



**ENVIRONMENTAL AND SOCIAL SUSTAINABILITY IN UPSTREAM SUPPLY
CHAIN IN PHARMACEUTICAL INDUSTRY**

Case Oy Verman Ab

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Kestävä kehitys on monelle tuttu käsite. Etenkin liikkeenjohdossa sidosryhmien vaatimukset pakottavat yritykset toimimaan mahdollisimman kestävästi. Yrityksen menestystä ei mitata pelkästään sen taloudellisen menestyksen mukaan, vaan myös sen ekologista ja sosiaalista vastuuta tarkastamalla. Koko toimitusketjua on kuitenkin tutkittava, sillä yritykset ovat ainoastaan yhtä kestäviä kuin liikekumppaninsa.

Harvat tutkimukset tutkivat, kuinka ekologisesti ja sosiaalisesti kestävä lääketeollisuus on, vaikka toimialalla on pitkä historia. Koska alalla on omat erityispiirteensä, heräsi tarve perusteelliselle tutkimukselle. Tämä tutkimus toteutettiin tapaustutkimuksena yhteistyössä Suomen johtavimpiin kuuluvan lääke- ja hyvinvointialan yrityksen kanssa. Tutkimuksen tavoitteena on laadullisin menetelmin selvittää, miten ekologinen ja sosiaalinen kestävyys tunnistetaan toimitusketjun ylävirrassa. Lisäksi tutkimus selvittää, mitkä ovat mahdolliset haasteet ja ajurit kestävässä toimitusketjuissa.

Tulokset viittaavat siihen, että ekologist ja sosiaaliset tekijät ovat hyvin tunnistettuja asioita, vaikka joillakin alueilla, kuten päästöjen seurannassa ja kierrätysmateriaalien käyttämisessä pakkauksissa, on edelleen puutetta. Yksi löydöistä viittaa siihen, että erikoisaloilla, kuten lääkealalla, tiukat lait aiheuttavat joustamattomuutta kestävien toimitusketjujen suhteen. Täten, yritykselle ei jää muuta vaihtoehtoa kuin jatkaa olemassa olevia toimittajasuhteita heidän vastuullisuustilanteestaan ja -halustaan huolimatta.

ABSTRACT

Lappeenranta–Lahti University of Technology LUT

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Environmental and social sustainability in upstream supply chain in pharmaceutical industry: Case Oy Verman Ab

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Sustainability is a known concept for many. Especially in business management, the ever-growing requirements from the stakeholders are forcing companies to act as sustainably as possible. The success of a company concerns not only the monetary value but also social and environmental responsibility of its actions. However, the whole supply chain should be put under examination as companies are only as sustainable as their business allies.

Not many studies examine how environmentally and socially sustainable the pharmaceutical industry is despite being well-established business with a long history. As the field has its own characteristics, a need for a profound research arised. This study is conducted as a case study with one of the leading pharmaceutical and healthcare companies in Finland. The aim of this study is to, by implementing qualitative methods, examine how environmental and social sustainability is recognized in the upstream supply chain of the industry, and what are the possible challenges and drivers for sustainable supply chain management.

The results suggest that environmental and social factors are well identified issues yet there is still lack in some areas, such as tracking of emissions and using recycled materials in the packaging, as implementation is a complex process. One of the discoveries suggest that in specialized fields, such as pharmaceuticals, strict laws cause inflexibility regarding sustainable supply chains. In this sense, the buying company can be left with no other option than to continue existing supplier relationships despite their sustainability status.

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This master's thesis has been so far one of the most challenging, extensive, and at the same time rewarding projects I've been involved. Not being sure where to start in the first place, this learning journey has taught me the theory of sustainable supply chain management, self-reflective and self-governing working attitude as well as the fundamentals of conducting a research in a professional manner. The journey was full of ups and downs, highs and lows, trial and error, repetition and finally – success!

It goes without saying, that this master's thesis wouldn't be possible without the continuous support from peers, colleagues, and specialists of the field. I would like to thank Professor Katrina Lintukangas and Post-doctoral researcher Elina Karttunen for your comments and supervision along the way. I would also like to thank case company Verman for providing this interesting subject for me and my wonderful colleagues for your support and input. I'm also grateful for my friends, family, and my beloved Mikael, who kept telling bad jokes to cheer me up!

Having finished this project, it is time to finalize my studies at LUT University and head for new adventures and experiences.

November 23rd, 2021

Kristina Jalonen

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Tiivistelmä

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1 INTRODUCTION

Sustainability is a word that is nearly impossible to avoid these days. Bhāle & Bhāle (2018, 4) state that the expectations in today's business world do not only concern the profitability and monetary success of a company but also the environmental and social responsibility of its everyday actions. The demand for both ethical and successful business practice has grown drastically over the decades. According to the survey conducted by Suomalaisen Työn Liitto (2019), 80% of the consumers in Finland find it important that the manufacturers can affirm sustainability of their actions. As sustainability awareness raises among consumers, there is an increasing pressure to take actions.

Pharmaceuticals as an industry has a long history in Finland. The first pharmacy was founded in Turku already in 1689 (Lavaste 2016). The industry has then been blooming in Finland, and by the end of 2020, there are more than 800 pharmacies across the country (Fimea 2021). Pharmaceutical wholesale has established its roots and is nowadays a massive network of different operators from manufacturers and raw material suppliers to logistics companies and product distributors. Pharmaceuticals has gone through many changes as technological development has boosted the blossoming of the field. However, not many studies examine how environmentally or socially sustainable the business really is. According to Kärkkäinen (2019), the wholesale is an important player of sustainable pharmaceutical industry. It must not only comply with the existing requirements, but also seek actively ways to, for example, reduce energy, increase proper waste disposal, and increase recycling of the materials.

The need for a profound research arised. This study is conducted as a case study with close co-operation with one of the leading pharmaceutical and healthcare companies in Finland: Verman. The aim of this research was to get a better understanding of the current social and environmental sustainability status of the upstream supply chain in pharmaceutical industry and therefore, answer the research questions in a proper manner. For the case company, this research will provide valuable information that can be used to help to determine the present sustainability situation of the supply network as well as recognize the challenges and the drivers in terms of sustainable supply chain management. Based on the results, the company can then make adjustments to its everyday business operations. Verman is a good example

of a proactive company that seeks solutions to comply with the requirements of today. The company has a strong desire to take part in sustainability matters and strive towards more sustainable future.

This study follows the methodology of a qualitative research approach and utilizes a self-administered questionnaires and semi-structured interviews as research instruments. The chosen approach is justified by the fact that there is only a limited number of manufacturers in the industry and the subject needs exploratory point of view. The main motive for selected research instruments is that sustainability as a topic is somewhat sensitive and participants may need time to gather the necessary information for the questionnaire and consult with peers, if necessary. The interviews, on the other hand, provide the much-needed supportive material to the study to understand the phenomenon better from the point of view of the buying company. The literature studied comprises environmental and social sustainability as well as sustainable supply chain management.

The results from this study are promising and give a good ground to continue the work on sustainable development in the pharmaceutical industry. However, there are some areas that still need more attention. First, a formal sustainability program with regular discussions and purposive work on sustainability-related initiatives seems to be missing in many companies despite the fact that sustainability has been mentioned in overall strategic plans. Second, the emissions from business operations are not always tracked which is crucial in the aim of reducing energy. Third, the use of recycled materials in packaging solutions is a slow work in progress despite the well-known problems regarding plastic and other waste along with the ever-increasing sustainability awareness of the end consumer.

It can be concluded that the direction of environmental and social sustainability in supply chains of the pharmaceutical industry seems to be right and many companies are fully aware of the need for sustainable development and continuous improvement in that matter. Despite being hard to interpret and measure, sustainability is undoubtedly an important subject that needs more attention and concrete actions in the near future. The faith relies in the hands of the executives as they should set examples to tackle the identified sustainability challenges. To end this chapter with a positive note, it can be stated, that challenges often come hand in hand with new opportunities and possibilities for innovation and breakthroughs in business.

1.1 Research structure

This master's thesis includes several phases which are divided further into chapters in this document. In the chapter '1 Introduction', relevant research questions are established. These questions are intended to bring new insights to the field as well as guide the study and set clear boundaries for the research process. Also, theoretical framework is established to frame the theory to concern the sustainable supply chain management – along with its challenges and drivers. In addition, research methodology is introduced, and limitations are set, and in this study, only environmental and social aspects of sustainability are examined. Therefore, the economic outlook is delimited. This master's thesis follows the adapted research process presented by Kothari (2004, 11) as illustrated in the figure below. The following steps are combined with the proper chapters of this document.

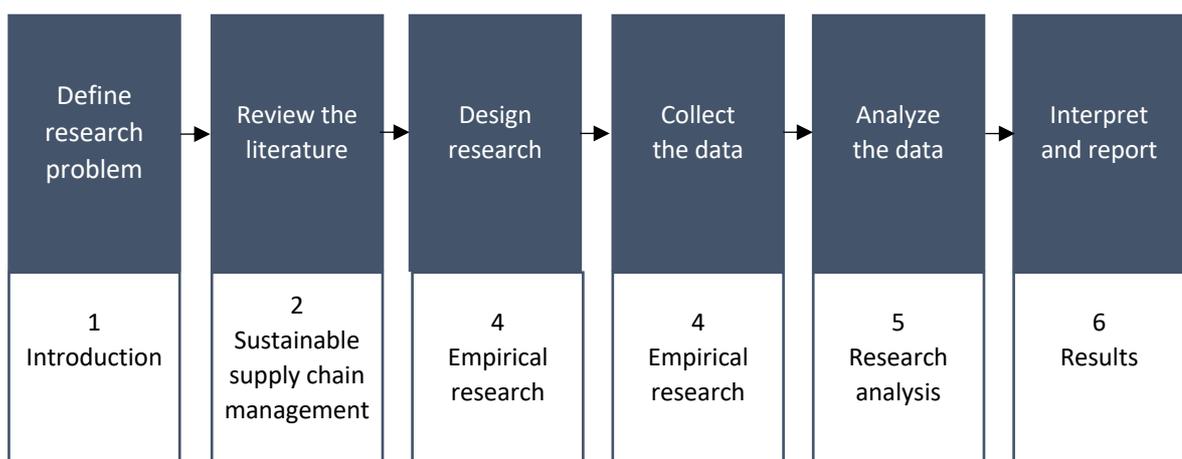


Figure 1. The adapted structure of a research process (Kothari 2004, 11)

In the chapter '2 Sustainable supply chain management', the necessary literature is collected, studied, and analyzed to establish a profound knowledge about the subject and its current status. The literature review also helps to understand possible issues or controversies studied previously and seek the gaps that need more examination. Based on this knowledge, a proper research can then be executed to seek the answers for the research questions. In the chapter '4 Empirical research', a profound research is conducted based on the research methodology established earlier. Also, formation of the self-administered questionnaires and preparation of the semi-structured interviews along with selection of the participants and reliability and validity of the research are covered in the chapter.

Based on the information gathered from the empirical research, a proper research analysis is then conducted in the chapter '5 Research analysis'. This phase includes preparation of the data and application of suitable analysis methods. In addition, the subject of data display is also covered in the chapter. The analysis then determines the results of the study which are presented in the chapter '6 Results'. The results open up the current environmental and social sustainability status of the upstream supply chain in pharmaceutical industry along with the challenges and drivers of the sustainable supply chain management, and therefore provide the necessary information to answer the research questions. The chapter also discusses the concrete outcomes of this study, the future measures and implementations. Finally, the study is wrapped up with analytical discussion of the subject in the chapter '7 Conclusions' in which the potential misconceptions and limitations along with recommendations for further research are discussed.

1.2 Research questions

Research question is a statement that identifies the issue or several issues that need to be studied. According to Sandberg & Alvesson (2011, 23–24), it is fundamental to formulate clearly defined research questions in all research as innovative questions result in interesting and significant theories. These questions should be defined in advance before starting off with the study. This will enable to identify and establish the appropriate study design for the research. Research questions should also take into account the researcher's status as well as limitations of time and research setting (Saunders, Lewis & Thornhill 2016, 43).

Most common way of setting a research question is so-called 'gap-spotting'. This basically means that, while reviewing the existing literature, the researcher finds a gap to be filled or refined. (Sandberg & Alvesson 2011, 27–28.) Thus, the research question should promote new insights to the industry (Saunders et al. 2016, 43). After a profound examination of the literature, it was somewhat obvious, that the subject needed more study and examination. According to Milanesi, Runfola & Guercini (2020, 9–10), especially social sustainability hasn't been investigated enough in the pharmaceutical industry. This seems controversial as the industry in general is assumed to contribute to social well-being. In addition, important topics related to environmental sustainability of the field need more research, such as waste management and the relationship between innovation and sustainability.

In this study, the following research question was established to guide the research process:

RQ1: How is environmental and social sustainability recognized in the upstream supply chain in pharmaceutical industry?

As there are assumingly some obstacles on the way to reach a fully sustainable supply chain in the field, a proper sub-question has been set to further determine the possible challenges in achieving sustainable supply chain. The challenges reveal the subjects that need more resources and examination in the business. However, and despite the obstacles, the pressure for sustainability still keeps companies striving for more sustainable future. In this sense, other interesting topic to investigate are the drivers for sustainable supply chain, which then formed a second sub-question for this study. The drivers can be seen as the true motivators to continue the work in terms of sustainable supply chain management. These sub-questions will help to comprehensively answer the main research question and fill in the discovered gaps. The sub-questions are formatted as follows:

SQ1: What are the possible challenges in achieving sustainable supply chain?

SQ2: What are the possible drivers for sustainable supply chain?

As Saunders et al. (2016, 42) state, research questions determine the issues that need to be studied in order to provide answers. This study aims to respond to the research questions formatted above. To do so, the necessary literature is collected and studied. An empirical research is executed based on the research methodology applied, using self-administered questionnaires and semi-structured interviews as research instruments. The gathered data is then analyzed to provide proper responses to the given questions.

1.3 Theoretical framework

The literature studied and reviewed is discussed further in the chapter ‘2 Sustainable supply chain management’. The chapter includes an overview of the concepts of environmental and social sustainability, and the practice of supply chain management; a comprehensive outlook on sustainability in supply chains (with a detailed review of sustainable supplier selection as well as the challenges and drivers of sustainable supply chain management); and a deep dive

to the topic of sustainability specifically in the pharmaceutical industry as it holds its own characteristics. As figure below indicates, this research focuses on the upstream supply chain management which is then limited to concern only the environmental and social aspects of sustainability and explicitly in the pharmaceutical industry. This framework is guiding the research in the right direction throughout the study. To answer the research questions, it was necessary to find out the current status of the phenomenon as well as the challenges and the drivers that influence it.

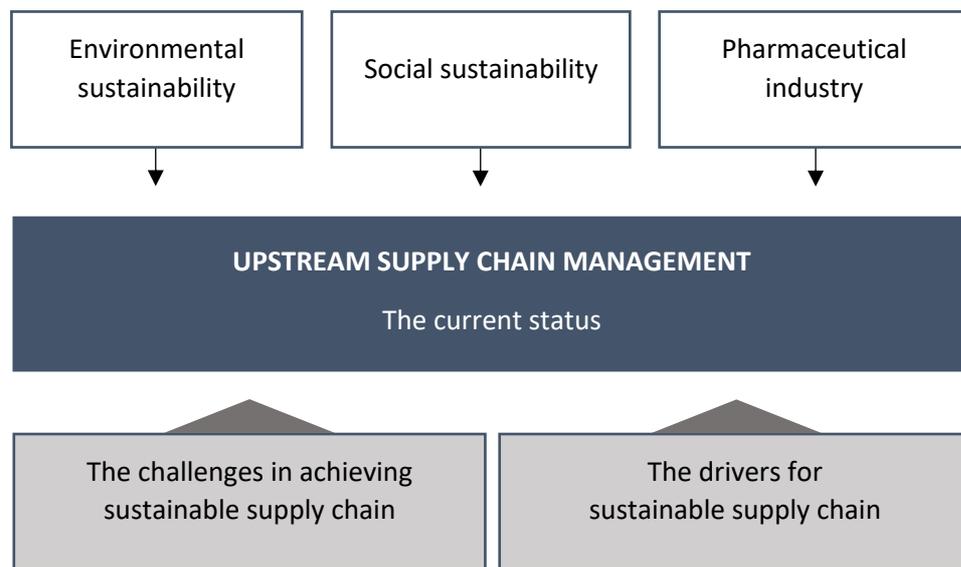


Figure 2. Theoretical framework

To better understand the phenomenon and the concepts included, a proper literature review was conducted. Key concepts are shortly covered later in the sub-chapter '1.4 Key concepts'. In addition, the literature to support the empirical research and the research analysis was examined. In the chapters '4 Empirical research' and '5 Research analysis', the theories for, to only name a few subject, data collection, reliability and validity, thematic analysis, data preparation, and data display were covered. This helped to get a good understanding of how such research is conducted correctly and in a professional manner.

1.4 Key concepts

As theoretical framework was established, the theory is collected and examined profoundly along with the concepts introduced earlier in the figure above. To study the literature in a

coherent manner, the key words were determined in order to frame the study. In this study, suitable key words are *supply chain management*, *sustainability*, and *pharmaceuticals*. A short description of each concept is provided below. These concepts were limited so that the supply chain management focuses only on the upstream flows and the sustainability takes into account only the environmental and social aspects. More on the limitations, see the sub-chapter ‘1.6 Limitations’.

Supply chain management covers the management of operations and relationships among the players of the supply chain. Therefore, along with the more traditional management of the logistics and procurement, it also involves other activities related to the practice, such as demand management, customer relationship management, and order fulfilment. (Wang et al. 2004, 1217.)

Sustainability is, as Brundtland et al. (1987) have thoroughly defined, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Sustainability comprises the economic, environmental, and social aspects also referred to as the triple bottom line.

Pharmaceuticals is an industry that has a long history and a strong contribution to the social well-being. In Finland, the pharmaceutical industry has been well-rooted for over 300 years (Lavaste 2016) and consists nowadays of over 800 pharmacies (Fimea 2021). The industry has been changing due to technological development and is now facing the ever-growing pressure for more sustainable actions from the stakeholders.

1.5 Research methodology

The research methodology determines which methods are used to collect the data in a proper manner. In this study, the goal is to examine how environmental and social sustainability is recognized in the upstream supply chain in pharmaceutical industry. The study also aims to provide a good outlook on the possible challenges and drivers for sustainable supply chain management. According to Kothari (2004, 8), a research methodology, or a systematic way of working on the designated problem, helps to determine proper methods that are relevant to use in the research.

Saunders et al. (2016, 174–175) suggest that to gain deep insight about a subject of interest, an exploratory research is often utilized. It is used especially if a certain phenomenon needs more clarification, as if it was somehow unprecise. Exploratory research is quite flexible and adaptable to changes that may occur during the research process. For example, it may start off with a broad focus and become narrower and more precise as the research moves on and refines along the way. An exploratory research design is preferred in this study as the need for deep insight and flexibility was recognized. In addition, the aim of this research is to give more clarifications and definitions on the subject that seemed lacking knowledge and fill in the gaps and strengthen the existing theories.

In order to receive valid answers to the research questions established earlier, a qualitative study approach was selected to conduct the research in a proper manner. As for the research instruments, both self-administered questionnaires and semi-structured interviews were selected for this study. The objective of a questionnaire is to collect necessary information from the supply network of a case company to understand how environmental and social sustainability is recognized in the upstream supply chain in the pharmaceutical industry and thus, provide the answer for the main research question. The interviews, on the other hand, are used to collect additional and more in-depth data to better understand possible challenges and drivers for sustainable supply chain management, from the perspective of the buying company, and contribute to answering the sub-questions. More on the empirical research along with the data collection and profound introduction of the research instruments, see the sub-chapter ‘4 Empirical research’.

What has to be pointed out, is that this study is conducted as a case study where the objectives and limitations are set based on the expectations of the case company. Thus, the company has provided its assumptions as well as assistance during the research process. For example, the questions used in the self-administered questionnaires were pre-tested by the company. In addition, the number of the participants was also provided by Verman. These requests from the case company have been considered when setting appropriate research methods. In this sense, close co-operation with the case company, especially in the phase of empirical research, is noticeable in this study.

1.6 Limitations

As Bhāle & Bhāle (2018, 5) remind, sustainability comprises planet, people, and profit. In this sense, sustainability has three different yet tightly entwined dimensions. This framework is also called the triple bottom line and it measures the environmental, social, and economic impacts of the business operations. In this study, the environmental and social aspects are examined. Therefore, the economic outlook is left out of the scope. It can be assumed that economic sustainability is the most developed and recognized aspect and thus, was not in the interest of the case company.

By setting its own priorities and expectations, the case company set other limitations to the research. Despite having many suppliers and associates in its broad portfolio, only the main partners of the supply network are included in this research. According to the Purchasing Director of the case company, 12 suppliers are identified as critical business partners for the company. In this sense, selection of the participants also plays a role in the limitations. For more information on the subject, see the sub-chapter '4.3 Selection of the participants'. The selected suppliers are the main operators in the Finnish pharmaceutical wholesale and serve other companies of the field as well.

2 SUSTAINABLE SUPPLY CHAIN MANAGEMENT

Nowadays, many companies aim to focus on their core competence which has resulted in increasing need for acquiring suppliers and other business partners (Schuh et al. 2014, 1). Thus, the dependence on different associates have grown significantly, which are now seen as strong allies in everyday business. In this sense, supply chain management is an important part of business management and cannot be ignored in this highly competitive environment. Supply chain management comprises management of both operations and relationships in the supply chain (Wang et al. 2004, 1217).

The responsibilities of the companies and the need for mutual objectives that aim towards sustainable business practices have long been in discussion. Bhāle & Bhāle (2018, 4–5) remind that sustainability awareness showed its first signs prior to the 1960s. By mid-1980s, people already expressed their strong opinions against unethical business. Today, business management has become a socioeconomic phenomenon that has big effects on communities and diversity. The success of a company depends not only on its economic performing, but also through its environmental and social actions. According to Schaltegger, Bennett, & Burritt (2006, 2), companies are the key contributors of our society meaning that they are playing a significant role in influencing the economic, environmental, and social wellbeing.

2.1 Environmental and social sustainability

Sustainability as a subject is impossible to avoid these days. The strong need for sustainable actions is recognized among consumers as well as in business management. Brundtland et al. (1987) defined sustainability as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Ever since, this profound definition has been widely adopted in business and is still valid to this day. From a business perspective, Montiel (2008, 246) offers yet another definition by stating that the goal of sustainability is “to balance economic responsibilities with social and environmental ones”.

Sustainability concerns the concept of triple bottom line which comprises planet, people, and profit (Bhāle & Bhāle 2018, 5; Rantala 2018, 48). In this sense, sustainability consists of three aspects: environmental, social, and economic. Despite having their own definitions, these three aspects play well together. Rantala et al. (2018, 48–49) remind that economic sustainability is the most studied and understood aspect of sustainability as profit-making has a profound meaning in business. However, both environmental and social sustainability have gained more and more attention in the past decades as the environmental and societal issues have been raised. Environmental sustainability takes into consideration the physical environment and its limitations whereas social sustainability is about maintaining the social capital, such as health, safety, and participation of communities.

Environmental sustainability presents a big challenge for the mankind. Increasing population and anthropogenic activities are taking toll of the natural resources. Not only are they being over-exploited but also becoming contaminated with toxic chemicals as industrialization and agricultural practices are polluting water, air, and soil. Therefore, the survival of the future generations is put to danger. Just to name a few of the issues related to the environmental sustainability, the mankind has to deal with the ever-increasing greenhouse gas emissions, biodiversity loss, polar ice melting, and extinction of species in the near future. In this sense, it is important to assess the impact of human activities. (Arora 2018, 1.) Seuring et al. (2008, 1545) state that, from the perspective of business, the company can spoil its brand along with the sales when problems related to the environmental performance occur.

Social sustainability is a relatively broad and abstract subject which includes measures such as gender non-discrimination, workplace diversity, safety, health, welfare, and human rights. As a relevant and comprehensive definition, scholars have proposed that social sustainability can be seen as an “ethical code of conduct for human survival and outgrowth that needs to be accomplished in a mutually inclusive and prudent way”. What has to be pointed out is that social dimension of the triple bottom line has been studied the least and therefore, has received only little attention in the literature. (Mani et al. 2016, 270–271.) In this sense, the subject needs more research in order to increase the understanding of the concept. Dempsey et al. (2011, 292) remind that social sustainability has to be seen as a dynamic subject and not an absolute. The subject will keep changing over time and gaining more perspectives and dimensions along the way.

2.2 The practice of supply chain management

Starting from early 1980s, supply chain management has gained popularity and familiarity among scholars. It includes many activities, such as extraction of resources, refinement into manufactured goods and delivery to end consumers. (Martins & Pato 2019, 996.) As supply chains often consists of several steps and actors, it can be easily divided into upstream and downstream chains. As Gafoor (2021) explains, and as the figure below shows, in upstream operations materials flow into the company and in downstream operations refined or finished products flow out of the company. Usually in between the two streams are the manufacturers who convert the raw materials into products. The middlemen that bring linkage to the chain also often include wholesalers, retailers, and distributors.

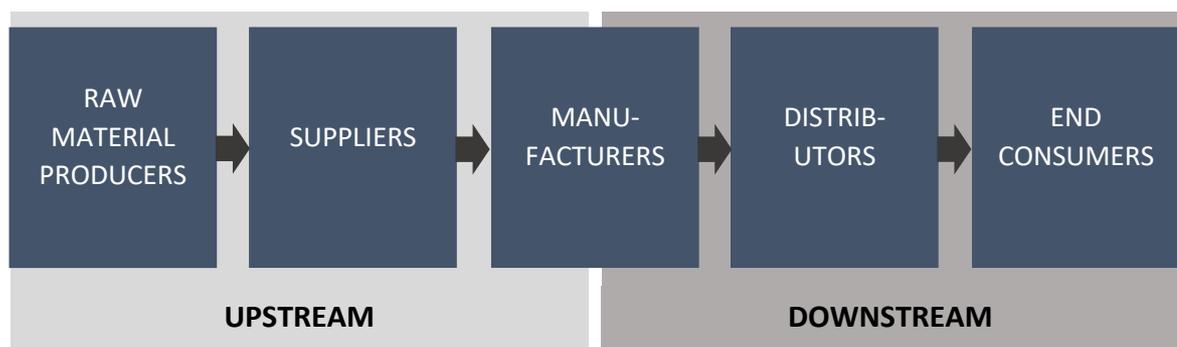


Figure 3. Upstream and downstream supply chains (Gafoor 2021)

Supply chain management aims to combine all the actors of the value chain into one system. The practice focuses on removing barriers, creating trust, and enhancing collaboration and operations among the supply network. It comprises not only the traditional procurement and logistics, but also related activities, such as demand and customer relationship management. (Wang et al. 2004, 1217). According to Salah et al. (2019, 25) the business decisions in terms of supply chain management can be related to, included but not limited, inventory control, supply contracts, and distribution strategies. As it may sometimes sound easy, supply chain management is a relatively complex practice as there is a large number of different players in the network. It takes a lot of resources to manage all of the suppliers from the point of origin to the point of consumption (Lambert & Cooper 2000, 67–68).

Partnerships between companies are crucial in the competitive business world. However, not all suppliers are equally important to the buying company. Some suppliers simply matter

more than others (Schuh et al. 2014, 28). Many suppliers are more or less only vendors but building long-lasting relationships with the key suppliers can bring many benefits for the buying company. As Schuh et al. (2014, 89) state, the key suppliers are contributing to, for example, competitive advantage and innovation. In this sense, they are serving an important role as equal business partners. The distinguishing factor in different supplier relationships is trust which should be highly valued and also actively built among the players of the supply network.

2.3 Sustainability in supply chain management

The sustainability issues come to light easily as seen from the news or social media feeds. The pressure to practice sustainable and transparent business is growing. Instead of being reactive to incidents, companies must act in a proactive manner in terms of sustainability. In order to achieve sustainability, the whole supply chain must be put under closer examination. As Seuring et al. (2008, 1545) remind, a single company is not powerful enough to make a change. The key lies in collaboration as companies nowadays rely strongly on their networks and partnerships. In this sense, companies are held responsible for the sustainability of their suppliers as well. Actions towards sustainability must be done throughout the whole supply chain.

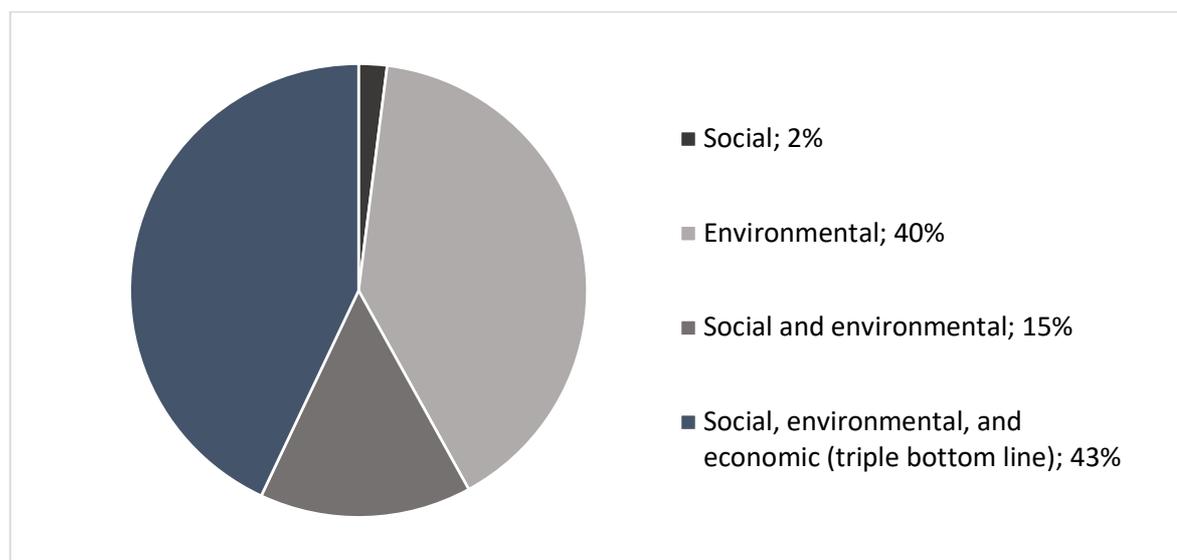


Figure 4. Sustainability research against triple bottom line (Bastas & Liyanage 2018, 732)

In supply chain management, sustainability has gained lots of attention which has resulted in ever-growing trend of research around the subject. However, the distribution of the three aspects of sustainability is not always even in the literature (Bastas & Liyanage 2018, 732.) As the figure above shows, triple bottom line as a whole is covered in less than a half cases. The good news is that environmental sustainability has been gaining more attention, and the understanding of green sustainability is somewhat secured in supply chain management. The bad news is that social sustainability is still lacking understanding as the concept is vague and needs more research and further examination. Martins & Pato (2019, 996) explain this fact by stating that sustainable supply chain management was originally devoted only to environmental and economic aspects. It was in the 1990s when social concerns popped to the scene as the concept of triple bottom line was introduced around that time.

Nevertheless, sustainability has been recognized as a huge competitive advantage in business environment and is no longer left unconsidered in modern organizations. Companies simply cannot afford to ignore the impacts it has on environment and social well-being. Martins & Pato (2019, 998) remind that the mindset has slowly changed for the better as executives of today realize that striving for sustainability does not always mean limitations. Surely, some trade-offs are undeniable in regards of three aspects of sustainability. However, sustainable business operations can also bring cost savings (Pullman, Maloni & Carter 2009, 40–41) and promote innovation (Chang 2011, 363).

2.3.1 Sustainability in supplier selection

Companies are as sustainable as their supply chain, and thus, extra attention and effort should be put in choosing the right suppliers and business partners. In this sense, supplier selection along with the criteria plays important role in sustainable supply chain management. Bai & Sarkis (2010, 253) remind that decisions regarding supplier selection are one of the most fundamental and important ones a buyer has to make. By implementing the supplier selection process, the buying company takes a necessary step to manage its corporate legitimacy along with its reputation.

As most companies already evaluate their suppliers and partners based on the economic factors, such as price, the attention is now shifting to also cover the social and environmental

impacts of the company. According to Bai & Sarkis (2010, 252–254) both environmental and social factors should be a priority in the supplier selection agenda. Traditional and purely price-based supplier relationship is no longer an option. Especially for a company, that wish to focus on innovative supply chain management issues, including social and environmental concerns, such relationships are simply not acceptable. Sharfuddin et al. (2018, 966) state that companies must integrate environmental and social attributes to the economic point of view of supply chain management. In this process, transparency and openness are the keys in promoting the sustainable supply chain management.

As mentioned earlier, and as according to Schuh et al. (2014, 28) not all supplier and partners are equally important for the buying company. For his reason, it is crucial for the buyer to carefully analyze its supplier base and determine the key suppliers it should focus the most in its supply chain management. Lambert & Schwieterman (2012, 338) state that in order to determine which companies should be focused on, the potential to co-create value must be identified and used as one of the measures in supplier selection. In addition, as Sharfuddin et al. (2018, 964) state, a supplier that shares similar objectives regarding sustainability is a partner worth working with.

Table 1. Sustainable supplier evaluation criteria (Luthra et al. 2017, 1689)

ECONOMIC	ENVIRONMENTAL	SOCIAL
Price of product	Environmental management systems	Occupational health and safety systems
Profit of product	Green design and purchasing	The interests and rights of employees
Quality of product	Green manufacturing	The rights of stakeholders
Flexibility	Green management	Information disclosure
Technological and financial capability	Green packaging and labeling	
Production facilities and capacity	Waste management and pollution prevention	
Delivery and service of product	Environmental costs	
Lead time required	Environmental competencies	
Transportation cost	Green R&D and innovation	

To partner with sustainable suppliers, the buying company must then establish criteria to be able to assess new partners and re-assess the existing ones. According to Bai & Sarkis (2010, 253), a number of criteria has to be used to perform a profound sustainability evaluation of a supplier. In their profound literature review, Luthra et al. (2017, 1688–1689) found a total of 22 sustainable supplier evaluation criteria. In the table above, the evaluation criteria is introduced. As can be seen from the table, and as confirmed by many scholars mentioned earlier (Mani et al. 2016; Bastas & Liyanage 2018; Martins & Pato 2019), the concept of social sustainability still lacks closer examination in the literature as the topic is relatively new in the field of sustainable supply chain management.

2.3.2 Challenges in sustainable supply chain management

Despite the fact that sustainability in supply chain management is a well-recognized issue in the literature, concrete actions may not be as straightforward and simple in real-life business setting. There are many obstacles along the way in the aim of achieving sustainable supply chain. Fallahpour et al. (2017, 392) state that in the supplier selection, which is one of the most fundamental and important decisions in the supply chain management, the main issue lies in determining the most suitable criteria. As can be seen from the table 1 in the previous sub-chapter, there are many criteria for sustainable supplier selection to choose from. Song et al. (2017, 111–112) confirm this by stating that according to their profound research about the risks of sustainable supply chain management, the failure to select the right suppliers is the most prominent threat.

As stated earlier, recognizing the key suppliers and building long-lasting relationships with them is crucial part of supply chain management. As they are equal business partners, trust is one of the most important factors to cherish in such relationships (Schuh et al. 2014, 89). However, Schmitz et al. (2016, 23) recognizes the threat of heavy dependence in buyer–supplier relationships. The high level of information exchange and relational satisfaction can lead to so called lock-in-situation where the buying company might have no other option than to maintain the relationship – whether really wanting or not. In the most ideal situation, key suppliers share similar objectives regarding sustainability (Sharfuddin et al. 2018, 964). Whether there is no mutual understanding of sustainability goals, the lock-in situation may cause strategic inflexibility in terms of sustainable supply chain management.

According to Giunipero, Hooker & Denslow (2012, 262), one of the issues in sustainable supply chain management, is lack of consensus on the executive level. Companies do not have a common definition for sustainability, meaning that some define it narrowly and some broadly whereas others still do not have a definition for the concept. This also increases the risk for misalignment of short-term and long-term strategic goals in terms of sustainability. Despite the fact that supply chain practitioners crave for concrete changes to the field, the leadership of many companies still lack the hunger for more profound transformations and that seems to be one of the main barriers along the way (Sarkar 2017, 2–9).

As sustainability gains more attention, the companies of all sizes and industries must take actions in order to promote economically, environmentally, and socially healthy business. Despite companies are capable to solve many sustainability problems, the external pressure from the government is still preferred as regulations play an important role in sustainable development (Ageron, Gunasekaran & Spalanzani 2012, 173). According to Seuring et al. (2008, 1545), and despite the fact that there are companies that operate in a more proactive manner and from internal motives, there are far too many examples where companies still need the external pressure in order to keep sustainability on their agenda. Regulations are thus important, but the lack of general sustainability standards is yet one of the challenges in achieving sustainability in supply chain management (Giunipero et al. 2012, 262).

According to Giunipero et al. (2012, 262), compliance to the regulations is not that simple as they vary by country, region, and sometimes even city. Different locations have different acceptable sustainability standards. In this sense, building a global supply chain and ensuring its sustainability throughout the network is not an easy task. Beske, Koplin & Seuring (2008, 64–67) state that despite many sustainability standards, e.g. environmental ISO 14000 and social SA 8000, the overall control of a large supply network is relatively difficult. Also, the standards are not specific enough to serve the needs of companies of all sizes and industries and this is why companies often develop sustainability standards of their own, often referred to as ‘Codes of Conduct’.

Yet one challenge regarding sustainable supply chain management emerges from literature: the costs of sustainability. As Giunipero et al. (2012, 262) state, many believe that in order to implement sustainability, it will add the total costs though not deliver immediate financial

benefits for the company. The same conclusion is made by Martins & Pato (2019, 998) as they argue that some executives are confident that environmental and social sustainability come only with a trade-off on economic sustainability. According to Coffman & Umemoto (2010, 599), the conversation around sustainability often jumps to the arguments of trade-offs as many claim that environmental and social goods need to be sacrificed in order to gain more economic sustainability for the company. This may lead to distorted image that only one aspect of sustainability can be favored.

2.3.3 Drivers for sustainable supply chain management

Despite there certainly are challenges in achieving sustainable supply chain management, as clearly seen from the previous sub-chapter, there is still a strong need to keep striving towards sustainability. Giunipero et al. (2012, 260) were unable to find a comprehensive list of sustainability drivers in terms of supply chain management. Thus, it can be concluded, that sustainability drivers are not always identified or examined in the literature. However, it is important to understand the sustainability drivers as they may act as true motivators to continue the important work around sustainable supply chain management.

One of the most significant drivers in terms of sustainable supply chain management is the managerial orientation towards sustainability (Sharfuddin et al. 2018, 966). In this sense, the top management of the company must be committed to sustainability initiatives and make sustainability the top priority of the corporate agenda. Therefore, the sustainable mindset and clear actions towards sustainability from the executives are needed to strengthen socially, environmentally and economically healthy business culture. According to Giunipero et al. (2012, 260), such involvement of top management is encouraging the company to evaluate its role in the society. Wijethilake & Lama (2019, 146) also remind that commitment of the executives plays important role in implementing sustainability strategies.

Despite the many challenges regarding the sustainability regulations (Giunipero et al. 2012, 262; Beske, Koplin & Seuring 2008, 64–67) mentioned earlier in the sub-chapter ‘2.3.2 Challenges in sustainable supply chain management’, the regulations and restrictions may also act as a powerful driving force for companies to start aiming for more environmentally, socially and economically sustainable business. As stated by Sancha, Longoni & Giménez

(2015, 96), many countries and their governments have already developed requirements and laws with the respect to environmental and social issues. According to Ageron, Gunasekaran & Spalanzani (2012, 171), the external pressure, such as regulatory requirements, may even be the predominating driver when pursuing for sustainable supply chain management.

As for the opposing argument for the heavy costs of sustainability (Giunipero et al. 2012, 262; Coffman & Umemoto 2010, 599), mentioned in the sub-chapter '2.3.2 Challenges in sustainable supply chain management', sustainability can also bring many financial benefits for the company as studies show that corporate social responsibility pays off financially (Giunipero et al. 2012, 261). As many scholars have confirmed, there are links and positive relationships especially between economic and environmental aspect of sustainability. These savings may come from minimizing emissions, preventing pollution and managing waste. (Pullman, Maloni & Carter 2009, 40–41.) Other potential cost saving measures are energy saving, water saving, and usage of ecological products (Cantele & Zardini 2018, 168). Thus, by implementing sustainability to the processes, a company can reduce its environmental impacts and lower the financial costs at the same time.

From the perspective of sustainable supply chain management, yet one of the important drivers is achieving competitive advantage for the company (Giunipero et al. 2012, 261). As Barney (1991, 102) argues, a company has competitive advantage when “it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors”. Cantele & Zardini (2018, 168) argue that competitive advantage is often linked to value creation, and thus to financial performance. Sustainability plays a strong part in the scene as sustainability strategies can lead to product differentiation (Pullman et al. 2009, 40) as well as introduce innovations that eventually lead to competitive advantage (Chang 2011, 363). As stated by Lambert & Schwieterman (2012, 338), in the phase of supplier selection, the potential to co-create value must be recognized. The buying company can also receive valuable feedback from its supply network to further develop its operations (Hughes & Wadd 2012, 26).

Last but not least, one of the most significant drivers for sustainability in the supply chain management is the demand that comes from consumers. Giunipero et. al. (2012, 262) state that behind ecologically conscious consumer behavior is the belief that one can affect and

solve the environmental problems, and that is a strong motive to act in a certain way towards businesses. As goes with sustainability regulations, consumer demand also inflicts powerful external pressure for companies to re-assess their business and the supply network in terms of sustainability. According to Ageron et al. (2011, 178), the external pressure have positive impact on the development of sustainable supply chain management. Whitehead (2017, 404) also argues that sustainability-related consumer demand may influence the viability and the resilience of a company.

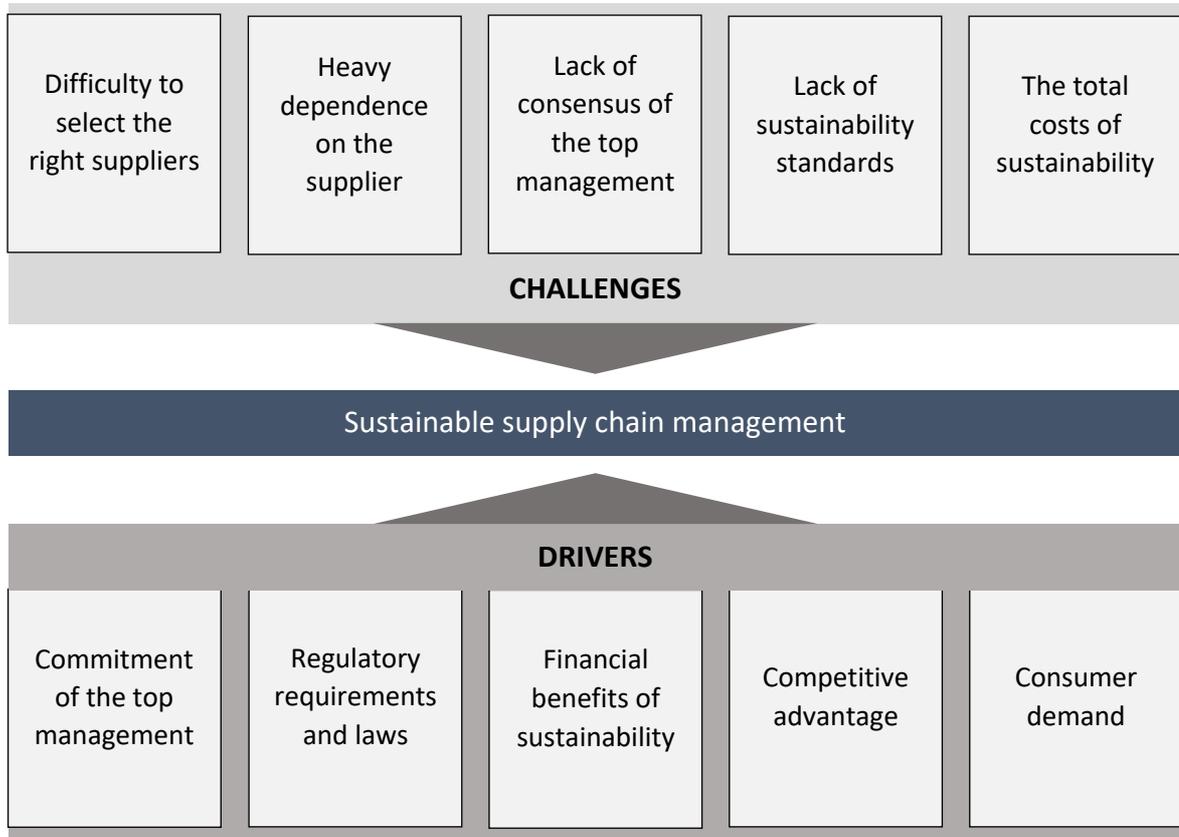


Figure 5. Challenges and drivers of sustainable supply chain management

As the literature regarding challenges and drivers of sustainable supply chain management is broad and somewhat complex, a simple figure was compiled to visualize both aspects in a more compact manner. The information shown in the figure above was gathered based on the issues covered earlier in the sub-chapters ‘2.3.2 Challenges in sustainable supply chain management’ and ‘2.3.3 Drivers for sustainable supply chain management’. This data was then used to construct the semi-structured interviews that are covered later in the sub-chapter ‘4.2 Semi-structured interviews’.

2.4 Sustainability in pharmaceutical industry

The companies from the pharmaceutical industry have also expressed their concerns and aims to tackle sustainability problems. Halim, Ang & Adhitya (2019, 433) argue that while in the past pharmaceutical companies strived to reduce emissions from their own activities, such as product manufacturing, the pressure has now grown to cover the whole supply chain. The same mentality applies to social aspect of sustainability as social responsibility is no longer subject to only one company as the whole supply chain network has to be put under closer examination (Nematollahi et al. 2018, 2878). However, as there are strict restrictions and laws in the pharmaceutical industry, the decisions regarding sustainable supply chain can be somewhat inflexible (Halim et al. 2019, 433).

Halim et al. (2019, 433) state that the main activities of the pharmaceutical supply chain include acquiring raw materials, manufacturing medicine and medical products, and finally delivering them to consumers through various distribution channels, such as wholesalers, hospitals, and pharmacies. A distinguishing factor from many other supply chain networks, pharmaceuticals often directly contribute to the social well-being (Nematollahi et al. 2018, 2876; Milanesi et al. 2020, 9–10). In this sense, shortages in the product deliveries may affect safety of individuals and increase the vulnerability of healthcare systems (Nematollahi et al. 2018, 2876–2877). Ding (2018, 116) argue that improving access to medicines should be considered as a core responsibility of companies that operate in pharmaceutical industry.

From the sustainability point of view, there is a lot of work to do in pharmaceutical supply chains. For example, and as listed by Ding (2018, 117–122), effort has to be made in product manufacturing, packaging, procurement and logistics, and waste management and disposal. One of the key elements of the sustainable pharmaceutical supply chain is the selection of suitable suppliers (Halim et al. 2019, 434). Therefore, and as noted in the sub-chapter '2.3.1 Sustainability in supplier selection', extra attention should be put in the supplier selection and preferably, from the sustainability perspective.

3 THE CASE COMPANY: OY VERMAN AB

This master's thesis is conducted as a case study and with close co-operation with the case company Oy Verman Ab, often abbreviated as Verman. According to Saunders et al. (2016, 184–186), the main objective of a case study is to explain a specific phenomenon in real-life setting. The benefit of such study approach lies in its ability to lead to rich and empirical descriptions of the subject as well as development of theory. The phenomenon this specific case study aims to explain is how social and environmental sustainability is recognized in the upstream supply chain in pharmaceutical industry. In addition, it tries to seek for possible challenges and drivers of the sustainable supply chain management. The 'case' in this study is an actual company from the pharmaceutical and healthcare industry.

As one of the leading companies in food supplements, over-the-counter medicines, medical devices, and prescription pharmaceuticals in Finland, Verman offers a great opportunity to contact the key suppliers of the industry to investigate the current sustainability status of the supply chain. The case company was selected by its availability, strong market position and expertise in the industry, and well-built relationships with its suppliers. Thus, to answer the research questions established in the sub-chapter '1.2 Research questions', Verman is an excellent company to partner with. The objectives of the case company reflect on the course of this study. More on the sustainability aims of the case company, see the sub-chapter '3.3 Current sustainability status and objectives'.

3.1 Introduction of the case company

Verman is a family-owned Finnish company founded in 1987. Through working closely with healthcare professionals and its customers, the company has established a strong position in the Finnish market. Verman is focusing on high-quality products that promote health and well-being. Innovation, research and development, as well as marketing and sales are the expertise areas that Verman strongly rely on. (Verman 2020a.) In 2019, the turnover of the company exceeded 44 million euros, and the strong financial position enables investments in future growth (Verman 2020b).

During the past few years Verman has been one of the fastest growing healthcare companies in Finland. Several products that have been brought to market by the company are now market leaders in their own product categories. From the very early days, the company has also extended its business outside the Finnish borders, and today has a strong presence in Sweden, Denmark, Norway, and the Baltic countries. Verman has established its leading position by working closely with key opinion leaders as well as the customers. The head office is located in Kerava, Finland. (Verman 2020a.)

Going forward, Verman will remain a family-owned company, and continues to build its presence both in its home market and countries outside Finland with the aim of becoming a Northern European consumer healthcare company with a strong Nordic heritage (Verman 2020a). The core mission of the company is to promote everyday health and well-being. The company values are to operate in a customer-oriented manner, to act responsibly, and to grow and develop together. At the moment, Verman employs more than 70 people. (Verman 2020b.)

3.2 The role of key suppliers in the supply chain

As Verman's business is somewhat complex and the core competence is in wholesale, the company is strongly relying on the relationships with the suppliers. Therefore, properly established supply management is one of the main functions of the company. As Kraljic mentioned in his article (1983, 110), supply management is relevant part of business when a manufacturer is producing a volume of critical items competitively and under complex conditions. This profound definition defines well the characteristics of the case company and the industry it operates in.

Verman uses several suppliers in its business. Some suppliers are more important than others and therefore, they have gained special position and role in Verman's supply chain. These are the key suppliers, and they are considered critical business partners. Addition to Verman, they serve other wholesale companies in the Finnish pharmaceutical industry. To get better understanding of the supplier's position in the supply chain, a short inquiry was conducted with Purchasing Director and Purchasing Manager of the case company. Among other tools, Verman has also used the popular Kraljic matrix in identification of the key suppliers.

HIGH PROFIT IMPACT	LEVERAGE ITEMS Focus on exploitation of purchasing power	STRATEGIC ITEMS Focus on building long-term relationships
LOW PROFIT IMPACT	NON-CRITICAL ITEMS Focus on maximization of efficiency	BOTTLENECK ITEMS Focus on volume assurance
LOW SUPPLY RISK		HIGH SUPPLY RISK

Figure 6. The Kraljic matrix (Kraljic 1983; Caniëls & Gelderman 2005, 142)

Kraljic matrix is one of the most famous purchasing portfolio models. Introduced back in 1983, the matrix has had a great impact on many purchasing professionals and scholars over the years. It has helped companies to shape their supply strategies and inspired them to see the importance of supply management (Caniëls & Gelderman 2005, 141.) The matrix, as illustrated above, encourages professionals to categorize purchased items and their suppliers into four sections (as well as form a proper supply strategy around them) according to two factors: 1) the importance of the supplier and its impact on profit, and 2) the complexity or the risk of the supply market. In this study, this information has helped to determine which companies are critical to contact in order to answer the research questions properly. For more information, see the sub-chapter ‘4.3 Selection of the participants’.

3.3 Current sustainability status and objectives

As one of the leading pharmaceutical and healthcare wholesales in Finland, Verman is under continuous evaluation by its customers, such as pharmacies and natural food stores, end consumers, authorities, and other players of the supply chain. In this sense, Verman should always be aware and prepared to react to acute issues. As mentioned by Ndlela (2019, 4), high risks and vulnerability are built in our society and there is a strong need to proactively prevent crises from happening in a business environment. Ndlela (2019, 81) also mentions that, in case of a crisis, reputation of a company can be shattered in an instant even though being built precisely and over a long period. Verman is a modern company and willing to stay on top of trends. The company is committed in continuous improvement and does not leave important matters unconsidered.

Since sustainability is one of the hottest topics nowadays, and companies of all industries and sizes are required to take prompt and serious actions, Verman is also striving towards more sustainable future in its everyday business operations. After a profound conversation with the Purchasing Manager of the company, it was clear that sustainability, especially the environmental aspect of it, has been in a discussion many times before on an executive level. Solutions have been actively sought, yet concrete actions were still imprecise and seeking for their more specific purpose and meaning. As a good example, sustainability matters are hardly considered when scanning for potential suppliers or evaluating and re-assessing the existing ones. There are no selection criteria determined in terms of environmental or social sustainability. Therefore, there is no clear outlook on the sustainability status of the supply network either.

The only written reference regarding sustainability was found in Code of Conduct of the company. However, the document itself is vague and leaves too much space for different interpretations in terms of sustainability. In addition, since Verman is a wholesale company, it is important to put the emphasis on supply network, not only the core company itself. The products are mainly manufactured outside the case company. It was somewhat obvious that more definitions and a profound research were required to get a more comprehensive and current outlook on the sustainability matters among the supply network. The importance of such study came to prominence and was widely accepted in the case company. Thus, the comprehension of the current sustainability status of the supply chain is crucial. Without solid understanding of the present, it is hard to make any adjustments and corrections to everyday business operations. It should be noted that sustainability at Verman is not regarded just as a one-off project, but something that helps the company to continuously improve its approach on environment, health and safety, respecting people, and business ethics.

4 EMPIRICAL RESEARCH

The main goal of the empirical research is to gather necessary information for the analysis in order to get the results that determine the answers for the research questions established for this study. In this chapter, the formation of self-administered questionnaires, preparation of semi-structured interviews, selection of the participants, and the phase of data collection are presented. All the steps mentioned are increasing reliability and validity of the research which are discussed later in the sub-chapter '4.5 Reliability and validity'.

In this study, self-administered questionnaires and semi-structured interviews are used. The research instruments are justified by many reasons. First, and according to Fowler (2009), the benefit of a questionnaire is that the respondent does not have to admit directly to an interviewer a possibly socially undesirable answer. This is important factor when dealing with sensitive topics, such as sustainability. Second, self-administered questionnaire often provide more time for the respondent to think the questions through and gather possible data before returning the answers. This factor has been taken into account as availability and accuracy of the sustainability information is not always guaranteed (Ernst & Young 2014, 15). Third, semi-structured interview is an excellent tool for qualitative research as it already includes a list of themes to be studied as well as key questions to be covered (Saunders et al. 2016, 391). The interview often provides rich and in-depth answers, which are highly needed to conclude the sub-questions established for this study.

In addition to answering the research questions, the results of this study will provide valuable information for the case company to understand the environmental and social sustainability status of its upstream supply chain as well as the challenges and the drivers for sustainable supply chain management. As mentioned in the sub-chapter '3.3 Current sustainability status and objectives', the case company struggles to see the overall picture of the situation. Despite the strong desire to take part in the sustainability matters, the concrete actions are lacking consistency and purpose. Profound understanding of the present situation is a requirement for any future adjustments to the business operations. As Kothari (2004, 6) states, the results of a research assist in taking business decisions. Therefore, research plays an important role in solving operational and planning issues in business.

4.1 Self-administered questionnaires

To examine how environmental and social sustainability is noticed in the upstream supply chain of the pharmaceutical industry, a self-administered questionnaire was sent by e-mail to the key suppliers of the case company. More on the respondents, see the sub-chapter ‘4.3 Selection of the participants’. This specific type of a questionnaire and selected distribution channel was justified by many factors. These factors are (Saunders et al. 2016, 440–442):

1. Characteristics of the participants

As the participants are the specialists of the field, the interference of the interviewer was not necessary. However, contact information was provided in case a participant needed additional information.

2. Importance of reaching the right participant

E-mails work as good distribution channels as most people read and respond to their own personal e-mail. In addition, the possibility to easily forward the questionnaire to the right person was taken into account.

3. Types of questions

The questions are related to environmental and social sustainability and therefore, are likely to be in the interest of the participants.

4. Number of questions

A total of 11 questions were included in the questionnaire. As the number is relatively low, the questionnaire was light enough to send via e-mail. In addition, despite being a qualitative research, the data received from the questionnaire should preferably also be quantifiable as later discussed in the sub-chapter ‘5.2 Quantifying the data’.

As sustainability is a broad topic, delimitation was necessary. The questions were influenced by the current sustainability status and the objectives of the case company. The questionnaire was formed based on the literature review conducted earlier. The questions derived from the sustainable supplier selection criteria presented in the table 1 focusing on the environmental and social aspects of the sustainability.

4.1.1 Formation of the questionnaire

The self-administered questionnaire was designed taking into account the characteristics and the expertise level of the participants. Fowler (2009) states that a question should be designed only for a measure purpose. Thus, conversational inquiries are left aside, and only relevant questions are asked in the questionnaire. In this study, despite being qualitative in the nature, the information received from the questionnaires should preferably also be quantifiable. The questionnaires work best with standardized questions so that they are interpreted the same way by all the respondents (Saunders et al. 2016, 439). The same key message is emphasized by Fowler (2009) who makes a note that, with no interviewer present, the answers may vary drastically and therefore, will not be comparable in the analysis phase. As sustainability as a subject may bring out different interpretations among the participants, the possibility for simplified 'yes' and 'no' answers can be easily justified.

According to the profound study conducted by Ernst & Young (2014, 15), both accuracy and availability of the sustainability information may reflect a major challenge in gathering the necessary data. As the purpose of the questionnaire is not to dig too deeply into the topics of environmental and social sustainability, the questions are designed to be more respondent-friendly. Thus, the questions that may cause inconvenience in data collection are delimited from the study. Despite being quantifiable, the possibility for comments and reflection was offered with each question for the opportunity to describe possible closed answers more comprehensively. Open questions in general give the respondent the option to answer the questions in own words (Fowler 2009).

The self-administered questionnaire was divided into three categories: General Questions, Social Sustainability, and Environmental Sustainability. Categorization in general means to treat things as equivalents or group subjects into classes, and it helps respondents to make inductive conclusions about the object discussed (Rakison & Oakes 2003, 3). The goal of such categorization is to make the questionnaire easier to interpret and visually attractive. As sustainability as a topic is broad and not always easy to understand, all three categories were decided to keep as short and concise as possible. Therefore, each category contained 3-4 questions. All in all, the questionnaire consisted of 11 questions. These questions were pre-tested by a few specialists of the case company.

4.1.2 Wording of the questionnaire

According to Fowler (2009), wording is one of the critical measures for reliability. Basically, the questions should mean the same to all the participants. For example, the questions must make a full and sensible sentence. Instead of asking “Reason last saw doctor?” it is better to use a whole sentence like “What was the medical problem or reason for which you most recently went to a doctor?”. In addition, optional wording can be used to make the questions more precise. For example, in question number six, the terms such as ‘well-being’, ‘equality’ and ‘work-life-balance’ are explained by concrete examples. This step mitigates the risk of different interpretations of terminology among the respondents. The question is formulated as follows:

6) Are well-being, equality and work-life balance mentioned in your sustainability program / strategy? (These may show in everyday working life, for example, by offered flexible working hours, insurances, and occupational healthcare or promoted gender equality)

The same exact logic was used in question number two, which brought up the term ‘formal sustainability program’. Such programs can be beneficial and essential part of business, when managed properly. They can affect positively on growth, returns on capital, and risk management of the company. (Berg, Schlag & Stuchtey 2015.) Although being powerful factors of change in the business environment nowadays, it was considered necessary to give an example of such program for clarification. The question was formulated as follows:

2) Does your company have a formal sustainability program? (Such programs often involve a working group that regularly discuss and work on sustainability-related initiatives)

Social sustainability is an elusive concept, and the least studied aspect of the sustainability. As Dempsey et al. (2011, 290) state, there is only a limited literature that focuses on social sustainability. Thus, the concept is vague, and from a research perspective, should be kept compact and clear. This means that challenging terminology is left out of the questionnaire and the questions simplified. In the category ‘Social Sustainability’, the topic concerns both internal and external stakeholders as the following questions show:

4) Are human rights and fair labor practices monitored in the supply chain?

5) Are safe working conditions for your employees ensured?

Generic language was used in the questionnaire and professional vocabulary reduced to a minimum to avoid the risks of misinterpretation and confusion. According to Englander (2012, 23), it is not rare that the structure of a research might change depending on the cultural background of the participant. To tackle this issue, all the selected participants are from Europe, where understanding of sustainability can be assumed to be somewhat similar. Also, as sustainability might be a sensitive subject to talk about, critical or oppressive tone of voice was avoided in all communication regarding this research.

4.2 Semi-structured interviews

Questionnaires are recommended to link to other methods to provide more comprehensive outlook to the research. Saunders et al. (2016, 439) give a good example as they say that a questionnaire may discover customer's buying behavior, yet an interview can further explain these behaviors in-depth. In this study, the questionnaire conducted with the supply network aims to give an understanding of how environmental and social sustainability is noticed in the upstream supply chain of pharmaceutical industry. Yet to examine challenges as well as drivers for sustainable supply chain management more closely, semi-structured interviews were conducted with the procurement specialists of the case company. As a conclusion, the challenges may reveal the obstacles that need more resources and closer examination, and the drivers indicate the important motivators to continue the work to achieve sustainability in the supply chain.

According to Saunders et al. (2016, 391), semi-structured interviews are often referred to as qualitative research interviews as they tend to provide more qualitative data. In practice, the interviewer asks pre-defined key questions and provoke conversation around the topic that is wished to be studied. The order of the questions may vary from interview to interview depending on its flow and the information derived from the conversation is often captured by note taking. Based on the profound literature review in the sub-chapters '2.3.2 Challenges in sustainable supply chain management' and '2.3.3 Drivers for sustainable supply chain

management’, the key questions for the interviews were compiled to simple multiple-choice lists and the conversation was engaged based on these themes. The data gathered from the semi-structured interviews provided the additional information to answer the sub-questions established for this study.

In the semi-structured interviews, there are two main factors to consider. First, it is important to listen closely to the participant for points and tips that may need more clarification and further explanation. Second, important extremities must be placed on hold during the flowy conversation as they can be later returned to for elaboration or on which the participant is encouraged to critically reflect. These two factors ensure the reciprocity of an interviewer as the conversation should not rest only on one counterpart. (Galletta & Cross, 2012, 77.)

4.3 Selection of the participants

As mentioned in the sub-chapter ‘3.2 The role of key suppliers in the supply chain’, Verman is using the Kraljic matrix to identify the key partners of its supply network. In this study, this information is valuable as it is important to determine which companies are critical to contact in order to get a good outlook on the environmental and social sustainability status of the upstream supply chain in pharmaceutical industry. In addition, as the number of the contactable companies is limited, the selection of the participants plays even more important role in the study. In this chapter, only the participants of the self-administered questionnaire are examined.

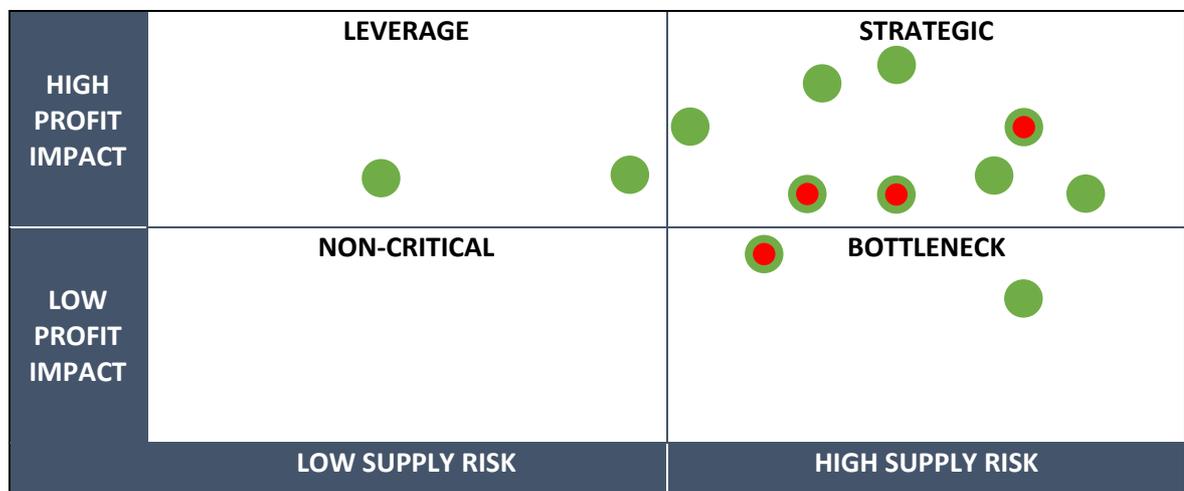


Figure 7. The contacted and participated companies

As seen from the figure above, the objective was to contact the suppliers mainly from the 'Strategic' section, adding a few companies from the 'Bottleneck' and 'Leverage' sections. None of the 'Non-critical' companies were selected for the research. The decision of these selections was confirmed by Purchasing Manager of the case company, who also provided the contact information of suitable participant from each company. In the figure, the green circles indicate all the companies that were invited to answer the questionnaire. The red mark inside the circle indicates a negative answer or no reply at all. All in all, 12 companies were contacted of which 8 participated resulting in a response rate of 66,7%. To avoid any cultural collision or misinterpretation of the questions presented in the questionnaire, all the selected participants were from Europe and thus, presumably share mutual understanding about the subjects discussed.

4.4 Data collection

The self-administered questionnaire was sent by e-mail to the participants. According to Saunders et al. (2016, 441), by using e-mail as a contact channel, there is a high possibility that it reaches the right person as e-mails are often personal and easy to acquire. Foreword of the e-mail was kept simple without leaving any necessary information out. It emphasized the need for co-operation and the fact that the data gathered from the questionnaire is going to be used to improve Verman's operations to be even more sustainable in the future. Also, the contact information of the researcher was provided in case any inquiries arise among the respondents. The questionnaire is enclosed to this document (see appendix 1).

As mentioned, 12 companies were contacted of which 8 participated and provided answers to the questionnaire. Thus, the response rate for this study was 66,7%. According to Saunders et al. (2016, 441) the response rate for questionnaires within organizations is usually 30–50%. Krosnick (1999, 539–540) ensures that questionnaires often stop short in cases where they aim for the perfect response rate. Therefore, increasing the rate does not monotonically increase the representativeness, as questionnaires with relatively low response rate can also be accurate. In this sense, the more researchers boost the response rate and force participants to respond, the more careless and vaguer the answers become which then results in a less representative sample.

Despite fast and real-time connections in digital era, there is still need for repeated contacts and reminders. In case of no replies to the first inquiry, a follow-up message was sent to the participants. In the follow-up message respondents were reminded of the ongoing research and its importance. A total of two follow-up messages were sent during the data collection phase. Despite providing the participants with deadline and a time limit of about three weeks, the questionnaire remained open for two months. This solution was justified by the fact that the information needed for the answers is not always easy to collect (Ernst & Young 2014, 15). The extended response time was also a common wish of majority of the participants.

To conduct the semi-structured interviews, text-based instant messaging software, in this case Microsoft Teams, was used. This type of internet-mediated interviewing is described as a synchronous form of interviewing as the technology is based on real-time transmission. However, the interviews may involve time gaps between the question asked and the answer provided. Also, one interview session can extend over many periods when both counterparts are online. (Saunders et al. 2016, 424–423.) A total of four procurement specialists from the case company were interviewed to get a more profound outlook on the possible challenges and drivers for sustainable supply chain. For the interview, a form was compiled to help the interviewer to identify the themes to discuss. Free and flowy conversation around the topics was encouraged. The interview form is enclosed to this document (see appendix 2).

An important factor of data collection is to ensure the motivation of participants. According to Brügger, Wetzels & Ruyter (2011, 371), it is somewhat unclear what is the true value derived by the participants. At the end, participating in research can be very time-consuming and interrupting. In this case, no remuneration was offered from responding to questionnaire nor participating to interview. As confirmed in the research by Bosnjak, Tuten & Wittman (2005, 501), the motivation may then lie in the moral obligation. As Krosnick (1999, 540) stresses, social responsibility is a powerful factor in research participation. In this sense, the subject of the research (sustainability) may be the main driver for participation.

4.5 Reliability and validity

Reliability and validity measure the quality of a research and are common principles of all research. Whereas reliability measures how stable, dependable, and consistent the research

is despite the times it is conducted (Ayiro 2012, 353), validity is used for validation of the measuring instrument in relation to its purpose (Carmines & Zeller 1979). Ayiro (2012, 353) also states that reliability and validity are general concepts in measurement as all research should possess certain qualities. Saunders et al. (2016, 203) remind that common threats to reliability and validity are factors which alters the behavior of participant or researcher. As development is fast in the field of pharmaceuticals and new research emerge constantly in the areas of environmental and social sustainability, it is good to mention that, in this research, the strong linkage to this specific period of time is noticeable.

There are several steps and procedures that can increase the quality level of a research. As there are many factors to consider, it is up to the researcher what measures are finally used to enhance the quality. To increase the reliability and validity of this research, the next steps were taken into consideration: 1) selection of the research methods, 2) profound preparation of the research instruments, 3) pre-testing of the questionnaire, 4) valid data collection, and 5) proper research analysis. These steps are examined more closely in the next paragraphs.

1) selection of the research methods

The first step of this study was to decide what to measure and define the research questions which determined the appropriate research design. Research methodology was established to guide the research process. The selection of the research instruments appropriate for this study increases the possibility for reaching the right participants which is then connected to the reliability of the research (Saunders et al. 2016, 440–442).

2) profound preparation of the research instruments

As wording is a good measure for reliability (Fowler 2009), it was clearly emphasized in the formation of the self-administered questionnaires. As the sub-chapter ‘4.1 Self-administered questionnaire’ shows, this factor has been widely considered.

3) pre-testing of the questionnaire

The self-administered questionnaire was pre-tested by a few specialists of the case company. The main objective of pre-testing is simply to identify the questions that may be difficult to understand. The process improves the measurement validity and reassures that the meaning of each item is clear. (Krosnick 1999, 541.)

4) valid data collection

Data collection involves phases of choosing proper channels for contact the participants as well as ensuring open communication and follow-ups. The response rate for this research is 66,7% which is above the average as for the questionnaires within organizations it is usually 30–50% (Saunders et al. 2016, 441).

5) proper research analysis

The analyzation of the data gathered from the research is then to make statistical estimates and finally reach a conclusion (Fowler 2009). For the reliability and validity of the research, it is important that the answers are decoded correctly and as respondents intended (Saunders et al. 2016, 450). More on research analysis, see the next chapter ‘5 Research analysis’.

5 RESEARCH ANALYSIS

After the responses were gathered and necessary data collected from the self-administered questionnaires and semi-structured interviews, it was carefully analyzed in order to provide results and conclusions for the research. Qualitative data is often analyzed by categorizing the information into themes and presenting the diversity ideas gathered during the research process (Ayiro 2012, 493). The nature of qualitative data is rich and thus, the actual meanings of the information are derived from words and images, not numbers (Saunders et al. 2016, 568). In this research, thematic analysis was executed. Also, the data from self-administered questionnaires was quantified in order to provide overall picture of the current environmental and social sustainability status of the pharmaceutical supply chain.

Despite data analysis is quite simple and straightforward process, it includes several smaller steps to consider. First, the data must be cleaned and logged into the database created for the research. Then, codes must be constructed against the data so that the clearest themes of the research are revealed. Finally, conclusions must be made based on the analysis in a way that clear results can be presented. (Ayiro 2012, 459–460.) Since existing theory was used in the groundwork of this research, a deductive approach was used in the analysis of the data. As Saunders et al. (2016, 570) remind, a deductive approach will simply link the research and its result into the existing body of knowledge.

5.1 Thematic analysis

Thematic analysis is a common way to analyze qualitative data and is often described as systematic yet flexible approach. The main objective of such analysis is to find patterns and relationships of the themes that occur across the data set. The approach suits well research with large and small data sets. (Saunders et al. 2016, 579.) The characteristics of thematic analysis fits this specific research well, and therefore, the choice of such approach is easily justified. First, flexibility is highly needed in the process since there are several sources of information, the amount of data is limited, and the time span for conducting the research was relatively long. Second, systematic way of working ensures that the energy is invested in the right deeds, such as answering the research questions.

The way of conducting a thematic analysis is not linear as the data is revised and checked several times during the process. Therefore, the data is read and re-read to refine coding and emerging themes. To conduct thematic analysis in a proper manner, the next steps should be considered. First, it is crucial to get familiar with the data. Naturally, this happens when the data is received, logged into the database and reviewed for accuracy. This step is covered in the sub-chapter '5.1.1 Data preparation and error detection'. Second, the data must be coded to reveal themes and patterns of the data set. In this phase, the data is categorized into groups with similar meanings. More on this procedure, see the sub-chapter '5.1.2 Construction of codes and coding'. Third, and naturally, specific themes of the data set and the relationships of patterns are identified. The sub-chapter '5.1.3 Recognition of themes and patterns' finally concludes the process of thematic analysis, and results of the analysis can be presented. (Saunders et al. 2016, 580–585.)

In this research, two coding sessions were executed as two different data sets were compiled. The data gathered from questionnaires covered the topics around the sustainability programs and initiatives, supplier requirements, the status of internal and external social sustainability, emissions tracking, recycling practices, and environmentally sustainable packaging. The information compiled from semi-structured interviews included the more in-depth outlook on the challenges and the drivers for environmentally and socially sustainable supply chain management from the perspective of the buying company. Despite being similar in nature, the latter data set was smaller and thus, the processes of data preparation, error detection, coding, and theme recognition were more straightforward to execute. The data sets were kept in different worksheets, but later combined to see the overlapping themes and relationships.

5.1.1 Data preparation and error detection

In short, data preparation means logging the data into the database and checking the data for accuracy. Thus, the data is converted into readable and consistent format as the information is often gathered from multiple sources at different times and may include texts, pictures and other incompatible forms. (Ayiro 2012, 460.) As the qualitative data is often rich and may have different meanings, the phase of data preparation plays an important role (Saunders et al. 2016, 568). In this research, the sources of data are e-mail messages, PDF and Word documents, and memos from Teams meetings.

As the literature reveals different preferences on how the incoming data is tracked and stored (Ayiro 2012, 460), the data for this specific research was collected into the database along the research, not only in the end of data collection phase. This is justified by the fact that the time span for this research was relatively long, and the time difference for the first and the last information received during the data collection was about three months. In this sense, it is reasonable to set up the database as soon as the first data entry can be recorded. This will help to assess what data is already in and what is still outstanding at any time of the process (Ayiro 2012, 460).

In data analyzation, any standard computerized database software or statistical program can be used (Ayiro 2012, 460). Fowler (2009) also adds that by using such software, the data is not only organized or coded properly, but also checked to ensure the needed quality control as the data entries can then be sorted, filtered and limited to only certain codes. Since there is a limited amount of information in this specific research, Microsoft Excel is a sufficient and most convenient program to use. The benefits of Microsoft Excel are in simple interface and the comprehensive possibilities to visualize data. In addition, the researcher of this study already had a profound knowledge of Microsoft Excel so that the energy could be invested in the activities of great worth rather than building technical understanding. Since there are two different data sets for this research, both sets were logged in and stored in the same Excel file yet on two different worksheets.

Data preparation also includes the phase of data cleaning in which the gathered information is reviewed in order to detect errors. As soon as the data is received, it is recommendable to screen it for accuracy. In short, the data should be scanned to see whether the responses are readable, and all the important questions covered. (Ayiro 2012, 460.) In this research most of the answers passed accuracy check with an ease, but in a few cases additional information and clarification were needed. These clarifications were provided to the respondents by e-mail and by arranging extra meetings using Teams software. In this specific research, a great emphasis was put to the data collection to ensure that the given questions were understood properly, and the answers covered well. This naturally reduces the energy used in the error detection and coding of the data as its quality is verified beforehand.

The phase of data preparation was relatively clear and consistent as the data received from the multiple sources was simple enough to process. Thus, many procedures that are familiar in larger research are not implemented to this study. Some procedures, such as establishing a separate codebook for the research or making double entries into database to ensure the accuracy of the information are not seen as necessary steps and therefore, are not included in this study.

5.1.2 Construction of codes and coding

The idea of coding is simply to create categories in which analytically similar answers are grouped and thus, the responses are differentiated. Therefore, a criterion for a good code is that it separates the answers in analytically meaningful categories. To do so, it is important to have a clear idea about what characteristics bring analytical significance to the answers. (Fowler 2009.) In short, coding means labelling each unit of data with a code that symbolizes the meaning of that specific data extract. A code can be a single word or a short phrase. The process itself follows a simple rule: if a piece of data brings new insights and does not have a similar meaning as the previous information, a new code is established. (Saunders et al. 2016, 580–582.) Also, the responses that do not fit clearly in the established categories must be placed under the code ‘other’ or similar so that all the records are noticed as the research progresses. (Fowler 2009.)

In short, a code is a set of rules that converts the responses into numeric or alphabetic value (Fowler 2009). As the database was set, all of the answers were given a code. Even responses with “I am not sure” or “I don’t want to answer this questions” were taken into account. As Fowler (2009) suggest, codes for missing data are important. In this research, the codes were established during data collection phase as the answers were recorded into the database and new information was revealed. This is usual in cases where the respondents are asked to provide answers in their own words and the number of codes is not predictable ahead of time (Fowler 2009). In this sense, code development is an interactive process as categories emerge from the answers (Saunders et al. 2016, 571; Fowler 2009). The process of coding in this research is showed in the table below.

Table 2. The process of coding

Sustainability documentation/program	Part of strategy / Strategic plan	5
	Other policies implemented	6
	Working group in progress	2
	Corporate Social Responsibility Program	1
	Not considered	3
Supplier requirements	Strong co-operation	3
	Monitored yearly	2
	Policies to follow	4
	On-site visits	2
	Not considered	1
Internal social sustainability	Employee surveys	4
	National laws and regulations	4
	Low turnover rate as evidence	1
	Code of Conduct / policies	5
	Working group established	2
External social sustainability	Policies to follow	5
	Monitored yearly	2
	Monitored once	1
	National laws and regulations	1
	Not implemented	1
Tracking of emissions	Scope 1 and 2 GHG emissions	1
	Scope 3 GHG emissions	2
	Implemented to logistics	5
	No data available	4
	Annual reporting	3
Material sorting / recycling	Implemented in the process	7
	Considered	1
	National standards followed	1
Sustainable packaging	Part of business	3
	In the process / R&D	5
	Only when requested	2
	Not in use	2

Coding is a versatile tool to use in a qualitative research. The codes are derived from mainly three sources: 1) The codes may be words used by the participants in their responses. These codes are called ‘in vivo’ codes. 2) The codes may be developed by a researcher as she or he comes up with labels that best describe the data. 3) The codes may be derived from the existing literature and theory. These codes are called ‘a priori’ codes. (Saunders et al. 2016,

582.) As this specific research uses deductive approach, the codes are mainly derived from the theoretical framework used for this research. Also, some ‘in vivo’ codes were used. What also has to be mentioned is that the main objectives of this research guide the approach to coding. In this sense, the process of coding aims to present results that will then provide the answers to the research questions established for this study.

Thematic analysis was used on both data sets resulting in two different coding sessions. In the other data set, the information provided an outlook on the challenges and the drivers for environmentally and socially sustainable supply chain management, especially emphasizing the perspective of the buying company. This additional data brought the much-needed in-depth material for the research. The more on overlapping themes and relationships between the two data sets are covered in the sub-chapter ‘6.3. Future measures and implementations’.

5.1.3 Recognition of themes

During the analysis, clear themes and patterns and their relationships are risen from the data sets, and they are all documented in Excel worksheet. As Saunders et al. (2016, 569–584) suggest, the data starts to make sense as coding and categorizing of the information proceeds. However, the search and recognition of themes and patterns fully starts when all of the data is looked over, processed and properly coded, and simultaneously reassured that all the codes have a specific and analytical meaning to the research. Thus, the number of codes does not play a significant role in a research and data should not be forced to match any number of codes. As mentioned earlier, the main focus should be put to the research itself including objectives of the study and formulation of the results that eventually bring answers to the research questions.

As the table below shows, the recognized themes are also strengthened by supportive quotes of the gathered material. The quotes are collected from many sources, such as PDF and Word documents and e-mail messages, although they are all in a written format. In this sense, the quotes are used in the original form. The supportive quotes help to determine the themes that were brought up in the coding process and give an excellent outlook of how the participants interpret the questions. The table below also provides in-depth review of the gathered data.

Table 3. The supportive quotes to the themes

Sustainability documentation/program
<p>“Sustainability is a key component of our strategic plan”</p> <p>“We are in progress of creating a formal sustainability program”</p> <p>“Sustainability objectives will be set in the strategy work we are undertaking this year”</p> <p>“The UN sustainability goals are the backbone of the company strategy”</p>
Supplier requirements
<p>“We have started a process of sharing our sustainability policies with our suppliers”</p> <p>“We aim to co-operate only with well-known and reliable suppliers”</p> <p>“At the moment we are working on a questionnaire we will send out to all our suppliers”</p>
Internal social sustainability
<p>“Working conditions are continuously followed and improved”</p> <p>“We follow national laws”</p> <p>“The law makes it obligatory to have a contract with an occupational health and safety service”</p> <p>“We have a social corporate responsibility policy, workplace policy and equality policy”</p>
External social sustainability
<p>“Social responsibility related questions are part of the evaluation”</p> <p>“All suppliers need to confirm they will follow our policies”</p> <p>“We have high standards for conducting business ethically”</p>
Tracking of emissions
<p>“Despite the growth of our company, the emissions have remained fairly static”</p> <p>“We have no emissions that require a permit from the Environmental authorities”</p>
Material sorting / recycling
<p>“All our packaging excess goes for recycling”</p> <p>“The possibility of recycling plastic is under evaluation”</p> <p>“We sort transparent plastic, corrugated cardboard and cardboard”</p>
Sustainable packaging
<p>“We are actively investigating new sources of packaging”</p> <p>“We offer recycled alternatives for the packaging materials, when requested”</p> <p>“We have a department taking care of the sustainable packaging”</p>

In this stage of analysis, patterns and their relationships are examined more closely. This phase also includes making judgements based on the data collected. (Saunders et al. 2016, 584.) The process of coding revealed the overall situation of the sustainability status of the upstream supply chain in pharmaceuticals and how it has been recognized and implemented so far. In addition, clear conclusions of challenges and drivers regarding sustainable supply chain management can be derived from the information. As Saunders et al. (2016, 585) state, it is important to study what trends are evident from the data and what is the essence of each

theme brought up during the phase of coding. All of the themes are discussed in a detailed manner in the sub-chapters '6.1 The current sustainability status' and '6.2 Challenges and drivers'.

5.2 Quantifying the data

In a research that follows the qualitative study approach, the answers can be interpreted as varied, elastic and rather complex (Saunders et al. 2016, 568). However, in this research, the information received from the self-administered questionnaires is also quantifiable as the amount of data is relatively scarce. In addition, and since the questionnaires provided the possibility to answer in a shorter manner, such as 'Yes' and 'No', the quantification of data is a rather simple process to take. The quantification of the data does not, however, erase the richness of the original qualitative data that is used in the thematic analysis. In this research, these two methods go well side by side.

Quantification of data gives a possibility to make rather quick conclusions of the information received from data collection phase. This possibility is then utilized in data display which is later discussed in the sub-chapter '5.3 Data display'. Therefore, before digging more deeply into the rich information of qualitative information, the quantified data gives a glimpse of the overall situation in a more simplified manner. The quantifiable data can be seen as very reliable format of information as the rate of error in data preparation is much less than 1% (Fowler 2009).

In short, quantification of the data distributed the positive responses of 'Yes' answers and the negative responses of 'No' answers and made a clear split that gives a good view of the current environmental and social sustainability status of the supply chain and its readiness in the pharmaceutical industry. However, and despite some of the answers had an inclination to 'No' answer, they were actually in progress, as described by the participants. In this sense, it was justified to add the 'In progress' indicator to designate that the problem has been recognized and solution is waiting for implementation. According to the participants, the implementation is taking place within a year. The results are showed and discussed in the beginning of the chapter '6 Results'.

5.3 Data display

The qualitative research produces a large amount of information. The conclusions are easier to make when the selected information is extracted from the extended data and transformed into more visual form. In short, and as Saunders et al. (2016, 614–615) describe, data display means organizing the gathered information into summary diagrammatic or visual display. Therefore, data display helps to make prompt conclusions and summaries of the information showed in the matrices, figures, graphs, and networks. In addition, it shows the relationships between the patterns as well as key concepts of the information and possible trends which then helps to make comparisons of the elements. In this sense, data display is a very useful tool to interpret the data and make further analysis.

The visual forms of information are relatively easy to generate. The aim is to focus on data condensation which means that the information collected, or only parts of it, is summarized and simplified. (Saunders et al. 2016, 614–615.) In this specific study, and as the analysis was executed with the help of Microsoft Excel, the possibilities for visualization were broad and comprehensive. A simple bar chart was used to give an outlook of current environmental and social sustainability status of pharmaceutical supply chain. The data was based in the quantified information of the self-administered questionnaires. As the research takes more quantitative approach at this point, the use of diagrams and statistics is common. The figure is shown on the next page.

6 RESULTS

As the data was collected and properly analyzed based on a thematic analysis, the results of this research are finally revealed and presented. The quantification and visualization of the data are put to use as the figure below indicates environmental and social sustainability status of the pharmaceutical supply chain. As can be seen from the figure, the results are promising, although not perfect. According to this research, and despite being somewhat vague concept, social sustainability has been widely recognized in the supply chain. As many companies stated, the well-being of people plays a big role in the success of a company. Environmental sustainability, on the other hand, was a clearer concept yet not always easy to implement in the process. The future for environmental sustainability seemed however stable as majority of the companies are putting lots of resources and thinking in the upcoming projects in terms of the ecological aspect of the triple bottom line.

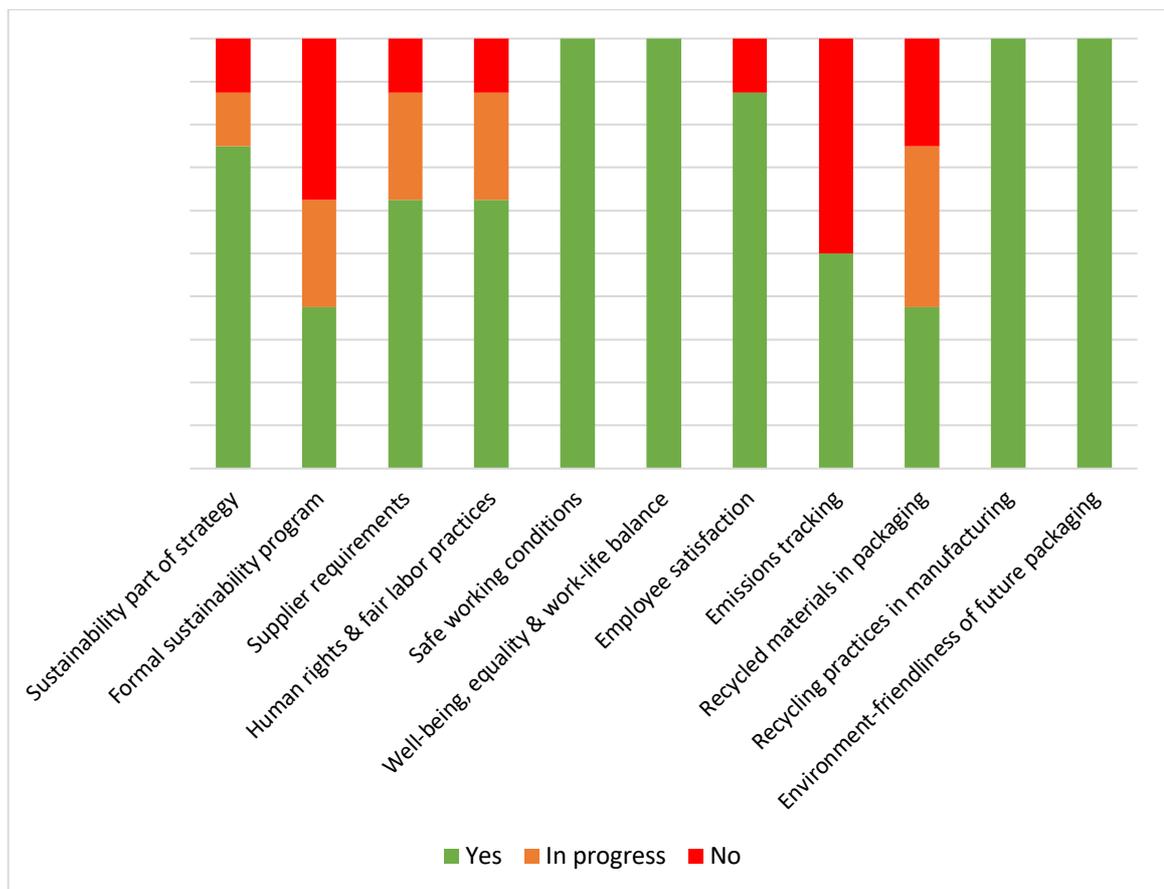


Figure 8. Sustainability status of pharmaceutical supply chain

As a conclusion, there is still work to do in terms of environmental and social sustainability in the pharmaceutical supply chain. This study provided a good outlook on some deficiencies that need closer examination in the future. For example, formal sustainability program was still looking for its purpose in the overall business strategy of many companies. In addition, emissions from business operations are not always tracked and the use of recycled materials in packaging solutions is still not considered in manufacturing or is still a work in progress for many companies. The sub-chapters below cover the results in a more comprehensive and consistent manner. It can be concluded, that despite the deficiencies and many obstacles on the way, the direction in terms of sustainability seems right. The social and environmental aspects of the sustainability are widely recognized in the pharmaceutical business. The main question is whether companies are willing and capable to tackle the identified challenges and keep up the motivation to continue the sustainability work.

6.1 The current sustainability status

Sustainability has been widely adopted and recognized in business. Many companies have covered sustainability in their strategic plan and set clear objectives to tackle the main issues related to the topic. Some, yet only a few, have prioritized sustainability from all the other strategic points. Sustainability has been also mentioned in many different policies and Codes of Conduct. A strong linkage to existing theory is found as it suggested that one of the main challenges still to this day is that the regulations and standards are simply not specific enough to cover the needs of companies of all sizes and industries which then forces companies to create sustainability policies and Codes of Conduct of their own. The scope of such policies and Codes of Conduct remains unclear. Extremities are not rare as some companies admitted not considering sustainability at all in their business practice whereas others have taken the next step in the process and have established formal working groups that regularly work on sustainability-related initiatives.

By setting supplier requirements for the supply chain, the buying company can express its strong need and concern for sustainability and implement concrete actions to the process. In the answers, a somewhat clear distribution can be made between proactive and reactive ways of working. Half of the companies are taking sustainability issues seriously as they promote strong co-operation through the supply chain in order to make sustainability a common topic

that requires the power of all the counterparts. In addition, in a proactive way of working, on-site visits and open communication are common. However, other half of the companies are monitoring their supply chain by sending sustainability policy contracts to sign without further supervision. In this more reactive way of working, measures are taken only if clear offenses occur.

The subject of social sustainability is divided to cover both internal and external aspects as it does not only concern the players of the supply chain, but also the employees of the buying company itself. Therefore, to cover the topic fully, both aspects has to be taken into account. Internal social sustainability has been widely recognized and implemented in the business. National laws and regulations are strictly followed, sustainability policies applied, employee satisfaction measured, and some companies have even established formal working groups designated to tackle the issues concerning social sustainability within the company. External social sustainability, however, was a bit trickier aspect for many. Even the basics of social sustainability, such as human rights and fair labor practices, are not always covered in any documentation and monitoring still lacks concrete actions. Once again, companies only send sustainability policy contracts for their partners to sign, and supervision remains overlooked. This distinguishing factor is easily explained by the fact that internal sustainability is more transparent, familiar, and a subject to influence. External sustainability, on the other hand, is vaguer concept with no clear point of contact.

The tracking of emissions is once again a topic that clearly brings distribution to the answers. Half of the companies are missing the data and were struggling to say whether the emissions from the business operations were increased or decreased for the past year. Other half was already doing annual reporting and had clear objectives on how to reduce emissions. Many companies could even name the scopes on which the targets have been set. Scope 1 includes direct emissions from owned sources, scope 2 includes indirect emissions from purchased electricity, heat and steam, and scope 3 covers indirect emissions that occur throughout the supply chain (Carbon Trust N/A). Despite obvious distribution in answers, the importance of transportation was brought up by many. Thus, logistics is one of the business activities where tracking of emissions is a relatively simple task because of the technological updates and devices implemented in vehicles.

Majority of the companies provided a detailed description of how sorting the excess material and other recycling practices are implemented to the business operations on a daily basis. In this sense, it can be concluded, that this aspect of environmental sustainability has been taken into account well in business. Recycled materials and environment-friendliness in packaging solutions are also topics that have been in discussion in many companies. The emphasis on this subject is explained by the fact that pharmaceutical industry relies mostly on packed products whereas ever-increasing consumer awareness forces companies to take prompt actions to promote more sustainable options for plastic bottles. While companies are assuring that environmental-friendliness is strongly considered in the future production and Research & Development is constantly seeking for more sustainable packaging solutions, the current situation is quite the opposite as even those companies which already are using recycled materials in the manufacturing processes, are offering more sustainable packaging options only when requested by the buyer.

6.2 Challenges and drivers

The semi-structured interviews provided additional information to the research as challenges and drivers of environmentally and socially sustainable supply chain are viewed from the perspective of the buying company. Despite some deviation and differing views, four themes were clearly emerging from the coded material. First and most importantly, one of the crucial challenges the buying company has to face is the lack of consensus of the top management. As sustainability as a topic may have different definitions, scopes, and meanings in business, the issue is then in determining what is sustainability and why is it important. This leads in troubles in prioritizing the subject on an executive level and set clear objectives and targets for sustainable initiatives.

In addition, so called lock-in situation in supplier selection is one of the issues in achieving environmentally and socially sustainable supply chain. As many specialist of the field would gladly evaluate suppliers based on their sustainability status and willingness to comply to the policies, the heavy dependence in buyer–supplier relationship can be a significant barrier to do so. The situation is troublesome and disconcerting, and is common in specialized fields, such as pharmaceuticals. To take a concrete example, many pharmaceutical products require special handling and processing not to mention specific temperatures in transportation. Also,

the high level of information exchange as well as relational satisfaction may cause the lock-in situation. Business relationships that have been long established are hard to abandon. If the understanding and objectives regarding sustainability are starting to show differentiating views, it may cause discomfort for the purchasing specialist to switch partner as replacement is much harder to find. In addition, in the specialized fields, the number of available suppliers is often limited. In this sense, in lock-in situations, the buying company might have no other option than to maintain the relationship which then causes strategic inflexibility in terms of sustainable supply chain management. Thus, mutual understanding and similar objectives in terms of sustainability are preconditions for the most ideal situation.

The semi-structured interviews also provided a glimpse to the drivers for sustainable supply chain management that keep motivating the buying companies to continue the work around sustainability initiatives. Based on the coded material, competitive advantage is seen as one of the most important drivers to continue promoting sustainability. The potential of such advantage can be then used in marketing materials as sustainability may be still overlooked subject in many companies or, in contrary, promoted to the point that consumers are more frustrated of the greenwashing than convinced of the sustainable actions. Also, consumer demand is yet another driver that is strongly forcing companies to change. The number of socially and ecologically conscious consumers is increasing which then forces companies to adjust their business to better fit the requirements of today's needs. In this sense, it can be concluded that the drivers for sustainable supply chain management include both internal and external motivators.

6.3 Future measures and implementation

As mentioned earlier, and despite the results from this research seem promising, there is still a lot of work to do regarding environmentally and socially sustainable supply chains. As the lock-in situation leads to strategic inflexibility for the buying company and leaves no options to change the suppliers, one of the aspects that should be strongly considered is to strengthen the relationships within the current supply network and focus more on supplier development. Traditionally, the buying company selects, monitors and evaluates suppliers based on their performance. Supplier development, on the other hand, focuses more on collaboration, two-way communications, and improvement on the recognized deficiencies.

As Krause & Ellram (1997, 21) state, supplier development aims to improve the performance of existing supplier as it can be tough to find replacements to the supply network. Therefore, replacement of even a single supplier needs investments in large amounts as searching and evaluating of the substitutes takes time and effort and is still surrounded by uncertainty and doubt. Concrete supplier development activities may include supplier recognition, educating the supplier personnel, raising performance expectation, and providing feedback to supplier. All of the potential measures are introduced in the figure below.

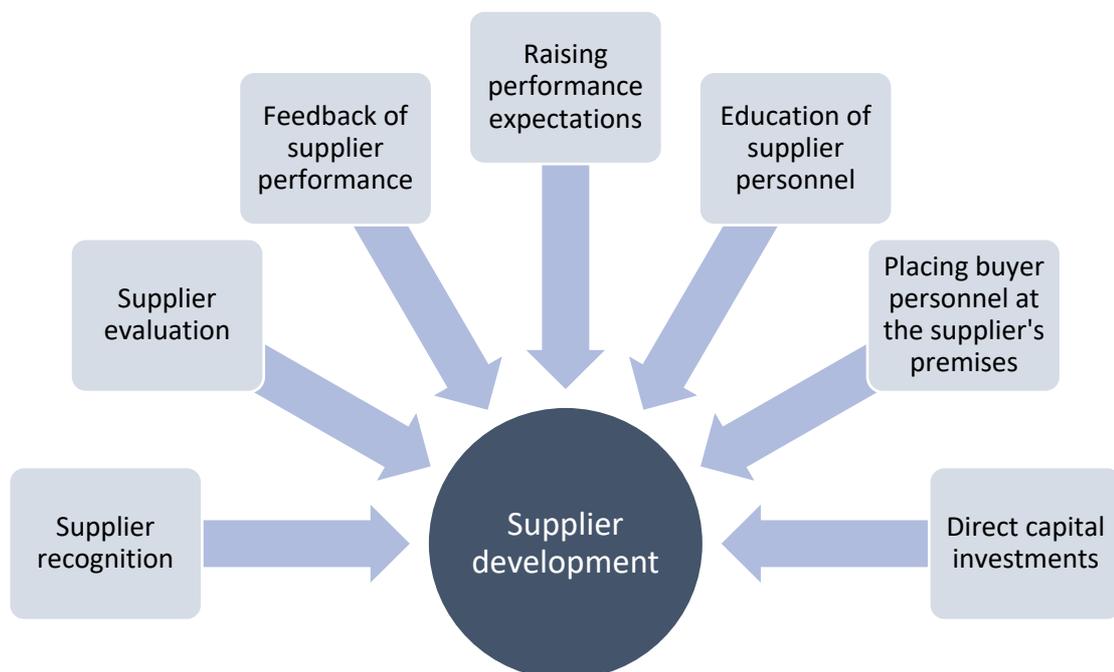


Figure 9. Activities of supplier development (Krause & Ellram 1997, 21)

Supplier development is based on multi-functional, two-way communication and long-term perspective between the counterparts, which means that both buyer and supplier should play an active role in tackling the challenges. In addition, both partners should invest resources to allocated issues and reassure the involvement and support of the top management. (Krause & Ellram 1997, 25). The transformation takes time and so the emphasis should be put to the long-term goals. Especially vague and difficult concepts, such as sustainability, can require relatively long time period to settle in the practice. Krause & Ellram (1997, 24) yet remind that short-termed perspective of the competitive bidding and price emphasis may actually result in higher total costs.

As mentioned, strong communication and co-operation should be in the center of supplier management. Hughes & Wadd (2012, 24) state that the benefits from driving value creation are noteworthy. The buyers realize 40 percent more value from those suppliers with whom more proactive and collaborative relationships are established. Respectively, the suppliers deliver nearly 50 percent more value to the customers with whom they have grounded the most collaborative relationships that are often characterized by high levels of trust, mutual respect, and commitment to common benefits. Therefore, investing in supplier relationships is a profitable measure in situations where replacing the supplier is not possible. In strong supplier-buyer relationships, communicating the recognized areas for development can be more fruitful than imposing strict requirements.

Since environmental and social sustainability is clearly a recognized problem with a high strategic priority in the case company, the emphasis should be then put in strengthening and evaluating the supplier relationships once again – and with a sustainability point of view. Based on the coherent research conducted by Busse, Schleper, Niu & Wagner (2016, 461), establishing communication activities and knowledge sharing within the supply network, building mutual understanding of sustainability concepts and goals as well as overcoming possible cultural differences all mitigate the obstacles for more environmentally and socially sustainable supply chain and increase sustainability levels of the supply network. Open and interactive culture within the buying company and among the supply chain should be also promoted. In the process, long-term orientation plays crucial part. As it takes time to see the actual fruit of implementations, it is important to focus on the suppliers with whom long-term co-operation is possible and meaningful.

As there was only little information about the current sustainability status of supply network of the case company, the importance of this study was undeniable. It offered an excellent groundwork for future measures and solid outlook of the present situation. In business, it is important to understand the current circumstances to be able to adjust and make corrections to everyday operations. As mentioned, sustainability at Verman is not a one-off project, but rather a topic that is under continuous evaluation and improvement. The understanding of the subject helps the company to continuously enhance its approach on environment, health and safety, respecting people, and business ethics. The case company will continue its work regarding sustainability.

The results and answers provided by this study can be widely used in communications, marketing materials, or sustainability reporting. As sustainability awareness and the pressure for sustainable business practices continue to grow, the need for sustainability reporting is undoubted. Kolk (2008, 3) remind that sustainability reporting is often labelled as ‘corporate social responsibility’ and has a large scale of potential readers, covering both internal and external stakeholders. In this sense, the case company can communicate its objectives and views on sustainability initiatives to a large audience. According to the study conducted by Ernst & Young (2014, 7), one of the main reasons to practice sustainability reporting is to promote transparency among stakeholders which then creates trust throughout the whole value chain.

In the process of developing sustainability practices among the supply network, the maturity model can be used. Tchokogu e et al. (2018, 345–353) suggest that since companies are in different stages in making supply chain management more sustainable, it is important to determine the current status. The model for sustainable supply maturity level presents five levels of sustainable supply practices. The model not only helps to determine the current sustainability situation but also show what steps should be taken to improve the position. The five levels are 1) Foundation, 2) Embed, 3) Practice, 4) Enhance, and finally, 5) Lead. The actions of the first level are to obtain basic knowledge of sustainable supply practices. As the understanding increases, sustainability practices are slowly implemented to everyday business until sustainability is firmly established in all sourcing policies and actions. The maturity level can be used by supply chain specialists who aim to align supply practices with the sustainability approach.

7 CONCLUSIONS

To wrap up this study, it is time to a look at the research questions once again. The aim was to provide valid answers to three questions. First, it was important to find out the current environmental and social sustainability status in the pharmaceutical industry by taking the supply chain into a closer examination. Second, it was essential to study the obstacles that were in the way of achieving sustainable supply chain. Third, to continue the sustainability work within the practice of supply chain management, it was also important to find out the drivers that motivate the specialists of the field. The research questions and the answers are provided shortly below.

RQ1: How is environmental and social sustainability recognized in the upstream supply chain in pharmaceutical industry?

As the results show, the direction in achieving environmental and social sustainability in the upstream supply chain in the field of pharmaceuticals is right and promising and gives a good ground to continue the work on sustainable development. However, there are some issues that still need more attention. Three areas can be brought to discussion to understand the deficiencies that need closer examination among the executives and specialists of the field. First, a formal sustainability program with regular and purposive work on sustainability-related initiatives seems to be missing despite many companies have included sustainability in their strategic plans. As Berg, Schlag & Stuchtey (2015) concluded, such programs are essential part of business as the value from sustainability initiatives rarely lasts long if not managed well. In this sense, sustainability programs bring systematicity and perseverance to the scene. These programs affect positively on many business areas, such as innovation and product development, reputation management, sustainable value chains as well as green sales and marketing.

Second, the emissions are not always tracked with the exception of logistical operations as the technology in that specific area has been developed the most. One reason for low interest for tracking emissions can be the fact that supply chains are nowadays complex and include many players which means that summarizing can be somewhat difficult. As Zhang et al.

(2021, 9) suggest, in many fields including manufacturing and service, the most emissions are produced among the tier 3 suppliers. In this sense, a company can have only vague and limited outlook of the overall emissions throughout the supply chain.

Third, the use of recycled materials in packaging is still a slow work in progress in many companies despite the fact that the industry is facing major demand from the customers to present more sustainable variations to the plastic bottles and jars that are common in the pharmaceutical field. The problem is well-known although the implementation might take some time. According to Plastics Europe (2015), nearly 40% of all the plastics is used in packaging in Europe and is thus, the largest application sector in the plastics industry. The profound study conducted by Ma, Park & Moultrie (2020, 2) suggest that the barriers for shifting to other packaging materials, such as compostable plastic, include higher costs and not enough waterproof or resistant composition.

SQ1: What are the possible challenges in achieving sustainable supply chain?

The main challenges in achieving sustainable supply chain in the pharmaceutical industry are the lack of consensus of the top management and the so-called lock-in situation related to supplier selection. It can be concluded that top management can fail in determining the scope and the more precise definition of sustainability which may then lead to a more profound problem in prioritizing the subject as well as setting clear objectives and targets for sustainable initiatives. In this sense, it is important for companies to determine what is sustainability and why is it important. As Giunipero, Hooker & Denslow (2012, 262) state, the lack of consensus on the executive level may lead to misalignments of short-term and long-term objectives of the sustainability strategy.

In lock-in situation, the heavy dependence in buyer–supplier relationship can be a significant barrier to evaluate and select suppliers based on their sustainability status and willingness to comply to the sustainability policies. The problem is common in specialized fields, such as pharmaceuticals, where strict laws and regulations play role in imposing the requirements for special handling and processing of the products. The lock-in situation can be also caused by the high level of information exchange and relational satisfaction (Schmitz et al. 2016, 23). In this sense, it is not always an easy task to find a replacement to the supply network.

SQ2: What are the possible drivers for sustainable supply chain?

The main drivers, or motivators, for sustainable supply chain are competitive advantage and consumer demand. First, the competitive advantage must not only be recognized but also promoted widely to the stakeholders of the company. In addition, the recognized competitive advantage can be used in communications through various marketing materials targeted to the selected audience. Sustainability as a competitive advantage can lead to, for example, diverse product differentiation strategies (Pullman et al. 2009, 40) as well as innovations which are then linked to the financial performance of the company (Chang 2011, 363).

Second, consumer demand has to be taken into account in terms of sustainable supply chain management, as the pressure is ever-tightening and strongly forcing companies of today to act in as sustainable manner as possible. Thus, companies simply cannot afford to ignore the environmental and social sustainability impacts of its operations. According to Whitehead (2017, 404), sustainability-related consumer demand may also influence the viability and the resilience of a company that increase the motivation even further. As it can be concluded, these two main drivers impose both internal and external pressure for the companies. The drivers continue to motivate companies in realizing as well as implementing sustainability initiatives to the practice of supply chain management.

7.1 Potential misconceptions and limitations

Although promising results of this study, there is always a risk of so-called greenwashing. According to Delmas & Burbano (2011, 65) the concept of greenwashing can be determined as “the intersection of two firm behaviors: poor environmental performance and positive communication about environmental performance”. The same concept can be applied to the social aspect of sustainability. Therefore, there is a risk that the company is not as sustainable as it claims to be. In this sense, the information of this research may be misleading if the companies have felt the pressure to polish the answers to be more socially acceptable. The main motivators for greenwashing include optimistic bias, consumer and investor demand, and competitive pressure (Delmas & Burbano 2011, 68).

Yet one misconception has to be mentioned. As the questionnaires were sent to the supply network of the case company by using the e-mail address under the name of Verman, there is a risk of cautiousness among the participants. Krosnick (1999, 545–548) remind that this phenomenon is well-known in research setting as respondents often overreport the admirable attitudes. Therefore, there is a risk of respondents settling for the most satisfactory answers instead of most accurate and appropriate ones. This behavior is called satisficing and it can be described by respondent's inactive approach to the questionnaire, including being less thoughtful about the actual meaning of the question or integrate the information carelessly. In worst case, the respondent may interpret each question superficially and only choose the answers that he or she believes is reasonable. Satisficing and greenwashing are imposing the greatest threats to this research. Despite many actions taken to ensure reliability and validity of this study covered in the sub-chapter '4.5 Reliability and validity', these risks can never be fully mitigated.

Errors may occur in any research and can be caused by many factors. According to Fowler (2009), these factors may include, for example, misunderstanding the question or not having enough information to answer the question properly. This factor is obvious when dealing with sensitive and extensive topics such as sustainability. As mentioned in the literature, social sustainability is a relatively broad and abstract subject which leads to the risk of different interpretations of the term. In addition, both accuracy and availability of the sustainability data may impose issues in gathering the necessary information. The risk for this well-known problem was recognized and mitigated by careful preparation and pre-testing of the self-administered questionnaire. However, and as Krosnick (1999, 545–548) remind, participants may answer quite superficially in cases where the question is too hard to interpret, or the respondent doesn't have the competence to answer the question.

As the primary data was collected through self-administered questionnaires, yet one possible limitation of this study might be the quality of the results and the lack of more comprehensive information. As the questions were simplified, vocabulary trimmed and data received was also in a quantifiable form, the results may lack the more in-depth overview to the topic. In addition, e-mail was used as a distribution channel for the questionnaires which may result in narrow and concise responses. Conducting interviews rather than sending questionnaires may have produced more rich and full information for the analysis.

7.2 Discussion and further research

Sustainability is a subject that is somewhat hard, yet extremely important, to measure. Many organizations have set up working groups to ponder and discuss the sustainability challenges and opportunities in the business environment. Surveys regarding sustainability have been sent many times before among business partners as the pressure from stakeholders forces companies to take rapid actions in terms of sustainability. As mentioned in the sub-chapter '6.3 Future measures and implementation', it is crucial to define the sustainability maturity level of the supply chain to understand on which level the company is now operating and what measures should it take to reach the next step. The main target should lie in continuous improvement.

This profound research about environmental and social sustainability in the upstream supply chain of the pharmaceutical industry provided important knowledge to the existing theory. As the main objective was not to propose new theories to the field, it can be yet concluded, that the results of this research are definitely bringing fresh insights and thoughts as well as strengthening the existing literature. Thus, few strong linkages can be found. For example, many companies revealed that instead of applying to the general sustainability laws and regulations set by government, they have compiled policies and Codes of Conduct of their own. This is due to the fact that sustainability regulations and standards are not specific enough to cover the needs of all the companies operating in different sizes and industries. Despite this solution may seem acceptable, the scopes of such policies and Codes of Conduct still remain unclear and vague.

In addition to the previous linkage, yet one founding can be connected to the existing theory as the results suggest that one of the challenges in sustainable supply chain management is the so-called lock-in situation of the buyer-supplier relationship. The same references can be found in the existing literature that strongly suggests that strict restrictions and laws of the pharmaceutical industry may lead to strategic inflexibility in sustainable supplier selection. This simply means that the buying companies of specialized industries are left with no other options than to continue and maintain existing relationships with the suppliers despite their sustainability status and willingness to comply to sustainability policies.

Sustainable supply chains should be desired research subject in the future as the pressure for green and ethical business keeps growing and the sustainability technology improving. Thus, more research is needed to cover the topics thoroughly. Especially, social sustainability is still looking for a more profound meaning in the literature. The interesting characteristics of the pharmaceutical industry are definitely imposing special need to understand better the lock-in situations in the buyer-supplier relationships and the solutions in that matter. As this research suggests, supplier development is one alternative to tackle the issue, yet a more comprehensive understanding of the phenomenon is needed. As stated in the sub-chapter '7.1 potential misconceptions and limitations', conducting interviews instead of sending questionnaires may have resulted in information with higher quality. Therefore, this research may need strengthening from the more in-depth and rich data to fully come to its rights and showing its potential.

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Appendix 1: The questionnaire form

Hi [name of the participant]!

We here at Verman are concerned as well as interested about sustainable development! Verman is committed in making all reasonable efforts to protect the environment, invest in health and safety of our people, and promote ethical business practices. As you are a strong part of our network, we kindly ask for your co-operation!

To get a better understanding of our current status in sustainability matters, we ask you to take part in our questionnaire below. Please, send me your answers by [deadline provided]. This questionnaire will help us to gather valuable information about our supply chain, which we will then use to improve our operations to be more sustainable, and to strengthen the co-operation with our suppliers.

Feel free to forward this message to the right contact person in your company, if needed.

GENERAL QUESTIONS

- 1) Is sustainability mentioned in your overall strategic plan?
- 2) Does your company have a formal sustainability program? (Such programs often involve a working group that regularly discuss and work on sustainability-related initiatives)
- 3) Are there any requirements set for your suppliers in terms of sustainability?

SOCIAL SUSTAINABILITY

- 4) Are human rights and fair labor practices monitored in the supply chain?
- 5) Are safe working conditions for your employees ensured?
- 6) Are well-being, equality and work-life balance mentioned in your sustainability program / strategy? (These may show in everyday working life, for example, by offered flexible working hours, insurances, and occupational healthcare or promoted gender equality)
- 7) Is employee satisfaction measured, for example via annual surveys?

ENVIRONMENTAL SUSTAINABILITY

- 8) Are emissions from business operations tracked?
- 9) Are recycled materials already in use in offered packaging solutions?
- 10) Are any recycling practices implemented in the manufacturing processes, such as sorting and re-using the excess material?
- 11) Is environment-friendliness taken into consideration in research and development (R&D) of new packaging solutions?

Do not hesitate to contact me in case you have any questions.

Best regards, [contact information provided]

Appendix 2: The interview form

CHALLENGES

Question: In your opinion, what are the biggest challenges in achieving sustainable supply chain?
(Pick 3 options)

1. **Determining the most suitable sustainable criteria.** Challenge: The difficulty to select the right suppliers in order to achieve the sustainable supply chain.
2. **Heavy dependence on specific supplier/suppliers.** Challenge: The so-called lock-in situation, where there is no other option than to maintain the relationship despite possible conflicts in terms of sustainability.
3. **Lack of consensus on the executive level.** Challenge: Unclear sustainability definitions or objectives from the top management.
4. **Lack of general sustainability standards.** Challenge: Inconsistent and incomplete sustainability regulations from the government (may also vary by country or region).
5. **The total cost of sustainability.** Challenge: Striving for sustainability adds total costs and trade-offs have to be made between environmental, social, and economic aspects.
6. Other?

DRIVERS

Question: In your opinion, what are the biggest drivers for sustainable supply chain? (Pick 3 options)

1. **Commitment of the top management.** Driver: Managerial orientation towards sustainable business. Also helps in setting the strategy for sustainability.
2. **Regulatory requirements.** Driver: The external pressure from the government in form of sustainability laws and restrictions.
3. **Financial benefits.** Driver: Savings that come from, for example, minimizing emissions, managing waste, and saving energy and water.
4. **Competitive advantage.** Driver: Differentiation of products and sustainable innovations to the market.
5. **Customer demand.** Driver: The external pressure from the consumer as sustainability awareness increases.
6. Other?