naturally, these four aspects are interrelated, since stakeholder engagement usually related to transparency improvement can also reduce risk by minimising the consumer boycott chances and thus be an integral part of the organisation strategy. (Carter & Rogers 2008)

A framework presented by Beske and Seuring (2014) groups sustainable supply chain management practices into five general categories; orientation, continuity, collaboration, risk management and proactivity. Figure 5 illustrates their framework. The practices within each category represent the operational implementation of the single category’s goals. A commitment to sustainability as well as to supply chain management must be integrated on a strategic level in addition to the values of the company. Here, “orientation” stress the support of top-management as a central factor for achieving the full potential of sustainable supply chain management. When SSCM is part of the strategic values of a company it supports the dissemination and compliance of sustainability values throughout the company. As in the figure 5, orientation is in the strategic values level. (Beske & Seuring 2014)

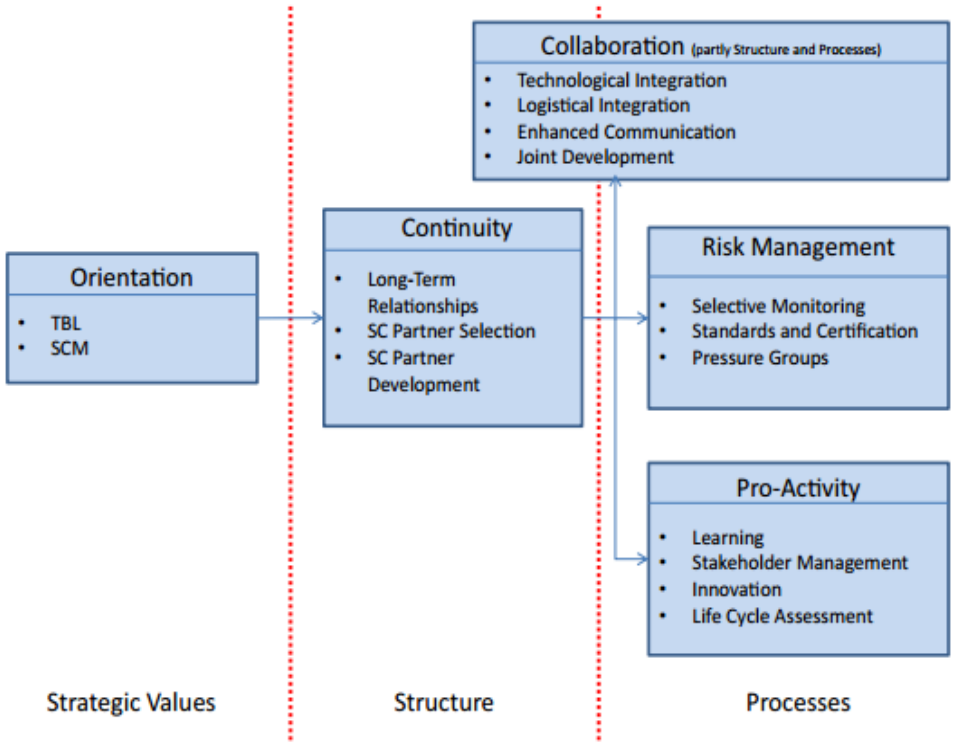

Figure 5. *"Sustainable supply chain management categories and practices" by Beske and Seuring (2014)*

Nevertheless, when deciding to commit to sustainable supply chain management there must be a trigger for it. The starting point, before orientation, is triggered by external pressure and incentives by various groups. Two groups of the wide description of stakeholders rise as of particular relevance. Customers, who are the final approval of products and services and therefore justify the supply chain existence, are of enormous importance. The second one of great relevance is all modes of governmental control, such as local municipalities and national or multi-national governments. (Seuring & Müller 2008) In their study Seuring and Müller (2008) have listed papers which have referred to pressures and incentives for sustainable supply chains, starting from the one with most references:

1. Legal demands and regulation
2. Customer demands
3. Response to stakeholders
4. Competitive advantage
5. Environmental and social pressure groups
6. Reputation loss

"Continuity" is on the second, structure level (figure 5) of supply chain indicating one of the key factors in SSCM, that is good and shared benefits of the relationships. One of the best ways to evolve relationship trust, common goals and continuity is to create long-term relationships with central partners. A fundamental aim of a continuity of supply-base is to assure that all the chain members not only stay in business but also strive them to develop, reinvest, innovate and grow. Common prosperity could be the best illustrator for the goal of supply-base goal. Inherent in this belief is that both suppliers' employees and communities where suppliers operate manage to develop. Hence, if the employees of a supplier are impoverished, or if that community's environment is pollution degraded, the supply-base continuity cannot exist. (Beske & Seuring 2014; Pagell, Wu & Wasserman 2010) In their research Pagell et al. (2010) identified basic practices observed from supply-base continuity:

- Decommodisation
- Traditional supplier development
- Reducing supplier risk
- Non-traditional supplier development
- Transparency

Closely related to continuity, "collaboration" is located at both the structure and process levels of the framework in figure 5. Collaboration includes both collaboration enhancers (organisational structure, IT infrastructure) as well as viewpoints to how collaboration is achieved in practice (regular meeting between organisations and departments). The fourth category in the framework, "risk management", is related to continuity, since by reducing the supplier base also the risks associated with individual suppliers diminish, though resulting in higher dependency on just a few suppliers. However, enhanced communication (collaboration) is beneficial practice to evaluate whether suppliers' actions are acceptable. Pagell and Wu (2009) state that proactive top management is required to build a sustainable supply chain. The fifth category "proactivity" therefore indicates the need for new technologies and methodologies to be able to walk this new path of sustainability. Therefore, these companies use tools to promote supply chain innovation. (Beske & Seuring 2014) The ultimate pro-active approach is named sustainable development management (Wognum et al. 2011).

Next sub-chapter will go in-depth to supplier sustainability management. Suppliers play a central role in supply chain management thus it is crucial to evaluate sustainability from their viewpoint.

2.2 Sustainable Supplier Management

A company is as sustainable as its supply chain is, thus as sustainable as its suppliers are (Krause et al. 2009). In current economy production processes are widespread around the globe bringing environmental and social burden during different production stages. Hence, one of the biggest challenges is that the boundary of responsibility spreads beyond the company's ownership and direct control (Gimenez & Tachizawa 2012). Focal companies are often held responsible for their suppliers' environmental and social performance forcing the companies to pay closer attention to their suppliers' actions. Accordingly, the focal company being pressured, it consistently passes the pressure on to suppliers. Progressively focal companies ask their suppliers to perform according to the environmental and social standards, by implementing documentation of management system for environmental (ISO 14001) and social (SA 8000) concerns. (Seuring & Müller 2008) Suppliers that are conscious of environmental and social issues of their operations can offer the buying organisations higher efficiency, less supply disruptions and protection to the image of the organisation (Krause et al. 2009).

Supplier sustainability risk management is becoming a central supply chain design and stragey element (Markman & Krause 2016). Damaged by their suppliers' suspicious practices regarding sustainability issues, organisations call for supplier sustainability risk management strategies. Hajmohammad and Vachon (2016) discovered four different sustainability risk management of suppliers: avoidance of risk, risk mitigation monitoring, mitigation of collaboration-based risk and acceptance of risk (figure 6). The framework presented in figure 6 is focused on the actions by purchasing and supply management, thus excluding broad policies of a corporate. Likewise, the framework only considers the interaction with suppliers. (Hajmohammad & Vachon 2016)

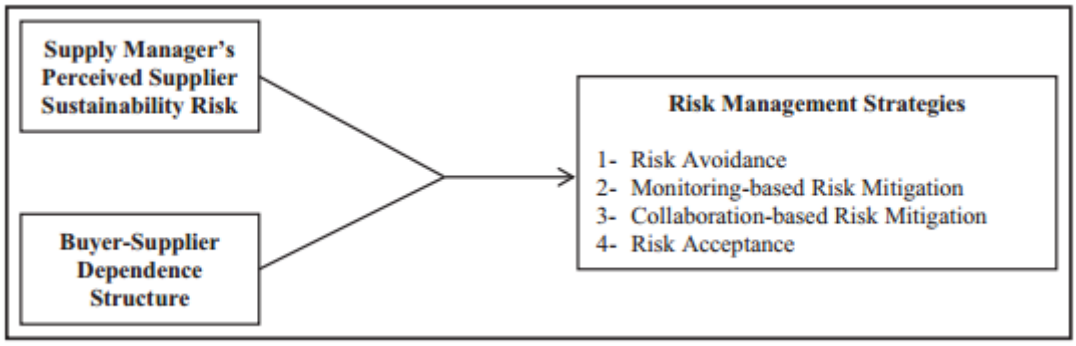

Figure 6. *Managing Supplier Sustainability Risks by Hajmohammad and Vachon (2016)*

The cumulative risk lever of supplier that is perceived by supply managers act as one predictor of choice within the risk management strategies in figure 6. Another predictor of the chosen risk management strategy is the dependence establishment of the buyer-supplier relationship because it indicates the buyer power in strategy implementation. As a key outcome of their study is the delineation of collaboration-based and monitoring-based strategies of mitigation. Substantially, for contexts characterised as interdependence of buyer-supplier or high realised risk context connected with a buyer dominance, the collaboration-based mitigation strategy is more appropriate. Contrary, only a specific context of buyer dominance with low risk perception the monitoring-based mitigation is appropriate. Furthermore, buyer-supplier independence context and a high level or risk perception were linked with risk avoidance. (Hajmohammad & Vanchon 2016)

Attractiveness of a buying company plays an important role in risk management as well. When a buying company is attractive to the supplier, the supplier is more likely to comply the needs of the buyer such as sustainability requirements. Adaptations, such as dissemination of technological know-how, trainings and developing evaluation methods for suppliers, made by the buying organisations are enhancers of its attractiveness. Essential elements linking to attractiveness are mutual communication and goal setting. (Makkonen, Vuori & Puranen 2016)

Partners of the supply chain must coordinate and share information to be competitive (Trienekens et al. 2012). Power asymmetries determine the strengths of buyer or seller. Strength of the buyer enables commanding its suppliers how to conduct business, hence forcing them to improve their business sustainability efforts. Working with actors on whom the companies can either dictate social responsibility efforts or collaborate with to enhance

social responsibility is a must. (Eriksson & Svensson 2015) The buyer attractiveness perceptions compared to other potential customers that cause specific supplier action may help managers to recognize motives and interest, or lack of those, of a supplier when developing and investing the focal relationship (Makkonen et al. 2016).

Significant for responsibility within the supply chain is shifting from arm's-length relationships with suppliers to partnerships while also reducing the tiers. Since it is more likely to multi-tiered supply chain to have sub-suppliers in low-cost countries, the fewer the tiers the better. (Eriksson & Svensson 2015) Acquiring the most benefit from sustainable supplier management organisations are required to incorporate all the upstream supply chain members. (Zimmer, Fröhling & Schultmann 2016) The preferred customer status of a buying firm with supplier more likely allows the supplier to be included in joint projects, such as new product development. Today, the supplier collaboration is fundamental for innovation and long-term sustainability of a firm. (Schiele & Vos 2015)

Similarly, Gimenez and Tachizawa (2012) disclose in their study that implementation of assessment and collaboration with suppliers is effective when extending sustainable practices to suppliers. Nevertheless, they state that assessment implementation is not enough but companies must employ collaborative practices to truly improve supplier sustainability. A focal firm striving to implement sustainable practices must have sufficient resources to initiative development. Their study recognized two types of enablers: internal and external. Internal enablers of sustainable practices are such as the company's commitment to environment, support by senior management and the resource availability. External enablers are such as trust and accuracy objectives in the relationship of buyer-supplier. Their predominant implication is that a clear sustainability statement is not enough. Broadening the sustainability along the supply network companies must dedicate the resources and management support required, develop the purchasing staff's supply management capacities and select the relevant measurement systems for performance.

Widening the scope beyond the supplier to the sub-supplier, a study by Grimm, Hofstetter and Sarkis (2014) recognize 14 critical success factors (CFS) for the sub-supplier management to safeguard their compliance with sustainability standards of the company in food supply chains. Figure 7 provides distinction of those factors. Compared with the focal firm and supplier interaction, there are similar elements when striving to be successfully sustainable. For example, trust, buyer-power, long-term relationship and supplier involvement are common factors. While internal critical success factors can be influenced straight by the

focal firm, other CFSs are not as simply apparent, such as trust between supplier and sub-supplier. A focal firm should acknowledge the importance of those CFSs for the sub-supplier management efficiency while interacting with suppliers and sub-suppliers. It is indeed important for organisations to incorporate sub-supplier management 'feasibility assessment' into early stages such as segmenting and selecting suppliers to spread sustainability standards in their supply chains. Consequently, firms wishing for corporate sustainability standard compliance throughout the supply chain involving sub-supplier must take specific attention on the CSF. The possibility of issues such as food safety, social and environmental misbehaviours pressure firms for supply chain traceability, and challenges of traceability are especially linked to sub-suppliers. (Grimm et al. 2014)

Identified critical factors	
CSF1	Trust between focal firm and direct supplier
CSF2	Trust between direct supplier and sub-supplier
CSF3	Focal firm's buyer-power (over direct supplier)
CSF4	Direct supplier's buyer-power (over sub-supplier)
CSF5	Committed long-term relationship between direct supplier and sub-supplier
CSF6	Supply-know-how of focal firm
CSF7	Direct supplier's willingness to disclose sub-suppliers
CSF8	Involvement of direct supplier
CSF9	Perceived value for direct supplier
CFS10	Perceived value for sub-supplier
CSF11	Low risk of supplier-by-passing
CSF12	Sub-supplier's capability to comply with requested sustainability standards
CSF13	Geographical distance between supply-chain-partners
CSF14	Cultural distance between supply-chain-partners

Figure 7. *Critical success factors for the sub-supplier management (Grimm et al. 2014)*

The following two chapters reveal the prevalent distinction of social and environmental sustainability. Both dimensions are equally important when striving to be sustainable so closer insight to the concepts is relevant here.

2.3 Social Aspect of Sustainability

The ethical, or social, aspect of sustainability usually refers to corporate social responsibility (CSR) (Closs et al. 2011). The essence of CSR concept lies in the idea that the business

sector should play a non-economic role beyond producing goods and making profits in society or even beyond the interests of a firm and actions required by law (Málovics, Csigéné & Kraus 2008; McWilliams & Siegel 2001). CSR action examples of going beyond legal requirements include such as adopting progressive human resource management programs, promoting non-animal testing procedures, recycling, diminishing pollution, local business support and representing socially sustainable product attributes. However, the various conflicting goals and objectives demanded by multiple stakeholders have led to the unclear definition of CSR. (McWilliams & Siegel 2001).

CSR has attributes of ecological dimension as well, while 'social sustainability' is more about purely social aspects. Still, the definition is not as straightforward, as many researchers have contributed to the term. While some work of social sustainability is precisely concentrated on meeting the basic needs, and focusing on 'underdevelopment', others are interested in changing the harmful behaviour of the world's wealthy and the improvement of more powerful ethics of environment. Additionally, some scholars see social sustainability as a way of maintaining or preserving certain ways of living or securing socio-cultural conditions. (Vallance et al. 2011) Poverty, injustice, human rights and employees' health and safety are concerned within societal equity dimension of sustainability too (Krause et al. 2009). Furthermore, consumers desire wide selection of affordable, fresh and processed food produced with minimal harm to the environment in addition of being safe (Wognumt et al. 2011).

Vallance et al. (2011) present their own threefold schema of social sustainability. It consists of a) "development sustainability" that addresses the basic needs, social capital creation, justice, equity et cetera; b) "bridge sustainability" regarding behaviour changes to attain biophysical environmental goals; c) "maintenance sustainability" indicating the preservation, or the ability to sustain, of socio-cultural attributes in the changing environment. (Vallance et al. 2011) Murphy (2012) presents four overarching social concepts linking them to environmental compulsories; public awareness, equity, participation and social cohesion. Stronger links with the environmental pillar are needed to further strengthen the concept, and this idea has its roots in an understanding of sustainable development as a interpillar linkages requiring concept. (Murphy 2012) Eriksson and Svensson (2015) list elements such as collaboration, transparency, holistic supply chain view, cultural differences and geographical length as issues affecting social responsibility within supply chain, and Closs et al. (2011) found three dimensions that ethical sustainability dimensions can be categorised to, based

on the examined research: “employee relations, community involvement and business management practices”.

When a company desires to establish a socially sustainable supply chain, the first step is to evaluate the company in terms of social impacts. Figure 8 illustrates the company and stakeholder interaction. (Hutchins & Sutherland 2008)

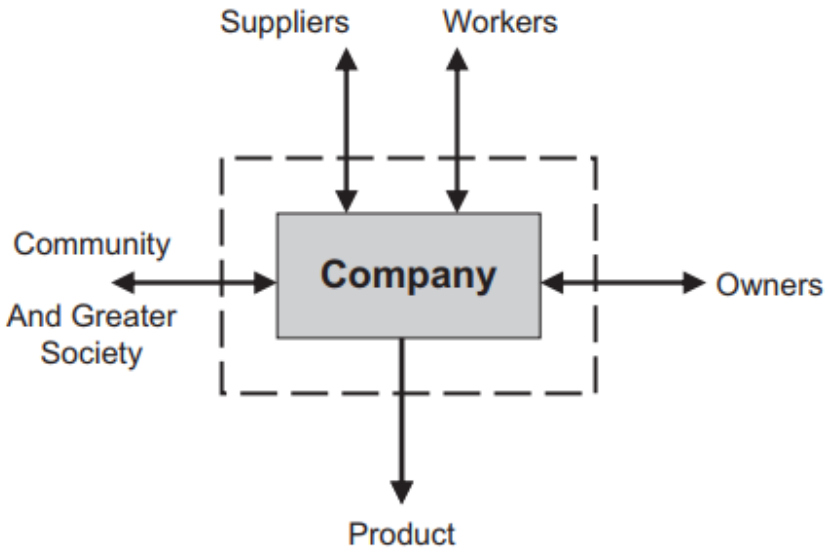

***Figure 8**. Synergy between a company and its stakeholders (Hutchins & Sutherland 2008)*

In addition to the basic exchange of labour, money and goods between companies and its stakeholders there is also opportunities for every stakeholder to guide the values of the companies. Similarly, the company has a role in shaping the values of the stakeholders. For example, a large company requiring a definite level of social responsibility from its supplier may increase incentives for other industrial sector members to acquire this level of social responsibility in order to compete. One example of positively affecting its employees a company can provide healthcare, childcare and education. (Hutchins & Sutherland 2008)

Situated at the ‘bottom of the pyramid’ (BOP), the local communities are often the target beneficiaries of a company’s CSR activities (Singh, Bakshi & Mishra 2015). It is in both developed and developing countries where poverty and under-development appear as barriers to ensuring better social and bio-physical environmental consequence. Thus, social sustainability incorporates concerns for variety of issues from basic requirements of water, food and medication to requirements for education, employment justice and equity. (Vallance et al. 2011) Multicultural societies and international supply networks have brought

cultural diversity to reality. Speaking of the local communities the companies do business in, cultural diversity needs companies to value the diversity and preserve the various cultures of the earth. However, progress in societal and cultural issues on mostly lacking within companies compared to environmental and economic issues. (Krause et al. 2009)

Ultimately, the interconnections among society, the environment and economic development are intrinsic to the sustainability concept. Sustainable development achievement in both industrialized and developing countries requires characterisation of the connections and interactions between these three dimensions of sustainability. The balance among these dimensions or pillars of sustainability is only achieved with a sufficient understanding of how societal and economic actions influence the environment of how the decisions made today impact the generations of the future. (Hutchins & Sutherland 2008; see also Murphy 2012)

2.4 Environmental Aspect of Sustainability

As long as the human history, the atmosphere of the planet has been the ground for dumping of all types of gases. Though the capacity is large, and when there were only few of those who dump there was no problem, but now there are more than seven billion people. In this situation, the atmospheric dump is overloaded by human activities and the climate has started to change. Forecasted by the United Nations there will be 10,5 billion people by 2100, the question lies in collective decision of what to do about it. (Richter 2010) Therefore, being responsible for generations of the future by sustaining a particular level of natural resources, thereby providing human society's necessities can be summarized as ecological aspect of sustainability (Málovics et al. 2008). The situation underlies the importance of the environmental protective actions.

Environmental dimension of sustainability introduces the natural resource preservation, minimisation of waste and emission reduction (Krause et al. 2009). Product quality dimension can be considered as environmental impact, just as technical products traits, pricing, or products and raw materials social circumstances (Wognum et al. 2011). Closs et al. (2011) grouped environmental sustainability practices into three categories: conservation, usage reduction and business practices. Conservation category includes energy, water and nature whereas usage reduction is about waste/recycling, greenhouse gases and end of life management. Business practices imply packaging, construction of facility and sustainable sourcing. (Closs et al. 2011)

One term that arise from the environmental aspect of sustainability is called green supply-chain management (GrSCM). The term is increasingly gaining interest between practitioners and researchers of supply chain management. Green SCM has also raised the industries' interests toward critical factors and performance indicators to green their supply chains. GrSCM is a contemporary approach to obtain efficiency, corporate profit, market share and brand image. (Srivastava 2007; Sharma, Chandna & Bhardwaj 2017) Figure 9 by Sharma et al. 2017 illustrates the idea of green supply chain management.

Figure 9. *Green Supply Chain Management (Sharma et al. 2017)*

The escalating environmental deterioration, such as raw material resource scarcity and increased pollution, and limiting the environmental damage has led to growing importance of GrSCM. Accurately, GrSCM addresses the relationship and influence between the natural environment and supply chain management, while also desires to limit wastes within production and to save energy. The actions of GrSCM vary from reactive monitoring to more proactive practices incorporated through variety of Rs, such as 'reduce', 'recycle', 're-use', 'rework' and 'remanufacture'. Additionally, the main activities of GrSCM are green design, green manufacturing, green transportation, green purchasing and reverse logistics. (Srivastava 2007; Sharma, Chandna & Bhardwaj 2017)

Another tool to support environmental sustainability is a life cycle assessment (LCA) that can give product or service impact information. Life stages, such as raw material extraction, processing of materials, manufacturing, distribution, use and options of disposal (recycling) are considered in LCA. While achievement of sustainability demands an inclusive view of the total lifecycle impacts, LCA is increasingly seen as an effective tool for ecological impact determination. The ISO 14000 series offers a standardised method for assessing the product's or service's life cycle environmental impacts. Environmental LCA emphasizes the

physical substance flow and change chemically, such as ozone depletion or formation of smog. (Hutchins & Sutherland 2008; Srivastava 2007)

In the environmental aspect of supply chain management logistics play a central role. Transportation is the most essential element of a supply chain and is a serious threat to the environment via gaseous emissions. Moreover, the location and layout of warehouses, ports and other facilities also pose a threat to environmental sustainability through implications on the transportation emissions. (Singh & Trivedi 2016) Within the boundaries of an individual firm technical systems (ISO) are offered to monitor and control environmental effects and technical product quality. Since the environmental impacts are caused by supply chains instead of single, isolated business units, the monitoring and controlling of those impacts is difficult. (Wognum et al. 2011)

A broader perspective of sustainability is a must for organisations today. Traditional environmental and ethical sustainability dimensions surely are important, but adding the understating of educational and economic dimensions is important as well for long-term viability of a firm. Benefits of an effective global sustainable strategies include increased profits through global waste and cost reduction, people and their community enhancement via acceptable working conditions and regulation compliance and ensuring the long-term viability by minimising the dependence on scarce environmental resources. (Closs et al. 2011) Furthermore, the sustainability achievement demands more than CSR and eco-efficiency; the active participation and cooperation of businesses, governments and citizens to define sustainable consumption as a society's common goals and to reach compromise on its conditions is required (Málovics et al. 2008).

To continue the discussion from the beginning of the chapter two, starving people and firms that are struggling cannot put environmental sustainability before societal or economic sustainability actions. However, extinction is forever and the sustainability leadership must come from affluent people and successful companies. If population overgrowth and overconsumption are not stopped by humans, it will be ended by nature. (Markman & Krause 2011) The following chapter will review the sustainability and transparency from the food industry context.

3 TRANSPARENCY AS A KEY PREREQUISITE FOR SUSTAINABLE SUPPLY CHAINS OF FOOD INDUSTRY

The increase in transparency is not anymore only about democracy, participation and the right-to-know of a small group of green citizens and consumers on a few niche products in a minority of developed countries. Rather, transparency is about powerful actors in leading global markets and the majority of products, critical economic consequences and profits, and finally surveillance. (Mol 2015) The economic impacts from foodborne diseases (salmonella et cetera) and food fraud must be considered by all food companies around the world while also consider the consumer interest changes in safe, high quality and sustainable food products to keep or increase market share and consumer trust (Ringsberg 2015). The third chapter explains transparency and how it is acknowledged in the sustainable supply chains of food industry. Figure 10 illustrates a typical supply chain of food industry (Wognum et al. 2011).

Figure 10. *A Food Supply Chain Process (Wognum et al. 2011)*

3.1 The Transparency Concept

“Transparency in business practice is crucial for sustainability”, is the fourth of the defining features of corporate sustainability. Companies willing to be committed to sustainability, it is imperative to report to stakeholders in a transparent and public fashion. (United Nations Global Compact 2014). In the transparency context information relies on honesty of products, processes and resources and means that the products, processes and resources need to match with the predefined specifications. The honesty of products is for instance when one assumes to eat an organic, labelled organic, food product it must have been produced by the rules of organic food production. Likewise, a company must have a proper documentation that the product is produced in the way they claim it is. In all situations, the information must reflect truly the reality of the object. (Trienekens et al. 2012)

Mol (2015) presents four types of transparency in value chains. *Management transparency* refers to information disclosure from upstream economic actors to downstream economic

actors in supply chains. *Regulatory transparency* expresses the need for information from economic actors of the chain to the regulatory and inspection bodies, and takes form of such as EU tracking and tracing system. Third transparency type is *consumer transparency* that reveals information about production and products that claim to be sustainably produced through public or private certification and labelling, such as eco-labels. Lastly the transparency can take a form of *public transparency,* where sustainability attributes of the product or processes are made public and additionally, certification and labels are examined by public media and non-governmental organisations in addition to consumers and citizens. (Mol 2015) Furthermore, associated with supply-base continuity, the flows of money in the chain must be transparent. Detailed information on the paid amounts to individual chain members provides the focal firm with chain-wide information of how suppliers (such as farmers in food supply chains) were paid, and to ensure suppliers earn a fair price to make a reasonable living. (Pagell et al. 2010)

Improving transparency can happen both vertically by coordinating across a supply chain and horizontally by coordinating across networks. Companies that are linked vertically in a supply chain collaborate to place products on a market (Trienekens 2012). An industry coalition, for instance, adopting common auditing procedures can grant a single, powerful supplier sustainability audit to be executed increasing supplier sustainability and transparency. At the same time, the procedure can lower transaction costs for both the supplier and the many buying organisations that might be in business together with that supplier. (Carter & Rogers 2008) The next sub-chapter underlines the standardisation and provides transparency tools.

3.2 Certification and Labels as Transparency Tools

The 21st century has remarkably increased the consumer market segmentation and due to information and production technological advances enables the consumer market to be connected with producers of agriculture. The connection enables producers to supply specific product attributes as requested by the specific end-use market. Generally, the special attributes of products could be linked with features such as volume, timing, texture or products not containing genetically modified organisms (GMO) or pesticides. Thus, ensuring that these attributes are true and fulfilled there must be a way to prove this. Since verifying characteristics of the production process is difficult ex post, a regulatory or voluntary code is fundamental to provide the affirmation. (Wall, Weersink & Swanton 2001)

Most visibly transparency in value chains takes a form of sustainability labelling and certification. The past two decades have introduced the emergence of labels and certifications; regulatory based and enforced as well as privately regulated and pressured certifications and labels exists. (Mol 2015) In the EU it is mandatory to label the food products. In addition to enable tracing the product origin, labels offer affirmation of intra-chain quality between supply chain actor transactions. If a supply chain wishes to differentiate itself from others it may use food labels as an information instrument for instance of specific quality brand. (Wognum et al. 2011) Usefulness of a certification is straight related to the traceability scheme adoption that are proficient of rising and guaranteeing the supply chain transparency. Hence, traceability plays a vital role representing an integral tool for certification adoption. (Stranieri et al. 2017) Certification scheme's key is the ability to trace back the sustainability claims of the final product to initial production origin (Mol & Oosterveer 2015).

To ensure simple and effective exchanges between and among organisations and individuals, standardisation is essential. Standard associations, such as ISO (International Organisation for Standardisation) have promoted the establishment of standards. ISO is established in 1946/47 and is a non-profit, voluntary, industrial or business association whose main purpose is to strengthen and assist the international exchange and transfer of goods and services reinforcing economic, technological and scientific activity around the world. The most universally known ISO effort is ISO 9000 that is a series of guidelines and standards for quality management designed to concentrate on customer requirement fulfilling. Compared to ISO 9000, the key concern of ISO 1400 is on the impacts on environment an organisation has when conducting its business. (Wall et al. 2001)

The standardized private codes such as ISO 14000 are characterised by the signatory firms' voluntary agreement to accept a given set of principles of environmental management that are supervised by an outside actor. (Wall et al. 2001) SA8000 (Social Accountability) is an example of a social standard with a purpose of promoting worker's labour rights around the world. The requirements of SA8000 if aligned on the same ethical requirements along the entire supply chain often leads to a firmer collaboration of the certified company with its suppliers. Other benefits include such as deeper knowledge of the supply chain, information asymmetry reduction, increase in productivity, decrease in work accidents, market expansion, employee enthusiasm and improved stakeholder relationships. Likewise, impediments contain such as internal expertise shortage (when getting the certification), data management complexity and delivery time increase (when managing the certification), high costs

and difficulty of local law interpretation (when getting and managing the certification). (Sartor et al. 2016)

Fairtrade Label Organisations International have developed fair trade – labelled products providing ethically harmless products for conscious industrialised world's consumers, while participating in intense vertical and horizontal interaction within the supply chain and the organisation of labelling. The fair trade -labelled products use three of what Trienekens (2011) refers to as 'upgrading options of supply chains'. These options include 1) value added production upgrade: through differentiation and innovation of products, processes and marketing activities 2) upgrading of value chain-network: right market and market channel selection and participation and 3) governance form uprgrade: selecting the right form of organisation with horizontal and vertical partners in value chains. (Gold et al. 2016; Trienekens 2011)

In the case of coffee, certifications are required of all members in farmers' organisations by Fairtrade, thus having the highest ratio of standard-compliant coffee versus with certification sold coffee. Cooperatives in the coffee industry examine their harvest size, number of members, quality of coffee and human resources, when selecting the certification they will pursue. While there is complain about the consumer confusion that the certification increase cause, the variety of certifications enables cooperatives to find a certification for their market niche. Compliance with certification is facilitated by well-enforced governmental regulation of environmental and social laws. Incentives for farmers and cooperatives to attempt certifications are such as financial incentives and improved record-keeping and management in the cooperative. In the case of distributing certification, the absence of transparency favours the buyer. (Snider, Gutiérrez, Sibelet & Faure 2017)

The above-mentioned certifications and labels are just few of the many, but offer insight what standardisation is about and how it enables transparency in the supply chains. The following chapter discusses the transparency in the context of food industry and provides some strategies to transparency enhancement.

3.3 Transparency in the Food Industry

Companies in agri-food and agri-business are under economic, environmental and social pressure. Dangers such as losing of bio-diversity by modifying genetic codes leading to

epidemic hazards, degradation of agricultural land and exhaustive use of anti-biotic medicine in chicken and pork supply resulting in the increased resistance of bacteria to these drugs while also endangering humans are serious issues for food industry to consider. (Wognum et al. 2011) The exchange of information about product, process and resource characteristics between food supply chain stakeholders to comply with governmental and consumer demands is outstandingly important. Transparency of the food supply chain is reached only through information exchange and visibility of the origin and history of the product. In the end, the entire food supply chain, not only the food safety and high-quality products, is a responsibility of a single firm since “a supply chain is as strong as its weakest member”. (Trienekens et al. 2012)

Trienekens et al. (2012) propose a framework for analysis of transparency (figure 11).

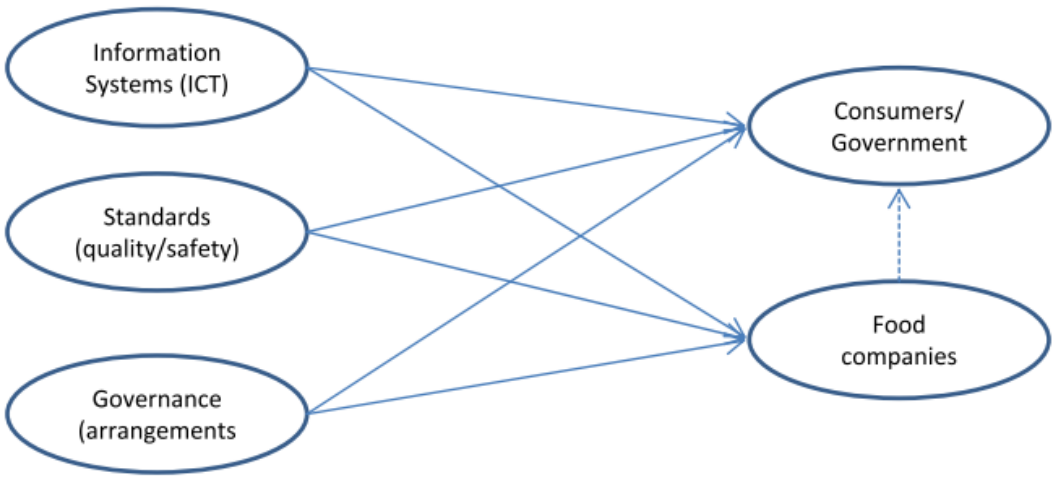

***Figure 11**. "Framework for transparency analysis" (Trienekens et al. 2012)*

In their framework Trienekens et al. (2012) address two key claimants of transparency, consumers/government and food companies, of which food companies not only aim for consumer and government demand compliance but also for optimisation of processes and additionally for branding of their transparent products. Information systems, standards (quality/safety) and governance (organisational arrangements) are transparency enablers and through the enablers food companies are responsible for transparency delivery. Furthermore, the companies are the transparency messengers of information also considering other companies in the supply chain with whom they cooperate. Intensifying the use of e-

information processing is a must while internet can promote the information exchange between supply chain actors inexpensively. Various electronic devices can ease the tracing while also creating transparency on the product's physical routes. (Trienekens et al. 2012; Wognum et al. 2011)

The motivation of the industry towards transparency has four aspects. First, complying with varying requirements of customers while also complying with legislative demands is a must for companies. Second, in a case of an incident, companies are obligated and want to be able to rapidly take the product off the markets and minimise the costs and consequences. Third, the improvement of information exchange within different actors will optimise business processes and the delivery of product and process features. Fourth aspect is that by paying attention to labelling products by different food attributes. Integrated and transparent information systems enable organisations to enhance their image by proving that products meet the specific quality requirements. (Trienekens et al. 2012) Additionally, improving co-operation between supply chain partners and companies and government is enhanced by information exchange, since opportunistic behaviour can shrink because of that. Information exchange can also help overcome technical rigidities through co-innovation. (Wognum et al. 2011)

Imbalance between delivered quality and expected quality by the recipient can still be found in most food supply chains and appropriately, leads to unhappy consumers and value losses caused by not being able to sell the products at the best price possible. The breeding stage already is the starting point for quality differentiation depending on growth circumstances of animals and plants, and thereafter how the logistics, storage and processes of the product are handled. Differentiated quality information must be collected and exchanged to better capture value from the variety of product diversity. Thus, the requirements for information exchange are critical. History of products and variation of quality are examples of detailed registration of process, resource and product attributes to enable transparent exchange of information. Product information concerns such as residue information (pesticides and hormones). (Trienekens et al. 2012)

Bastian and Zentes (2013) propose strategies to achieve transparent supply chain by which they study reduction of complexity in supply chain and supply chain complexity handling. For the reduction of complexity in agri-food supply chain a primary instrument is to build lean supply chains with few tiers. With few tiers, also the number of transactional intermediaries is low, resulting in less complex supply chains. As a result, transparency is improved

and complexity is reduced when supply chain tiers and supply chain members are reduced. Secondly, the degree of voluntary standardisation and controlling concerning ethical or qualitative obligations of the focal company in value chains is referred as formalisation. For structuring attributes and improving the goal achievement review formalisation offers a valuable tool and thus can lower and help dealing with complexity. Thirdly, third-party integration, such as independent organisations offering information regarding specific area, can help in complexity reduction and credibility increase. Lastly, for handling complexity in supply chains supply chain communication offers another instrument. Deep insights into the processes are offered by informal meetings and social contacts between suppliers and customers and plays a critical role in collaborative relationships. (Bastian & Zentes 2013)

Likewise, traceability plays a central role in transparency improvement. Traceability of food has become an essential global economic and legal issue. Companies and authorities operating in food supply chains have recognized the need for food traceability confirmation for a noticeable time to diminishing the food safety disruption impacts (Ringsberg 2014). Linking internal logistics and business, quality and safety control recordkeeping systems are involved in food traceability. Furthermore, these systems should be connected to business partners or regulatory bodies' logistics and recordkeeping systems. To meet traceability requirements for food standardized information sharing techniques has been addressed by improved exchange of data and communication in food supply chains. Within food supply chains interoperable systems for management and regulatory control are the way to achieve food traceability requirements for quality, safety and sustainability for food. (Ringsberg 2015)

Mol and Oosterveer (2015) distinguish four ideal types of traceability, where quality information of products and processes is traced for various target groups in value chains and networks. Figure 12 illustrates the idea of different traceability types and their target groups.

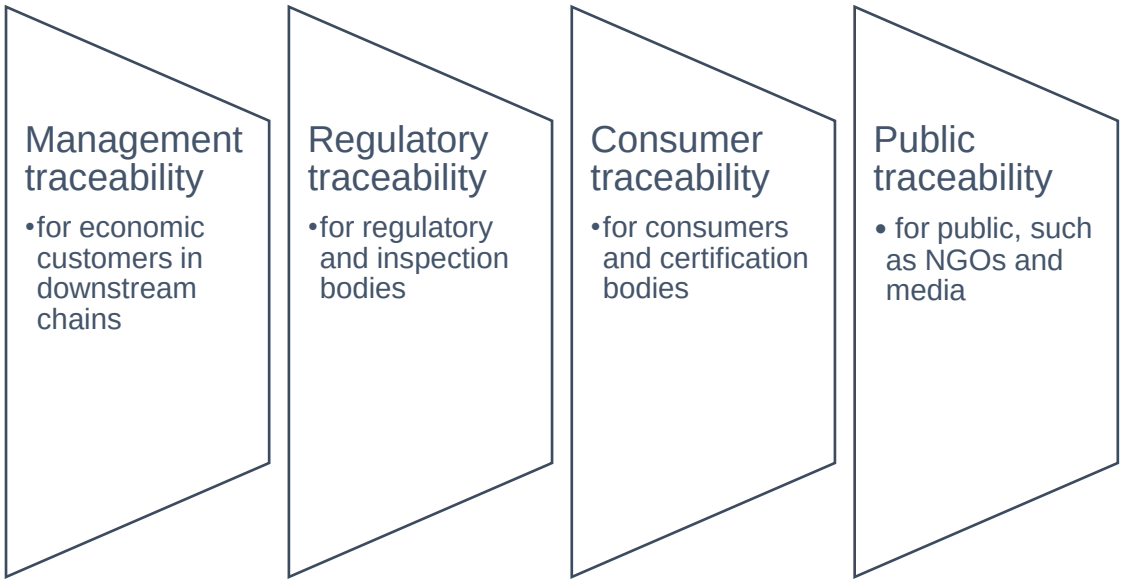

***Figure 12**. Four ideal traceability types (Mol & Oosterveer 2015)*

Management traceability refers to logistics, total quality management of chains and products and product verification specifications and focus on product quality. Regulatory traceability concerns public authorities'' legal and policy requirements such as EU tracking and tracing policies and focus on food safety and quality of the products. Consumer traceability refers to public or private labelling and certification and is meant to track and validate information along the consumer, public and certification body value chains. Green, organic and fair-trade claims must be verified and trusted via traceability systems and can be labelled as traceability for consumers. Public traceability requires traceable information on the production process and characteristics of product sustainability to protect the chain actors' reputational capital and to acquire public domain competitive advantage. Tracing and tracking of sustainability involving both product and production process information is more common in consumer and public traceability types and less in regulatory and management ones. (Mol & Oosterveer 2015)

In the study by Ringsberg (2015) global traceability standard (GTS) is suggested to ease interoperability in food supply chains, and thus generates opportunities for firms based on the food traceability requirement fulfilment efficiency. The implementation of GTS motivated improved communication by reduction of the risk of dishonest product mislabelling, because a GTS involves information presentation guidelines on transport units and consumer packages. GTS may be helpful in meeting legal and consumer requirements for food traceability. In the study, the prime incentive for firms to implement GTS is to fulfil legal requirements

for food traceability. (Ringsberg 2015) The following chapter continues the examination of information systems and technologies as a central part of transparent and sustainable supply chain.

3.4 Information Technologies as Transparency and Sustainability Enhancers

Addressed in figure 11, information systems (IS) are transparency enablers. Pursuing the integration of sustainable practices into the supply chain organisations demand a great amount of information from their partners. Information systems and technologies are the 'backbone' for sustainable supply chain management and nevertheless, majority of companies hardly know the potential environmental and social impacts of their networks of production. Likewise, the research of IT's effect on sustainable supply chain management is limited. Information systems have become central sources for accurate and reliable information to support decision making and management of information flow. (de Camargo Fiorini & Jabbour 2017; Thöni & Tjoa 2017) To act quickly and disclose the responsibility chains, mostly the aggregated real-time information that is also adequate to give liable information would be expected (Schatten 2009).

Promoting sustainable development is only possible if organisations have a solid overview on the entire production process, beginning with the resources and covering lines and transport of the products, usage and final disposal and recycling. Transparent process is the only way to ensure energy, resource and emission control and optimisation in addition to accounting. (Schatten 2009) Information technologies (IT) influence sustainable supply chain management by various ways. Regarding the food traceability for example, the information management plays a central role. Food traceability information management requires exhaustive information from all food supply chain processes to ensure food safety (Ringsberg 2014). It is rather obvious that enhancing the transparency of the food industry is by means of ICT capability improvement and organisation information exchange and provision, particularly giving support to farmers to invest in individual identification and registration systems (Wognum et al. 2011).

In the research by Thöni and Tjoa (2017) multiple aspect of how IT can stimulate sustainability are presented. First, the different elements of the supply flow can be improved, such as transportation and enhanced coordination between companies. Second, different levels of supply chain management are supported by respective IT systems. This can particularly

appear in network planning or enabled B2B (business-to-business) e-commerce on a strategic and tactical level. The importance of data interchange is stressed on a monitoring and execution level. IT infrastructure can act as an enabler for improvements of sustainability on an overarching level. Third, IT may influence separate elements of sustainability. On social sustainability, the positive effects of IT are mostly combined with environmental improvements and argued either for the supplier or the consumer side. Fourth, IT effects can either be direct or indirect. In the first case, it is when carbon emissions or such environmental outcomes are mathematically optimised with the IT use, while in the latter case operational performance improvements are often then responses of suggested sustainability effects. (Thöni & Tjoa 2017)

Radio frequency identification (RFID) is one example of an IT tracking tool. RFID offers ways to automatically identify objects applying radio frequency signals (Björk et al. 2011). It is used for security and toll collection and has a central role in distribution and manufacturing. RFID can transform the information capturing and organising pattern during the manufacturing process. RFID tags on every product enables decentralising product information tracking instead of confiding on a central IT-infrastructure. RFID technology supporting vendor managed inventory considerably improve the benefits for the supplier and the retailer. Various key business advantages are offered by RFID-based systems such as capabilities to prevent theft and loss, inventory and cost reduction streamlining and reducing turnaround time and responsiveness. (Jain, Wadhwa & Deshmukh 2009) Tracking tools remarkably enhance the traceability of the products and naturally, promote the transparency.

The global problems recognition has forced the European Union and governments to introduce new regulations and guidelines and policies to production. Yet multiple monitoring capabilities are available or will be in place shortly. The EU has started a series of observation programs that have the potential to offer necessary information needed for a transparent supply chain, such as investigation of forests and fishery. Figure 13 is a simple illustration of how transparency increase empowers optimisation efforts and international regulations.

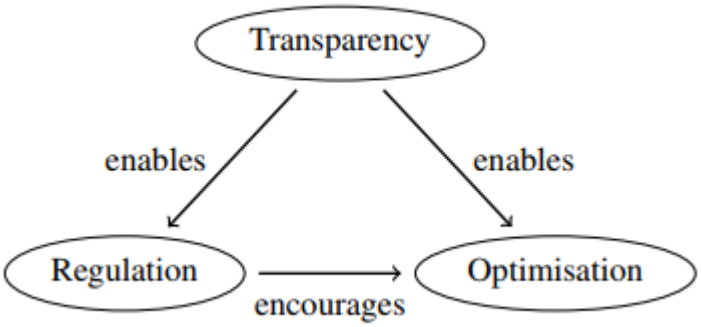

Figure 13. *"Transparency as a foundation for optimisation and regulation/certification efforts" (Schatten 2009)*

Controlling the processes inside the firm is a danger of improving only what 'we' have and should be avoided. Information exchange allows to broaden the scope and promote the whole supply chain and network. Technical solutions in transparency creation are not enough; increasing the added value by reducing administrative costs and other waste with share efforts, and finding ways to distribute it in an equal way to benefit all is crucial since supply chain actors are both connected to each other and depend on the same added value source. Ultimately increasing sustainability through increased transparency, legal, organisational and institutional changes are needed to offer new ways of cooperation and to bridge the gap of knowledge between producer and consumer. (Wognum et al. 2011)

4 SUSTAINABILITY OF SUPPLY CHAINS IN FOOD INDUSTRY – EMPIRICAL STUDY

After the literature review and theoretical background formation the empirical part is conducted. The empirical part of the study was conducted by interviewing six actors in food industry. The actors where from different tier-levels of supply chain and thus enables the examination of transparency. All the interviewees were from Finnish food industry. The chapter three discusses the research methodology, data collection and description of material and finally evaluates reliability and validity of the research.

4.1 Research methodology

In general, the research methodologies are twofold; quantitative or qualitative. Quantitative research is statistically oriented way of examining the world as a causal system that can be measured and modelled and remarkably forecasted based on different statistical analysis. On the other hand, qualitative research mainly aims at increasing the understanding of the companies' actions by itemising qualitative data. Ultimately qualitative research operates by itemising single cases, such as interviews or part of texts. Nevertheless, to ensure the academic research profundity and variety, both qualitative and quantitative methods are needed. (Koskinen, Alasuutari & Peltonen 2005, 16, 31; Kähkönen 2011) This research is qualitative and includes the idea of diversity of reality. Describing "real life" forms a basis for a qualitative research. The object of the research is described as comprehensive as possible and the goal is to reveal or find facts instead of proving already existing claims. (Hirsjärvi, Remes & Sajavaara 2004, 152)

Being one of the most common qualitative research methods, case study refers to a study of single or couple of cases which are carefully chosen. Usually in the case study there is only one case, but sometimes there can be multiple cases, as it is in this paper. The case is usually a company's process, function, department or a history. (Koskinen et al. 2005, 154) Furthermore, in examining the contemporary events when relevant behaviours cannot be manipulated, the case study is favoured (Yin 2009). Schramm (1971) defines the essence of a case study as "the central tendency among all types of case study, it tries to illuminate a decision or a set of decisions: why they were taken, how they were implemented, and with what result."

Especially useful for approaching various stages of supply chain, case studies enable straightforward field observation (Seuring 2008). The case study method used in the paper

is a scientific approach trying to acquaint theoretical concepts with reality. In the process of case research five critical steps can be identified. Figure 14 illustrates the process of a case study. (Stuart et al. 2002) Case design enables rich empirical data collection and thus reinforce the understanding of the researched phenomenon (Kähkönen 2011).

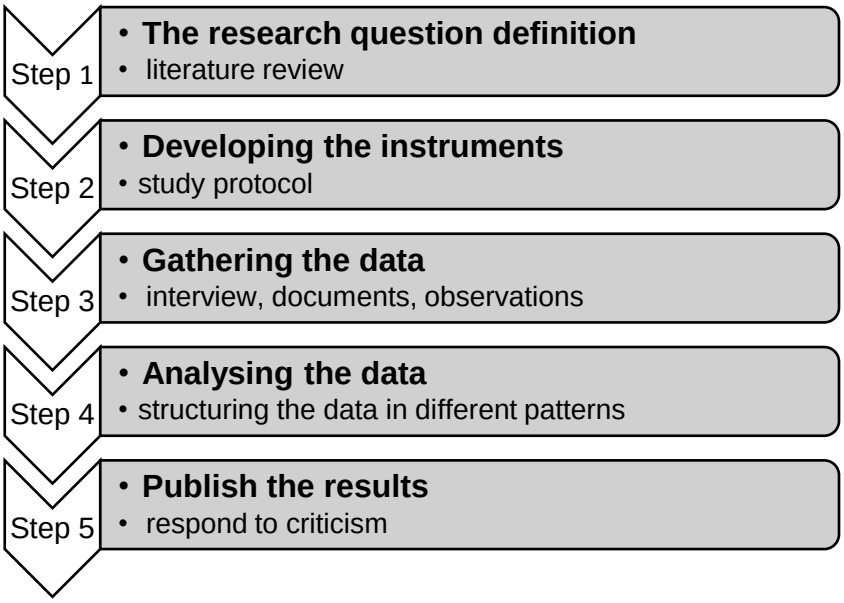

***Figure 14**. The Research Process (Stuart et al. 2002)*

Essential part of the research is a literature review. Creating the basis for the research, a literature review allows researcher to recognise the possible gaps for research and furthermore, illustrates the research question and research strategy. Thus, creating the knowledge base and theory development is invariably involved in step 1 in figure 14. (Kähkönen 2011; Stuart et al. 2002) After the research question definition the study protocol is established. The study protocol includes development of measurement instruments to the data capture for future analysis. The study protocol incorporates the key documentation necessary to provide the researchers with the needed focus, visit organisation and secure that the evidence trail is comprehensively documented. In step 3 in figure 14 the data gathered is usually the written and taped record of the interview, company's documents and the observations of the researcher. Fourth step is about seeing order from chaos and last step is disseminating the findings but also to address the criticism. (Stuart el al. 2002)

The aim of the research is formed in the research question '*How can companies ensure sustainability and transparency in the supply chains of food industry?'.* The sub-questions provide answers to how sustainability is recognised in the supply chains, how can supply

chain management increase transparency and how does transparency affect the sustainability of the supply chains and thus support the aim of the research. The case study was found most applicable given the nature and aspect of the research. Practical research, as the case study is, was the only appropriate choice to conduct this research. Eventually, as it is the last step in the research process illustrated in figure 14, the aim is to disseminate the findings and thus provide applicable suggestions and results.

4.2 Data collection and description of material

Interview is the main data collection method in this study. Moreover, interview is the most common way to collect data in qualitative research. Interview is an interaction of both parties where the aim is to find out what someone has in mind. (Eskola & Suoranta 2008, 85; Koskinen et al. 2005, 157) Adjusting data collection and flexibility required by the situation are essential benefits of the interview (Hirsjärvi et al. 2004, 194).

In general, there are three types of interviews: structured interview, semi-structured interview (also called as theme interview) and depth interview. Structured interview is commonly referred as 'survey interview', since the researcher has defined the questions, the order of the questions and usually the answer choices too. Semi-structured interview allows the interviewee more freedom than structured interview, allowing the interviewee to use own words for answers and changing the order as well. Additionally, the interviewee can even suggest new questions. Depth interview aims to minimise the effect of a researcher to the interview and in the perfect form the role of a researcher is to set some general topic of interest. Semi-structured, or theme interview, is clearly the most used qualitative data collection method. The efficiency builds on the fact that the researcher can guide the interview without a total control. (Koskinen et al. 2005) In this study the semi-structured interview is used.

The selection of the case and case companies in addition to number of cases, analysis units and the perspective for time for the research are essential in the case study (Kähkönen et al. 2011). In this study six actors from Finnish food industry were interviewed. The interviews were conducted by Lappeenranta University of Technology (LUT) researchers in spring 2016. The research case companies were selected by the LUT researchers. Two main themes in the interviews were 'sustainability realisation in food supply chains' and 'supplier selection and supplier relations'. All the interviewees were supply chain professionals, and companies' different positions in the industry allowed the examination of transparency

throughout the supply chain. The interview questions provided insight to a company's sustainability actions and thus contributed to the transparency examination as well. Table 2 lists the interviewees' companies and positions. The interview questions can be found from appendix 1.

Table 2. *Interviewees*

Company	*Position of the representative*
Case 1	Procurement professional
Case 2	Head of purchasing
Case 3a	Head of sales
Case 3b	Head of purchasing
Case 4	Head of procurement quality
Case 5	Head of procurement

Regardless of the beforehand formed questions, the interviews were flexible and allowed the interview to wander within the subject. The researchers guided the discussion whenever was needed to stay within the subject. The companies interviewed were from different tier-levels in supply chains and operate in the food industry. Case 1 and 3 represent manufacturers/supplier side in the food industry. Case company 3 had two interviewees from different position, thus they are separated as 'a' and 'b'. More precisely, case 1 represents a public procurement supplier. Case 2 and 4 are manufacturers/buyers and case 5 represents an end-customer side. Interview times varied from one hour to one and a half hour. Interviews were conducted face-to-face and recorded to enable the transcription of the interviews. Every interview was conducted by two or three researchers from LUT and they took place on different days. In total, there were 76 Word pages of transcribed material.

4.3 Reliability and validity

Reliability in qualitative research depends on the researcher itself and reliability evaluation must be done throughout the process. Continuously thinking the decision, the researcher makes is a must and hence the coverage of the analysis and reliability of the work is considered at the same time. (Eskola & Suoranta 2008, 208-210) Furthermore, reliability means that when studying the same person/case two times, the same result is given both times. Preparing the interview and the questions well beforehand and transcribing the interview as

quickly as possible after the interview are also critical to the reliability. (Hirsjärvi & Hurme 2001, 184-186) In the study of Kähkönen (2011) the reliability was increased by a case study database creation: the evidence received, the research stage process and the procedures and questions of the interview were all completely documented.

Construct validity, meaning that the measurements demonstrate the phenomena they are supposed to, and internal validity, meaning the validity of the relationships “B” whether the assumed relationships really exist opposing to outcome results from false relationships, are the primary concerns for case studies. To enhance construct validity, it is essential to describe the data collection sources and method, to create “a chain of evidence” and to have decisive informants revise the draft report. (Stuart et al. 2002) In the study of Kähkönen (2011) multiple evidence sources were used to increase the construct validity. Interviewed informants varied and several sources were used for data retrieval. Additionally, “investigator triangulation” was apparent since six researchers were interviewing and analysing the data. In addition, the chain of evidence reinforced the construct validity of the study since the research steps were well documented, and all the original documentation is accessible and thoroughly documented. (Kähkönen et al. 2011).

Evaluating the validity of the case study in this paper, multiple evidence sources were used, interviewed informants varied and there were multiple interviewers, thus validity can be seen good. Additionally, reliability is rather good since transcription was done as quickly as possible and the interview questions were well prepared beforehand, and the research process itself was carefully documented.

5 EMPIRICAL RESULTS

The fifth chapter presents the empirical results of the study. First, the case companies are shortly described and then the results are revealed. Results are presented within themes of sustainability in the food supply chains, supplier sustainability, supply chain transparency and future trends. Further discussion and conclusions are presented in chapter 6.

5.1 Case Companies

The data was collected from six interviews from different actors in business-to-business food industry in Finland. In this chapter, each company is presented shortly to better understand the case companies and their role in the Finnish food industry. The company names are kept anonymous and thus information revelation of the companies must be kept minimum.

Case company 1 operates in public procurement. Their product categories vary from energy and ICT to food and governance related large volume products. In this study only the food category is under examination. Case company 2 is a Finnish, international family-owned company in the food industry and their main product category is coffee. Case company 3 represents a purchasing solution provider in the HoReCa (hotel, restaurant, café) sector, and case company 1 is their biggest customer. Their mission is to provide the best quality logistics and supply solutions to their customers. Case company 3 had two representatives from different positions, and they are separated as 3a and 3b (see table 2). Case company 4 is a Finnish manufacturing food company and case company 5 represents a hotel chain's food and beverage section and thus is end-customer in the supply chain of food products. A typical value chain for food industries is illustrated in figure 15.

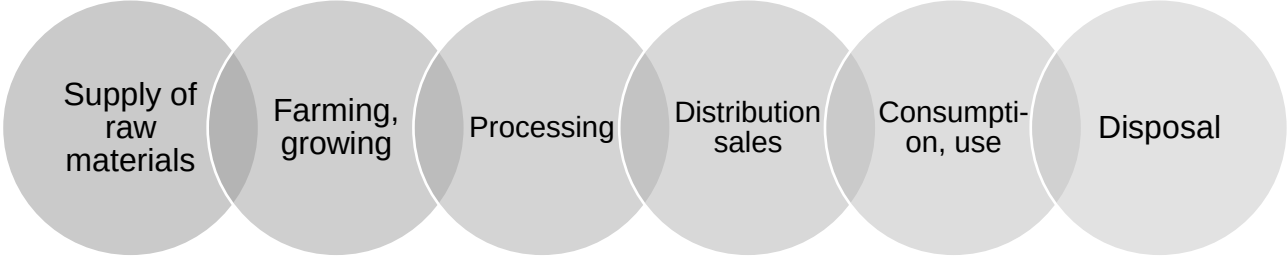

Figure 15. *Value Chain of Food Industry (Wognum et al. 2011)*

5.2 Sustainability in the Food Supply Chains

In the case of food industry, the central and most critical issue among all the interviewees is the food and product safety. The food safety is something that affects everyone, since problems in food safety cause severe issues such as food poisoning. Food safety has no room for compromising whatsoever. Table 3 combines the motivators, barriers and general practices for sustainability initiatives. The general practices refer to the practices the focal company uses to ensure sustainability in the food supply chain, not only from product perspective but rather from holistic perspective incorporating all the possible sustainability aspects. Supplier questionnaires are good examples of an industry-wide practice, that is found in every case company. Supplier questionnaires consider issues such as working conditions and wages in addition to the quality and ingredient standard revelation.

Motivators for sustainability practices within case companies vary from demands of industrial clients, non-governmental organisations, media, company's values, ensuring the business and minimising risks. Customer demands are important motivators as well, especially in the case of business-to-business customers, where also customers' customers' demands must be acknowledged. Thus, the company values are derived from customer expectations, as it is in the case of company 5.

The representative 3b emphasizes the importance of environmental protection in future, and ensuring human rights to the groups that otherwise might experience the lack of them. The case companies have differing emphasis regarding social and environmental sustainability, but as stated, the food safety is the most critical motivator for all. Likewise, the country of origin seems to have a critical role in food production and home country production is undoubtedly preferred. As the representative of the case company 5 declares, when discussing about food products, the question of whether a product is Finnish or foreign, the product from Finland is obviously preferred. Naturally this is product related, and the product quality and availability must not suffer from the country of origin preference.

"Our sustainability in procurement is divided in three: first, the most important is food safety, second is social responsibility and third is environment." Case 4

Table 3. *Motivators, Barriers and General Practices for Sustainability*

Company	*Motivators*	*Barriers*	*Practices*
Case 1	- Customers -Non-governmental organisations - Food safety	-Availability of products -Time -Price -Dishonesty of Suppliers	-Test-preparing food in the customers' premises -Incorporating nutritional experts into product selection -Finnish 'Heart association' -label -Supplier questionnaires
Case 2	-Climate change critical for coffee production - Company values - Food safety	-Time -Migrant workers -Price -Dishonesty of Suppliers	-Cooperation with producers -Development projects -Responsible sourcing -Supplier questionnaires
Case 3	-Corporate values - Food safety -Customers (e.g. Municipalities)	-Conflicting interests by customers (money et cetera) -Dishonesty of Suppliers -Time -Different work legislation	-Health inspections (Oiva) -Long-term relationships with producers -Key customer management -Supplier questionnaires
Case 4	-Food safety -Industrial clients -Non-governmental organisations -Media	-Dishonesty of Suppliers -Time -Lack of auditing competence	-Good communication and relationships with suppliers -Networking and cooperation within industry

			-Supplier questionnaires
Case 5	-Corporate values -Customers -Food safety	-Availability of products -Price	-Inspections regarding cold-chains et cetera -Supplier cooperation -Swan ecolabel -Supplier questionnaires

Barriers for incorporating sustainability practices are presented in table 3. One of the central issues that rise among case companies are the often-conflicting customer preferences. Customers might require sustainable products, but not all are ready to pay the premium of sustainably produced product, especially when the reason for higher prices is sometimes unknown. Those situations put companies in a difficult position. The representative 3a reveals a situation, where customer needs such product attributes that are not existing, thus impossible to supply. As an example, a customer demands certain size meatballs with certain amount of salt and other ingredients served from specific size packaging. This can lead to the situation where the whole tendering must be denied, because the product as it is exactly wanted does not exist.

The availability of products reflects the issues such as requirement for product attributes or the country of origin, and there is not enough production or security for production. In these situations, the company must consider the food safety and production security first, even though the customers might not get exactly the attributes they hoped for. One example presented by the case company 5 is when a customer wanted organic apples in the middle of Finnish winter and naturally there were no organic apple production anywhere near. The apples could have been imported from New-Zealand via Middle-European wholesaler to Finland and finally to the customer. However, as the representative states, the value of an organic product suffers remarkably, and questions the affordability of such decisions. This situation also addresses the environmental harms caused by the long transportation. These are complicated situations, and require good communication among the parties.

The representative 3b mentions that in case of auditing process, one can never tell one hundred percent that the circumstances are truly such as they are in the moment of auditing.

The factory might have hidden the child labour et cetera for the auditing. Additionally, as noticed by most case companies, there is not enough time to audit every single factory they supply from and the dishonesty of following the regulations is impossible to control. The representative of the case company 4 discloses the fact that the emphasis on the auditing process is on the food safety. Thus, issues such as sufficient payment for employees are not controlled. Additionally, the representative 4 admits that they do not have competence for in-depth responsibility auditing, that automatically represents a barrier for overall sustainability controlling. Similarly, the countries companies are supplying from might have different work legislation and issues such as migrant workers, who comes to the harvest only. The representative of the case company 4 state that the coffee production can consist of thousands of farmers, so the inspection of all these farmers is impossible. In those cases, it is difficult to decide whether to supply from them, if the legislation differs from the company's home country legislation. The issue arises in all the interviews as the biggest barrier; how can one ever know what is the true reality of production sites?

"The difficult part is that there is no way for forcing the information. Everyone can just say that 'this is the world now'. If we require too much, we might end up in a situation with no supplier." Case 4

Practices for engaging in sustainability are demonstrated in table 3. From a single product perspective, labelled products are a way to ensure sustainability. For example, case company 1 states that they have sustainable product selection with products such as organic labelled, Fairtrade and MSC-certified fish products. MSC-certified fish is used throughout the supply chain of case company 3 as well. The representative 3a of the case company 3 discloses their attempts to help customers to make responsible choices by providing information about sustainability issues on their websites. For instance, the case company 3 provides illustration of WWF's (world wildlife fund) list of acceptable products in their own selection. Marked as 'green' the products are favoured and marked as 'red' products are not included in their selection. In the food safety, Oiva-system offers certification for the producers if the food preparing circumstances are safe and hygienic enough. Thus, food poisoning risk is minimised. Likewise, in the case company 1 the Finnish 'Heart association' marks heart-healthy foods and thus helps the consumer to make better choices, considering their health. Case company 1 representative states that they utilised nutrition experts to adjust their product offering and to specify the nutritional facts of their products.

The representative of the case company 4 indicates the importance of networks and cooperation among buyers to enhance sustainability practices. It would eliminate duplicate work among companies and ease the sustainability inspections. Cooperation within networks was acknowledged by almost all the case companies as an important sustainable practices enhancer.

Case company 5 representative emphasizes the role of cold-chains and the compliance of those requirements, highly connected to the food safety security. The representative of the case company 5 also brings out the question of ease to use a product. All the vegetables et cetera are calculated by how much waste they generate. Fishes are measured by their degree of waste compared professional fish cutting versus non-professional kitchens' cutting. The representative 5 highlights the fact that not everything can be compared to the unit price, as issues such as waste generated by a certain food product has a remarkable role as well.

From the environmental aspect logistics and product materials play a central role. The representative of the case company 1 declares that they aim for logistics efficiency when only one vehicle delivers all the needed products. Additionally, packaging materials are examined, though the representative also admits that not every product can be examined because it is such a massive work. Thus, only the most obligatory requirements are fulfilled every time. Case 5 representative discloses their environment strategy including waste reduction and single package reduction. The swan ecolabel achieved by the case company 5 requires certain number of organic products, allows no single packages and requires monitoring of waste. Case representatives 3a and 3b state that they have environmentally certified logistics, optimised efficiency, reduce packaging waste and the newest eco-vehicles. Municipalities set requirements for the case company 3 to offer environmentally certified logistics. Representative of the case company 2 state their profound issue of climate change affecting their business.

"Coffee needs certain growing circumstances, and it is quite narrow area. If some factor changes there, it affects immediately the harvest. Scenarios such as raise of average temperature in Uganda can swipe off the whole harvest. Extreme weather conditions are a true risk for coffee harvest." Case 2

From the social aspect Wognum et al. (2011) states that consumers wish for a variety of choices in fresh and processed food in addition to concerns such as food safety. Case 1

states that they used in their planning process nutrition experts to advise them with food products' different nutritional facts. Working with municipal actors, their clientele consists of variety of institutions such as schools, kindergartens, churches and hospitals with varying needs. For the case company 1 it is therefore important to acknowledge the differing needs and additionally regulations considering for example school food. Similarly, the representative 3a reveals the need for responsible school food, while the parents want their children to eat healthy and responsibly produced food. That puts the immediate customers of the case company 3 in pressure, thus reflecting their requirements to the case company 3 itself.

Likewise, case 5 representative states the variety of choices, regarding allergies and preferences, must be available for consumers. That is sometimes a difficult task to offer something for everyone, while not every consumer wants to be vegetarian or avoid white bread for example. Here as well, the willingness to pay is an influencing matter. Social aspect of sustainability also includes, what the representative of the case company 1 discloses, is the work ergonomic. The unpacking of the trolleys must be considered so that no one hurts themselves. It is under work surveillance issue and is extremely relevant throughout the supply chain in all the case companies.

Additionally, important factors to take into consideration are issues of child labour, living wage requirements and slavery. All the case companies state that they have no tolerance against child labour whatsoever. Representative of the case company 2 disclose their tolerance against slavery:

"Slavery has no benefits to any party in supply chain whatsoever. The farmer might be the only one benefitting from using cheap labour. Anyway, we would only have an extreme risk if there would be a news about using slavery. That is why we do everything to get rid of such practices." Case 2

Case company 2 representative presents their risk concerning the ultimate weather conditions, and that mediates to social aspect of sustainability as well. The representative states that if the weather has damaged the harvest or complicated the production otherwise, it is impossible for the farmers to get a proper wage from their productions. Furthermore, it is difficult for the case company to help developing the farming so that the farmer could respond to the changing weather conditions. This addresses the importance of connecting the different aspects of sustainability rather than focusing on the dimensions as separate.

The interconnection of sustainability dimensions within the case companies is somewhat unrecognisable.

None of the case companies state that they would not incorporate sustainability dimensions when sourcing products. Sustainability plays a central role in all the case companies. Especially in the case of food, the issues such as safety and healthiness play a central role and are acknowledged by the case companies. Nevertheless, sustainability within case companies is still acknowledged more as a separate dimension, rather than truly incorporating and proactively managing the overall sustainability of the company.

5.3 Supplier Sustainability

Supplier sustainability basically defines the company's overall sustainability, as stated by Krause et al. (2009). Thus, supplier sustainability is crucial to examine. Table 4 presents results of assessing the supplier and product sustainability by case companies and demonstrates the practices used for supplier sustainability measurement and control. More precisely, product sustainability in table 4 considers entirely product sustainability attributes as compared to the table 3 sustainability practices.

Table 4. *Practices Assessing the Supplier & Product Sustainability*

Company	*Practices for Suppliers*	*Practices for Products*
Case 1	-Auditing	-Labelled food products such as Fairtrade, organic and MSC-certified fish
Case 2	-Country risk evaluation -Requirement of certificates and code of conduct - Audits and shadow audits	-UTZ-certified coffee
Case 3	-Country risk evaluation (UN) -Requirement of certificates and audits -A member of BSCI (business social compliance initiative).	-MSC-certified fish -ISO 220000 food safety systems -Food safety certificates

Case 4	-Country risk evaluation -Sedeks-membership requirement -Supplier Questionnaires and audits - A member of BSCI	-Own questionnaire for food safety
Case 5	-Code of Conducts -Certificates, visits to suppliers	-Double certificates; Fairtrade AND organic

The case companies require suppliers to admit on codes of conducts and other conditions of sustainability securement. The transaction is ended if the supplier does not want to comply these rules and regulations. However, the situation is not as simple as that, while various issues can ascend from ending the business relationship, and not all the possible results are easily forecasted.

The representative of the case company 2 explains that shadow audit is an audit done by another organisation, such as UTZ, and they are there learning how the audit is done by the other organisations. Hence, they buy good practices for auditing. Representative of the case company 2 describes the process of evaluating the supplier sustainability:

"With the code of conduct we sent a questionnaire to every coffee supplier. We asked how they manage their own supply chain inside the country regarding the country risks, slavery, child labour, environmental aspects, we wanted some background information whether they have some practices regarding these. It varied so that some suppliers did not have any practices, while some had advanced practices. After that we made a new risk evaluation, whether we can lower the risk with their practices." Case 2

The challenge in ensuring the sustainability is that it is basically impossible to visit every supplier. Case company 1 declares that they meet stakeholders all the time and if clarification from the suppliers is needed, they mostly do it. The representative of the case company 4 demonstrates the difficulty of child labour issue, since denying working with suppliers who use child labour may increase poverty and misery, while accepting it is not a good option either. Now, the case company 4 does not require any certificates from suppliers, but that is about to change regarding the partners. As the representative 3b states, they must trust that the supplier obeys these rules. Practices such as the membership of BSCI enables the

case company to access a database of audited suppliers. The representative of the case company 2 addresses the difficulty of where to draw the line of unsustainable behaviour.

"These are incredibly difficult issues. If there are every time practices we cannot accept, we must ask whether it is a right solution to stop buying. It is not necessarily right since if we do not buy from those (coffee) farmers, they are forced to bargain the profit. It must base on such supply, whether we stop buying or we establish a cooperative development program. Nevertheless, issues such as child labour we just cannot accept and those must be eliminated." Case 2

The case company 5 representative discloses that in addition to the code of conduct compliance requirement, inspections and visits to suppliers' production sites are done. The representative defines that 'audit' is a wrong word to use, since they are not official auditors. Always, when they get a new supplier they attempt to visit the production sites, how they produce and where they get their products from, and this happens also during the contract period. The contract obliges the suppliers the visits by the case company 5 and no one has ever denied the access.

The representative 3a states that the ISO 22000 food safety system implies that the risks for food safety are minimised. They are also one of the few merchants in Finland who has it. Naturally, the system requires strict audits and thus engagement of the suppliers. The product sustainability practices are strongly interconnected to the supplier sustainability since certain requirements are needed for the certain certificates and labels of the products. The price arises here as well as an incentive and impediment; on the other hand, labels such as organic bring competitive advantage but on the other hand limit the production and raise prices. Thus, customer demand and possible production does not necessarily always meet.

Regarding the organic production, not all the suppliers and farmers are interested in organic production and because of the rising prices do not wish to engage to that. The representative of the case company 5 highlights that the issue of organic production is the strict, and sometimes too strict, compliance requirements that hinders the farmers interest toward organic production. The farmers might find the organic production requirements too limiting compared to regular production and the monetary benefits might not suffice. Still, the inspections of organic production requirement compliance are not always clear and the information of the country of origin is not always available. As the representative of the case

company 5 discloses, here Finland represents a trustworthy organic producer compared to foreign organic producers.

Table 5 demonstrates supplier engagement methods to sustainability. The representative of the case company 1 replies that they, as a largest customer of the case company 3, have a favourable position to demand certain requirements and visibility to pricing. The representative argues that smaller purchasing units do not have such advantage when it comes to negotiations. Mutual trust enables exceptional cooperation when one does not have to supervise the other all the time, the representative of the company 1 declares.

Table 5. *Engaging Suppliers to Sustainability*

Company	*Method*
Case 1	-Mutual trust -Largest share buyer position -Cooperation
Case 2	-Close cooperation -Monthly meetings -Providing feedback and evaluation -Developing the farming together
Case 3	-Long-term relationships -International buying cooperation -Cooperation and trust
Case 4	-Good communication -Good relationships -Developing cooperation -Mutual trust
Case 5	-Mutual trust -Cooperation

In the case of engaging suppliers to the sustainability initiatives the case 3b representative reveals that the worst solution is to end the transaction, since there are always other buyers

who will replace. Accordingly, the representative of the case company 2 prefers other methods than ending the transaction in the case of non-compliance. Development cooperation is one example of such. Assistance of farming development is mutually beneficial since added productivity leads to added quality and ability to sell more products. Monthly meetings allow evaluation of the supply, risk and strategic planning with suppliers. Respectively, the case company 2 representative speaks about supplier cooperation rather than supplier selection, since their suppliers does not change very often. However, the representative 2 admits that every country has at least three suppliers, considering that every supplier has its risks anyhow, the risks must be decentralised.

The case company 3 representatives emphasize conversations with the supplier and long-term relationships. Additionally, international buying cooperation enables more actors to demand sustainability, thus presenting larger buying volume and attractiveness. The representative 3b declares that there has been a case where the supplier did not comply with the sustainability requirements, but after explaining the importance of sustainability practices the supplier agreed on those terms. The supplier understood the importance of being sustainable in today's business environment. Such issue addresses mostly the differing values and interests between developing and developed countries, while the developed countries simply do not have enough resources altogether to emphasize on sustainability aspects rather than profit.

The representative of the case company 4 expresses the engagement of the supplier to sustainability as developing the supplier and collaboration relationships. The requirements of sustainability cannot be a distant factor, and not demanded as a threat 'If you do not do this, we do not order anymore'. The representative states that large international suppliers seem to have sustainability as a central value, at least they present it so, but they have not examined it closer. It is all about building trust and long-term relationships.

Cooperation and mutual trust are key engagement practices for the case company 5 as well. Additionally, the representative of the case company 5 states that they can offer visibility to the supplier, and they can display certain products by the supplier to a larger clientele. Often the suppliers are interested in this opportunity and ask themselves whether some product display would be possible. The most important practice for the case company 5 is that the collaboration should strive for mutual development. They do not want to determine themselves what to do, rather together with the supplier. For example, the package solutions are developed together with the supplier all the time and both parties benefit from the

collaboration. Innovations to truly develop sustainably are required to keep the business alive.

5.4 Transparency in Food Supply Chains

Bastian and Zentes (2013) explained that few tiers enables low number of transactional intermediaries and results in less complex supply chains. Thus, transparency is improved and complexity is reduced. The same issue is addressed by the representative 3b as well; the more intermediaries there are, the more 'question marks' appear on the way. The representative 3b underlines the importance to go as far as possible to the original roots of the product and supplier. The case company representative 5 addresses the exact same issue, that even though a product is defined as for instance fair-trade, one can never know what has happened to the product in the long and often international supply chain, and whether the product truly is a fair-trade. The case companies well acknowledge the lack of transparency in the food supply chains.

The representative of the case company 4 highlights the fact, that for them should be enough to know 'one step backwards'. Consequently, trusting that the company backwards does the same inspection for their supplier and so on. The representative of the case company 5 announces that in some cases the ability to go backwards the supply chain is possible, as it is an obligatory requirement in the agreements. The representative 5 offers an example that a while ago they visited one vegetable producer and saw where the vegetables are growing, and the representative reveals that many of the farmers are proud to present their plants. The visits are a concrete way to ensure the sustainability of the production sites.

The representative of the case company 1 disclose their transparency being good. If problems in supply chains occur, they will know it quickly and then immediately revise the problems, the representative of the case company 1 explains. However, the fact that they have good visibility to the cost structure of the supplier and it is a business secret is questionable. Likewise, the case company 4 reveals that the name of the original producing company is a business secret, but the country of origin information is available. The representative of the case company 1 emphasizes the importance of including the customers in all the stages of the process, starting from the product decision and continuing to the visit with the suppliers. The end-customers of the case company 1 can see the nutritional facts and whether the food products fulfil the nutritional requirements set by the nutritional experts.

"I think only we have such transparency all the way to the supplier's own cost structure. That is of course business secret between us and the supplier. --- Customers are also there, when the supplier comes to visit." Case 1

Another interesting fact for increasing transparency for case company 1 was that they test-prepared some meat products in the customer's locations, they measured the fat percent, the 'sauce' and tried some coffees. That ensured high quality meat and coffee, and according to the representative of the case company 1 was worth it. Their customers react immediately if there is news about food scandals so they monitor the products throughout the process. The representative of the case company 1 states that they have possibility of changing the suspicious products, even though they require already in the bidding phase to have all the information from the product. The case company 5 has done some gene tests to meat to avoid scandals considering the purity of the meat. It seems that the scandals are an effective incentive to pay attention to the product quality.

The case company representative 3a addresses the importance of offering the customers the ability to see their product selection. They use tools that enable them to examine the customer interest toward sustainable products. The labels and certificates of the products are well acknowledged and the customer can build their own selection based on sustainable products. The information is comprehensively available for customers and thus enables sustainable selection for the customers.

Traceability is a critical factor of transparency and the representative of the case company 2 claims that they have rather good traceability. They use eco-certified coffee that includes traceability in some level. At best, the farmer puts a mark on the coffee, that follows it all the way to the roaster, thus it is completely traceable. The critical point, where the traceability stops, are the farming cooperatives where the number of farmers' products can be uncountable. Traceability is addressed by the case company 4 as well, since the Finnish milk is traceable all the way to the cow. However, the added ingredients may be supplied from all over the world which adds complexity to the overall traceability. The representative of the case company 5 adds to the conversation that single products, such as coffee, are easier to trace. The more complexity is brought by products that are further processed, including various ingredients. That requires detecting multiple ingredients and their origin, leading to enormous workload. Anyhow, the information of the product origin is required,

but in practice it could be impossible to truly discover the origin, the representative 5 declares.

The representative of case 3 mentions the big data and information services as important facilitator of organisational transparency. The labels and certifications are well acknowledged and easily available for the customer to build their needed sustainable product selection, the case representative 3a declares. The representative 3a also states that they are included in the website called “Tilaajavastuu.fi”, that reveals information such as paid taxes and possible crimes, and customers can check everything from there. On contrary, the case company 5 representative discloses that they do not have any supplier database or any system for supply management. The representative admits that having a proper system for suppliers and their documents would be ideal.

5.5 Summary and Future Trends

The figure 16 summarises the empirical results reflecting to the food industry’s value chain. The figure 16 demonstrates the importance of understanding that sustainability must be implemented into all levels of the supply chain. Likewise, transparency should be maintained throughout the chain to support the sustainability.

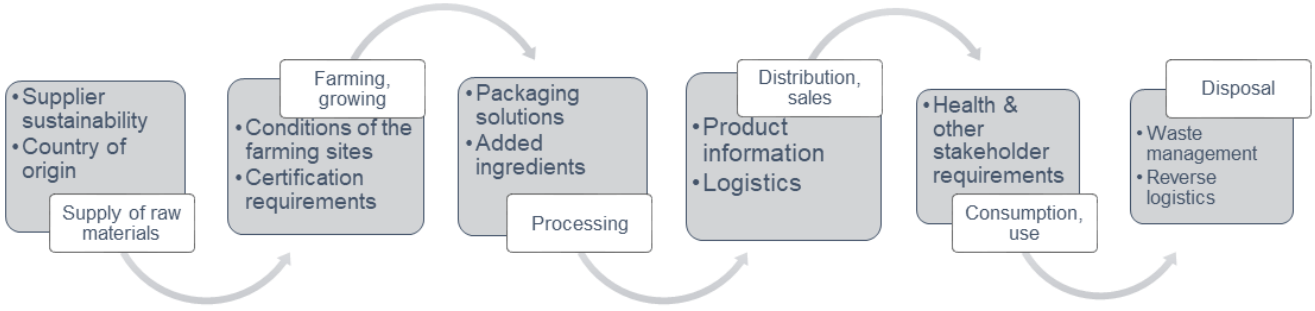

Figure 16. *Sustainability in Food Value Chain (Modified from Wognum et al. 2011)*

Starting from the supply of raw materials, sustainability issues within the case companies regard supplier sustainability, such as working conditions and wage, and country of origin. The question of country of raw materials’ origin is extremely relevant in the case of food industry, the case companies state. Consequently, the information must be available and

comprehensive from the beginning of the supply of raw materials. Second phase of farming and growing also considers supplier sustainability. Precisely, conditions of the farming sites and certification requirements, such as organic production, must be supervised to ensure sustainable production, as the case companies remark. Hence, information transparency and dissemination, in the forms of audits and inspections by the case companies, are essential again. Next, the phase of processing within the case companies includes monitoring the ingredients and creating packaging solutions. The case companies seek to create environmentally sustainable packaging solutions and reduce waste. Ingredient information must be made available for the case companies' customers, again emphasising transparency.

Distribution and sales is essential in terms of logistics. Majority of the case companies acknowledge the need for green logistics solutions, and notice the efficiency benefits brought by greening the logistics. Product information must be provided by the companies and once again, requires transparency to the supply chain. Consumption and use of a food product is determined by the various stakeholder requirements, as the case companies reveal. Health, safety, quality and other requirements are derived from their stakeholders' needs, such as municipalities and other customers. Disposal phase does not have strong emphasis in the interviews, therefore the figure 16 presents here the aspects provided by the theory. The true challenge within the value chain of food industry is the question of honesty of information. Multiple stages of a food production hinder the information dissemination and cause 'black holes' to the information flow. The case companies simply do not have enough time and expertise to thoroughly inspect all the suppliers' production sites.

As future trends within the case companies, local and near produced food arose as one megatrend for coming years. 'Home made'-food products are increasingly desired by customers as organic, healthy and other sustainability attributes raise popularity. Added ingredients are progressively avoided and customers demand more transparency to the production of the food. Appropriately, the production in home country significantly reduces the complexity of supply chains compared to globally sourced products, thus enabling more transparent supply chains. Certainly, the awareness is growing all the time, thus reacting to the changing needs and criteria is vital. Additionally, the variety of different diets, such as vegetarian and gluten-free, is growing all the time.

The sustainability is seen rather abstract and needs more specification. Environmental protection is rather straight-forward and easily calculated, but social dimension of sustainability

is more complex. For every company and customer, social issues are different and addressing all the requirements and preferences is complicated. Additionally, the interconnection of the sustainability dimensions (environmental, social and economic) is crucial as none of them cannot be neglected. The true, proactive incorporation of sustainability dimensions is lacking within the case companies based on the interviews.

The case companies notify that the changing governmental reforms, such as combining municipal facilities and decision-making units, influence strongly to the future sustainability actions. In addition, regulations of EU affect remarkably for sustainability requirements and will undoubtedly influence the future of the food industry. The use of information systems will certainly raise its importance in the coming years. Internet allows rapid information exchange and not everyone has yet found the true potential of it. Additionally, industry coalitions will increase when companies understand the importance of cooperation not only with suppliers but also within focal buying companies. Ultimately the information dissemination is the key to the transparency and thus sustainability. The more transparent the supply chain, the more likely the sustainability is ensured.

6 CONCLUSIONS

Chapter 6 concludes the research, reflects the empirical results to the theoretical findings and provides answers to the research questions in the light of empirical results and discussion. Theoretical and practical implications are also presented in this chapter. This chapter presents limitations of the study and future research suggestions as well.

To begin with the motivators for sustainability within the case companies, those are mostly in line with the findings by Sajjad et al. (2015) of the company's motivators for implementing SSCM practices, which include internal (value-driven motives, support by top management, long-term orientation) and external (expectations of customers and community) motives. Barriers presented by Sajjad et al. (2015) include internal (absence of awareness and understanding and negative attitude) and external (supplier incapability to deliver wanted services and products and higher prices) factors. Sajjad et al. (2015) also mention that the lack of government commitment to sustainability can hinder the SSCM practice implementation. The findings of external barriers (table 3) are mostly consistent. The incapability to produce wanted products with a reasonable price is one of the most critical challenges. The balancing between customer demands and supplier capabilities can sometimes cause serious complications.

Referring to the figure 5, Beske and Seuring (2014) group SSCM practices into five general categories; orientation, continuity, collaboration, risk management and proactivity. Orientation, in their model, indicates the top-management support as a central factor for SSCM potential, hence seeing SSCM as a strategic value. Most of the case companies state that sustainability is in the core of company values. Continuity, in the figure by Beske and Seuring (2014), strives for co-developing, investing, innovating and growing by creating long-term relationships with central partners. Supplier cooperation and long-term relationship creation is a central practice of sustainability enhancement for all the case companies. Collaboration links closely to continuity and includes the collaboration enhancers, such as organisational structure and IT, while also viewpoints to how collaboration is practically achieved. Here also the case companies mention the regular meetings and different incentives for supplier relationship development. Risk management is especially emphasized by the case company 2, but all the case companies discuss about diminishing the supplier base to minimise the risks. Proactivity, in terms of new technologies and methodologies to be able to further promote sustainability, do not seem to have a vital role within the case

companies. The sustainability approach is rather reactive, than proactive. The proactivity enhancement requires sustainable development management.

As many authors (see Makkonen et al. 2016; Trienekens et al. 2012; Eriksson & Svensson 2015); Zimmer et al. 2016; Schiele & Vos 2015) have stressed, long-term relationships, collaboration and power symmetry between supplier and buyer are crucial for sustainability practice implementation within the supply chains. All the case companies emphasize that the long-term, mutually trustful relationships with suppliers are desired. The companies acknowledge the fact that demanding and controlling the suppliers is not effective in the long run, rather cooperation, good communication and co-developing practices are fruitful in supplier engagement. However, based on the interviews it is not visible whether the companies truly strive to become more strategic, long-term partners with their suppliers. The intense, innovation oriented collaboration between the parties is perhaps yet to come.

Trienekens et al. (2012) highlighted the honesty of products, such as eating an organic labelled food and trusting that it truly is organic. Thus, a proper documentation must reflect the true reality of the object. All the case companies agree on the fact that one hundred percent traceability is impossible. Since the global food supply chains are complex and involve various manufacturers, it is difficult task to document every single product attribute. However, the labelling and certifications of the products are the most visible transparency tools in the value chains (Mol 2015) and as can be seen from table 4, all the companies are engaged to at least one certification scheme and offer products with certifications and labels.

The question of ‘what sustainability is not’ as stated by Markman and Krause (2016) is essential to consider. Markman and Krause (2015) describe that supply chain activities that are regenerative to the environment are truly sustainable compared to only reducing environmental harm. Likewise, actions associated with corporate social responsibility such as donations or building local schools, are not necessarily sustainable solutions in the long-run, if resource extraction effects on that certain area are much greater than the benefits derived from single actions. (Markman & Krause 2015) Based on the interviews the companies’ actions are still seen rather reactive rather than proactive. The sustainability actions of the companies are undoubtedly carefully thought and important part of the strategy, but reflecting to the statement by Markman and Krause the case companies are still in the initial phase of truly implementing sustainability into the supply chains.

Understanding how societal and economic actions influence the environment and how the today's decisions impact the generations of the future are the key to balance the dimensions of sustainability (Hutchins & Sutherland 2008; see also Murphy 2012). Likewise, Málovics et al. (2008) identified the sustainability achievement demanding more that CSR and eco-efficiency, rather affect society in much broader perspective by cooperation of businesses, governments and citizens. This underlines the importance of holistic view on sustainability and the true interconnection between the dimensions. Too often in the empirical results of this research the dimensions were separate and the connection between the dimensions was not visible. Case company 2 reveal the practical connection between the social and environmental dimension, where the ultimate weather conditions centrally affect the overall well-being of the farming community. Concentrating only on one of the dimension, no matter which one, does not make the actions truly sustainable.

Trienekens et al. (2012) underline the outstanding importance of the information exchange about product, process and resource characteristics between food supply chain stakeholders to satisfy governmental and consumer demand. The information exchange and visibility of the origin and history of the product is only reached through transparency. Trienekens et al. (2012) remark that the whole food supply chain is a responsibility of a single firm since "a supply chain is as strong as its weakest member". Thus, transparency is a remarkable sustainability enhancer. The requirement of labels, certifications and supplier questionnaires are a way to ensure the information revelation among the case companies. The case companies understand the importance of transparency as a sustainability prerequisite.

Information technologies are a notable influencer to sustainable supply chain management and transparency. Traceability is central to transparency, and requires exhaustive information from all food supply chain processes to guarantee food safety. Thus, the information management is significant. (Ringsberg 2014) As Wognum et al. (2011) assert, obviously the improvement of IT capabilities and information exchange within organisation support the transparency. Some of the case companies do have information technologies to facilitate the information management, but some declare they do not have proper systems. Today, when the amount of data available and required is enormous, the effective use of information technologies is inevitable. An area for improvement lies in the comprehensive implementation of suitable information technologies to transparently disseminate the information between stakeholders.

This study brings contributions to prevailing literature as transparency has not widely been examined as interconnected to sustainability. Moreover, the food industry context reveals important issues to consider, such as the crucial importance of information transparency to avoid scandals. Additionally, the perspective of IT systems in enhancing the transparency and thus sustainability is not widely present in prevalent literature. However, the study results show that the sustainability within the supply chain managers is still seen as a separate, isolated value rather than holistically affecting every decision made by the managers. Thus, sustainable supply chain management is not fully understood by the supply chain managers.

The increasing number of conscious consumers and the need for reassuring the sustainability of the supply chains highlights the importance of transparency. The empirical as well as theoretical part emphasised the criticality of transparency in ensuring the sustainability. The scandals of food industry could be diminished with a proper level of transparency, while also providing the customers the throughout information of a product. The question of willingness to pay is central, and by creating transparency also to the cost structure the customers would better understand why they pay a certain amount. By improving sustainability, the added value creation signifies transparency creation, thus reassuring consumers by showing that higher prices are the result of measuring sustainability to increase it (Bastian & Zentes 2013; Wognum et al. 2011).

6.1 Answers to Research Questions

The main research question is ‘how can companies ensure sustainability and transparency in the supply chains of food industry?’. To answer the question, the understanding of sustainability and transparency is mandatory. Especially the term sustainability can be interpreted in various ways and thus complicating the true understanding of the term (Ahi & Searcy 2013). Ensuring sustainability begins with the company commitment and values. Sustainability must be implemented in the strategic level and to all functions of a company. Sustainability must be realised and the aspects of it comprehensively understood. In the case of supply chains, the supply chain managers are in a central position to incorporate sustainability to every part of the supply chain. (Beske and Seuring 2014; Carter & Easton 2011; Carter & Rogers 2008) Based on the empirical results, sustainability is ensured by different practices, such as sustainable supplier management including audits and inspections for suppliers, supplier collaboration, supplier development and the requirement of supplier questionnaires. Other practices mentioned are including customers into the different

phases of transaction, such as test-preparing products and inspecting supplier with them. Montabon et al. (2016) argued that through ecologically dominant logic, rather than instrumental logic, a truly sustainable supply chain is created instead of reducing the harm from a single firm perspective. Montabon et al. (2016) present that unavoidable trade-off confrontation results in the priority order where environmental protection is first, then society and only after that profits. Likewise, Svensson (2007) claims that to genuinely understand SSCM a widened approach beyond the traditional restricted point of origin and end boundaries in supply chain is required.

However, one of the most relevant practices to ensure sustainability is transparency (United Nations Global Compact 2014). Transparency is indeed ensured with the same practices as sustainability, since information dissemination, certifications and labels and ability to examine the production sites are tools of transparency (Mol 2015). The supply chain managers have powerful position to make the supplier selection, so requiring transparency to the supply chain altogether is important. Based on the empirical results, the sometimes-conflicting interests among supplier and a buying company, the collaboration and long-term relationships with suppliers are practically an efficient option to ensure sustainability and transparency. As mentioned, the information and power asymmetry does not appeal to suppliers, the collaboration is only way to ensure continuing the business relationship.

The sub-question ‘how sustainability is recognised in the supply chains’ links to the main research question by offering insight to the present sustainability realisation within the companies. The empirical results entail that the sustainability is mostly recognised by various requirements addressed to the suppliers. Hence, the focal companies are usually held responsible for their suppliers’ sustainability performance and forced to examine the suppliers’ actions closely (Seuring & Müller 2008). Supplier sustainability defines the company’s overall sustainability (Krause et al. 2009). Requirements, such as appropriate working conditions and wage, are expected from suppliers by the case companies and they do inspect those requirements. Also, the memberships of such as BSCI allows the companies to get information of risky suppliers, thus enabling sustainable selection. Moreover, customers are advised to choose more sustainable products by offering enough information regarding the products. Sustainability also has a central strategic value in the case companies, despite the lack of true understanding of sustainability dimension interconnection. Hence, the sustainability dimensions are clearly separated and the companies have prioritised the food safety before anything else.

The second sub-question is ‘how can supply chain management increase transparency in the supply chains?’. Certifications, memberships of various organisations that promote sustainability, product labels and audits are used to extract the information from the suppliers based on the empirical results. Additionally, industry coalitions and other collaboration forms are mentioned to improve the information delivery within the companies. However, the issue of information dishonesty arises among the case companies. The resources whatsoever can never be enough to inspect every single supplier unit and employee. Nevertheless, the use of information systems is not nearly as thorough as it could be. Thus, information systems offer an opportunity for companies to remarkably increase their transparency to the supply chains. Carter and Rogers (2008) suggested an industry coalition, where adopting common auditing procedures can allow a single, powerful supplier sustainability audit to be executed that increases supplier transparency and sustainability. The procedure can also lower transaction costs for both the supplier and the organisations that do business with that supplier (Carter & Rogers 2008).

The last sub-question ‘how does transparency affect the sustainability of the supply chains?’. As demonstrated earlier, transparency is essential in securing sustainability. The interconnection of those two terms is so strong, that the distinction is difficult to make. Transparency enables the information delivery and at best total transparency eliminates the possibility of food scandals, since companies know immediately what the product truly includes. (Ringsberg 2015; Mol 2015) Based on the empirical results, transparency is a must to truly be sustainable. Scandals and other negative publicity are actively avoided by the case companies, and through transparency these scandals can be minimised. By requiring certain amount of information from their suppliers, case companies can optimise the sustainability and safety of the food.

However, important question is whether the companies themselves are ready to incorporate the total transparency. This issue arises especially when the requirements for sustainability might ‘scare’ the suppliers away, thus leaving the companies with no producer. Anyway, as one of the case companies states, the suppliers are increasingly understanding the sustainability requirements of today’s business world, and thus willing to incorporate the sustainability initiatives progressively. Carter and Rogers (2008) suggest four aspects to support the triple bottom line (see figure 3), that are risk management, transparency, strategy and culture. They emphasise that the four aspects are interrelated, because stakeholder engagement generally relates to transparency improvement and can reduce risk by minimising

the boycotts by consumers and thus, is an integral part of the strategy of an organisation. That supports the necessity of transparency to ensure sustainability of the supply chains.

The chosen method limits the generality of the findings. A qualitative case study was conducted by interviewing six different actors form Finnish food industry. The case study results are seldom generalisable, since only specific cases are chosen. In total six interviews were conducted in spring 2016. Even though the study had multiple cases, the findings cannot be generalised to the entire industry. Naturally, the recognised practices can be presented, but it cannot be said that those practices are used within the entire industry. Nevertheless, the research objective was to reveal how companies in the food industry ensure their sustainability and what practices are used to enhance transparency and sustainability, thus provide closer analysis of some food industry actors.

Regarding the growing importance of sustainability and the lack of firms' ability to fully utilise the potential of the information and data that is available, a research considering the connection of IT systems and sustainable supply chain could be done in the future. Likewise, innovation with suppliers to promote sustainability would be future research proposal. The collaboration with suppliers is one of the most critical issues affecting the supply chain sustainability, thus research considering the effects of supplier collaboration and partnership in ensuring sustainability presents an interesting study object. Food safety is the most important aspect in food industry, and more research should be done how to ensure the safety of the food utilising transparency to the supply chain. Furthermore, a quantitative research with larger sample would generate more generalisable results on the effects of transparency and sustainability to the firms' overall performance.

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APPENDIX 1

Semi-structured interview questions

Sustainability recognition in the food supply chain

1. What are the motives for responsibility/sustainability considerations in the food supply chain?

2. Where do these motives come from, are they based on for example the strategy of the company or stakeholder demands?

3. From a single product perspective: what are the target sustainable supply objectives?

4. How are the sustainability objectives monitored and controlled? Are there some metrics you use?

Supplier selection and supplier relationships

5. Supplier selection criteria:
    - Which sustainability criteria must be fulfilled?
    - Are there some criteria for sustainability that are used to score the supplier?
    - In a case of minimum requirement fulfilment, what aspects define the result of a selection process?

6. In the selection process, how it is discovered that supplier is sustainable?

7. How the sustainability of the suppliers is monitored and measured?
    - How is it possible to discover the product origin from all the ingredients? Is it possible?
    - Is there a supplier register with sustainability info and updates?

8. How is the sustainability managed or reached all the way to the suppliers? What are the practices to engage suppliers to sustainability?

9. What are the most important practices to ensure sustainability (certificates, audits etc.)?
10. Which sustainability issues will highlight in the future?