Implementation of a new regulation practices in sustainable sourcing – the changes and challenges

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ABSTRACT

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Implementation of a new regulation practices in sustainable sourcing – the changes and challenges

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This master's thesis studies how the implementation of the EU Deforestation Regulation (EUDR) impacts sustainable sourcing in the case company and broader sourcing environment. The study aims to understand how the EUDR implementation influences sustainable sourcing practices, its challenges, and the changes it brings to the sourcing environment. The study was conducted as a qualitative single case-study utilizing interviews from the case company, observations and previous literature.

The key findings of the study show that the EUDR requires changes in sourcing, such as improved supply chain transparency, increased data collection, and supplier compliance management. New sustainable sourcing practices need to be implemented, and existing practices already implemented during the EUTR need to be improved. The challenges in the EUDR implementation included differing interpretations, regulation's complexity and ensuring supplier compliance. Suppliers may struggle with the EUDR's demanding requirements, as the requirement implementations increase costs and administrative burden.

The EUDR may cause global sourcing environment changes, supplier portfolio shifts and trade disruptions. Companies which act proactively in their sustainable sourcing may gain competitive advantage from the EUDR. The findings highlight that the case company would need proactive engagement, investments to company's technology and supplier management practices to successfully implement the EUDR. Overall, companies will need to reassess their supply chains, implement new sustainable sourcing practices and act proactively to successfully comply with the regulation.

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Tässä pro gradu -tutkielmassa tutkitaan, miten EU:n metsäkatoasetuksen (EUDR) toimeenpano vaikuttaa kestävään hankintaan case yrityksessä ja laajemmassa hankintaympäristössä. Tutkimuksen tavoitteena on ymmärtää, miten EUDR:n toteutus vaikuttaa kestäviin hankintakäytäntöihin, sekä sen tuomiin haasteisiin ja muutoksiin hankintaympäristössä. Tutkimus tehtiin kvalitatiivisena yksittäistapaustutkimuksena, johon käytettiin empiirisenä datana case yrityksen haastatteluja, havaintoja ja aikaisempaa kirjallisuutta.

Tutkimuksen keskeiset havainnot osoittavat, että EUDR vaatii muutoksia hankinnassa, kuten toimitusketjun läpinäkyvyyden parantamista, tiedonkeruun lisäämistä ja toimittajien vaatimustenmukaisuuden hallintaa. Uusia kestäviä hankintakäytäntöjä on otettava käyttöön ja olemassa olevia EUTR:n aikana käyttöön otettuja käytäntöjä on parannettava. EUDR:n implementaation haasteita olivat vaihtelevat tulkinnat, asetuksen monimutkaisuus ja toimittajien vaatimustenmukaisuuden varmistaminen. Toimittajat voivat kamppailla EUDR:n korkeiden vaatimusten kanssa, sillä asetuksen implementaatio lisää kustannuksia ja hallinnollista taakkaa.

EUDR voi aiheuttaa maailmanlaajuisia hankintaympäristön muutoksia, toimittajaportfolioiden muutoksia ja liiketoiminnan häiriöitä. Yritykset, jotka toimivat ennakoivasti kestävän kehityksen mukaisessa hankinnassa, voivat saada kilpailuetua EUDR:stä. Tulokset korostavat, että case yritys tarvitsisi ennakoivaa sitoutumista, investointeja yrityksen teknologiaan ja toimittajien johtamiskäytäntöihin EUDR:n implementoimiseksi. Kaiken kaikkiaan yritysten on arvioitava uudelleen toimitusketjunsa, otettava käyttöön uusia kestäviä hankintakäytäntöjä ja toimittava ennakoivasti noudattaakseen asetusta onnistuneesti.

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1 Introduction

In today's global business environment, managing sustainability has become more and more topical; if even mandatory for many businesses. Global supply chains are usually complex networks, which link multiple different organizations in various locations worldwide. Due to the complexity, it may be difficult to manage the sustainability of supply chains. (Koberg & Longoni 2019) Transparency is essential in dynamic and complex supply chains – it is needed to ensure sustainability, especially if there is a possibility for environmental and social risks. Due to competitive markets and costs, raw materials are generally sourced through multiple suppliers, which may be located in developing countries. This phenomenon scatters the supply chains all around the globe. (Garcia-Torres et al. 2019) Legislative and regulatory requirements have been risen to address the complex supply chains and traceability, and their effects to the people and the planet. Therefore, compliance with regulatory frameworks makes it mandatory for businesses to handle sustainability matters in their supply chains. (Awuah-Gyawu et al. 2024)

Due to deforestation, about 10% of the world's forests have been lost worldwide. The deforestation has been going over for the past thirty years, and the lost forest area globally is comparable to an area which is larger than the European Union (EU). Deforestation has significant negative impacts socially, economically, and environmentally, and the impacts can be seen locally as well as globally (European Commission 2024a). The issues concern especially tropical rainforests where beef, palm oil, soy and wood products are responsible for 40% of tropical deforestation worldwide (VanderWilde et al. 2023). As EU citizens are major consumers of such products, which are heavily linked to deforestation, EU and its economy are partly being responsible for these issues (European Commission 2024b).

The EU Deforestation Regulation (EUDR) concerning deforestation-free products was set in order to control materials linked to the expansion of agricultural land, which are cattle, wood, cocoa, soy, palm oil, coffee, rubber, and products derived from these raw materials such as chocolate, furniture, and tyres. Under the EUDR, relevant companies will have to conduct strict due diligence processes in order to export or place the materials in scope, and companies also have to verify that these products comply with relevant legislations, human

rights, and that the rights of possible indigenous people have been respected. (European Commission 2023)

Under the EUDR, any operator or trader who puts commodities and products of the scope on the EU market, or exports from it, has to be able to prove that none of the commodities or products do originate from recently deforested land or have contributed to forest degradation. The objectives of the EUDR is to prevent that the scope products which Europeans buy, use, and consume, are not supporting deforestation and forest degradation in the EU and globally. Carbon emissions caused by EU consumption and production should be cut by at least 32 million metric tons annually of the relevant products. In addition, both the deterioration of forest conditions and deforestation caused by agricultural growth will be addressed. (European Commission 2024b)

The EUDR will repeal the EU Timber Regulation EU No 995/2010 (EUTR). The EUTR entered into force in March 2013, and it is one component of the EU Forest, Law, Enforcement, Governance and Trade (FLEGT) action plan. The EUDR has similar characteristics as the EUTR, although the requirements in the EUDR will be much stricter. The EUTR addressed illegal logging, and timber which had been logged in violation of the country of origins' laws was illegal to place on the EU markets. It applied to certain timber products whether they were logged domestically or internationally, and when materials arrived to EU via processing country. (ClientEarth 2018) The EUTR focused only on timber, yet the EUDR has expanded the scope to concern six other commodities as well. Also, the EUTR's focus was on ensuring legality rather than environmental protection. In addition, it did not cover deforestation by agricultural expansion or did not include differentiate requirements based on sourcing risks. In the EUTR, the due diligence requirements considered only the initial EU market entry point, whereas in the EUDR the due diligence is required throughout the supply chain. (Köthke et al. 2023)

In addition to the EUDR, companies are under great pressure to maintain and monitor the existing supply chains due to trends in globalization, demand uncertainty, economic challenges, and changes in the markets (Panigrahi et al. 2018). In global business environment, supply chains are more prone to disruptions and challenges, which can result to negative impacts operationally and financially. Identifying the challenges in sourcing and managing proactive sourcing practices will promote sustainable supply management and resilient supply chains. (Katsaliaki et al. 2022) Also, new legislations and requirements

related to sustainability have increased and probably will increase in the future. As in the EUDR, such transparency is required throughout the supply chains to answer to the requirements of the regulation. Data and technology are needed for integrating the sustainability goals with actions such as collecting and sharing information throughout complex supply chains. (Winkelmann et al. 2024) While sustainability among businesses has improved with different methods and practices, sourcing practices still usually include only first tier suppliers, and beyond that the actions to ensure sustainable supply chains are low (Schulze et al. 2022).

Sustainable supply chain management and vastly changing legislation will alter companies' sourcing practices and create new challenges for sourcing. Companies need to identify the challenges which may be caused due to implementation of new requirements and investigate if changes for sourcing practices are necessary. Especially the EUDR will transform supply chains and sustainable sourcing practices of those companies whom the regulation applies to, thus it is necessary to study how to implement new sustainable sourcing practices. This master's thesis will study how to implement new regulation requirements to sustainable sourcing practices, which challenges may emerge from the implementation, and also how the implementation of the EUDR affects the sourcing environment.

1.1 Previous research

The global sourcing environment is evolving constantly, as transformations such as legislative changes, technology, market fluctuations and sustainability pressures rise. Such changes will pose significant challenges for companies, especially in sustainable supply chain management and sourcing practices. The concept of supply chain management started in the mid-1980s and has been evolving ever since. In traditional aspect, the execution of a supply chain has been measured by its economic performance. Generally, the performance indicators of supply chain are quality, speed, flexibility, cost, and durability, and the supply chains are evaluated based on the achievement of those indicators. The concept of supply chain management (SCM) has however changed to sustainable supply chain management (SSCM). Sustainable development, which was defined in the Brundtland Commission in 1987, has become the baseline for SSCM, promoting the three dimensions of sustainable development: economic, social, and environmental. (Anilkumar & Sridharan 2019)

The study of Seuring & Müller in 2008 was one of the first major literature papers of SSCM. The significance of the field of sustainability is reflected to the increasing number of scientific publications of related topics especially during the past two decades (Brandenburg et al. 2014). An analysis of SSCM articles showed that from 1997 to 2020, 776 journals had been published in 3085 SSCM related articles. The two journals, Journal of Cleaner Production (JCP) and Sustainability (Switzerland) comprehended over 20% of all SSCM peer-reviewed articles. (Amofa et al. 2023) Before, SSCM was also known as '"green supply management" or "green purchasing", and the social aspect was not as noted as it is nowadays. SSCM research usually focuses heavily only on its environmental side. (Brandenburg et al. 2014) Anilkumar & Sridharan's (2019) study also suggested that there is a need for further identification of implementing SSCM practices in manufacturing industry, as academical studies have mainly focused on food, textile and service industries.

Previous research shows that sustainability is usually motivated by the demands or needs of government, customers or stakeholders (Brandenburg et al. 2014). Compelling public requirements in the 21st century in forest industry have been the EUTR, the US Lacey Act, and the Australian Illegal Logging Prohibition Act. Such regulations have aimed to remove illegally sourced timber from supply chains globally. Market-driven certification schemes, such as FSC, rely on third-party audits, and aim for sustainable and legal wood products. Some scholars believed that the EUTR and private certification schemes (e.g. FSC, PEFC) were enough to complement each other, but some argued that public legality verification would weaken market-driven sustainability certifications focusing only on legality rather than broader sustainability aspects. It has also been stated that private sector driven forms of governance, such as certification schemes, can last only as long as state-driven sufficient regulatory frameworks appear. According to the study, FSC had not been fully recognized as due diligence or proof of compliance under the EUTR, even if the certification scheme had wider sustainability and legality standards. (Dieguez & Sotirov 2021)

There has not been much previous literature related to the EUDR, as it was published only in 2023. However, few academical publications have emerged, as well as information from European Commission's own webpages. In the EUDR the EUTR's basic approach is preserved, but due diligence traceability is stricter, addressing some loopholes of the EUTR. However, control mechanisms have increased, and it is argued whether the EUDR will affect negatively to global trade flows and cause market segregation. It is also expected to increase

administrative burden, and other economic impacts still remain uncertain. The EUDR implementation requires technological advancements from the companies which are trading commodities and products in the scope. Digital tracking and reporting have been said to make it harder for companies to avoid sustainability demands of the regulation. Scientifically leakage effects did not appear during the EUTR, but the EUDR's requirements are much stricter. Though the EUDR may influence other regions to adopt similar deforestation reduction measures, according to researchers multilateral cooperation is still needed to reduce global deforestation. (Köthke et al. 2023; Muradian et al. 2025)

According to DiMaggio's & Powell's study (1983) companies adopt sustainability practices due to; coercive pressures (for instance the EUDR); mimetic pressures (imitating leading competitors); and normative pressures (industry norms and expectations). For such reasons, companies re-modify their supply chains to align with existing pressures. This applies to the EUDR; companies need to comply with the regulation as it is mandatory to operate in Europe. Non-compliance with the EUDR can be seen negatively in public, as it can send a message to others that a company does not engage in sustainability, and as in normative pressure, companies are expected to be sustainable and able to answer to the requirements of the EUDR.

In Eisenhardt's study (1989a) the buyers (principals) in developed markets struggled to control suppliers (agents) in different environments, and based on Principal-Agent Theory (PAT), it was suggested as a solution to invest in information systems, such as reporting procedures, or transfer the risk of supplier's behaviour to the supplier. This theory already strengthened the idea why traceability and transparency in supply chain networks are important and offered different solutions to track the transparency. In more modern context, Schäfer's (2023) study states that the sustainable supply chain transparency has different understandings among authors and industries. In the study, sustainable supply chain transparency was defined as:

> *"Sustainable supply chain transparency is the visibility and disclosure of sustainable supply chain information between actors within and outside the supply chain"*(Schäfer 2023).

The views of supply chain transparency and traceability vary whether those two definitions are connected or referring to the same phenomenon. It has been argued that traceability

provides transparency, or transparency is part of the traceability construct. However, in the study most recently referred to, traceability is seen as a part of transparency. (Schäfer 2024)

Technology and digitalization in sustainable supply chains and ensuring transparency has been discussed in academia. According to research, usually blockchains, Internet of Things and information as well as communication technologies have been used for sustainable supply chains. Technology has been used to reduce inequality by creating transparency in SCs, supporting communication, and improving partnerships. It has been found that use of technology, such as blockchains, will cause positive consequences. (Winkelmann et al. 2024)

From previous research it can be seen that the concept of SCM originates from the 1980s, and based on measuring only economic performance. However, sustainable development and awareness of sustainability has transformed SCM into SSCM. Companies are facing the growing pressure to implement environmental and social sustainability measures due to compulsory legislative demands or public pressure. As discussed, supply chain transparency is vital to succeed in SSCM, and is also one of the main themes of the EUDR. The EUDR will shift the global transparency of sustainable supply chains, and it will be interesting to see how the existing supply chains will evolve in terms of sustainability.

1.2 Research objectives

These vast requirements will require companies to make changes in their sourcing practices and implement new systems. As the EUDR requires thorough supply chain transparency, it will set more demands for companies' sustainable supply chain management. It is essential to recognize the possible challenges that such changes can cause in business environment, as companies face pressure to adapt their sourcing practices to meet the environmental, social and economic expectations. There has not been a compelling regulation related to supply chain sustainability like the EUDR before, and yet it is a mystery how companies can adapt to such arduous requirements. The EUDR's predecessor, EUTR, also set mandatory requirements for wood and prevented illegal logging, but it did not cover the environmental side and transparency of supply chains as in the EUDR.

The study will examine how the EUDR implementation and the requirements of the EUDR affect case company's sustainable sourcing practices within the context of paper industry, which usually include dimensions such as traceability and supplier management. The main research question investigates how the implementation of new regulation requirements influence sustainable sourcing practices. The first sub-question investigates what challenges the implementation causes in sustainable sourcing. Also, the study focuses on revealing key sourcing challenges when companies face changes in their sourcing environment due to the regulatory changes. Therefore, the research questions of this master's thesis are following:

RQ1: How to implement new regulation requirements to sustainable sourcing practices?

SQ1: What are the challenges in the implementation?

SQ2: How the implementation changes the sourcing environment?

The conceptual framework below in figure 1 represents the key concepts and their relationships within the study. The figure illustrates the main theoretical themes in the study and the structure between the themes and research objectives.

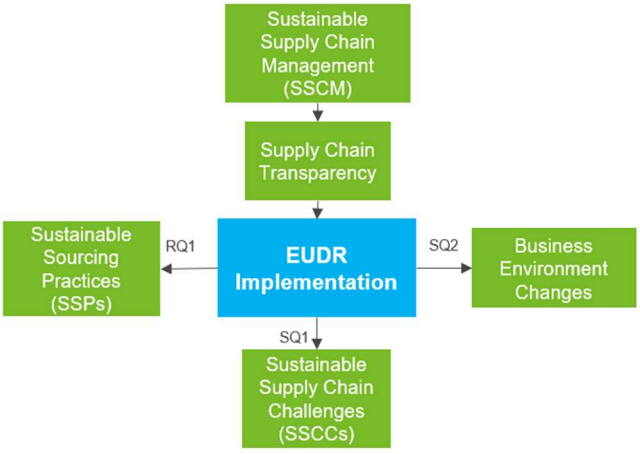

Figure 1. Conceptual framework

This research supports more holistic understanding of how companies should navigate in changing business landscapes, and how should be proceeded with the regulation implementations. However, the main focus is in the implementation of the EUDR and how it affects the case company. In the end it will be interesting to see whether the study has

managed to give practical insights of needed sustainable sourcing practices, what possible challenges emerge with the implementation, and what will change in the sourcing environment.

1.3 Methodology

This thesis is a qualitative single case study, which is conducted mainly with interviews and observations, as well as previous literature and regulative sources of the EUDR. Also, internal information as secondary material about the case company's sourcing processes and EUDR implementation will be used. Interviews make it possible to be in immediate interaction with the interviewee, and it gives the possibility to gather more important information which has not been included in the interviewing plan. It is also possible to understand the topic more profoundly after having the interviews. (Hirsijärvi & Hurme 2022; Tuomi & Sarajärvi 2018)

Interviews will be the primary data collection method. The interviews are semi-structured, meaning that the questions have been planned beforehand, but they can vary depending on the interviewee. In semi-structured interviews the respondents can answer to the questions more freely, expressing the answers with their own words. The interview method used in this thesis, semi-structured interview, can also be called as theme interview. In theme interviews the questions concern certain themes, in this case the EUDR, challenges and sustainable sourcing practices in the label company and in its sourcing environment. If possible and needed, the interview can focus on certain subject about the theme more profoundly, which may bring more value to the research. (Hirsijärvi & Hurme 2022; Tuomi & Sarajärvi 2018)

In addition to the interviews, observations will be one method in this qualitative research. Observation may be used when the author is participating to company's internal meetings and workshops regarding the EUDR. Observation is justified data collection method to collect secondary data in this research, as this study requires internal company information of sourcing methods. Furthermore, there is a very little material about the EUDR, thus it is necessary to utilize the company's internal systems and practices to carry out the research. (Hirsijärvi & Hurme 2022; Tuomi & Sarajärvi 2018)

The interviews will be conducted within the case company's employees. There will be eight (8) people interviewed, who work in sourcing, development, and sustainability areas. There will be total of 10 interview questions, as well as additional conversations. The interviews enclose questions and conversations about the EUDR and the case company's sourcing practices, as well as challenges and changes in the sourcing environment. When using case study strategy, it is important that the context of the study is fundamentally understood. It is thus reasonable that the author understands holistically the studied subjects and the context, and is capable of performing the study and give meaningful insights. (Saunders et al. 2016)

1.4 Research limitations

This qualitative study is a case study only focusing on one company, and its implementation of the EUDR to sourcing. While this study may provide in-depth analysis, it should not be generalized to all industries, regions, or companies operating in paper industry neither to other companies affected by the EUDR. The study relies on the interviews and observations of the case company, thus limited sample size will restrain the diversity of perspectives, especially related to sourcing practices implementation and detected challenges. The challenges and sourcing practices discussed in this master's thesis are formed based on the previous literature and secondary data (interviews and observations), hence such should not be generalized. Due to confidentiality, fully disclosing case company's internal strategies and procedures is not possible.

The EUDR is relatively new regulation, as it entered into force in June 2023, later postponed being effective in the end of 2025 (European Commission 2024b). This should be noted, as its long-term effects are not yet known. The EUDR is revolutionary as it is putting such strict requirements for certain commodities and products, therefore it is unsure how the global markets will react once it is applicable. Industries, companies, and organizations may have varying responses, which may differ from current predictions. This research only considers paper business (products derived from wood), hence the study should not be generalized to other commodities (cattle, soy, cocoa etc.) under the EUDR.

1.5 Key concepts & theoretical framework

This thesis studies the sustainable sourcing practices and challenges in the EUDR implementation, as well as changes in the sourcing environment. Following key concepts are essential to fundamentally understand the researched topics. The key theoretical topics will be discussed more in sections two and three.

Sustainable supply chain management: A supply chain (SC) consists of three or more entities, which are directly involved in the upstream and downstream flows of materials and services from the point of origin to a customer (Mentzer et al. 2001). Supply chain management (SCM) is systematic coordination and activities in sourcing, production as well as distribution in upstream and downstream processes in supply chains. The idea is to improve efficiency, optimize processes and reduce costs across all stages from raw material sourcing to delivering the product to customer. (Gold et al. 2010) SCM is systematic coordination of business functions and measures within the company and across its supply chain partners in the chain. The purpose is to improve long-term performance of the participating companies. (Mentzer et al. 2001) Nevertheless, as trends evolve and concerns about environmental and social problems increase, sustainable supply chain management (SSCM) has become a critical focus area for many companies. SSCM addresses sustainability matters within the business capabilities (Touboulic & Walker 2015). In SSCM, the three dimensions of sustainability; social, economic and environmental have an impact to business activities (Font et al. 2008). When practicing SSCM, companies examine social and ecological matters beyond minimal legal requirements (Hofmann et al. 2014).

Sustainable sourcing practices: Sourcing serves as a bridge between organization's internal operations and its external upstream stakeholders. It comprehends activities such as product selection, supplier selection and management, choosing logistic services, and other third-party services. Raw materials and services are sourced from suppliers all around the globe by multiple organizations in order to meet customer demands for costs, speed, flexibility, and quality. Adding to such traditional factors, companies also need to comply with legislations and regulations, as well as satisfy the needs of the stakeholders. As organizations are responsible for the sustainability in their supply chains, sourcing criteria have expanded to include environmental and social characteristics alongside economical needs. Sustainable sourcing practices are needed to achieve holistic approach for company's

economic, social, and environmental strategies, as sourcing functions have a great impact on organizations' performance. (Ambekar et al. 2019)

The EUDR: *Regulation (EU) 2023/1115* known as the EUDR (The EU Deforestation Regulation) was implemented to fight against deforestation and forest degradation. This regulation is influenced by EU's consumption and production of certain import and export raw materials and derived products (cattle, cocoa, coffee, palm oil, soy, rubber, **wood**). The main goal of the EUDR is to ensure that only deforestation-free products are placed on the EU markets. (European Commission 2024b)

1.6 Thesis structure

This study includes seven parts. The first section was introduction, where the previous research, methodology chosen for this thesis, limitations, theoretical framework and study's objectives were discussed. The introduction section also expresses why this topic was chosen for the research. The theory section consists of holistically examining the main theoretical frameworks for this study. It is followed by the methodology chapter where the case company description, data collection and the reliability of the research will be discussed. After the methodology section, the findings of this study based on empirical research and previous literature will be presented. The study and its results will be summarized in discussions and conclusions section, and future research suggestions will be given.

2 Sustainable supply chain management

Flow of materials is globally widespread, as suppliers, manufacturers, focal companies and customers are scattered around the world. For instance, wood can be sourced from South America, manufactured to paper in Finland, and sold to a customer located in Italy. The ability to have such global flow of products creates great value, but it also creates environmental and social burden. The awareness of this has led to the concept of sustainable supply chain management (SSCM), which stands for voluntarily integrating economic, environmental and social matters with important inter-organizational business actions. The

goal with such integration is to answer to the needs of stakeholders and customers, as well as improving the flow of materials efficiently. (Rajeev et al. 2017) Companies which have adapted to SSCM practices are seen as value-driven and aiming to improve their performance (Beske & Seuring 2014).

In SSCM, the sustainability matters must be implemented to the core functions of a company's SC functions (Panigrahi et al. 2019). Mutual trust and long-term strategic partnerships between entities, which are usually dependent on one another, are important in efficient SSCM. SSCM involves strong cooperation with stakeholders, for example with suppliers and customers. In order to reach the sustainability goals in SCs, all stakeholders must work together. (Gold et al. 2010; Panigrahi et al. 2019)

Usually stakeholders share common goals about sustainability, and information is exchanged throughout the supply chain to improve sustainability in economic, social, and environmental aspects. Collaboration between companies in the supply chains will improve both environmental and economic performance, which may have an impact to the relation between sustainability and company's performance. The sustainability goals are started because of an external pressure or incentives, which are usually derived from customer or stakeholder needs, but also from legislative and governmental requirements. (Touboulic et al. 2015; Seuring & Müller 2008)

Governmental legislations and requirements may be one of the most significant external pressures for SSCM. Such laws and policies include for instance environmental protection laws, local labour regulations and mandatory reporting frameworks. As such laws and regulations force for strict monitoring and controlling, it may motivate companies to integrate sustainability strategies into their supply chain processes. (Hervani et al. 2005) Pressure from NGOs and governmental entities for a buyer company is usually transferred to buyer company's suppliers (Seuring & Müller 2008).

Stakeholders, such as NGOs and customers are demanding sustainability from companies. Customers are being more environmentally conscious, thus they seek products and services which are ethically and responsible sourced. Companies are also expected to care about people and the planet. (Kleindorfer et al. 2005) According to Seuring's & Müllers study (2008) legal demands, customer demands and response to stakeholders are the most

frequently mentioned pressures and incentives in other academical papers regarding sustainability in supply chains.

Supply chain transparency is vital part of SSCM. In Schäfer's study (2023) three dimensions of supply chain transparency were formed. These three dimensions are; sustainable supply chain information; involved stakeholders; and perspective of sustainable supply chain transparency. These three dimensions form essential framework how supply chain transparency should be carried out in SSCM. The table 1 below will show the definitions of each dimension.

Table 1. Dimensions of sustainable supply chain transparency (Schäfer 2023).

Dimension	**Example**
Sustainable supply chain information	Material information, production process information, information about involved suppliers, transactional information, commitment (to laws or own commitments) information , information about sustainability impacts, information about the sustainability evaluations.
Involved stakeholders	**Sustainable supply chain information is sent from:** focal company, stakeholder (supplier, third parties).
	Sustainable supply chain information is sent to: focal company, stakeholder (supplier, public, customers).
Perspective of sustainable supply chain transparency	**Supply chain visibility:** visibility in the state where certain information about the SCs is available at a certain part of the SC.
	Supply chain disclosure: Disclosure is the activity to knowingly pass on SC information: voluntary or mandatory disclosure.

Sustainable supply chain information is mostly directed to upstream operations, so supplier-buyer relations. Transparency is profoundly about sharing information within supply chains. The table presents which types of supply chain information are part of the first dimension. These types of information are crucial to provide to have clarity in the SCs and visibility beyond first-tier suppliers. According to the research, transparency in SCs is necessary, but often fragmented and partial. Regarding involved stakeholder dimension, it is essential to exchange supply chain information between involved parties. In this dimension it must be

noted to evaluate the trustworthiness of the received data, and think how the information is sent and received, as well as which parties are involved. Both stakeholders and buyer companies influence each other. (Freeman et al. 2010; Schäfer 2023)

Lastly the third dimension comprehends the perspective of SC transparency, which is not uniform, but depends on one's point of view. It is different for each participant of the supply chain and has various purposes. Supply chain visibility refers to the situation where specific SC information is available at different stages of the SC for different parties. Such information can be obtained through audits or supplier surveys, for instance. Supply chain disclosure is sharing SC information to other actors. This can be mandatory or voluntary disclosure. Mandatory disclosure is when the information is forced or required by law, and voluntary is when information is given freely, thus companies choose to disclose the information. (Schäfer 2023)

SSCM can offer companies a competitive place, when focusing on proactive sustainability initiatives that are integrated to company's strategy and supply chain processes. With proactive measures, companies are able to stand out from competitors and maintain competitive advantage. (Kirchoff et al. 2016; Zhu et al. 2008) The Resource-Based View (RBV) of SSCM states that companies may gain competitive advantage when developing and improving their sustainability-related competencies in the supply chains. Sustainability in supply chains is seen as a more holistic approach which considers the whole supply chain of a focal company. (Touboulic et al. 2015) Proactive and opportunity-driven strategies that have the focus on developing suppliers and their capabilities are more effective when meeting sustainability requirements. Such proactive strategies are seen to lead the development of unique capabilities of an organization. (Kähkönen et al. 2018)

2.1 Sustainable sourcing practices

Sustainability consciousness is positively correlated to company's performance, as SSCM may increase employee morale, enhance positive attitude from customers, and strengthen relationships with stakeholders. Improved relationships with stakeholders may lead to reduced costs and increased investments. In addition, sustainable sourcing practices (SSPs) can improve company image and its reputation, as according to RBV having strong reputation among stakeholders can be seen as competitive advantage, which will eventually

enhance company's overall performance. (Paulraj et al. 2017) Also, the level of resilience in SSCs can be improved and maintained by SSPs. Functional SSPs can be connected to lower waste levels, improved quality, and more consistent lead times. (Negri et al. 2024) According to Kähkönen et al. study (2018) SSPs illustrate a significant share of a company's sustainability performance.

As discussed before, there are usually certain incentives or pressures for SSCM, as well as for SSPs. There are three main motives driving companies for SSPs; instrumental, relational, and moral. Instrumental motives are motivated by self-interest, relational are derived by relationship within group members, and moral motives are driven by ethical and moral standards. (Aguilera et al. 2007) In Paulraj's (et al. 2017) study relational and moral motives had positive effects on a company's SSCM practices, and also SSCM practices had positive correlation with company's environmental and financial performance.

In order for companies to implement SSPs, they first need to adapt to the orientation and dedication for SSPs. Dedication to sustainability in supply chains has to be incorporated on a strategy level and must be part of company's core values. Implementation of SSPs requires top-management support, and it is the key factor to gain full potential in SSCM. Sustainability goals should be implemented to everyday decision-making within the supply chain, as well as SSPs should be fundamental part of business strategy. (Beske & Seuring 2014)

"Practice" is usual, routine or standard method or way of doing things to carry out a task or activity (Beske & Seuring 2014). Supply management practices can be divided into internal and external practices, whereas internal practices are executed inside the company and external practices among organizations which are implemented in at a corporate level. Internal practices for sustainable supply management include, for instance, implementation of certification obtaining and maintaining, environmental management systems (EMS), design for environment (DfE), and life-cycle analysis (LCA).

External practices ideally aim to improve the environmental and social performance of the supplier base and are usually stakeholder driven. Such practices include supplier collaboration, environmental requirements and code of conduct. Certifications contribute to improved environmental and social outcomes. Environmental certifications are linked to pollution control and workplace safety, such as ISO 14001, whereas social certifications

enhance the working environment of employees and efficient work processes. Example of EMS may be systems like ISO 14001 which help companies to manage environmental responsibilities systematically. (Gualandris et al. 2014; Kähkönen et al. 2018; Tuppura et al. 2016) LCA assessments have shown that sustainable products usually have lower total costs over lifetime since such products require less energy consumption, have longer lifespans, and fewer legal issues (Hollos et al. 2012). In DfE products and processes are created which are eco-friendly, reusable, and recoverable. In DfE the environmental impacts are considered throughout a product's lifecycle. (Panigrahi et al. 2018)

Forest industry sector is expected to have responsible practices in raw material sourcing and production. Chain of Custody (CoC) certifications are widely used as a practice in sustainable supply chains. They are crucial in sustainable forest management and to succeed in environmental responsibility. Adequate and widely used CoC certifications and forest management systems are FSC (Forest Stewardship Council), and PEFC (Programme for the Endorsement of Forest Certification). (Tuppura et al. 2016)

FSC is non-governmental, international organization which has been founded in 1994. Currently it is the most widespread and respected forest certification system in the world. According to FSC, the forest management certification verifies that forests are being managed in sustainable way, preserving biological diversity, and benefiting the lives of local people and workers. PEFC is also an international certification system which endorses sustainable forest practices globally, covering environmental, social, and economic viewpoints. 10% of world's forests are PEFC certified. PEFC certification has strict standards for forest management, confirming that the origin of wood and the products are possible to be traced through CoC system. In both FSC and PEFC, companies need to go through strict audits and verify compliance with the certification standards in order to receive the certification. (FSC 2024; PEFC 2024) ISO 14001:2015 is an international standard that outlines the requirements for EMS. With ISO 14001:2015 organizations can improve their environmental performance, and it offers a structure to support sustainability efforts. Organizations need to implement all the standard's requirements in order to claim compliance. (ISO 2015)

Supplier collaboration includes supplier cooperation and supplier involvement, and it is the second most popular practice for sustainability in sourcing after CoC certification (Ambekar 2019). Company's collaboration with suppliers has shown improvement in environmental,

social and economic performance. Unique and valuable resources are created and exchanged, such as organizational learning, when buying firms and suppliers collaborate. Buyer firm and supplier cooperation can create more innovative and sustainable products, as well as information sharing and inter-organizational learning. Supplier collaboration practices have been shown to have positive influence on sustainable supply chain resilience. (Beske & Seuring 2014; Gimenez et al. 2012; Negri et al. 2024) In supplier development buying companies give support for a supplier thus the supplier can improve its sustainability performance. Such can include training, improvement plans, and advising. Buying companies can help and encourage suppliers to gain certifications and other standards to improve their sustainability, which will also benefit the buying companies. Such practices will bring positive advantages for both parties. (Beske & Seuring 2014; Tate et al. 2012)

Supplier selection is one of the proactive practices to ensure resilience in sustainable supply chains (Gualandris et al. 2014). As sustainability measures and requirements are widely known throughout the industries, choosing incorrect supplier may result to significant financial and reputational losses (Ambekar et. al 2019) To increase sustainability, buyer firms should select suppliers who share common values and drive for sustainability. Therefore, buyer firms can either choose and accept only those suppliers who already have adequate sustainability standards and processes, or they can collaborate with existing or new suppliers to improve their sustainability performance. (Hollos et al. 2012) Other practices related to supplier selection may be for instance long-term supplier partnerships; use of multiple suppliers; alternatives for critical suppliers (Negri et al. 2024). Supplier collaboration and long-term supplier partnerships are essential for SSCM continuity as well as for overall supply chain performance (Beske & Seuring 2014)

Supplier monitoring can include supplier audits, and ensuring that suppliers adopt mandatory sustainability initiatives. (Marshall et al. 2015a) Monitoring and auditing suppliers, as well as evaluating and checking supplier's compliance with sustainability requirements are key SSPs. This can include social aspects, such as auditing supplier locally to see how the workers are treated, or environmental aspects, where compliance with CoC certifications are ensured. (Marshall et al. 2015b) Supplier monitoring and auditing enhance the traceability of supply chains (Kähkönen et al. 2018).

Socially responsible purchasing (SRP) addresses issues such as human rights, safety, diversity, and local welfare. It takes into account worker's rights, equality and minority

support. On corporate level, SRP is usually supported by codes of conduct for instance, and management that sets the social responsibility goals. Code of conduct defines the ethical standards and gives guidelines for ethical behaviour. Code of conduct can be composed for buying firm's employees as well as for suppliers and other third-party partners. (Goebel et al. 2012) Definition of ethical standards and supplier selection are ways to enforce SRP in operational level. Global standards can be implemented for SRP, such as guidelines from different organizations, for instance international labour organization (ILO). (Leire & Mont 2010)

Due to grown demands in SSCM, information requirements have been increasing which forces companies to track their supply chain transparency. Ensuring sustainable supply chain transparency is essential in order to avoid risks, which could lead to reputational and financial losses. Establishing trust in supply chains can be managed with functioning and up-to-date technologies, as companies are facing the burden of excessive data management. Utilizing technology can make supply chains more transparent and traceable. (Montecchi et al. 2019; Schäfer 2023) Companies receive increasingly growing volume of data, which originates from different sources to manage supply chain functions. Use of technological systems, such as blockchains, can support supply chain's sustainability and transparency. Due to big volumes of data, technology and data management are important cornerstones to efficiently implement sustainability in supply chains. For instance, blockchains and internet of things (IoT) can support reliability in complex supply chains, and such technology can be used for monitoring product locations, tracking, and verifying origin of fibre. With artificial intelligence (AI) predictive analytics, supply chain optimization and green transportation can be utilized to drive more sustainable supply chains. (Alsolbi et al. 2023; Bai & Sarkis 2020; Romagnoli et al. 2023) The SSPs have been listed in the table 2 below.

Table 2. Summary of sustainable sourcing practices.

SSP (sustainable sourcing practice)	Example(s)	Authors
Company's orientation	Top-management dedication and involvement	Beske & Seuring 2014; Kähkönen et al. 2018
Certification	CoC certification, such as FSC & PEFC	Tuppura et al. 2016
Environmental management system (EMS)	ISO 14001	Gualandris et al. 2014
Design for environment	Designing eco-friendly products	Panigrahi et al. 2018
Life cycle analysis (LCA)	LCA assessments	Gualandris et al. 2014; Hollos et al. 2012; Kähkönen at al. 2018
Supplier collaboration	Supplier involvement, improving supplier's sustainability, creating more innovative products together with suppliers	Ambekar et al. 2019; Beske & Seuring 2014; Gimenez et al. 2019; Negri et al. 2024
Supplier development	Training, advising, improvement plans	Beske & Seuring 2014; Tate et al. 2012
Supplier monitoring	Supplier audits, supplier evaluating	Kähkönen et al. 2018; Marshall et al. 2015a; Marshall et al. 2015b
Supplier selection	Accepting only sustainable suppliers, alternatives for critical suppliers	Gualandris et al. 2014; Hollos et al. 2012; Negri et al. 2024
Socially responsible sourcing	Considers worker's rights, equality, and minority support. Supported by code of conducts and social responsibility goals.	Goebel et al. 2012; Leire & Mont 2010
Technology	Blockchains, AI, data management	Alsolbi et al. 2023; Bai & Sarkis 2020; Romagnoli et al. 2023
Communication	Internal communication, employee training, organizational awareness	Jacobs et al. 2016; Sult et al. 2024

In addition to all SSPs listed above, lack of employee training may lead to unsuccessful corporate sustainability implementation, as capabilities are needed in organizational as well as in individual level. It is important that the employees understand the sustainability aspects of company's strategy. Studies has shown that employee's knowledge and communication has a big impact on implementation processes. Employee awareness, training and internal as well as external communication is crucial in order to succeed in sustainable sourcing. (Sult et al. 2024) Employee communication is recognized being essential for successfully handling supply chains (Jacobs et al. 2016).

2.2 Challenges of SSCM

Due to global outsourcing, information availability, and the growing importance of sustainable business conduct, supply chains may face challenges in sustainability matters. SSCM challenges can cause disruptions in the flow of materials, such as delivery and quality problems. SSCM challenges can also obstruct the information flow between supply chain partners. Stakeholders usually hold companies accountable for unfit behaviour, even for company's suppliers' behaviour, supposing that focal companies have the possibility to fully monitor and influence their supply chains. Sustainability challenges may have gone unchecked before as supply chains had lower standards for sustainability. (Hofmann et al. 2014) Even though the importance of supply chain sustainability and proactive measures to prevent sustainable supply chain challenges are recognized, buying firms do not possess full information about their suppliers, and management of the challenges can be difficult due to complex supply chains (Busse et al. 2017).

Regarding sustainable supply chain challenges (SSCCs), endogenous challenges are those which are caused by company's own actions along SCs, and exogenous challenges are those which companies face as a result of their interactions within their external environment (Giannakis & Papadopoulos 2016). Stakeholders' expectations towards companies' sustainability performance possess great pressure, and when these sustainability-related expectations aren't met, it can lead to negative consequences, such as negative reputational image, legal issues, and harmful publicity (Busse et al. 2017). Rather than focusing only on supply chain disruptions, SSCCs take into consideration the impacts on the environment,

corporate reputation, financial fragility, and compliance with regulation (Giannakis & Papadopoulos 2016).

Events causing SSCCs can be also categorized. Factors, such as globalization, technology advancements, and customer expectations pressure companies to adapt their sourcing practices to maintain competitiveness. These events can lead to the challenges, such as increased costs and reduced supply chain resilience. Outsourcing as well as offshoring different sourcing activities may increase possibility to disruptions and can make supply chains more vulnerable. Disruptions during upstream can cause various negative effects through multiple tiers, and impact supply chains severely. (Katsaliaki et al. 2022)

In global supply chains, it is almost impossible to avoid uncontrollable accidents and interruptions. Abrupt disruptions and challenges, such as economic shocks, pandemics, and political frictions will cause changes in global sourcing environments, and with adequate measures and sourcing practices, the management of such challenges can be sustained. (Kazancoglu et al. 2024) All the events and SSCCs derived from different events have been listed in the table 3.

Table 3. Events which cause challenges in supply chains and sourcing (Busse et al. 2017; Giannakis & Papadopoulos 2016; Katsaliaki et al. 2022; Manuj 2013; Rao & Goldsby 2009).

Category	**Examples**	**Nature of challenges**
Catastrophic events	Epidemics, international terror attacks, wars	Exogenous
Legal, financial, and bureaucratic events	New laws or regulations, political barriers, currency exchange volatility	Exogenous
Demand-side events	Volatile customer demand, changing customer preferences, short product lifecycle trends	Exogenous
Supply-side events	Supplier performance, quality problems, price increase, selection of suppliers, supplier bankruptcies	*Endogenous/Exogenous*
Market competition events	Price wars, market saturation affecting sourcing strategies	Exogenous
Logistics-transportation events	Poor logistics performance from logistic service providers or suppliers, transport network disruption, equipment failure	*Endogenous/Exogenous*
Production-infrastructural events	Local disruptions, production changes, equipment breakdowns	*Endogenous/Exogenous*
Technological events	Integration issues with software, lack of data, unplanned IT outage, cyber attack	*Endogenous/Exogenous*
Internal company events	Employee engagement, internal communication, organizational culture, lack of training	Endogenous
Environmental events	Sustainability of raw materials, emissions & pollution, natural disaster, waste management	*Endogenous/Exogenous*
Social events	Child/forced labour, discrimination, health & safety of workers	Endogenous
Ethical business management events	Non-compliance with regulation/requirements, transparency of SCs, corruption, frauds	Endogenous

To avoid SSCCs, companies need to implement proactive actions into their strategies. Firms need to be in alert to notice the fast-phased changes, and act proactively for upcoming and

abrupt transitions in sustainability requirements. Proactive measures in internal activities are needed, as well as cooperation and development with suppliers. Sustainable sourcing practices are part of company's dynamic and proactive measures to manage and implement sustainable strategies into their supply chains. (Kähkönen et al. 2018)

3 The EU Deforestation Regulation

The EU Deforestation Regulation entered into force on June 29th 2023, and originally operators and traders were given 18 months to implement the new requirements. Smaller companies have longer adaptation period than bigger enterprises. The EUDR compliance was first set to be mandatory from 30th December 2024, but due to feedback from international partners, it was delayed (European Commission 2024c). On November 2024, the EU parliament agreed to postpone the EU deforestation obligations for one more year, thus the EUDR will now be officially applicable on 30th December 2025 for large operators and traders, and for micro- and small enterprises from 30th June 2026, if relevant products aren't yet subject to the EUTR. (European Parliament 2024; UPM Raflatac 2025).

Companies doing business in the EU may only trade and sell commodities if they are deforestation-free and legal. This implies that the commodity must be produced on an area which is not deforested illegally after the cut-off date 31st of December 2020. Legally the materials must be produced according to the local laws of the origin country. Also, in wood products the sourced wood has not caused forest degradation after the cut-off date. (Climate & Company, 2023; Agrinfo 2024)

In the EUDR there are operators and traders who have the major regulatory burden. "Operator" is any natural or legal person who commercially places the scope products in the EU markets or exports them. Operator is the first party to make the relevant product or commodity available on the EU market, and also has a permanent business establishment in the EU area. "Trader" is any organization in the supply chain other than operator who also commercially puts relevant products available on the market, for example buying from other trader or operator. (PwC 2024) Operators and traders are further divided to; operator, non-SME (downstream) operator, non-SME trader, SME (downstream) operator, SME trader,

and authorized representative (European Union 2023). Descriptions of each role in the EUDR are described in the Appendix 1, and link to the EU Deforestation Regulation can be found in the Appendix 2.

Companies sourcing and supplying paper are required to follow the EUDR in the EU area. As the EUDR will be mandatory and it requires vast implementations, companies affected by it need to alter their sourcing practices. Operators must conduct due diligence to ensure that the commodities and products which are placed and exported to the EU market are free from deforestation. This requires major development transparency and traceability measures. The important due diligence steps include information collection, risk assessment, and risk mitigation. Information collection includes geolocations of the plots of land where the products were produced or sourced, product descriptions, and quantity. Supplier and country of origin information need to be provided as well as evidence of compliance with local legal requirements. The record-keeping is mandatory for 5 years. (Orbify 2024; European Union 2023)

The products included in the EUDR are based on relevant commodities and relevant products. Relevant commodities are the seven raw materials included in the EUDR, for instance cattle, wood, and rubber. The relevant products are those products which have been derived from the relevant commodities, ergo are fed or manufactured by using them. Relevant products have been listed in the Annex 1 of the EUDR, which also presents the specific custom tariff numbers that are used for identifying impacted products. (Taylor Wessing 2024)

The operator or trader entity needs to include definite and verifiable information that the relevant products or commodities are deforestation free and that the relevant products or commodities are produced in accordance with local legislation. Based on the information collection, operators must verify and analyse the collected information and assess risks to ensure compliance. Risk assessment should be carried with certain criteria, such as the level of risk assigned to each country by the Commission, the reliability of the data, the complexity of supply chain, the presence of indigenous people in the country of production, or any information which would point that the relevant product or commodity is non-compliant. This risk assessment should be carried at least once a year. (PwC 2024; European Union 2023) Operators and traders can use certification schemes, such as FSC and PEFC, to support the risk assessment processes (European Commission 2024d). The European Commission

will also assign risk levels to relevant countries of production, low or high risk. The list will be published 30th of June 2025 at the latest. (European Union 2024)

If risk assessment reveals anything else than no risk or only a negligible risk for relevant products or commodities of non-compliance, operators must adopt risk mitigation measures. Such risk mitigation measures include for instance carrying out independent audits or surveys, adequate controls and procedures to mitigate and manage risks, requesting additional information or documents, and supporting suppliers' compliance with EUDR. Operators have to implement policies and procedures to manage the risks of non-compliance, such as record-keeping, independent audits, and internal control systems. The actions in risk mitigation procedures and measures should be documented and reviewed at least annually, and be available for competent authorities upon request. (European Union 2023)

The due diligence statements have to be submitted electronically to the EUDR Information System which has been created by the European Commission. The due diligence statements must be created for each shipment in the EU area. The due diligence statements will be created in the Information system, and the system will create reference and verification numbers, which will be given forward to customers, or received from suppliers. With those reference and verification numbers, any operator or trader can track the statements throughout the supply chain in the EUDR Information system. (European Commission 2024d; European Commission 2024e; UPM Raflatac 2025)

3.1 The EUDR criticism

The needed transparency of the supply chain information will be remarkable – big volumes of data about products and suppliers will be required. This will demand companies to define compliance framework, implementing data gathering procedures and develop new processes in order to answer the strict requirements of the due diligence processes. (PwC 2024) Compared to other regulations, the EUDR was negotiated and accepted quite silently (Taylor Wessing 2024). The EUDR has received critique that the new regulation could exclude smaller producers, and also it will affect other countries exporting to the EU. Smaller companies may not have the same resources as larger companies to provide extensive transparency and sustainability measures, at least as fast as needed. There is a possibility,

that smaller producers are deleted from supply chains if they are not able to meet the requirements. (East Asia Forum 2023)

Additionally, the impacts to the farmer community has been highlighted. For example, forest maps are created to divide a country's agricultural area into polygons, which identifies farm holdings based on map divisions. Under the EUDR, farmers situated in unmapped land have a big risk of exclusion from the EU market. Creating these maps will cost, and can be too big financial burden for smaller farmers. According to a survey by International Coffee Organization, 80% of coffee farmers lack maps of their plots, and would struggle to meet the EUDR compliance requirements. (Gilbert 2024) The EUDR will most likely add workload to many companies and authorities. The new requirements and increased bureaucracy will create added workload, require more capacities and need for data management. It is still unclear how the EUDR will increase costs and to what extent. (Köthke et al. 2023)

The EUDR's implementation has been criticized to be unilateral implementation, meaning that it only reflects EU-specific priorities with minimal or zero collaboration with producer countries, and the regulation has caused negative opinions among producer countries. The regulation has been expressed to be "green imperialism", implying that the EU commands its values and requirements without considering local contexts of producer countries, which may lead to friction and unwillingness to cooperate. It has been discussed among the ambassadors of Brazil, Colombia, Indonesia and other 14 countries that the unilateral and punitive benchmarking system may be inconsistent with WTO commitments. Indonesia had even considered taking legal actions against the EU. (East Asia Forum 2023, Muradian et al. 2025)

The EUDR may as well cause trade distortions and diplomatic tensions. It has been argued that it reflects a governance gap, and a multilateral and cooperative framework would better address the global challenges of deforestation. The EUDR has been criticized lacking procedural justice, and that the EU has not involved countries and organizations into meaningful consultation and discussion. It is unclear how the unilateral model can drive sustainable outcomes, when it has been said to fail to adjust diverse values and economic situations around the world. (Muradian et al. 2025)

The EUDR may cause “leakage” effects, meaning that deforestation-linked activities may be pushed to non-EU markets. Also, the production of relevant commodities or products can be changed to other alternatives, which are not regulated by the EUDR. For instance, palm oil suppliers may switch production to other oil crops, such as sunflower or canola oil. Also, international collaboration where deforestation occurs is crucial in order to achieve deforestation reduction. The EUDR’s effectiveness may be less without support from local policies and territorial approaches. It has been warned by critics that the EUDR can disrupt supply chains and increase prices in the EU. Its long-term effects are unknown, as it also effects on products and commodities which weren’t part of the EUTR before, and as it has implications for countries outside the EU too. The EU hopes to lead by example, but it should be noted that there are different export markets globally with varying possibilities. (Köthke et al. 2023; Muradian et al. 2025; Earth.org 2024a; Earth.org 2024b)

The European Commission had proposed to delay the implementation of the EUDR, which was agreed by the Parliament. The postponement received criticism from international organizations as well as from environmentalists. The postponement was criticized to send wrong signal to national governments, and that it communicates lack of urgency in addressing climate change and biodiversity commitments. Therefore, the postponement is vastly seen as a setback for enforcing global accountability for deforestation-free products. (Earth.org 2024b; European Parliament 2024)

3.2 Changes in an organization after new regulation implementation

After the revolutionary EUTR stepped into force in 2013, it required new sourcing practices from companies to answer to its requirements. Many companies hired new employees to ensure the EUTR compliance. In addition, some companies allocated new budget for ensuring compliance. After the EUTR implementation, the collected data considering supply chains increased significantly, and the information requests were frequently asked from suppliers. Data related to supplier, material and certification information, and the needed documentation were checked and verified for validity.

Use of different tools and resources for risk assessment rose after the EUTR implementation, and operators implemented also risk assessment tools offered by third parties, such as FSC. New tools became part of their risk assessment processes. Companies also cooperated and

worked together with monitoring organizations to support compliance. Assessing and analysing sourcing countries, certification claims, documentation and other criteria became part of companies' practices to ensure compliance with the EUTR. (Forest Trends 2021) Compliance with regulation which includes environmental, social and governance (ESG) matters demands scalable processes and tools, which can handle huge amounts of data from various different sources, unlike traditional methods such as Excel (World Economic Forum 2024). Practices implemented by companies after the EUTR adaptation can be seen from table 4 below. (Forest Trends 2021)

Table 4. Practices implemented in organizations after EUTR implementation (Forest Trends 2021).

Practices used in an organization to ensure compliance with the regulation after the EUTR implementation 2012-2019	
Practice	Example
Hiring more personnel	Hiring employees who are responsible of the EUTR compliance in a company
Budget allocation	New budget allocation
Collaboration with NGOs	Working together with NGOs other third parties
Data collection & analysing	Collecting and analysing the data received from suppliers
Use of tools and resources	Using different tools, such as FSC risk assessment framework to evaluate compliance risks in supply chains
Assessing risks for compliance	Assessing the country of origin and if it has higher risk for illegal logging
Third-party certification	FSC, PEFC
Audits	Internal audits or external audits for suppliers
Use of scientific methods for timber identification	Wood-anatomy analysis
Consultation	Receiving consultation from stakeholders
Change your position in the supply chain	Avoid being the operator

As can be seen from the changes after the implementation of the EUTR, sustainability regulations, as the EUDR, are marking the evolution of environmental and social governance. The regulations require clear actions from companies to ensure continuity of their business. New regulation implementation will need changes from organizations in their sourcing practices, consistent data management as well as much more focus on transparency throughout the complex supply chain networks.

4 Research Methodology

In this section the research methods, data and the process of the data collection will be presented. This master's thesis studies how the challenges in the sourcing environment and EUDR implementation impact company's sourcing practices. The study is limited only to a single company and considers only paper materials. Therefore, this qualitative study can be considered as a single case study. A case study is a research method used to investigate a current issue in its real-life setting. In case studies the data collection methods are usually combined; for instance in this master's thesis, interviews and observations are used for data collection, interviews being the primary data and observations secondary data. Qualitative single case study is a research method where the single case is studied holistically. Qualitative single case study is very useful when a phenomenon is wanted to be understood in a certain context. This study method is reasonable for this thesis as it makes possible to have deep analysis about the EUDR and its implementation practices, challenges and changes in sourcing environment. With the case study method profound understanding about the studied subject can be achieved. (Eisenhardt 1989b; Farquhar 2012) Case study works well in the field of business, as its results can give how the phenomenon works in real-life situation; however, it must be noted, that this study is limited only to certain regulation (EUDR), certain material (paper) and certain company (the case company in label business) (Crowe et al. 2011).

The reliability of a qualitative study is examined based on credibility, transferability, dependability and confirmability. Such areas can confirm that the study has been conducted accordingly. (Lincoln & Guba 1985) In each study, the research should be supported by previous research, and the possible gaps of the previous literature considering the researched

topic should be presented. This way the results of the study can be validated. (Eriksson & Kovalainen 2008) Credibility measures trustworthiness of the study, and how well the results reflect participants' views. Data collection triangulation was used in this study, and it is a justified method to support the credibility of the research (Nowell et al. 2017). In data collection triangulation, the data is collected from various participants. Transferability measures whether the study's results could be generalized. (Tuomi & Sarajärvi 2018) The participants of the interviews as well as the research process should be descripted in detail. In terms of dependability, research should be conducted logically, be traceable, and be documented. Other researchers should be able to judge the trustworthiness of the research and possibly repeat the study in similar context. (Nowell et al. 2017) To have confirmable research, the reasons for methodological, analytical and theoretical choices should be justified. In addition, it should be clear that the researchers findings and interpretations are evidently derived from the empirical data, not from the researcher's own opinions. (Korstjens & Moser 2018; Nowell 2017)

4.1 The case company description

The case company for this study is a company which operates worldwide in self-adhesive label and graphics business. The company offers different kind of label materials, but this study focuses on their paper labels, which are affected by the EUDR. The company employs over 3000 people, has annual sales over 1,5 billion euros, and has various factories and distribution terminals globally. The case company was chosen due to the case company's need to gain more holistic understanding of the EUDR and how it affects the company's sourcing practices. As paper is one of the EUDR's scope products, the case company needs to consider how changing regulations affect its supply chains and sourcing practices. In order to continue business and be compliant with the regulation, the case company must identify the challenges and needed changes in sourcing practices. The case company has been under the EUTR before, but the EUDR will require more transparency and bigger changes inside the company and its operations.

This master's thesis will help the case company to identify the challenges which may originate from changes in the business environment, such as the EUDR. Also, studying the EUDR's influence on company's sustainable sourcing practices and how to implement new

regulation requirements will benefit the case company and possibly help them to prepare better for the EUDR once it is applicable in the end of 2025.

4.2 The data collection

For primary data, interviews were done for eight (8) professionals from the case company. The professionals, named as experts 1 to 8, were chosen due to their job position in sourcing, role in implementation of the EUDR requirements, sustainability, and/or knowledge of internal processes and practices. This way important knowledge of the case company's internal functions was gained, and it gave great insight of the different functions inside the company. The interviews were held on December 2024 and January 2025 on Teams or in person. All of the interviews were recorded, and the author wrote down the answers during the interviews. The experts will remain anonymous, as well as the case company. Introduction of the experts can be found from the table 5 below. Further identification about the experts will not be given to protect their anonymity.

Table 5. Introducing the experts.

Expert 1	Manager in responsibility
Expert 2	VP in sourcing
Expert 3	Director in sustainability
Expert 4	Director in sourcing processes and systems
Expert 5	Manager in process development
Expert 6	Director in sourcing
Expert 7	Category director in paper materials
Expert 8	Senior Manager in Global Forest Affairs

Interviews in this study were carried out as theme interviews, and more precisely as semi-structured interviews. Interviews were held individually with each participant, and each interviewed expert had their own set of interview questions, ergo the interview questions varied depending on the participant. In total, there were 10 questions, but interview questions for each expert ranged from 7 to 10. The distribution of the interview questions depended on the expert's area and knowledge in relation to the studied subject. (Hirsijärvi & Hurme 2022)

Semi-structured interviews were functional for this study, as they are versatile and make it possible for the interviewer and participant to have reciprocal conversation. The author's previous knowledge of sustainable sourcing and the EUDR as well as previous literature helped when forming the interview questions. The questions were determined before the interview and sent to the participants beforehand. The interview questions were categorized to three different categories, following the structure of the research questions: practices, challenges and changes. Categorizing the interview questions was seen helpful, and made the planning of the interviews smoother as there were many participants from various professional backgrounds. This way it was easier to divide the interview questions between experts. (Kallio et al. 2016) All of the interview questions and the distribution of the questions between the experts can be found from Appendix 3.

The interviews were recorded in Teams, and written down along interviewing. To answer to the research questions, the interviews were transcribed and the text which was not necessary for the data analysis was cut off. The answers of the experts have been sorted by interview question. This way it is conveniently seen what the participants have answered to certain interview question.

The research questions of this master's thesis are:

RQ1: How to implement new regulation requirements to sustainable sourcing practices?

SQ1: What are the challenges in the implementation?

SQ2: How the implementation changes the sourcing environment?

Further categorizing, or in another words coding, was conducted when sorting the answers. The answers were highlighted from the text with code words, which were categorized to "practices", "challenges" and "changes", similar to how the interview questions were categorized. The interviews' answers were further reduced to simplified expressions and subcategories. Appendix 4 presents an example how the categorization of the data was done for interview question 2."What changes do you expect to be made in sourcing practices in your company as a result of EUDR?". (Tuomi & Sarajärvi, 2018)

5 Analysis & Findings

Based on the answers to the interview questions, author's observations in the case company and theoretical framework the research questions can be presented. The three categories formed during data collection and analysing processes, "practices", "challenges" and "changes" will be used to answer the research questions, more precisely "practices for the first research question, "challenges" for the second and "changes" for the third.

5.1 Implementing new regulation requirements to sustainable sourcing practices

This section will answer the main research question of the thesis, which is "How to implement new regulation requirements to sustainable sourcing practices?". In this section, the answers have been categorized to three different categories. First, the pre-EUDR practices will be presented. After this, the case company's current SSPs in high-risk areas will be studied, and lastly the sustainable sourcing practices to implement the EUDR requirements will be covered. Regarding the EUDR, adequate SSP measures are critical to ensure SC resilience through the demanding regulation implementation, and also to preserve the case company's sustainability performance.

5.1.1 Pre-EUDR practices

This section will focus on the time pre-EUDR, ergo the EUTR, and when adapting to the EUTR. The EUTR stepped into force in 2013, and required new sustainable sourcing practices from forest industry companies in order to fight against illegal wood products. To be compliant with the EUTR, data collecting and management increased. Companies had to request information from suppliers in order to have needed documentation for the EUTR. This situation was similar in the case company; various experts stated that data collection increased when the EUTR requirements were implemented. Surveys to suppliers, such as origin of fibre questionnaires, responsibility surveys, and supply codes became part of the company's regular tasks. The case company also worked together with external consultant to strengthen their EUTR policy. Expert 2's comments below:

"Had to implement new processes, for example new questionnaires such as origin of fibre, and data collection increased."

The supplier surveys became yearly tasks and also internal processes improved. New systems had to be taken into use to ensure compliance with the regulation, and the case company set risk management procedures for suppliers. For instance, there was a lot of collaboration with the suppliers, as well as discussions about suppliers' awareness. Example from expert 7 below:

"Quite often, such projects progress by first mapping out how aware the suppliers are. Then, quite quickly, suppliers are asked how they plan to handle and manage this new and changing legislation."

After gathering the data regarding the case company's products, such as suppliers' information and origin of fibre data (tree species and country of origin), the data was analysed and it was evaluated how to continue. For instance, origin of fibre information was assessed to track if there were any high risk countries or tree species. Mostly the experts mentioned data collection & analysing as the practice which increased during the EUTR and other sustainability regulation implementations.

The case company has FSC and PEFC certifications, which are one important way to manage EUTR compliance and sustainable supply chains. As discussed before, FSC and PEFC are non-governmental international organizations which provide forest certification systems. Both respected certification schemes cover requirements and standards for forest management and chain of custody for wood supply chains, often beyond legislation. Though FSC was not fully recognized under EUTR, the certification schemes still managed to provide adequate chain of custody systems. Internal as well as external audits were developed for monitoring supplier's actions and internal operations. Other internal risk management procedures have also evolved, which are linked to auditing, code of conducts, and surveys.

The case company's parent company set standards for sustainability and advised with EUTR compliance. Company's orientation is considered one of the sustainable sourcing practices, and has to be implemented into company's core values. The guidelines for sustainability requirements have vastly been supported by the parent company's dedication to sustainability in supply chains. The pre-EUDR practices can be found below from table 6.

Table 6. Implementing pre-EUDR practices

Implementing pre-EUDR practices	
Pre-EUDR practice	**Example**
Data collection & analysing	Collecting data from suppliers, internal operations and other possible stakeholders
Assessing risks for compliance	Assessing origin of fibre information and supplier surveys, internal risk management procedures, internal audits
Supplier monitoring & management	Supplier audits, supplier evaluation, information exchange
Third-party certification	FSC, PEFC
Company's orientation	Company's core values and sustainability strategy

In the past the case company received feedback regarding sustainability requirement implementation. Some experts stated that adapting to changing requirements has been more reactive than proactive. Before, the case company has only reacted to the requirement when it becomes mandatory rather than planned in advance and researched what the requirement means.

5.1.2 Existing sustainable sourcing practices

Since the EUTR and generally in the previous years, sustainable sourcing practices have improved in the case company. Current SSPs are showing dedication and orientation for SSCM and are part of company's core values. In additional conversations during the interviews, some experts stated as well that EUDR's requirements align very well with company's existing sustainability goals and strategies. Expert 3's comment below:

"EUDR aligns very well with our company. We want no deforestation. We only source certified papers now, EUDR just takes it to higher level. Now suppliers are being forced to deal with these things, rather than we pushing them. This is the only way to get this done, voluntarily is not good enough. This fits very well for us, it is like accepting a challenge which we can do."

For already some time, the case company has purchased only certified paper, meaning that the paper materials purchased are either FSC or PEFC certified. If supplier is uncapable of

supplying certified paper, the case company will either support the supplier to obtain the certification or the cooperation will end. This purchasing strategy shows dedication to sustainability and how sustainability is fundamental part of business strategy. The case company also requires its suppliers and other third parties to be compliant with its code of conducts, and it is mandatory for raw material suppliers to adhere some of the codes in order to have business with the case company.

Also, audits and due diligence checks are conducted if needed, especially for high-risk suppliers. Suppliers are also demanded to have Ecovadis ratings; Ecovadis is a platform where companies' sustainability actions can be rated. If supplier's rating is poor, audits will be conducted and the rating improvement will be supported. As Expert 2 has illustrated below:

"All purchases must be certified and meet criteria like Ecovadis score. For specific situations, supplier audits are conducted."

If risk is assessed to be relevant, additional data is requested from a supplier. The case company annually requests origin of fibre information from the suppliers. For instance, if suspicious tree species or country of origins are provided, the case company will ask more questions and evaluate the situation. If any previous SSPs are not working and supplier's SC sustainability cannot be ensured by further development of suppliers' practices, the supplier collaboration will be ended.

5.1.3 Implementing the EUDR requirements

Despite the case company's up-to-date and dedicated sustainable sourcing practices, there's development to be done to be compliant with the EUDR. As the case company will most likely act as a non-SME (downstream) operator or non-SME trader, it must conduct the EUDR due diligence, and provide the due diligence statement reference number to its customers. It will also have to check the due diligence conducted by the previous party, and the case company will receive the due diligence statement reference numbers from its suppliers. The EUDR due diligence includes information collection, risk assessment, and risk mitigation. Once the EUDR is applicable, the case company must provide verifiable information that the paper they purchase and sell as label laminate is deforestation free and

produced in accordance with local legislation. After information collection, the case company must assess risks and possibly conduct risk mitigation measures.

The information required for the EU Commission's Information system where the due diligence statement reference numbers are issued will be significant. The due diligence statement reference numbers gathering and verification and the processing of the needed data from the suppliers related to each shipment may lead to significant workload, especially if system support is not available. This activity does not apply pressure only to data collection, but as well to other operations inside the company.

Regarding the EUDR, there will be big changes in supplier selection, and the case company should select and keep suppliers who are able to meet the regulation's demands. The experts mentioned that most likely the supplier portfolio will change; some suppliers may not meet the EUDR standards. Outside the EU area the suppliers may not have the desire to implement the EUDR measures, and it is questionable if all companies have the possibility to meet the requirements. Expert 8 has commented following:

"It may be that suppliers who cannot meet EUDR requirements are excluded. Small producers may not be able to meet EUDR requirements, so is it right to exclude them? Then material flows may shift to other countries where EUDR is not mandatory."

Due to supplier portfolio changes and companies' possibility or willingness to comply with the EUDR, the paper purchasing may see a shift towards more sourcing in Europe for the European market. European companies must comply with the regulation, but companies originating outside the EU do not unless they place products on the EU market, which may place a risk; for example, non-EU companies may not understand the requirements of the regulations as fundamentally as needed, or not take the regulation "seriously enough", potentially placing the EU buyer company at risk. Early supplier engagement is needed in the beginning of the EUDR implementation as well as during new supplier selection, where checking the EUDR compliance becomes mandatory already in the early phases; this can include surveys or conversations about the demands. EUDR compliance will become an additional criterion in the supplier selection process. Expert 6's citation below:

"Starts with who supplies to us, and if we have new supplier candidates. So before we even start to test new materials we need to know our suppliers' capability for EUDR compliance. If there are any challenges, we won't even start collaboration or it will end if it is already

going on. This is mandatory that our suppliers comply with EUDR. If supplier is not able to give us the needed data, we are not going to operate with them. It will be part of supplier qualification, and also risk management processes."

Supplier monitoring is needed as well to ensure the level of SC transparency. New suppliers should be evaluated early-on to confirm their ability to meet the EUDR standards and their readiness. This should be monitored, being the ongoing agenda with the suppliers. The case company stated that they're also training the suppliers, as supplier development is mandatory to retain the suppliers and be compliant with the EUDR. The case company's experts commented that they are ensuring that the suppliers are aware and building readiness.

The EUDR implementation requires communication and training inside the case company. It is clear that the EUDR affects to many levels in an organization, therefore many employees must be aware what is changing and what is needed from them. Some experts were asked about what investments will be needed in order to comply with the EUDR, and the answers unanimously indicated that mostly investments are needed in people and development of internal systems. Personnel has to be trained about various matters throughout the organization, such as general training of the EUDR and what the regulation stands for, how the EUDR matters are handled in case company's internal systems, and how to manage the new implementations. The case company's employees need to understand the EUDR and be able to inform customers as well as suppliers accurately. Expert 3 commented following:

"We need to educate personnel about EUDR, qualifying personnel and helping people to navigate. For example all the additional tasks what comes with the EUDR, such as auditing, there needs to be people who can and know how to do that."

Many experts strongly emphasized how much training will be needed. Fundamental understanding is also needed for other dimensions of procurement, not just understanding what the regulation itself means. For instance, expert 4 highlighted that sourcing professionals need to understand tariff codes and incoterms better than before, and understand how such also affect the EUDR. Especially procurement has an important role, as they act as a "gatekeeper"; the must understand the requests regarding products and deliveries, as well as be able to inform other people inside and outside the company. Expert 4's comments below:

"Everyone involved with new materials and purchasing needs to understand the significance of the EUDR, so no one acts independently. Procurement must act as a gatekeeper and be alert. Knowledge and its importance must spread throughout the organization. Similarly, in the creation of new materials, procurement should act as a gatekeeper to understand requests and ask the right questions from the right people."

Internal information sharing should be aligned and clear, so any challenges do not arise which could lead to the worst-case scenario of non-compliance or financial losses. Sourcing has increased its significance, as how sourcing and procurement are managed impacts clearly the rest of the organization. Expert 1 has highlighted this situation as following:

"This additional complexity will require more training for employees to ensure they understand the EUDR and its requirements. Information sharing within the organization must also improve to support compliance."

The main aspects of the EUDR is to ensure transparency throughout supply chains. Due to mandatory information collection, and other risk procedures, vast amounts of data will be collected from suppliers and given forward to customers. As discussed earlier, the information provided has to be definite and verifiable, meaning that errors and unverified data can lead to non-compliance. In addition, the case company needs to assess the data and its reliability. There will be big volumes of data, which will need accurate data management. Various experts have stated that digitalization needs to improve in the case company to connect the data traceability from sourcing to sales. Expert 1 has commented:

"The regulation also demands significant data management efforts, including monitoring and record-keeping for five years, which will increase the administrative burden."

The due diligence statement (DDS) numbers will be needed and given forward to customers with each shipment. The DDS numbers need to flow through the organization all the way from sourcing to production and lastly to customers. There are many places where the DDS number is needed. The DDS numbers have to be managed properly to avoid risks, which could possibly lead to non-compliance with the regulation. As discussed earlier, more information needs to be requested from suppliers, and shall be given to customers and possible other third-parties; thus data requests will increase, same as during the EUTR. Similar surveys will probably still continue in the future, as such are needed for risk assessment and ensuring transparency in addition to shipment level traceability.

Internal reporting also relies on these aspects, which is why data management needs to be accurate. To successfully prepare data management and systems for the EUDR implementation, the internal systems have to be functioning at needed level. Existing internal systems need to meet the requirements of the EUDR, and additional data management improvements are needed. Expert 2 commented:

"System investments are needed to update and improve systems. The goal is to automate supplier collaboration and ensure the collection of DDS numbers. It's still unclear how much workload will increase once the regulation is active."

The case company emphasizes for sustainability and would have a strategy set for deforestation risk management even though EUDR did not exist. There should be and there are business rules to ensure compliance from top-management, and these matters are taken seriously. Also, the case company avoids being the operator, if possible. The table 7 represents the SSPs needed for case company's EUDR implementation.

Table 7. SSPs needed for EUDR implementation.

SSPs	**Example**
Supplier selection	Supplier portfolio changes, accepting only supplier compliant with EUDR, early supplier engagement, centralized sourcing
Supplier monitoring	Supplier evaluation to meet the EUDR requirements
Supplier development	Supplier training
Communication	Internal employee training, internal information flow, internal company awareness
Technology	Data management, data traceability, improvement of internal data systems and processes
Company's orientation	Business rules to ensure compliance, avoid being the operator

In addition to these SSPs for EUDR implementation, other comments regarding the implementation were given by the experts. Many experts expressed how the regulation is complex, and there is a lot of uncertainty how much more will change once the regulation is applicable. These practices are just preparations for implementation; maintaining the systems and being up-to-date once the regulation is in force is a different matter.

5.2 Challenges in the new regulation implementation

In this section the second sub-research question “What are the challenges in the implementation?” will be reported. First, the SSCCs the case company has encountered in the past will be presented, and then the challenges of EUDR implementation will be examined. Due to emerging pressures from regulatory, economical, and environmental aspects, companies must identify the possible challenges appearing from the implementation. The findings for the second sub-research question have been categorized as following: pre-EUDR challenges, and the EUDR implementation challenges. The environment within the study, the environment where "challenges" and "implementation" are studied is mostly the EUTR and EUDR.

5.2.1 Pre-EUDR challenges

This section will use the data from the fifth interview question, which was assigned for all interviewees. The pre-EUDR challenges are derived from events which happen due to changes in sourcing environment. From the interview data the most challenges were emerging from legal, financial and bureaucratic events. In this context, the answers and discussions are mainly focusing on the legal side, more specific on sustainability regulation, such as the EUTR, or other sustainability requirements through certifications for instance. As regulations have increased, it has risen the workload in sourcing functions. Sourcing professionals have to adapt more knowledge related to the regulations and requirements, and inform suppliers and customers about the requirements. Though regulatory changes may not always need immediate reactions, there can be risk of penalties for non-compliance.

Similar to the EUDR, with the EUTR there was also uncertainty with the legal enforcement and compliance expectations. The requirement itself was perceived differently by each organization, which led to challenges how the regulation itself should be carried out in real life. In the EUTR the challenge was simply that no one knew exactly what to do. Companies interpretation of the regulation varied, and companies promised to be compliant though there was a risk that they weren’t. This caused challenges to sourcing, as the SCs weren’t as transparent as thought, causing risks for SSCM. Expert 7’s insights of the situation below.

"EUTR; the legislation was problematic, and no one knew what to do. There were many promises of compliance, but were any really compliant? There were promises to be compliant, but there were different interpretations between companies and no one really said directly how things were."

In supply-side events, management and collaboration with suppliers can be challenging as the information flow can be slow in complex and global supply chains. The buyer company had to ensure that its suppliers are compliant with the regulation, and are able to meet the new sustainability criteria. Thus, different supplier management activities took place, such as collaboration or monitoring. Many suppliers obtained the FSC and/or PEFC certification, but there was still a risk that certified suppliers lacked full compliance. The certifications, such as FSC and PEFC, have to be managed through the value chain and ensured that the chain of custody is unbroken.

Supply-side events which cause challenges can both be endogenous or exogenous. Buyer firm cannot influence if supplier is ending its business, but for instance selection of suppliers is endogenous. When new requirements are implemented, buyer firms have to be more aware of suppliers' actions, as such will affect buyer firm's performance and compliance. When new regulations are presented, it must be evaluated whether it is possible to continue with the same products and suppliers as before. Sometimes it can be necessary to change raw materials or suppliers to get products required that are compliant. Suppliers may be unable to answer to the changing regulatory needs, which set challenges for buying firm's sourcing. Also, it is a possibility that the suppliers are not willing to share the needed data.

If risk is identified on the supplier performance and capability to be compliant, the case company stated that the business ended. There can be a lot of uncertainty related to maintaining supply relationships in changing regulatory landscape. The case company manufactures special label products, where sourcing can be challenging from time to time as there aren't many suitable suppliers available. In case of new regulations, there was a possibility that the requirements of the regulation were too demanding for the supplier, especially if the supplier was a smaller one. New regulations may require product development as former products do not comply with the requirements, and suppliers may not have the financial possibility for that, thus implementation caused challenges in supplier portfolio management. As Expert 4 highlighted below:

"Sometimes it has been necessary to change suppliers' raw materials or switch to a new supplier to get the products required by the market/regulation."

In complex and global supply chains, where customers and stakeholders require more and more sustainability, providing adequate level of transparency can be challenging. For many sustainability regulations data collection is compulsory. Information from suppliers must be gathered in order to provide needed data to other parties. Once the data had been received, other challenges followed: is the data trustworthy and how can the case company be sure that the provided data is enough, in terms of quality and quantity? The data can also be perceived differently, since "sustainability" as a context is vast and complex. Different stakeholders may have understood the data differently, for instance what was relevant and what was not. Expert 3 has illustrated this situation:

"Lack of understanding of what supplier credentials really mean by their information…. The claims which suppliers make; how can we trust that, if it's true what they say or not. Also, is the data we have and receive trustworthy?"

Maintaining case company's internal master data, which is associated with internal procurement systems, faced challenges as well. The case company needed to be alert and ready to manage its internal data so the information is aligned throughout the company's systems. Also contacting suppliers and documenting the received data increased workload, and it was challenging to track the accuracy of compliance. Expert 8 has dealt with similar challenges in the case company:

"The challenge with the information requests was getting suppliers to respond and sending many reminders."

In ethical business management events the challenges included overall SC transparency, which then led to challenging EUTR implementation, as level of required transparency was difficult to provide. Sustainability made managing supply chains more complex, as transparency must be always ensured. The pre-EUDR challenges are listed in appendix 5. Expert 1's words below:

"Challenges in the sourcing environment include managing a long supply chain, where the source of wood and forests are distant. Customers are increasingly interested in the origins of raw materials, down to the forest level, making it difficult to provide reliable and up-to-date information."

With many actors in the supply chain, ensuring transparency is challenging, and verifying the accuracy of the data has its risks. Sustainability is a complex theme, and again it can mark different cases for different parties. Certifications challenges can also be included in ethical business management events, as it is an instrument to track due diligence and sustainability requirements.

5.2.2 Challenges in the EUDR implementation

In this section the challenges emerging only from the EUDR implementation in the case company will be discussed. As the previous answers may have indicated, various practices for sustainability regulation implementation and pre-EUDR challenges were identified. Of all the interview questions and answers, most data from interview answers were received from question 6. “What challenges do you expect there will be regarding meeting the EUDR requirements, such as collecting geolocation data, conducting risk assessment etc. ?”. This section will present the answers to the interview questions 6. and 7., as well as observations.

Regarding legal, financial and bureaucratic events, experts commented that the EUDR itself is very complex and leaves many things unclear. The regulation states what needs to be done but does not give examples or guidelines how the actions should be done. Companies must meet the requirements, but they aren’t provided with adequate level of detailed guidelines on how to proceed with the requirements. For instance, a holistic due diligence system is mandatory, but the EUDR does not provide any guidelines how to do it, and what would be the appropriate level of risk assessment practices. The EU Commission has also delayed publishing necessary information, which is critical for companies to implement the regulation. The EUDR was first to be applicable in the end of 2024 but was now delayed to in the end of 2025 for bigger enterprises. Initially the transition period was too short, and expert 5 commented it following:

“The way EUDR transition period was started before the EU Commission itself was ready, such as the information systems. They assumed that us and other companies can fulfil requirement, while at the same time the EU's end is open and undone. The new transition period during 2025 is very good from technical development perspective.”

Companies need to independently interpret the regulation, which probably leads to different interpretations and practices among industries. This can cause challenges in sourcing, as different companies may require different levels of due diligence. The situation is similar as with pre-EUDR challenges; no one is 100% sure what to do. The experts also stated that many companies are unsure about the EUDR and what it actually requires. Even if companies claim their products are compliant, there is a doubt whether it is true, as there is a risk that the regulation is understood incorrectly. There will be implementation challenges, as the requirements need to be implemented to companies' sourcing practices without solid guidelines. Regarding different interpretation views about how the EUDR due diligence should be fulfilled in companies, expert 1 commented:

"Companies must decide how to interpret the requirement, especially for management of DDS numbers, which will cause challenges. Different companies will demand various different proofs and audits, with differing interpretations of compliance and implementation plans."

Tackling these challenges and improving the implementation process of the EUDR will cause increased workload. Same as in the EUTR, more knowledge has to be adapted and the workload rises. The EUDR implementation preparations adds even more, as there are much more activities to be done than just understanding the regulation itself. Meeting the regulation with given time frame and limited resources can be challenging.

In demand-side events one challenge was identified, as customers are increasingly sending information requests to the case company. This is a downstream challenge, but creates more burden and workload, as customers are not educated about the EUDR. In addition, the challenge is what kind of information can be shared to downstream and how to tackle certain issues with customers. Expert 3 has illustrated this situation:

"Challenge is in the commercial side, what kind of info do we get and what can we share and what not. Dealing with the brands and customers and trying to explain them about the EUDR."

When talking the results regarding SSPs, supplier portfolio changes was the most mentioned SSP for the EUDR implementation. This is also a challenge, as supplier changes will take time and resources. It can create challenges for the case company, as it may not be possible to use some suppliers in some countries anymore. Expert 2 highlights:

"The most unfair aspect is that it affects our ability to use certain suppliers, even if they have no deforestation risk, simply because they cannot meet the data requirements."

Some supplier may be unable to answer to the new requirements. Though there wouldn't be any deforestation or other compliance risks, companies may not have the possibility for investments required for the EUDR compliance, as expert 2 comments above. Compliance of suppliers has to be tracked constantly, as the case company has many suppliers globally. Ensuring that all suppliers comply with the EUDR requirements with acceptable measures is a significant challenge.

Effective communication with suppliers is essential in these cases, but challenging at the same time. Since the EUDR is complex and there are many dimensions, communicating and navigating those can be challenging. Suppliers must provide correct information, which has to be enough to cover the EUDR due diligence requirements. Here the main challenge is the complexity of the EUDR and different interpretations – for example, suppliers may give the case company information which is not enough in terms of quality and/or quantity. This challenge may be more severe with suppliers especially located outside the EU, where the detailed understanding of the requirements might be missing. Lastly, another challenge is whether suppliers will be ready. Ensuring that suppliers are prepared in time for the EUDR compliance is another major concern.

Next findings related to production-infrastructural events will be presented. Such events were not identified in pre-EUDR challenges. These challenges are all mainly exogenous, as case company has not much influence for such events. Due diligence steps include information collection, where origin of fibre is needed. In the EUDR, operators have to provide geolocations of the plots of land where the fibre was sourced, and put this information to the EU Commission's Information system. In the wood industry, depending on the area, providing such specific information can be very challenging if even impossible due to technical reasons. The forest owners and then pulp manufacturers have to be able to provide the information first, and after that the rest of the chain will follow. Pulp manufacturers usually purchase fibre from multiple locations, and in the manufacturing process when the pulp is mixed, it can be impossible due to technical reasons to identify which input batch has been used for the product output. Geolocation information may get lost in the process, and it might not be possible to know the exact origin of an individual pulp bale; it can only be estimated. Expert 2 commented:

“A common challenge is that not all countries' forest industries can provide geolocation data.”

The EUDR itself has challenges, such as interpretation of the regulation, lack of guidelines, and timely availability of DDS numbers. In the EU Commission there may have been lack of understanding the companies’ operations and material flows when finalizing the regulation. Expert 4 stated below:

“The EU's lack of understanding of companies' processes and systems and how these processes work. For example, what comes to information system reporting, how their data systems stay up and running, and how the systems work agilely.”

It can be challenging to bridge the regulatory and knowledge gap, as the EUDR has not taken into consideration how companies’ information and data systems work. There is a possibility that companies’ data systems do not align with the EU Commission’s Information system. The EU’s Information system will face huge amounts of data inputs and outputs daily, as each individual shipment must be put to the system. Information system’s functionality may cause challenges, for instance if the system is facing a failure, it may impossible to send or receive shipments. Expert 8 commented following:

“The EU's Information system, where DDS notifications must be submitted, will have an enormous number of entries daily. It depends on the functionality of the Information system; what if it doesn't work? If notifications can't be made, materials can't be accepted. There is about a 5-minute delay in the systems, which is acceptable in some cases but catastrophic in others.”

In addition to the EU’s Information system, there is also a challenge how to integrate data systems with suppliers and customers, and have it as automated as possible. Each company has its own way of handling things, thus how to connect the case company’s data and IT to outside systems. The data should be as compatible as possible to ensure smooth receiving and sending of data. It is not sure whether the information is received in desired format, or if it will work with the case company’s systems. This may cause technical challenges in data collection and increase the workload, as well as lead to disruptions in procurement. The challenge is similar to downstream, as the case company has to be able to provide sufficient data to customers. Expert 3’s words:

"*More considering the downstream parts, and how to connect to customer systems. How to connect our data and information to third party systems for instance. IT issues and traceability issues in our company wide internal systems. Becoming compliant is the first step, but how to make it commercial viable."*

Big volumes of data will need adequate data management and this can be a source of risks. Regarding studied SSCCs in EUDR implementation, the most data was gathered related to technological events. The case company's procurement and reporting relies heavily on internal systems and master data. Maintaining accurate and up-to-date master data is crucial for the case company, and the new systems put a lot of pressure on master data. For instance, if certain information, such as tariff code is missing, it may stop the systems. The high stakes of compliance leave only little room for errors, which increase the pressure for the case company. Expert 4 commented:

"If the customs code is missing from the delivery, what then, and where are they put on hold, and what is the process, and what is done in the worst-case scenario? On the supplier's side, how long does it take, and what caused it, etc. The EU assumes that the process is quite error-free in terms of data. There is not much room for errors."

Internal data challenges can lead to management issues and inaccuracies, especially since in the case company materials are transferred between sites globally. In case company's internal supply chains it is possible to be flexible, but the EUDR makes it difficult and adds challenges. Business relations and materials can also vary depending the site, which adds complexity on handling internal data. If business ends at one site, or certain material is no longer used, it is more critical to manage gaps in internal processes due to information flow and the effects to company's data management. Expert 8 illustrated the situation following:

"The process works when we are within the EU and importing directly from the EU. But if, for example, something is sent from Uruguay to China and then moves around the world before finally arriving in the EU, the necessary documents and information are required. However, the information must pass through many operators, making it difficult and challenging to manage. The paper originating from Uruguay is not initially recorded in the Information system, which must eventually pass through many other operators before reaching the EU."

Some experts also discussed that error processes are not yet well defined. It is still unclear what such errors can cause and when they are noticed. The case company needs technical solutions and processes to be resilient. Expert 4 commented:

"Large volumes are involved; when the supplier sends the delivery information, it comes electronically, e.g., delivery number and roll ID. We are adding the EUDR due diligence number and the linking verification number to this communication, and the entity maintaining this data system has added them to the internal systems. If this system is not in place and faces error, if it is manual input, and the error travels down the chain, so what then? When is such an error noticed?"

Lastly, regarding technological events, the most mentioned challenges were receiving and sending accurate data, as well as data transparency and traceability throughout the chain. The case company has many paper suppliers, and all must be compliant. Receiving accurate data and being on track can be a challenge, due to the complexity and length of supply chains. Some suppliers may be unable to provide accurate and transparent data which is needed in the EUDR. Ensuring the reliability of data collected from various sources as well as transparency is essential and can be difficult, especially with multiple involved stakeholders. The issue is similar as in pre-EUDR challenges: is the data trustworthy and how can the case company be sure that the provided data is enough, in terms of quality and quantity. Data management challenges may lead to disruptions in procurement. Expert 3 stated:

"Traceability and system issues with the data and how to share and deal with it. If non-EU supplier refuse to share data, what can we do. Availability of certain information, what if data is not available."

There will be SSCCs in internal company events as well. This category wasn't disclosed during pre-EUDR challenges, and is therefore a new addition to challenges in the EUDR implementation. Due to increased workload, needed knowledge, the regulation's complexity and internal system management, human errors and mistakes may emerge. Mistakes can happen. Also, there can be a challenge ensuring that all employees are aware of the EUDR requirements. Overall, there is more to manage, understand and communicate. The case company is a bigger global company, which operates in many countries and different sectors. It can be challenging to grasp the full complexity of EUDR requirements and its implications.

Lastly, the final category for challenges in the EUDR implementation will be ethical business management events. Tracking the transparency and compliance of SCs will be complex. It is crucial to address these SSCCs, as transparency is an important aspect of SSCMs and the EUDR itself. The list of the risk level of relevant countries of production will be published in the end of June 2025 the latest; the risk country list will place challenges for companies as well, since it may require varying processes depending on the risk levels and probably increased actions, if the production country appears to be in a high risk country. There is also uncertainty whether smaller suppliers can meet the EUDR requirements, as smaller suppliers can lack the resources to comply with the EUDR's strict standards. In the appendix 6 challenges in the EUDR implementation are being presented with examples.

5.3 Changes in the sourcing environment

Finally, the last research question *"How the implementation changes the sourcing environment?"* will be answered. In this section, the expected and possible changes in sourcing environment due to the EUDR will be presented. The results will be examined from boarder business environment and the case company point of view. The EUDR significantly alters sourcing environments, for instance with affecting suppliers, markets, and operations. Lessons from previous regulatory implementations and changes will be covered first. Some thoughts of the case company's own implementation process will be shared as well.

Compared to other regulations, the EUDR was passed rather quietly. When the EUDR was published in 2023, it really was a surprise for many companies what the regulation actually means and how strict the requirements are. It would have been important to proactively collaborate in the creation of the regulation and engage in preparatory actions, rather than react once the regulation is set. From the start, many experts commented that there should have been internal project teams to understand the regulation and start preparation early. It would have been beneficial if there would've been comprehensive guidelines how to proceed with such changes. Expert 2 and 6 commented:

"EUDR is highly cross-functional, so it's crucial to identify early on what needs to be done and where. If a new regulation is anticipated, action must be taken at an early stage."

"We should really have proactive actions, so what possibly will come and start preparations early. From the start we should have thought how to do this wisely. It would be important to also somehow collaborate in the regulation process. These are big things so there should be group wise policies with systems and processes. We need to have time and resources for implementation."

In terms of sustainability data and internal tools, some previous experiences have shown that the case company's current systems may be often insufficient for managing complex data. Sustainability data and its management is crucial for success and SSCM, but it was discussed that often these topics do not receive the similar attention as investments in other departments, such as financial reporting. One of the experts commented:

"We often create solutions to fix only one problem, and we try to manage with systems which are just barely enough. Internal systems should be enough and manage the traceability, but this is ignored, neglecting the wider view. There should be more investments to our systems, the case company is more reactive rather than proactive. There should be wider picture what such issues and changes really mean, thinking bigger."

Regarding technology and digital systems, it mustn't be assumed that systems are risk-free. Processes and data management can often face errors and risks, which can influence widely to operations. Development of company's sustainability needs support from sourcing, but also increasingly from data management.

Effective internal and external communication is necessary to understand and implement the requirements. Also, it was found that too few employees have been involved in considering the regulation and assessing its impact. Project teams may struggle to fully understand the EUDR, and may lack knowledge of various areas, such as who would need training and how different functions operate. Expert 4 stated following:

"Communication within the company needs to be good, with proper documentation, training, and communication, so that everyone involved in this process knows about it and what will change, etc."

Lastly, a challenge towards the EU Commission and the EUDR: the EU databases and information should have been ready before. The EU Commission's delay in providing clear guidance and functioning databases has made the implementation process much more difficult. The preparations seem to be done hastily without proper preparations, and current

suitable SSCM tools, such as FSC certification, were said to be not enough. General basics, requirements, information system and proper guidelines should have been ready first before the transition period. Expert 8 highlighted the situation:

"It was realized that there are so many things that do not work, hastily made and tried to meet the requirements, then a one-year extension was given. The EU should have played it differently. It would have been better to use the existing system and its policies, rather than creating something new from scratch."

As companies adjust to new sourcing landscape due to changes in business environment, investments in various areas such as sustainability data, proactive sourcing practices and risk management, as well as internal and external communication will be essential based on previous lessons. Next, the current changes in the business environment due to the EUDR implementation will be presented.

As previously studied, there will be changes in SSPs and SSCCs impacting possibly the supplier portfolio. Some suppliers, especially suppliers outside the EU may not be able to comply with the regulation. Particularly smaller suppliers may struggle with the compliance due to the EUDR's complexity and vast data requirements. There is also a risk, that something will be implemented but after all it will not comply with the EUDR rules. As in both EUTR and EUDR, the regulation is very complex and interpretation may vary. Supplier portfolios may change, as companies need to choose suppliers based on the EUDR compliance capability rather than other traditional sourcing criteria. Expert 3 has stated:

"Suppliers are massively underestimating to answer to the EUDR compliance, and they underestimate the resource and organization investments. Some compliance requirements and due diligence burden might be really difficult to tackle for some smaller suppliers."

Complying effectively to the EUDR requires higher level of automation, and increased technological advancements. Due to these reasons alone, some companies may not have the willingness to comply, and will stop supplying to Europe. In some places there is also a possibility that companies go with whatever is the lowest bar in terms of data. Some companies have limited resources, therefore they might not have the needed capabilities, which may create uncertainty and risks to further supply chains. Companies may also underestimate the workload needed for meeting the extensive requirements, and many companies need external help. Expert 1 & 6 have commented following:

"The EUDR requires major automation projects, which take time, money, and resources, but the financial benefit may be small. Many suppliers outside Europe will likely stop supplying to the European markets."

"Outside of EU there is a possibility that the requirements and needed data are not respected and what should be actually provided, and then they give information which is superficial. They say that they will handle the EUDR requirements, but can we then trust the data we receive, and is the data enough?"

The EUDR makes it less tempting to supply to the EU area. There may be price and availability changes, costs may increase and material flows to the EU may turn outside Europe, to those markets not affected by the EUDR. The costs may increase due to many reasons, such as higher operational costs as workload increases and investments have to be made. Expert 2 highlighted:

"EUDR compliance will impact costs, as companies need to make investments to meet the requirements, potentially raising purchase prices. There will likely be hidden costs as well."

Many experts also discussed how the EUDR will cause global market shifts. The markets will change, and volumes will likely shift too, as non-compliant suppliers exit from the EU markets. Some assumed that Europeans would favour European products and companies, as there are obviously less risks and all parties must comply with the same requirements. The goals of the EUDR are good, but there is a big risk that the EUDR isolates the EU, becomes a trade barrier, which will have negative consequences in other areas. The EUDR rules are much stricter than in other regions, and other companies may shift to markets where these matters are not considered as seriously.

Experts commented that transparency of supply chains will increase for certain due to due diligence statements. Proactive companies will most likely gain competitive advantage, as expert 4 comments:

"Someone somewhere could also use this as a competitive advantage. Do we achieve anything in terms of sustainability? The ideal situation would be that it changes and improves things."

The companies which take the EUDR seriously, prepare early and have the possibilities to implement the needed sourcing practices may most likely gain competitive advantage. Those

who fail to answer to the EUDR standards will face risk of losing business or regulatory penalties.

6 Discussion

The EUDR has already brought significant changes to sustainable sourcing environments. In order to ensure deforestation-free products under the EUDR, companies must transform their sourcing practices and face the challenges of the regulation implementation. As the regulation requires transparency across supply chains, different challenges and changes will impact in the sourcing environment. This master's thesis studied these transformations by analysing the practices, challenges and changes due to the EUDR implementation in the case company, which produces label laminates that use paper. Qualitative data collection methods with interviews and observations, as well as previous literature were utilized for findings. Next, the key findings of the study will be discussed.

The findings align very well with previous literature about sustainable supply chain management, especially emphasizing the importance of transparency of sustainable supply chains. The previous literature stated that the sustainability goals are usually implemented due to external pressure or incentives, often being customer needs or legislative requirements, the latter being the most significant external pressure (Hervani et al. 2005; Touboulic et al. 2015; Seuring & Müller 2008). The case company's approach for sustainability is also in alignment with DiMaggio's & Powell's study (1983) about different pressures, the EUDR itself being a coercive pressure for sustainability. Although the EUDR is a coercive pressure, it still can be seen as normative and mimetic pressure too, thus companies are expected to be sustainable and follow industry norms. The case company aims to be the leader in sustainable labels as well. Thus, it is up to company's values and strategy how critical the implementation for the regulation is seen.

6.1 Sustainable sourcing practices needed for the implementation

The findings of the first research question were categorized to "pre-EUDR practices", "current sustainable sourcing practices in high-risk areas", and "practices to implement the EUDR". According to Kähkönen et al. (2018) SSPs are part of a company's proactive actions to manage and implement sustainability into supply chains and also give a picture how a company's sustainability is handled. Identifying "pre-EUDR practices" was seen beneficial for the study, as the EUTR is the EUDR's predecessor, and gives a good base for what is also needed in the EUDR implementation. The pre-EUDR practices identified in the case company align well with the previous literature regarding practices implemented in organizations after the EUTR implementation (Forest Trends 2021). Especially data collection was increased, and many SSPs became frequent tasks, such as origin of fibre and supplier questionnaires. Additionally, chain of custody certification became a more standard practice in forest industries' sustainable supply chains. Also, the previous studies have shown that proactive practices are needed for SSCM and resilient supply chains.

Existing sustainable sourcing practices were also identified, giving some baseline for when the EU Commission will publish the high-risk production countries' list, which should happen on 30th of June 2025 at the latest. The current SSPs align well with the SSPs identified in previous literature (table 4.). The case company takes proactive measures to minimize the risks in sustainable sourcing, such as mandatory FSC and PEFC certifications or ending the supplier collaboration if sustainability from supplier's side cannot be ensured. Sustainability is highly valued in the forest industry; therefore companies should only select suppliers who can reach the needed level of sustainability, irrespective of the EUDR strict due diligence requirements (Hollos et al. 2012).

The company's orientation was already highlighted in pre-EUDR practices and again in SSPs needed for EUDR implementation. This illustrates well how the case company has been striving for sustainability in supply chains. Sustainability must be part of company's core values to implement SSPs successfully (Beske & Seuring 2014). If there is no support from the company's top-management itself, it will be challenging to implement SSPs. Though the case company already has high level of sustainability measures and is actively incorporating SSCM and sustainable sourcing practices, there are new practices needed for

the EUDR implementation. In addition, according to Sult's (2024) study, employee awareness and training is important in order to have successful implementation process.

Previously it was discussed how the EUDR requires more technological advancements and capacities, and how the due diligence traceability is much stricter than in the EUTR (Köthke et al. 2023). This has been proved by this research as well, as almost all experts highlighted strongly how important data management and improvement of internal systems will be to successfully implement the EUDR. From all the practices identified in this study, data management was one of the most mentioned SSP among the experts. This finding strengthens the alignment with Schäfer's study (2023) about how part of SC transparency is to share SC information and evaluate the information's trustworthiness. The previous study also enlightens how the evaluation of the data and whom it is sent to and received from need to be considered. The EUDR aims for supply chain transparency, therefore SC information is mandatory dimension to fully answer to the regulation's requirements. The case company could also utilize more technology to improve the transparency of the supply chains, such as investing in blockchains and IoT (Bai & Sarkis 2020; Montecchi et al. 2019).

In addition to increased data management and improvement of internal systems, supplier portfolios might change, with shift towards sourcing in Europe, in case other suppliers are not able to meet the EUDR requirements. It was discussed earlier in previous literature that the EUDR may exclude smaller suppliers and suppliers outside the EU due to strict requirements and mandatory technological advancements (East Asia Forum 2023; Gilbert 2024; Köthke et al. 2023). This is also supported by this study, as the results show how supplier selection may change, and some suppliers may not be used due to their incapability to meet the EUDR requirements.

While considering SSPs for the EUDR implementation, such as supplier selection, monitoring and development, it should be noted that in the EUDR the requirements consider the whole supply chain of the scope product, which can make the management of the requirements difficult as usually sourcing practices consider only first-tier suppliers (Schulze et al. 2022). Supplier-based SSPs are crucial to succeed in the EUDR implementation, as such have been shown to have positive influence on sustainable SC resilience (Negri et al. 2024). To ensure compliance, supplier management is one of the most vital aspects, as ensuring supply chain transparency has a lot to do with sustainable SC information, sending and receiving information, and supply chain transparency, as discussed previously in

Schäfer's (2023) study about supply chain transparency. Companies should select suppliers, who are able to be compliant with the EUDR requirements.

Also, it was discussed earlier how private sector driven forms of governance can last only as long as state-driven regulatory frameworks appear, and that FSC was not fully recognized by the EUTR as due diligence (Dieguez & Sotirov 2021). Although FSC was not recognized by the EUTR, it was still considered one of the appropriate ways to manage sustainability in supply chains. It will be interesting to see if use of respected FSC and PEFC certifications will change in the forest industry, as the EUDR due diligence covers widely same aspects as the CoC certifications. On the other hand, FSC and PEFC certifications could possibly be another practice for the EUDR's risk assessment and risk mitigation actions.

6.2 Sourcing challenges

In SQ1 when discussing overall about challenges, "nature of challenges" whether it was exogenous, endogenous or both, this feature was added for more in-depth analysis of the SSCCs. To recap, exogenous challenges are external factors which impact the company but the company cannot control directly, for instance geopolitical events. Endogenous challenges are internal factors which act within company's operations, decision-making, or systems, and influence the adaptation and management of challenges, such as supplier management and internal communication. The results show that mostly the challenges were exogenous. For example, interpretation challenges were classified as exogenous, as the case company cannot influence how other companies interpret the regulation. In addition, endogenous challenges can be for instance lack of knowledge about the EUDR internally, since the case company has the possibility to educate its employees about the regulation. Some challenges also spanned between both categories. The nature of the challenge can give more insights on how to handle the challenges identified in this study, and what SSPs could be suitable for each implementation challenge.

The results show that there were sourcing challenges associated with the pre-EUDR challenges as well. Both the EUDR and the EUTR faced similar challenges for implementation in the case company. Mostly the challenges were legal, financial and bureaucratic events; technological events; supply-side events; and ethical business management events. In the EUDR implementation challenges new events emerged, such as

demand-side events and production-infrastructural events. Similar for both the EUTR and EUDR, the findings indicate that challenges are vastly shaped by the regulations' uncertainty and complexity, as well as differing interpretations. The EUDR is said to be vague, leaving companies unsure what is needed to be done and making it hard to make decisions based on unclear rules. Companies' own interpretations of the regulation can lead to inconsistencies among industries. In addition, the EUDR will rise administrative burden and increase workload, which aligns with the findings of previous literature (Köthke et al. 2023). The workload has increased in many departments, not just in sourcing, as customers keep sending growing information requests. Regulation's complexity increases the possibilities for human mistakes as well. Sustainability requirements emerging from either coercive, mimetic, or normative pressures have already put workload and resource constrains, and the EUDR implementation preparations adds even more, as there are much more activities to be done than just understanding the regulation itself (DiMaggio & Powell 1983).

The findings also highlight that some suppliers may not have the technical or financial capacities to comply with the EUDR. In SSCM, supplier collaboration is important to reach the sustainability goals in the SCs, therefore the supply-side event challenges are critical, as some suppliers may not be able to comply with the EUDR, or communication has been said to be difficult (Panigrahi et al. 2019). The similar supply-side event challenges also emerged in the EUTR implementation. Supplier management challenges may be problematic, as it places buyer companies at risk for not having full compliance in their SCs (Hofmann et al. 2014). Therefore, it is critical to identify the SSCCs in order to act proactively and have resilient SCs. The case company must prepare for supplier portfolio changes and increased continuous supplier monitoring to track the compliance.

The EUDR aspires to minimize or end deforestation related to the scope products and commodities. The main aspects of the regulation are supply chain transparency and increased supply chain sustainability. Companies need to ensure accurate traceability and transparency of their materials and have sufficient compliance measures. What has been stated in many parts during this study is the data accuracy and transparency. In the findings, it was revealed how important data management and improvement of internal systems will be, and how most of the SSCCs in the case company emerge in technological events. Also tracking geolocation data through the value chain can be a challenge. These actions are linked to ensure the EUDR compliance, following DDS implementation, risk assessments and possible other risk

mitigation measures. If the case company does not have adequate data management practices, it can cause serious challenges in various parts of supply chains. There is a possibility that companies' data systems do not align with the EU Commission's Information system – what will happen to the shipments if, for instance, the Information system is not working. The challenges in technological events were either endogenous or exogenous, implying that the case company does not have much influence to manage some of the challenges, such as Information System errors or data transparency throughout the SCs. In pre-EUDR challenges the challenges in technological events were all endogenous, but challenges in the EUDR implementation were also exogenous. Therefore, it is mandatory to prepare well for the EUDR also from the IT system point of view to minimize the risks in supply chains.

In addition to the already challenging situation, the EU Commission's own systems haven't been ready in time, delaying important information and testing capabilities, making it more difficult for companies to implement the requirements. It will be interesting to see once the regulation is in force if the EU Commission's systems can manage such big amounts of data, and what other errors and challenges there may be in terms of technological events. Another interesting aspect is if companies will actually invest into more advanced technology systems or still use traditional systems such as Excel (World Economic Forum 2024).

Eventually it will be interesting to see if sustainability will actually increase globally, or if it will shift deforestation-linked products to less regulated market areas. According to previous research, market shifts did not happen during the EUTR, but the EUDR puts more stricter and complex challenges for companies (Muradian et al. 2025). The EUDR's risk producer country -list will be published in June 2025, which may add even more challenges. Risk country management and transparency of complex SCs are real challenges and require cooperation across supply chains (Panigrahi et al. 2019). Therefore, the challenges in the EUDR implementation require cross-functional collaboration among departments inside the case company, as well as support from the suppliers.

6.3 Implications on the sourcing environment

Finally, the key findings of the third research question will be discussed. It is evident, that there will be changes in the sourcing environment, as previous literature and this study has

proven. The EUDR will cause changes for the case company as well as other companies in global sourcing environment. Previously it was discussed how critics have warned that the EUDR can disrupt supply chains and increase prices in the EU area (Köthke et al. 2023). These statements align with the findings of this study as well, as it was found that the EUDR may isolate the EU, and there will be increased costs due to higher operational and hidden costs. Some suppliers may exit the EU markets and therefore sourcing may shift more towards Europe. In previous literature it was discussed how the EUDR may influence other regions to adopt similar requirements, thus it will be interesting to see how other regions actually react once the regulation is applicable (Köthke et al. 2023).

The EUDR aspires to minimize or end deforestation of the scope products and commodities. The main targets of the regulation are supply chain transparency and increased supply chain sustainability. Non-EU suppliers and small suppliers may lack technical and financial resources, which would be needed for the implementation to ensure transparent and traceable supply chains. Therefore, sourcing decisions will be heavily based on compliance capabilities in the future rather than traditional factors. Many suppliers in producer countries may not have the capabilities or willingness to invest in technological advancements required by the EUDR, and it can be difficult for buyer companies to navigate these challenges with their suppliers (Busse et al. 2017). It is inevitable, that collaboration with some suppliers will not continue.

Management and collaboration with suppliers may be more difficult than before, as some suppliers will struggle with the requirements. On the other hand, relationships with some suppliers may become closer because both companies are working on common problems and have the same goal. This would align with previous literature, as achieving SSCM and transparency in SCs requires collaboration and mutual trust between entities, as well as disclosing SC information (Gold et al. 2010; Panigrahi et al. 2019; Schäfer 2023).

As discussed previously in literature and findings of the study, the EUDR was accepted quite silently, and companies were surprised by the regulation (Taylor Wessing 2024). Lessons from previous regulatory framework, the EUTR, illustrated the importance of early engagement and proactive practices. Some of the experts in the case company discussed that the approaches have been rather reactive and their internal systems were said to be insufficient for handling data for the EUDR and other sustainability requirements. Investments in sustainability data infrastructure would be needed to handle data accordingly

in terms of traceability. Many experts stated also that there should have been more proactive practices and actions inside the case company to understand the regulation and what is needed to comply. Companies may often have reactive responses, therefore fixing individual issue without addressing the root cause places risks for overall SSCM.

The EU Commission and the EUDR have widely received critique from companies, organizations and experts (East Asia Forum 2023, Köthke et al. 2023; Muradian et al. 2025). Proactive regulation engagement, proper guidelines and consultation were missing from the EU Commission's side (Muradian et al. 2025). Though the regulation aims for good purposes, it received critique from the case company's experts as well. The late release of tools, guidelines and systems which are important for implementation created challenges for the case company, suppliers and customers. Smoother transition and implementing previous SSCM tools for the EUDR, such as FSC certification, would have been necessary in order to minimize companies' implementation burden.

During the findings it was revealed that companies which take the regulation seriously can gain competitive advantage with proactive measures. This finding matches well with previous literature, as it was discussed how in SSCM with competitive measures companies can stand out from other competitors and enhance company's performance, as well as how proactive strategies are effective when meeting sustainability requirements (Kirchoff et al. 2016; Kähkönen et al. 2018; Paulraj et al. 2017; Touboulic et al. 2015; Zhu et al. 2008). In the findings it was discussed how the case company already has proper SSPs and is focused on sustainability. Therefore, the EUDR also presents possibilities, and can give the case company a possibility to standout from its competitors and improve its sustainability performance. The EUDR presents a new turning point in terms of sustainable supply chains, which requires companies to re-evaluate their supply chains and change their sourcing approaches. The EUDR vastly changes the sourcing environment, leading to increased cost, supplier changes, market shifts and increased transparency. Well-prepared companies will gain advantage, but the regulations places difficulties for some suppliers, and those incapable to invest in technological advancements. It will be very interesting to see how the markets and companies actually react once the EUDR is in force, and if more challenges and changes will emerge.

6.4 Reliability of the research

In this chapter, the reliability of the study and its execution, including data collection and liability of the data will be examined. In terms of credibility, this study had multiple professionals interviewed from the case company, which support the concept of the triangulation. Each expert has a strong professional background and years of experience in the paper industry. The number of experts interviewed illustrate comprehensive context to the study, as the sample size is enough to give credible information about the EUDR implementation in the case company and broader business environment. The study has taken into account various perspectives of the studied phenomenon, which also offers broader understanding of the studied theme and reduces bias risk. All the interviews were recorded and transcribed, hence original interview answers and expressions were preserved. Emerging themes were constantly monitored and the data was checked and assessed with coding processes.

In terms of transferability, the study could show potential relevance in other settings. The results should not be generalized statistically, as the study was conducted as a single case study for the case company in self-adhesive label industry. The results can give valuable insights to other companies in their EUDR implementation, but it should be noted that the study was conducted for the specific company operating in the self-adhesive label business. This study has been conducted logically and is traceable, as the process of the study has been clearly mapped. All the interviews and coding processes for each research question (practices, challenges, and changes) are documented, and can be examined if needed. Also, the study could be repeated with its qualitative data collection methods. The study can also be considered as confirmable, as the results are not based on the researcher's own interpretations and expectations. The results of this study are clearly based on the data, and the process of analysing the results has been illustrated transparently, as experts' direct expressions were used to support the results. The results were reflected to and supported by the previous literature as well. Therefore, this research can be summarized to be reliable.

7 Conclusions

This master's thesis studied the implementation of new regulation practices in sustainable sourcing, specifically focusing on the EU Deforestation Regulation (EURD) and its impact on the sourcing environment. With previous literature and qualitative single case study approach, the thesis aimed to gain a holistic understanding of the researched key areas, which were the implementation of the EUDR requirements to sustainable sourcing practices, the challenges of the EUDR implementation, and how it changes the sourcing environment from the case company and broader sourcing environment point of view.

The findings state that the EUDR clearly poses challenges to the case company. The regulation has triggered changes in the company's sourcing and sustainable supply chain management practices, and it is still unclear if more challenges will emerge, as there continues to be uncertainty about the regulation. Compared to the EUTR, the EUDR requires deeper level of data collection and management, increases supplier compliance management and supply chain transparency. The EUDR requirements surpass the traditional supply chain practices, and sustainable sourcing practices are more relevant than before.

The case company already had sufficient SSPs, such as CoC certification and supplier collaboration processes in place. In addition, sustainability is part of the company's core strategies and values. The current level of SSCM and SSPs are in adequate level, yet the case company has identified that more practices need to be implemented. Development of the SSPs in the areas of technology and supplier management is critical. The case company needs to prepare for potential changes in the supplier portfolio, how to handle the increased data requests as well as inputs, and ensure the transparency throughout the supply chains.

The study shows that the EUDR is complex and creates a lot of uncertainty. It has been stated that the EUDR has lacked clear guidelines, and has already created administrative burden and increased workload for companies. Ensuring supplier compliance with some suppliers can be challenging, and the interpretation of the regulation varies. Accurate data management and integration with internal as well as external systems are critical. The case company needs to prepare for challenges which it can't influence, such as Information System errors, human errors or lack of transparent data. In addition, all employees need to be clearly informed about the EUDR and what changes it requires.

Changes in the broader sourcing environment are relevant for many companies in the paper industry. Some supplier may exit from the EU markets due to strict requirements and unwillingness to implement needed technological developments. Also, the sourcing could potentially become more regional. According to the findings, the EUDR may become a trade barrier, causing global market shifts. It can also impact cost levels. The case company would need proactive engagement, investments in technology and effective communication in order to implement the regulation successfully. The EUDR aims to increase supply chain transparency and sustainability. Eventually it will be interesting to see if the EUDR will actually make supply chains more sustainable. Companies who can successfully navigate through these demanding changes and challenges will most likely gain competitive advantage.

The single case study method is seen suitable for the study. The findings and previous literature support each other, and will give valuable information to the case company about the EUDR implementation. Overall, this study managed to gain valuable information about the EUDR implementation to sustainable sourcing practices, challenges of the implementation, and changes in the broader business environment. The data was collected from December 2024 to January 2025, and since then the case company has advanced greatly in their EUDR implementation processes. The challenges are still topical, and the changes in the business environment identified in this study will be more relevant when the EUDR is applicable in the end of 2025.

7.1 Limitations and future research suggestions

As the study was conducted as a single case study, the results should not be generalized. As discussed, the results may give good overview to other companies and industries tackling with the EUDR compliance, but it should be noted that the study has a limited sample size and scope, as it considers only paper label laminates (products derived from wood under the EUDR) and the case company. The EUDR is also a fairly recent regulation, coming into effect at the end of 2025 for large companies, therefore its long-terms effects are not known and difficult to estimate. There are temporal limitations, as the study captures only the initial and recent preparations for the EUDR. The SSPs, SSCCs, and changes in the sourcing environment can be different than predicted once the regulation is in force. The empirical

data was gathered only from the case company within a certain time frame, thus this may effect to the comprehensiveness of the study.

Based on this master's thesis and the results, there are future research suggestions. Later, once the regulation has been effective for some time, the long-term effects of the EUDR on supply chain and sourcing sustainability could be studied. Also, it could be investigated how companies in different industries and regions implement the EUDR requirements. The best implementation practices could be compared. The EUDR requirements can be studied from the small and medium-sized enterprises point of view, studying more in-depth what challenges and changes there can be, and how effectively non-European suppliers are able to comply with the EUDR. Lastly, whether the EUDR succeeded to effectively improve sustainability and transparency in supply chains of the scope commodities and products could be studied.

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Appendix 1. Roles in the EUDR (European Union 2023).

Role	Description	Must conduct EUDR due diligence	Must issue due diligence statement into EU Commission IT system	Has to provide due diligence statement reference number to customer	Has to check the due diligence conducted by the previous operator	Receives due diligence statement reference number from a supplier
Operator	Has a permanent business establishment in the EU. Produces relevant commodities or products which are available in the EU market.	X	X	X		
Non-SME (downstream) operator	A large EU company which purchases relevant product or commodity from other operator or trader and processes it into a different relevant product which is then sold to EU or non-EU customer.	X	X	X	X	X
Non-SME trader	A large EU company which does not process relevant commodity or product into relevant product, but trades with relevant commodities and products in the EU markets.		X	X	X	X
SME (downstream) operator	Micro, small- or medium-sized EU company, which purchases relevant commodity or product from other operator/trader and processes it into relevant product, which is then sold to EU or non-EU customer.			X		X
SME trader	Micro, small- or medium-sized EU company, which does not process relevant commodity or product into relevant product, but trades with relevant commodities and products in the EU markets.					X
Authorized representative	Authorized representative of an operator is a party which has been authorized by the operator to act on its behalf in relation to EUDR responsibilities.	X	X	X		

Appendix 2. Link to the official EUDR.

Appendix 3. Interview questions for primary data collection.

Interview questions	Asked from the experts							
Practices	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8
1. What practices/strategies have been used when trying to adapt to a new sustainability requirement or regulation in the past, e.g. EUTR?		x	x	x	x	x	x	x
2. What changes do you expect to be made in sourcing practices in your company as a result of EUDR?	x	x	x	x	x	x	x	x
3. How does your company approach sustainable sourcing in high-risk areas? E.g. sourcing wood products from high risk country?	x	x			x	x	x	x
4. What types of investments (technology, personnel, partnerships etc.) will be needed to comply with the EUDR?		x	x		x	x	x	x
Challenges								
5. Can you provide examples of challenges your company has faced in the past in sourcing due to regulatory, economic, or/and environmental etc. events?	x	x	x	x	x	x	x	x
6. What challenges do you expect there will be regarding meeting the EUDR requirements, such as collecting geolocation data, conducting risk assessment etc. ?	x	x	x	x	x	x	x	x
7. What do you see as the biggest challenge for your company in implementing the EUDR?	x	x	x	x	x	x	x	x
Changes								
8. How do you see the EUDR impacting your suppliers? Especially smaller suppliers and in less regulated regions?	x	x	x			x	x	
9. What changes or trends do you predict in the broader business environment as a result of the EUDR?	x	x	x	x		x	x	
10. Based on your experience with other regulatory changes or/and sourcing, what lessons do you think are applicable for effectively implementing the EUDR?		x	x	x	x	x	x	x

Appendix 4. Example of categorization for interview question 2. (Tuomi & Sarajärvi 2018)

Upper category	Original expression	Simplified expression	Subcategory
Changes in sustainable sourcing practices due to EUDR implementation	"It is still unclear how well all suppliers globally can meet EUDR compliance. The supplier portfolio will likely change if some suppliers cannot comply with EUDR requirements."	Suppliers which are non-compliant with EUDR can't be used	Supplier portfolio changes
	"Paper purchasing will likely shift towards centralized sourcing from Europe. The supplier portfolio may need adjustments, as some suppliers will not meet EUDR standards."	All suppliers will not be EUDR compliant	Supplier portfolio changes
	"We look more into suppliers which operate in other continents, so how they handle these things. If there are any challenges, we wont even start collaboration or it will end if it is already going on. This is mandatory that our suppliers comply with EUDR."	Evaluation of how suppliers outside handle EUDR, and the collaboration ends if there are any challenges	Supplier portfolio changes

Appendix 5. Events causing pre-EUDR challenges in sustainable sourcing.

Category	Challenges (examples)	Nature of challenges
Legal, financial, and bureaucratic events	Possible sanctions	Endogenous
	No one knows what to do (EUTR)	Exogenous
	Different views of interpretations	Exogenous
	Work load rising	Endogenous
	Required knowledge rising	Endogenous
Ethical business management events	Supply chain transparency and traceability	Endogenous
	Sustainability making SCs complex	Endogenous
	Certification management	Endogenous
Supply-side events	Uncertainty in maintaining supplier relationships	Exogenous/endogenous
	Changes in supplier portfolio	Endogenous
	Supplier's suspicious activity	Exogenous/endogenous
	Suppliers unable to answer new requirements	Exogenous
	Supplier management	Endogenous
	Communication with suppliers	Endogenous
	Certification	Endogenous
Technological events	Transparency & traceability of data	Endogenous
	Data gathering from suppliers	Endogenous
	Data reliability	Endogenous
	Sustainability data differentiation	Endogenous
	Master data maintaining	Endogenous

Appendix 6. Events causing challenges in the EUDR implementation.

Category	Challenges (examples)	Nature of challenges
Legal, financial, and bureaucratic events	Implementation challenges	Exogenous
	Lack of clarity in EUDR, guidelines are not clear	Exogenous
	Interpretation challenges	Exogenous
	Time and resource constraints, increased workload	Exogenous
	Delay in information publishing	Exogenous
Demand-side events	Customers not educated about EUDR	Exogenous
Supply-side events	Suppliers being compliant with EUDR	Exogenous
	Supplier portfolio changes	Endogenous
	Communication with suppliers, receiving correct information	Endogenous/Exogenous
Production-infrastructural events	Pulp manufacturers able to provide needed information	Exogenous
	Tracing the exact origin of raw materials	Exogenous
Technological events	Receiving accurate and transparent data, data transparency throughout the chains	Endogenous/Exogenous
	Internal data management & systems, master data maintaining	Endogenous
	Data & system integration with suppliers, customers and other outside systems	Endogenous/Exogenous
	Information system errors, the EU does not understand how material flows and data systems work inside companies	Exogenous
Internal company events	Lack of knowledge about EUDR, communication	Endogenous
	Human errors	Endogenous
Ethical business management events	Risk country management, tracking and monitoring the compliance, SC transparency, complex SCs	Endogenous
	Small suppliers struggling with the EUDR compliance	Exogenous