

**A QUALITATIVE CROSS-SECTIONAL STUDY: FROM EU TIMBER REGULATION
TO EU DEFORESTATION-FREE PRODUCTS REGULATION**

Master's Thesis Sustainable Entrepreneurship

June, 2022

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ABSTRACT

On November 17, 2021, the European Union (EU) Commission published a proposal for the EU Deforestation-free products Regulation (EUDR). The EUDR builds on the EU Timber Regulation (EUTR) and the mandatory Due Diligence System (DDS) that operators have to have in place is similar to the EUTR DDS. The implementation of a new regulation can be perceived as complex by operators responsible for demonstrating compliance. The absence of a well-researched approach for obtaining EUTR and EUDR DDS compliance motivated this study. A qualitative research technique is used to investigate EUTR and additional planned EUDR approaches to achieve DDS compliance. As a result, a practical framework is presented that highlights approaches and methods for achieving EUTR DDS and EUDR DDS compliance. It extends on the limited research on EUDR DDS requirements as well as on the EUTR and EUDR operator compliance process. Moreover, the study sheds light on how operators overcome challenges that may arise.

Keywords: EUDR, EU deforestation-free product regulation, due diligence system, EUTR, operator compliance

INTRODUCTION

Commodity-driven permanent land-use change is the leading cause of worldwide forest loss (Curtis, Slay, Harris, Tyukavina, & Hansen, 2018). Forests are converted to cropland to cultivate commodities like soy, palm, beef, wood, oil, and extract minerals, which account for 40% of global deforestation¹ (Global Forest Watch, 2020). The European Union (EU) is the world's second-largest importer of deforestation-related tropical commodities. (Wedeux & Schulmeiser, 2021).

In 2013, the EUTR, entered into force to put a halt to illegally harvested timber from entering the EU market (EU Commission, 2010). The regulation lays out requirements for operators² in the form of a mandatory DDS which shall include evidence on the gathering of specific information, a performed risk assessment, and if applicable the mitigation of risks. The EUTR's comprehensibility and feasibility have been studied over time (Köthke, 2020; Raluca & Nichiforel, 2011; Trishkin, Lopatin, & Karjalainen, 2015). However, researchers paid less attention to the practical implementation process for operators that have to demonstrate compliance with the regulation. Köthke (2020), for example, discovered that many German operators are uninformed of the EUTR and lack adequate understanding, resulting in regulatory non-compliance. Lallas, Karageorgos, and Ntalos, (2021) provide six EUTR domains, including DDS requirements, that have to be considered to achieve compliance. Their findings, however, do not provide operators with a practical pathway to achieving EUTR DDS compliance.

Since a significant portion of the world's deforestation is associated with a range of tropical commodities, rather than timber alone, the EU commission and the majority of the 1.2 million

¹ The FAO (2022) defines deforestation as the conversion of forest to other land-use independently whether human-induced or not, including permanent reduction of the tree canopy cover below the minimum 10% threshold and areas of forest converted to agriculture, pasture, water reservoirs, mining and urban areas.

² The European Commission (2010) defines EUTR operators as entities placing timber or timber products on the EU market.

consulted stakeholders acknowledged the need for a more comprehensive regulation than the EUTR (European Commission, 2021a). On November 17, 2021, the EUDR was proposed (European Commission, 2021a). Besides legality aspects, this proposal additionally sets out requirements to stop deforestation caused by European consumption and production of the high-risk commodities beef, palm oil, soy, wood, cocoa, coffee, and its derivatives (European Commission, 2021b). The EUDR builds on the EUTR and the mandatory DDS includes the same as well as additional requirements (EU Commission, 2010; European Commission, 2021a).

Because the EUDR is a new concept, it has yet to be accepted by the scientific community. The consequences of its implementation remain unclear. Several stakeholders expressed doubts as to whether the requirements can be met (Bosplus, 2021; Byrne, 2022; Greenpeace, 2021; Solidaridad, 2021). Actors who must demonstrate compliance with new regulations may find its implementation to be complex (Lidskog, Sundqvist, Kall, Sandin, & Larsson, 2013). Challenges to achieving compliance may arise like achieving complete supply chain transparency and bearing the higher administrative responsibilities (European Commission, 2021b). Therefore, creating insight into a suitable approach for future EUDR operators³ is needed to effectively achieve EUDR DDS operator compliance. EUTR operators, consultants, and monitoring organizations⁴ (MO) were an interesting starting point for this study. These stakeholders have already had to respond to the EUTR and thus are familiar with the requirements of a similar regulation. Furthermore, the

³ The European Commission (2021e) defines EUDR operators as entities placing relevant commodities and products on the EU market or exporting them from the EU. In this study, the focus lies on imports into the EU and therefore operators are defined as placing relevant commodities and products (beef, palm oil, soy, wood, cocoa, coffee, and its derivatives) on the EU market, excluding operators exporting from the EU.

⁴ Monitoring organizations are organizations that are recognized by the European Commission to maintain and evaluate the DDS of an operator (EU Commission, 2010).

EUDR will replace the EUTR. Consequently, EUTR operators will be required to comply with the EUDR as well.

This study investigated EUTR as well as planned EUDR approaches to achieve DDS compliance. As a result, a framework is proposed containing approaches⁵ and methods⁶ for achieving compliance as well as solutions to overcoming challenges. The motivation of the study was a lack of research on the EUTR practical implementation process for operators and a well-researched approach for achieving EUDR DDS compliance.

The research question “*What can be learned from EUTR compliance approaches to help operators comply with the EUDR DDS?*” has been answered. A qualitative research technique was used to address the question. Data was collected through semi-structured interviews. The study makes contributions by adding to the understanding of EUTR DDS and future EUDR DDS compliance process and by presenting the main approaches, methods, and solutions to challenges.

In the next section, the theoretical background is provided, expanding on relevant definitions, theory, concepts, and challenges. Then, the methodology section is described which includes the study design, followed by the findings section in which the analyzed data is presented. In the concluding section, the framework is illustrated and the outcomes are discussed. Implications, limitations, and future research topics are also described in the concluding section.

⁵ Approach: Way of dealing with... (Oxford Dictionaries Oxford Dictionaries, 2012)

⁶ Method: Way of doing... (Oxford Dictionaries Oxford Dictionaries, 2012)

THEORY

This section covers the definitions of legal and deforestation-free products and the concepts of EUTR DDS and EUDR DDS. It also covers a literature review on EUTR, deforestation-free legislation and EUDR and the challenges in achieving EUDR DDS compliance.

Legal Product and Deforestation-free Product

The EUTR focuses solely on legality aspects, the EUDR takes into consideration concepts of legality and deforestation-free (EU Commission, 2010; European Commission, 2021a). The definitions of a legal product and a deforestation-free product are defined in this section.

A legal product is a product complying with the relevant legislation of the country of origin (EU Commission, 2010; European Commission, 2021a). More specifically, this encompasses regulatory compliance with local land use rights, legislation on environment protection, third-party legal rights, and relevant local trade and customs rules (European Commission, 2021a). For timber operators, this includes demonstrating compliance with timber harvesting rights, forest legislation, third-party rights of individuals affected by the harvest (e.g. indigenous people), and timber trade and customs rules.

A deforestation-free product is a product, produced on land that has not been subject to deforestation or forest degradation after December 31, 2020 (European Commission, 2021a). Forest degradation is described as non-sustainable harvesting, leading to the reduction or loss of biological or economic productivity (European Commission, 2021a).

To prevent confusion of multiple definitions, these definitions are used throughout the paper as they are consistent with the European Commission's explanation. It is beyond the study's scope to define if these definitions are complete.

EUTR DDS and EUDR DDS Requirements

The DDS of both regulations lays out the main requirements for operators, which must be met before a product can be placed on the EU market. The EUDR's DDS requirements are more extensive than the EUTR's and can be perceived as an extended version of them (European Commission, 2021a). Both mandatory DDSs include three steps: information gathering, risk assessment, and risk mitigation. Figure 1 depicts the EUTR DDS and the additional EUDR DDS requirements.

| DUE DILIGENCE SYSTEM REQUIREMENTS | | | |
|-----------------------------------|--|--|---|
| INFORMATION GATHERING | | RISK ASSESSMENT | |
| EUTR | Product information | EUTR | |
| | Country of harvest information | | Prevalence of illegal harvesting, including armed conflict |
| | Supplier and buyer information | | Assurance of compliance with applicable legislation |
| | Quantity | Supply chain complexity | |
| | Compliance information on relevant legislation | Additional for EUDR | |
| Additional for EUDR | Geolocation coordinates and time range of production | | Country origin concerns like corruption level and risk based on benchmarking system |
| | Information that the product is deforestation-free including forest degradation-free after December 31, 2020 | | Reliability and validity of sources |
| | | | Presence of forests and prevalence of deforestation and forest degradation |
| | | Risk of product mixing with unknown origin | |
| | | RISK MITIGATION | |
| | | EUTR | |
| | | If no negligible risk, mitigation measures and procedures have to minimize risk to negligible risk | |
| | | Additional for EUDR | |
| | | See EUTR Risk Mitigation | |

Figure 1. DDS requirements for EUTR and EUDR.

Information has to be gathered on the country of harvest, product information, quantity imported, supplier and buyer information, and documentation indicating compliance with local legislation (EU Commission, 2010; European Commission, 2021a). The EUDR specifies that

operators must additionally gather geolocation coordinates for the commodity's production area, a date or time range of production, and information that the product is deforestation and forest degradation free after December 31, 2020 (European Commission, 2021a).

Risk has to be analyzed and evaluated during risk assessment (EU Commission, 2010; European Commission, 2021a). The EUTR's risk assessment criteria deal with illegal harvesting including the presence of armed conflict and compliance with local and international legislation (EU Commission, 2010). Whereas the criteria of the EUDR risk assessment are also concerned with assessing risk based on the presence of forests, the prevalence of deforestation and forest degradation in the production area, and the risk of product mixing with unknown origin (European Commission, 2021a). The reliability of available data including country-specific concerns (e.g. country corruption level) and the outcome of the EU Commission benchmarking system⁷ should also be included in the EUDR risk assessment (European Commission, 2021a). The value chain's complexity and the potential of demonstrating compliance through third-party verification have to be considered for both DDSs (EU Commission, 2010; European Commission, 2021a).

Risk mitigation has to be exercised when a risk is identified during risk assessment (EU Commission, 2010; European Commission, 2021a). Additional measures and procedures have to demonstrate negligible risk⁸ for the product imported (EU Commission, 2010; European Commission, 2021a). Risk mitigation procedures should include strategies and measures that demonstrate negligible risk (EU Commission, 2010; European Commission, 2021a).

⁷ The Commission will develop a benchmarking system to classify low, medium, or high-risk countries based on deforestation patterns (European Commission, 2021e). The obligations of authorities and chain actors will differ according to the country's risk class (European Commission, 2021a). At the moment of writing the benchmarking system was not yet in place. It has therefore been excluded from the scope of the thesis.

⁸ By demonstrating negligible risk, an operator demonstrates that there is no cause of concern (EU Commission, 2010; European Commission, 2021a).

From EUTR to EUDR

Researchers agree that the EUTR is not reaching its full potential. (Köthke, 2020; Levashova, 2011; McDermott & Sotirov, 2018; Nermin & Francesco, 2022; Patel, 2019). Levashova (2011), for example, argued previously to the regulation's entry date that it was too limited to eliminate illegal timber entering the EU market. The regulation contains controversial elements, like the exemption to exclude printed materials from its scope despite it being a timber-derived product (Levashova, 2011). The causes of its ineptness are a narrow product scope, technical difficulties in implementation, and local competent authorities not performing as projected (Patel, 2019). Jonsson et al. (2015) developed policy implications: the need for partnerships and cooperation with major timber producers and timber importing countries outside the EU, the feasibility for Small and Medium-sized Enterprises (SMEs) has to be guarded, the implementation should be in close cooperation with stakeholders, and a broader goal than legality should be included (i.e. sustainability). Operator compliance costs, like traveling to suppliers as well as translation and consultant fees are further noted as pressuring matters (Jonsson et al., 2015; Nermin & Francesco, 2022). These studies imply that the implementation of the EUTR comes with challenges for the EU Commission, local authorities, operators, and other Supply Chain Actors (SCA). It further demonstrates that the EUTR has not reached its full scope of practice.

Other studies found that both local competent authorities and operators perceive the EUTR as complicated to understand and implement (Köthke, 2020; Leipold, 2018). For example, the interpretation of the requirements, the use of penalties, and the role of third-party evidence are unclear (Trishkin et al., 2015). The United Kingdom and The Netherlands are large timber importing countries that are engaged in the implementation of the EUTR but they are taking a gentle, learn-by-doing approach to DDS compliance (McDermott & Sotirov, 2018). In addition,

McDermott and Sotirov (2018) found that member states with a low Gross Domestic Product are minimally involved in its operation. In fact, in the 2021 Fitness Check, the EU Commission found similar results and acknowledged that the EUTR's functioning comes with challenges (European Commission, 2021c).

Bager et al. (2021) proposed that a new regulation or improved version is needed. On November 17, 2021, the European Commission published a more complete regulation, the EUDR (European Commission, 2021d). The proposal includes a broader product scope and aspects of sustainability (European Commission, 2021a). Due to its recent publishing, the EUDR has yet to be identified in the literature. Consequently, it is still unclear how and if stakeholders can meet the requirements. Through interviews with experts, approaches to achieving EUDR DDS compliance are examined in detail.

The existing literature on deforestation-free commodities predominantly focused on challenges and issues (Boucher & Elias, 2013; Carodenuto, 2019; Lyons-White et al., 2020; Weber & Partzsch, 2018), progress (zu Ermgassen et al., 2020), and impact (Newton & Benzeev, 2018; Pirard, Fishman, Gnych, Obidzinski, & Pacheco, 2015; Taylor & Streck, 2018). Other studies called for EU action (Bager et al., 2020; Villoria et al., 2022; Winarni et al., 2014). For example, Bager et al. (2021) proposed to address tropical deforestation through policy. The options they identified to reduce agricultural deforestation are (1) reducing demand for high-risk commodities, (2) increasing demand, and (3) increasing supply for deforestation-free commodities. The EU Commission integrates these options as EUDR implementation will result in an increase in EU demand (2) for deforestation-free commodities (European Commission, 2021a). Deforestation-free commodity supply is expected to increase (3) by requiring SCA compliance to preserve access to

the EU market. Furthermore, it could be debated that demand for high-risk commodities will decrease (1) once deforestation-free commodities supply and demand increase.

Wood et al. (2021) discussed the inclusion of several aspects in DDS regulation for deforestation risk commodities: improve data availability, adapt to supply chain complexities, regularly review commodities within the scope, use certification schemes, and provide financial and technical support for developing countries. The EU Commission acts by improving data availability by developing EGNOS/Galileo⁹ and Copernicus¹⁰ to locate forests and deforestation in production areas (European Commission, 2021a). Third-party certification may be used by operators to demonstrate compliance, although it does not substitute the operator's mandatory DDS (European Commission, 2021a). In addition, the EUDR is set up in such a way that the scope can be revised. Nevertheless, Wood et al.'s recommendation to provide financial and technical support for developing countries is not stated in the proposal or its Explanatory Memorandum (European Commission, 2021a). The document refers to working in partnerships and international cooperation with producer countries but the Commission does not indicate that financial or technical assistance for developing countries is a priority. Currently, however, there are concerns about whether smallholders in developing countries will be able to meet the EUDR requirements to be allowed to export to Europe (Greenpeace, 2021; Preferred by Nature, 2022; Solidaridad, 2021).

EUDR Operator Challenges for Compliance

To comply with the EUDR DDS requirements operators have to demonstrate transparency in the supply chain, trace the product back to its origin, and obtain the required geolocation coordinates of the plots where the commodity was produced. Researchers agree that supply chain

⁹ EGNOS/Galileo is a positioning, navigation and timing technology through satellites (European Commission, 2021a).

¹⁰ Copernicus is an earth observation and monitoring system (European Commission, 2021a).

transparency is difficult to create (Galvez, Mejuto, & Simal-Gandara, 2018; Gunawan, Vanany, & Widodo, 2021; Kros, Liao, Kirchoff, & Zemanek Jr., 2019; Sarpong, 2014), but necessary to efficiently manage risk (Astill et al., 2019), reduce environmental impact (Kashmanian, 2017), advance sustainability governance (Gardner et al., 2019), and improve market efficiency and realize consistent quality (Trienekens, Wognum, Beulens, & van der Vorst, 2012). Moreover, Bakhtary et al. (2020) argued that in high-risk areas it is nearly impossible to achieve full traceability. For example, Stoop et al. (2021) found that mixing certified and un-certified cacao by farmer cooperatives in West and Central Africa is a common but undisclosed practice. This example is one of many regarding the complexity of supply chain transparency (Gardner et al., 2019; Godar, Suavet, Gardner, Dawkins, & Meyfroidt, 2016; Lyons-White & Knight, 2018). Furthermore, while comparing the traceability systems of Côte d'Ivoire, Ghana, and Cameroon Stoop et al. (2021) discovered that the presence of a traceability system and its effectiveness varies per country. Consequently, operators who want to comply with the EUDR but currently source from high-risk countries with a complex supply chain need to take additional measures or decide to change supplier or country of origin. This is not only time-consuming but may also have an impact on the product's quality (Daroń, 2017).

Timber is the only non-food product covered by the EUDR. The food industry is known for having a large number of SMEs (FoodDrinkEurope, 2022) but also the forest industry works with SMEs (Brady, Macqueen, & Behr, 2018). Köthke (2020) found that large operators more often comply with the EUTR than smaller ones. Other studies found that it may be difficult for SME operators to carry additional costs as well as to collect the necessary information and find the time to gather it (Jonsson et al., 2015; Nermin & Francesco, 2022; Saguy & Sirotinskaya, 2014).

The majority of coffee and cacao production is managed by smallholders in the country of origin (Bakhtary et al., 2020; Carto, 2019). The product is produced by farmer cooperatives, sourced from intermediaries and third-party-owned mills or warehouses making it difficult to trace the product back to its original production plot (Bakhtary et al., 2020; Carto, 2019). As a result, to achieve EUDR DDS compliance, (smallholder) SCA involvement is required, yet a difficult undertaking within complex or untransparent supply chains (Bakhtary et al., 2020).

Overall, the challenges that come with creating supply chain transparency, gathering the required information, managing additional costs and time, and working with smallholders and other SCAs have to be overcome by operators to achieve EUDR DDS compliance. Solutions to these challenges are explored, based on the interviews with EUTR operators, consultants, and MOs.

METHODOLOGY

Research Design

The study aimed to explore operators' (planned) approaches to achieving EUTR and EUDR DDS compliance. A qualitative cross-sectional methodology, using data from semi-structured interviews, was taken to approach the topic. Several motives explain this methodological choice. First, the topic allowed for inductive reasoning¹¹. A qualitative approach consequently is an appropriate choice (Bryman, Bell, & Harley, 2019; Eisenhardt, 1989; Gioia & Pitre, 1990; Pratt, 2009). Second, a cross-sectional design is particularly well suited to compare findings within a specific context at a single point in time because it focuses on the sample of interviewees rather

¹¹ Inductive reasoning can be described as using data to make predictions, a qualitative approach it is often used (Bryman et al., 2019; Hayes, Heit, & Swendsen, 2010).

than their individual circumstances (Bryman et al., 2019). The focus of the study was on the interviewees' perspective on achieving regulatory compliance. Third, a cross-sectional approach is found to be more reliable than, for example, a single-case study approach and results in a more convincing outcome (Gustafsson, 2017; Zainal, 2007). Finally, in unexplored areas like EUTR and EUDR pathways to compliance, a qualitative method using semi-structured interviews enhances the process of obtaining new understandings (Dearnley, 2005).

Data Collection

As indicated, EUTR operators, consultants, and MOs fitted into the study's setting. These stakeholders are familiar with the requirements of the EUTR and will have to understand the EUDR as the regulation will replace the EUTR once it is adopted.

Data collection was undertaken in April 2022. Depending on the conditions of the interviewees, semi-structured interviews were conducted online via Teams or in person. The interviews were held in English or Dutch, recorded, and transcribed. The duration of the interviews was between 25 and 90 minutes. The consent form (see Appendix A) was sent beforehand and includes a summary of the questions and research topic. A trial interview was conducted (Mikuska, 2017), and consequently, the interview guide (see Appendix B) was revised. A set of planned prompts was designed (Leech, 2002) to probe the respondent in the direction of the research if this was not achieved by asking only the interview question. The interview guide comprised of questions on the EUTR DDS compliance process and the (planned) process for EUDR DDS compliance. The interview guide included open-ended questions that allowed interviewees to respond on their terms and without making suggestions (Bryman et al., 2019). Nine experts have been interviewed who were active either internationally or based in the Netherlands as an operator.

Table 1 provides a brief description of the interviewees. The interviews were obtained through snowball sampling¹².

Table 1
Description of interviewees.

| Interviewee | Description |
|--------------------|--|
| Operator 1 | Dutch importer of mainly roundwood and solid wood from all over the world. |
| Operator 2 | Dutch importer of mainly roundwood and solid wood from Brazil and Congo. |
| Operator 3 | Dutch importer of mainly roundwood and solid wood from South America and Gabon. |
| Consultant 1 | Has over 30 years of international experience in sustainable forest management, certification, and regulation. |
| Consultant 2 | Has over 40 years of international experience in sustainable forest management, certification, and regulation. |
| Expert MO 1 | Executes amongst others EUTR audits. Has over 15 years of international experience in sustainable forest management, certification, and regulation. |
| Expert MO 2 | Executes amongst others EUTR audits. Has over 20 years of international experience in sustainable forest management, certification, and regulation. |
| Expert MO 3 | Executes amongst others EUTR audits. Has over 15 years of international experience in sustainable forest management, certification, and regulation. |
| Expert MO 4 | Executes amongst others EUTR audits. Has over 20 years of international experience in forest certification and regulation. |

To gain field knowledge, two EUTR MO verification audits were observed at timber importing companies. Another verification audit was observed at a cacao multinational which was in the process of working to achieve deforestation-free supply chains. Accompanying verification audits provided a comprehensive view of operator and MO approaches to achieving DDS compliance. While observing and taking notes offered context-specific understanding, it provided

¹² Snowball sampling is a convenience sampling technique where a participant proposes another participant relevant to the research, to partake in the research (Bryman et al., 2019).

additional insight into information gathering, risk assessment, and risk mitigation approaches and methods used by the organization.

Data Analysis

As coding software applications, Atlas.ti 9 and Microsoft Excel 2108 were used. To interpret and derive implications from the data, three steps of coding were followed: open, axial, and selective coding (Glaser & Strauss, 1967). After transcribing and translating the interviews, the data was organized by open coding and categorically examined, compared, and conceptualized (Strauss & Corbin, 1990). Subsequently, the initially found codes were narrowed down to 65 by comparing and refining the codes into categories. Open coding was used to obtain a general idea of the study's overall direction (Glaser, 2016). The data was re-examined after initial coding, and the analysis proceeded with axial coding to uncover links and build connections between the distinct categories (Strauss & Corbin, 1990). The categories were divided into 18 second-order themes. The last phase consisted of selectively coding and connecting categories with each other. During this phase, it became clear that although operators appear to approach EUTR DDS and future EUDR DDS compliance in a certain way, there does not seem to be a precise method that needs to be included. Instead, a range of methods is employed. However, certain approaches need to be followed to achieve compliance. Following this realization, the categories and themes were arranged as per methods used to achieve compliance (second-order themes) and approaches taken to achieve compliance (first-order categories) (see Appendix C). Eventually, aggregate dimensions were created (see Appendix C). Relevant interviewee quotes were translated into English (if originally Dutch) and presented in the Findings section and Appendix D.

Research Quality and Ethics

Each voluntary interviewee agreed to participate in the study. They were asked to sign a consent form and give permission for recording. The Dutch code of conduct for scientific integrity was respected (KNAW, NFU, TO2-federatie, Vereniging Hogescholen, & VSNU, 2018). After transcription, respondent validation technique was employed by sending interviewees a key outline of their responses for verification purposes.

To gain a thorough understanding of the topic, two triangulation¹³ forms were used to improve on the study's reliability. The taken notes during observation were used for method triangulation, so multiple methods were utilized. (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). Data source triangulation was employed to obtain perspectives from a broader variety of interviewees (Carter et al., 2014) by performing a cross-sectional study rather than a single case study. Moreover, all data, including recordings, notes, transcripts, and coding categories and themes were saved for traceability purposes (Bryman et al., 2019). Besides that, bias is avoided throughout the research process through respondent validation and peer-reviewing.

FINDINGS

Although all timber operators must comply with the same EU regulation, it was found that no uniform method is used. Depending on the supplier, the country of harvest, or the type of product different methods are employed to develop the DDS. It was however found that operators take a set of specific approaches to achieve compliance.

¹³ Triangulation is employed to improve the reliability of the study by using more than one method to cross-check findings (Bryman et al., 2019).

The following section describes the DDS order in which compliance is achieved according to interviewees. The succeeding three sections present methods and approaches that arose from the data as to how operators develop their EUTR DDS and future EUDR DDS. The last section presents how interviewees would address the identified challenges.

DDS Order to Compliance

The EU Commission presents the DDS in the following order: information gathering, risk assessment, and risk mitigation (EU Commission, 2010; European Commission, 2021a). It was found that operators begin to develop their DDS in that manner as well. For example, Consultant 1 commented on how operators achieve EUTR DDS compliance:

The first thing they do, of course, is the entire stream of documents, to get them down on paper. Then there is a global analysis of, is there a high or is it a low risk? That determines a bit, which way I should go.

When was asked how operators would start approaching the EUDR to achieve compliance, interviewees seem to want to take a similar approach. Operator 2 elaborated: “*Kind of like EUTR, I guess.*” Figure 2 illustrates the interviewees’ order to achieve compliance.

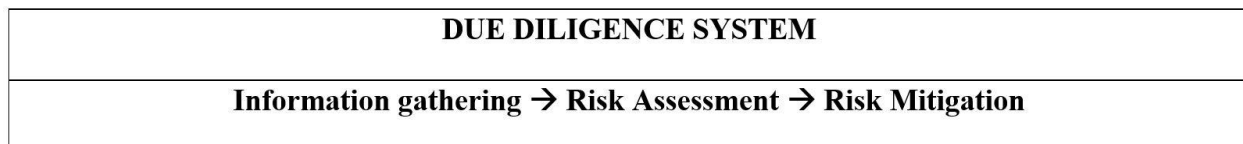


Figure 2. DDS order to achieve compliance.

Information Gathering

Two information-gathering approaches were found to be used based on the EUTR requirements. These are asking for information through an SCA and searching for information from

an independent third-party. Table 2 details the two approaches and various methods used for information gathering based on the data obtained.

Table 2
Methods and approaches for information gathering.

| INFORMATION GATHERING | | |
|------------------------------|--|---|
| | Approach | Methods |
| EUTR | <i>(1) Contact supply chain actors</i> | Contact supplier, contact supply chain actor other than supplier |
| | <i>(2) Search for independent third party data</i> | Use online country risk profiles, contact consultant or local agent or MO, use other sources |
| EUDR | <i>Same approach as EUTR</i> | - |
| | <i>Additional methods</i> | Work with a traceability system, work with regular suppliers, buy certified, use satellite images, visit origin |

For the first approach, interviewees mentioned using two methods to obtain information. The method that was mentioned the most was asking the direct supplier. Operator 3 explained: “*I go to the supplier and ask for the documents of the concession where he harvests.*” Furthermore, contacting SCAs other than the operator’s direct supplier was indicated as a method used. Although, not always recommended because of the drawbacks, like suppliers refusing the importer to directly communicate with their supplier.

Under the second approach, searching for independent third-party data, three methods were recognized. Often-mentioned is using specific online country risk profiles and tools such as Preferred by Nature Risk Assessments or FSC National Risk Assessments. Consultant 1 mentioned:

[...] from a very large number of countries there are country profiles in it [website with online timber country risk profile] and you can find out what the current legislation and regulations are. What are the underlying documents? What have other parties said about this? So you can get a lot out of that.

Another method that falls under the second approach is asking a consultant, MO, or local contact person for help. Operator 2 described: *“We have one contact person in Brazil who is a kind of an umbrella contact person for several people. To him, I ask my questions...”* Expert MO 1 introduced a third method, namely the use of other sources like scientific research, local government websites, NGO reports, and other data information tools (e.g. local chamber of commerce or Consumer Price Index)

Concerning the EUDR, interviewees suggested that information can be acquired using the same two approaches as for the EUTR. In addition, to obtain information about geolocation coordinates and the time range of production, interviewees highlighted using a traceability system as a method. Some interviewees explained that QR codes or barcodes can be assigned to a tree or harvested product batch from the same plot of land in a specific time frame. Moreover, interviewees elaborated that a traceability system involves the movement of data through the supply chain, either through online availability or a paper-based trail from supplier to supplier. Expert MO 3 noted:

You actually have that data per production, with blockchain it is super easy, but otherwise, you actually have a kind of certificate with the first production and that travels through the chain. That can just be a digital certificate [...] that data just goes with every delivery.

Having regular suppliers is another method. Expert MO 1 stressed the importance of working with regular and reliable suppliers to obtain the required data together with each shipment.

Buying certified products is also emphasized as an effective method to obtain the geolocation and time frame data. Expert MO 4, suggested buying certified products, especially in complex supply chains.

Certification has specifically been considered as a method for demonstrating no prevalence of deforestation and forest degradation. Expert MO 3 recognized Rainforest Alliance certification and Operator 2 saw FSC certification as a means to demonstrate compliance with this requirement. Most interviewees suggested satellite images to determine whether a product is deforestation-free. If geolocation data is available, maps can be compared with the product harvest date and the cut-off date. Expert MO 2 considered: “[...] *The Global Forest Watch* [...]. They have a map of the world forest and a time series of that. It's quite easy to obtain information about your products and to evaluate the level of deforestation that has happened.”

A third method for demonstrating no deforestation and forest degradation is visiting the product origin location, this method was illustrated by two interviewees.

Risk Assessment

Based on the EUTR requirements, one overall approach was found to apply to assess risk: verifying (additional) information as well as interpreting and understanding the risk of that information. Expert MO 1 explained:

This risk analysis coincides with the first step of collecting information because the moment you know what the local situations are, what kind of information you need already contributes to the assessment of risks [...]. Then you have to again interpret and understand, read, compare... Yes, and then you come to a conclusion.

During the EUTR verification audits it was observed that operators were expected to gather sufficient information and then follow the determined risk assessment approach. Table 3 displays the methods and approach for performing the risk assessment.

Table 3
Methods and approaches for performing a risk assessment.

| RISK ASSESSMENT | | |
|------------------------|---|--|
| | Approach | Methods |
| EUTR | <i>(1) Verify (additional) information as well as interpret and understand the risk of that information</i> | Verify supply chain specific data, use online tools, verify product sub-region, verify certification requirements, bring in local authority or consultant, perform stakeholder analysis, check Supplier/origin, perform supply chain mapping |
| EUDR | <i>Same approach as EUTR</i> | - |
| | <i>Additional methods</i> | Verify satellite images, obtain information on type of segregation method used in supply chain |

The interviews revealed eight methods for performing the EUTR risk assessment. First, most interviewees indicated that verifying supply chain-specific data is an essential part of the risk assessment. Expert MO 4 described that operators should verify the requested documents on the legality of the (sub)suppliers and harvested products. The certification code on the delivery documentation and audit reports of the concessions is one of the first things operator 2 checks. Operator 3 named various methods and said: “ [...] it should make sense what you're looking at.” During the EUTR verification audits it was observed that verifying supply chain specific documentation on quantity imported, (sub)supplier details, documentation of product origin, certification details, traceability of the product, and product mixing is an important aspect of the risk assessment.

Second, online tools may be used to assess risk (e.g. Uppsala Conflict Data Program to determine the number of violent conflicts in an area). Such tools, according to interviewees, can be used to evaluate the validity of documents provided by SCAs, and to detect the prevalence of armed conflicts in the production area. Third, not only the country of origin but the sub-region in which a product is produced can be studied to verify if armed conflict plays a role. Expert MO 1 stated: *“If you buy something in the eastern part of the country and the conflict is in the western part of the country, it doesn't have to touch each other immediately.”*

Fourth, verifying certification requirements on legality, compliance with local legislation, no deforestation, and no forest degradation are predominantly discussed when determining the risk of purchasing a certified product. Operator 2 elaborated: *“It makes a difference that we only buy FSC [responsible forest certification]. So then you already know, it's [the legality aspects and assurance of compliance with local legislation] all right there.”* Expert MO 2 noted: *“That's [no forest degradation] difficult to evaluate, from the air, from satellite imagery, and there you would actually have to, again, rely on certified material. which would be, I would say, meet the requirements of ensuring no degradation.”*

Fifth, for verification purposes, additional information can be gathered by contacting consultants or local authorities to verify document validity. Consultant 2 commented: *“So you already have to use a, for example, a local consultant who can establish the real truth.”*

Sixth, performing a stakeholder analysis. This method has been used by one of the interviewees to assess the risk of importing from a new high-risk country.

Seventh, various interviewees specified monitoring suppliers or original production locations to examine compliance. Verification through field visits is especially suggested for

assessing deforestation and forest degradation but also to assess assurance with applicable legislation.

The last EUTR risk assessment method discussed by interviewees is supply chain mapping, to assess the chain's complexity.

For the EUDR, interviewees suggested that a risk assessment can be performed using the EUTR approach. Additionally, using satellite images is highlighted as a method to determine the presence of forests and the prevalence of deforestation. For example, expert MO 4 described comparing satellite images and historical satellite images as a logical option for assessing the risk of deforestation. Another additional EUDR method that came forward was to obtain information on the segregation method used in the supply chain to assess the risk of product mixing from unknown origins. Expert MO 1 elaborated:

[...] I think you should start with a kind of classification for certain products, certain supply chains that already have a high risk by nature. Products produced in bulk, where there is no physical separation, those are at the top of the list [high risk].

Risk Mitigation

Based on the EUTR requirements, interviewees suggested using five risk mitigation approaches. Table 4 reveals the approaches and various methods for mitigating risk.

Table 4
Methods and approaches for mitigating risk.

| RISK MITIGATION | | |
|------------------------|--|---|
| | Approach | Methods |
| EUTR | <i>(1) Collaborate with stakeholders</i> | Make agreements with supplier, create partnerships |
| | <i>(2) Change buying behavior</i> | Buy certified, stop/not buying, buy from Europe |
| | <i>(3) Involve third-party</i> | Consultant, MO, NGO, Other expert |
| | <i>(4) Active engagement</i> | Verify at origin, cross-verification, simplify risk assessment, train supply chain actors |
| | <i>(5) Gather more information</i> | More documentation, isotope and DNA testing |
| EUDR | <i>Same approaches as EUTR</i> | - |
| | <i>Additional methods</i> | Request product segregation |

The first approach is collaborating with stakeholders. Two methods were found to fall under this approach: making agreements with suppliers and creating partnerships with operators. Operator 2 revealed to collaborate with other operators on product shipment to reduce costs and the risk of illegal timber entering Europe.

The second approach is changing buying behavior. The approach was found to include three methods. The most commonly discussed method is buying certified material. This method is described to mitigate the risk of illegal harvesting, non-compliance with applicable legislation, and supply chain complexity. Nevertheless, interviewees pointed out that certification alone is not automatically enough to mitigate all risks. Operator 2 said:

We've set it down to the point that we just buy FSC [responsible forest certification], well that does not say everything these days either. [...] But anyway... [...] You are already doing a great deal there.

Expert MO 2 commented: “[...] and another one is certification, of course, not a hundred percent perfect, but quite much better than nothing.” Another method that falls under the second approach is mentioned by expert MO 4: “And yes, a very good mitigating measure is to stop purchasing. You should always keep it open.” Expert MO 3 explained that buying a European product or a product that has already been placed on the European market is also an option.

The third approach is involving a third-party. Interviewees suggested that a third-party like a consultant, MO, NGO, or another expert may be able to assist with further risk mitigation strategies based on their experience.

The fourth approach is the active engagement of operators. Four methods were found to fall under this approach. Verification at origin is an often mentioned method. Either by the operator verifying on-site or by sending a third-party to do so. Expert MO 1 described the importance of cross-verification as a risk mitigation method:

If you ask, ‘can I have more documentation’, chances are you will. But that does not mean that the risk has suddenly become smaller. The moment you visit there and verify those additional documents with your own observations or independent third-party review, then you can say so, or with a little more certainty...

Specifically for complex supply chains, the mitigation method “*making supply chains less complex*” and “*reducing the number of suppliers*” are suggested to simplify the risk assessment. According to Expert MO 2, another method is to train SCAs to meet EUTR requirements.

The fifth approach is to gather more information. Expert MO 3 commented: “*An additional measure is to collect additional documents. [...] for example, having verification of documents carried out, or having a translation of documents carried out, by a third-party.*” In addition to

gathering more documentation, interviewees suggested isotope or DNA testing to determine if a product originates from the location stated in the documentation. Expert MO 2 outlined: *“Documents are easy to manipulate and often are being manipulated. So another method that has been used, has been something like isotope testing.”*

EUDR-specific risk mitigation, according to interviewees, can be achieved using the same approaches as mentioned for the EUTR. Furthermore, to mitigate the risk of product mixing with unknown origins, product segregation is brought forward as a method to be used. Expert MO 1 noted: *“[...] if you agree with your suppliers you just have to keep it separate, that's great, and when you have evidence for it, then you're good.”*

Challenges

All interviewees agree that the challenges identified in the Theory section are pressing matters. Table 5 demonstrates the EUDR challenges and the interviewees’ presented solutions to overcoming these.

Table 5
EUDR challenges and solutions to overcome these.

| EUDR CHALLENGES | |
|---|--|
| Challenges | Solutions |
| <i>Creating transparency</i> | Work with traceability system, collaborate with supplier, shorten supply chains, buy certified |
| <i>Time and cost management</i> | Assign responsible person, use consultant, request standard data with each shipment, take samples for risk assessment, work in partnerships with operators, use regular suppliers and fixed supply chains, buy certified, buy low-risk product |
| <i>Working with smallholders</i> | Buy certified, buy from other supplier |
| <i>Gathering sufficient information</i> | See Information Gathering and Risk Assessment |

For the first challenge, creating transparency in the supply chain, interviewees mentioned working with a traceability system, collaborating with suppliers, shortening supply chains, and buying certified material as solutions to overcome this challenge. These solutions were also found as information gathering or risk mitigation methods, and further elaborated under the previous sub-sections.

For the second challenge, time and cost management, interviewees described the following solutions using a consultant, requesting standard data with each shipment, taking samples for risk assessment, working in partnerships with operators, using regular suppliers and fixed supply chains, and buying a low-risk product. Another solution is to buy certified. For example, Expert MO 2 said: “[...] *the most efficient way for these companies to actually meet these [EUDR] requirements is to buy certified material.*” Furthermore, assigning a responsible person is mentioned. Expert MO 4 explained that efficient companies have people that are responsible for managing EUTR compliance.

For the third challenge, working with smallholders, two solutions were defined: buying certified and buying from other suppliers. Specifically when the supply chain is complex and includes smallholders, buying certified material is depicted as a solution. Consultant 1 elaborated on the challenge of buying from small exporting timber farmers: “*With certification it is easy, then you just have group certificates where that is better arranged, with the producers. But if you buy from uncertified companies, it's just extremely difficult.*”

For the fourth challenge, gathering sufficient information interviewees revealed solutions presented in the Information Gathering and Risk Assessment sub-section. The approaches and methods in these sections provide ways to overcome the challenge of gathering sufficient

information, such as contacting suppliers or consultants, using online tools, and verifying certification requirements.

DISCUSSION

The lack of research on the EUTR and EUDR road to DDS compliance creates difficulties for operators to meet the requirements. Creating insight into feasible approaches and methods to achieve DDS compliance is critical when operators are expected to demonstrate compliance. This section presents the developed framework and discusses the outcome. It continues by presenting implications, limitations, and future research topics.

Approaches and Methods to Achieving Compliance

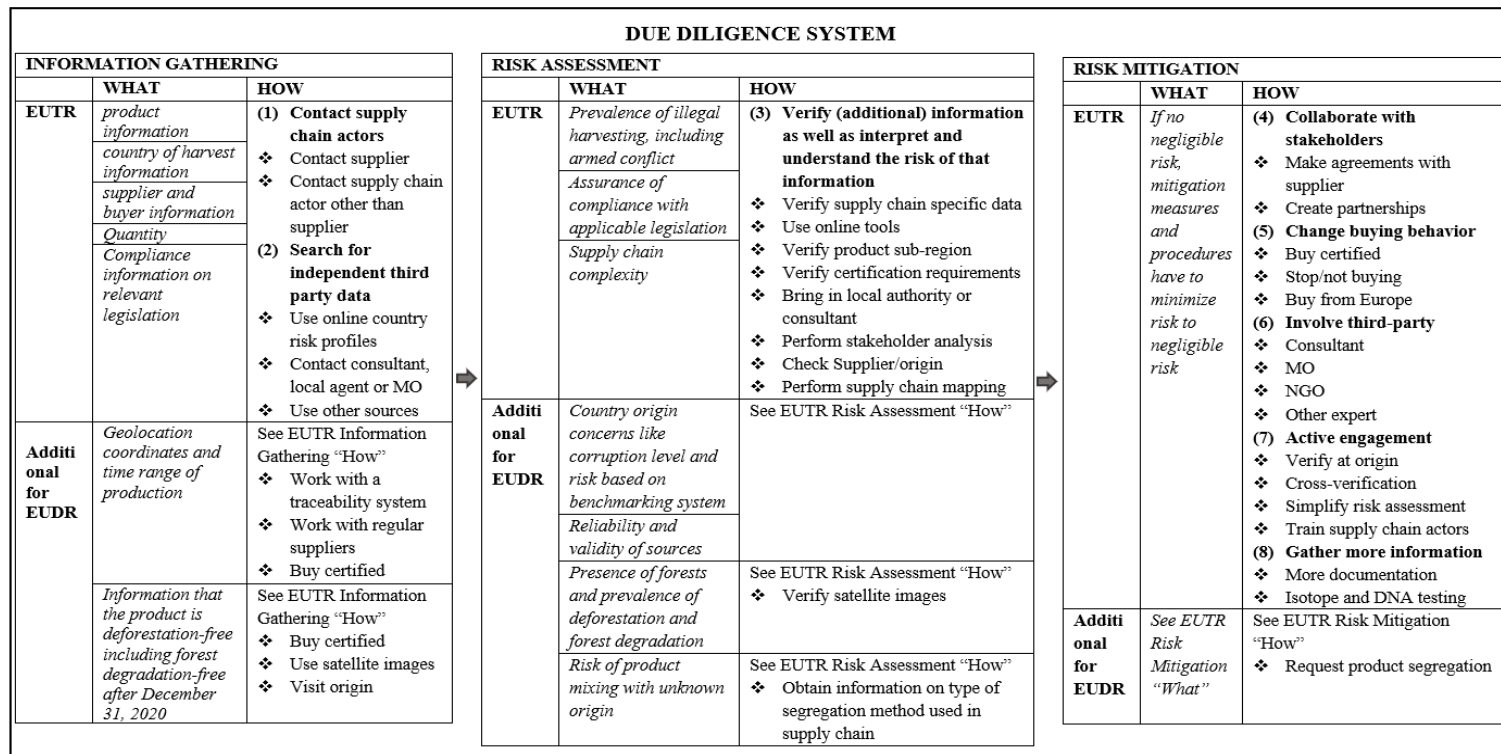
This study found that operators take several approaches and use different methods to achieve DDS compliance. Operators will intend to achieve EUDR DDS compliance in a similar way they approached EUTR DDS. However, strategize on adopting supplementary methods to meet the EUDR's additional requirements.

In total eight approaches have been identified, including 37 methods to achieve EUDR DDS compliance. Figure 3 presents how compliance can be achieved by demonstrating the required approaches and potential methods to be adopted. "What" in figure 3 determines the EUTR DDS and additional EUDR DDS requirements. "How" defines the approaches and methods. The 37 methods are grouped under the eight defined approaches. "What" and "How" are identified per DDS step (information gathering, risk assessment, risk mitigation). The arrows that point from information gathering to risk assessment to risk mitigation determine the steps in which the DDS

is developed. While this progression is not mandated to achieve compliance, interviewees do prefer this tactic.

Figure 3 also outlines 15 solutions to overcome the defined challenges that future EUDR operators may encounter. The arrow that points from the DDS requirements to the challenges denotes the challenges that may arise throughout the process of achieving compliance. “What” refers to the challenges and “How” indicates the way these challenges may be overcome.

The EUTR requirements for the DDS information gathering step are met by using the approaches of contacting SCAs and searching for independent third-party data. Different methods may be employed to obtain the information. Similar approaches are proposed to achieve EUDR DDS compliance. Additional methods may be used, such as the use of satellite images to determine whether the product is deforestation-free. The EUTR requirements for the DDS risk assessment step are met by verifying (additional) information, as well as interpreting and understanding the risk of that information. Several methods, such as checking supply chain-specific data, can be used. The same approach is proposed for the EUDR, using the same and additional methods. Depending on the risk identified, EUTR operators may utilize a variety of approaches and methods to mitigate risk. Compliance with the EUDR will be approached similarly, using the same and additional methods.



| CHALLENGES | |
|---|--|
| WHAT | HOW |
| <i>Creating transparency</i> | <ul style="list-style-type: none"> • Work with traceability system • Collaborate with supplier • Shorten supply chains • Buy certified |
| <i>Time and cost management</i> | <ul style="list-style-type: none"> • Assign responsible person • Use consultant • Request standard data with each shipment • Take samples for risk assessment • Work in partnerships with operators • Use regular suppliers and fixed supply chains • Buy certified • Buy low-risk product |
| <i>Working with smallholders</i> | <ul style="list-style-type: none"> • Buy certified • Buy from other supplier |
| <i>Gathering sufficient information</i> | <ul style="list-style-type: none"> • See Information Gathering and Risk Assessment "How" |

Figure 3. Framework to achieve EUDR DDS compliance based on EUTR expert experience.

Theoretical and Practical Implications

The study attempts to fill several gaps and in doing so makes important implications. Two main theoretical implications are made in the field of EUDR and DDS compliance. The first implication is in extending the limited research on the understanding of the EUDR, EUDR DDS compliance, and solutions to challenges. Whereas domains for achieving EUDR DDS compliance have been presented before in literature (Lallas et al., 2021), practical approaches to achieving DDS compliance have not. This cross-sectional study is one of the first to do so for the EUDR and to consider the recently proposed EUDR.

The second implication is in uncovering the integral role that certification plays in achieving compliance. Certification plays a crucial role in tackling deforestation (Wood et al., 2021). This study found that certification may become a critical aspect for operators to demonstrate compliance with the EUDR or other no-deforestation regulations. Many interviewees described certification to play a role in gathering the required information and assessing risk by verifying the certification requirements of the standard for which the product to be imported is certified against. Moreover, certification is a useful method for mitigating risk and overcoming challenges.

This study serves to guide operators attempting to comply with the EUDR. Four practical implications can be made. The first implication is in demonstrating how EUDR DDS compliance can be approached effectively. Through the developed framework and addressed solutions to challenges, the study elucidates how operators may approach regulatory compliance.

The second implication is in explaining how SME EUDR operators can successfully approach DDS requirements. Large operators are more likely to comply with the EUDR than smaller ones (Köthke, 2020). The study clarifies how (SME) operators might approach EUDR

regulatory compliance by addressing challenges in time and cost management, as well as gathering sufficient information.

The third implication is in underlining the importance of effective communication with SCAs and access to third-party data or stakeholders. The findings of this study indicate that communication with the supplier and possibly other stakeholders is critical not just for gathering information, but similarly for assessing and managing risk. As is access to third-parties and third-party data like MO's, consultants, and online tools. In addition, the study emphasizes the importance of operators collaborating with stakeholders to mitigate risk.

The fourth implication is in stressing the key role certification plays in the development of a EUDR DDS. The study indicates that certification can play a role in all steps of the DDS, as outlined in the second theoretical contribution. Therefore, buying certified may lead to achieving compliance effectively.

Limitations and Future Research

This study is subject to several limitations. First, the interviewee sample was limited. Due to the study's time constraints, a small sample of experts was interviewed and data saturation could not be attained. Similarly, despite including three types of experts to obtain more complete data, the use of snowball sampling increased the likelihood of sample selection bias (Cohen & Arieli, 2011) and hence reduced external validity (Bryman et al., 2019). Although this was an exploratory study a larger sample size could have led to the identification of other approaches and methods for achieving DDS compliance.

Second, data were coded by a single researcher, which can be seen as a methodological limitation. Personal thoughts which may have formed during or after the interview process, both

from the interviewer's and interviewee's perspective, may have had an impact on the findings and conclusions (Polonsky, 1998). Furthermore, previous to the interviews, the researcher was acquainted with several interviewees. The content of the data obtained may have been influenced by the interviewees' prior knowledge and perceptions of the researcher (Dixon-Woods et al., 2007).

Third, the data collected was through cross-sectional analysis and did not encompass numerous time points. Since the EUDR is a new concept, reactions to it and awareness of it may evolve. A replication of this study will be useful to determine the validity of the findings and perhaps additional conclusions.

Research on the EUDR and DDS compliance is still in its infancy. This leads to the following suggested areas for future research. More in-depth research could lead to additional insights into specific approaches and methods. Questions like, "Why is this particular approach/method employed?" "Is verification at the origin a viable risk mitigation method?" or "What certification standards can be used to demonstrate compliance?" could be asked. On a related note, research could look into certification schemes that cover EUDR DDS requirements, or it could focus on a EUDR-specific requirement. Furthermore, the definition of EUDR compliance could be explored. For example, when is compliance achieved? In addition, studies could investigate how other SCAs, like farmers, can provide the information that operators need to demonstrate compliance. Future research could also further delve into the challenges and solutions to achieve compliance. Besides that, the validity of the presented framework could be tested through quantitative research.

Conclusion

The presented framework which integrates EUTR DDS requirements with the additional EUDR DDS requirements and provides approaches and methods for achieving compliance is a first step in modeling the process for operators to achieve DDS compliance. It includes approaches to be taken by operators such as contacting SCAs, verifying and interpreting information, and changing buying behavior to achieve compliance. It also allows for considering methods operators may use like using online tools, verifying certification requirements, and performing verification at the original product location. The framework can be used by any operator required to comply with the EUDR, including coffee, cacao, soy, beef, and palm oil importers. Stakeholders, like operators, may find it difficult to demonstrate compliance with new regulations (Lidskog et al., 2013). Hence, operators may benefit from the proposed framework in this study. It is intended that the insights encourage operators to actively strive to achieve EUDR compliance even before the regulation is enacted and that researchers will continue to study the EUDR and its process to achieve effective implementation.

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APPENDIX A: Participant Consent Form

Project: Dissertation on regulatory compliance process of EUTR and EUDR

Researcher: Sanne van Rijn

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Organizations involved:

- Royal Peterson Control Union Group B.V.
- Rijksuniversiteit Groningen

This informed Consent Form has two parts:

- Information sheet
- Consent to take part in research

Information sheet

Introduction

I am Sanne van Rijn, a student from the University of Groningen and working for Royal Peterson Control Union Group BV. For my MSc studies, I am currently conducting research on the operator's process towards compliance with the European Union Timber Regulation (EUTR) and the European Union Deforestation-free products Regulation (EUDR). As you will know, the EUTR is a regulation that European operators have to comply with before they may place timber products on the EU market. The EUDR is a recently proposed regulation that is in some aspects similar to the EUTR, and which will replace the EUTR, but instead of only including legality aspects it also covers zero-deforestation.

Purpose of the research

The implementation of the proposed EUDR will directly affect companies that import commodities within the scope of the regulation (beef, palm oil, soy, timber, cocoa, and coffee). I want to identify if lessons learned from the implementation of the EUTR can help in the way operators can implement the EUDR requirements. I want to learn how timber importers achieved EUTR compliance and if lessons can be obtained from this process in preparing for EUDR compliance. Therefore I kindly ask you for an interview to explain used approaches and lessons learned as preparation for EUTR compliance, and which approaches will be planned to prepare for EUDR compliance. I expect to learn about how you plan or believe operators will plan their approach towards EUDR compliance, and how the challenges will be addressed that have to be overcome like overcoming lack of transparency and complexity in the supply chain. Obtaining this knowledge may help operators and other stakeholders towards compliance and so lead to more legality and zero-deforestation in supply chains.

Participant selection

You are being invited to take part in this research because I feel that your experience as a EUTR expert (timber importer, EUTR consultant, EUTR monitoring organization, general expert) can contribute much to my understanding and knowledge of the process of compliance.

Consent to take part in research

- Please check all boxes -

- I voluntarily agree to participate in this research study.
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind.
- I understand that I can withdraw permission to use data from my interview within 2 weeks after the interview, in which case the material will be deleted.
- I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study.
- I understand that participation involves sharing information about my business.
- I understand that I will not benefit directly from participating in this research.
- I agree with my interview being audio-recorded.
- I understand that all information I provide for this study will be treated confidentially.
- I understand that in any report on the results of this research my identity will remain anonymous. This will be done by changing my name and disguising any details of my interview which may reveal my identity or the identity of the people I speak about.
- I understand that disguised extracts from my interview may be quoted in... [*dissertation, conference presentation, papers, training, etc.*).
- I understand that if I inform the researcher that I or someone else is at risk of harm they may have to report this to the relevant authorities - they will discuss this with me first but may be required to report with or without my permission.
- I understand that signed consent forms and original audio recordings will be stored and accessible for Sanne van Rijn, for 2 years.
- I understand that a transcript of my interview in which all identifying information has been removed will be retained for 2 years and available for revision to the examination board of the University of Groningen.
- I understand that under freedom of information localization I am entitled to access the information I have provided at any time while it is in storage as specified above.
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Signature of participant

Date:

I believe the participant is giving informed consent to participate in this study

Signature of researcher

Date:

APPENDIX B: Interview Guide

1. Can you tell me a bit about yourself, your role in the company, and your experience with the EUTR?

Part 1

2. Could you walk me through the process of how you work towards EUTR compliance?
 - a. In Specific, could you walk me through the process of gathering information on the country of harvest and compliance of timber products with applicable legislation? Could you also walk me through the way you approach or would approach these risk assessment criteria? When or if the risk is identified, what did/would you do in response? Or how would you respond to a specified risk outcome?
3. Could you describe to me how you overcame the cost and time constraints you had?
 - a. Could you describe to me how you see operators overcoming costs and time constraints?
4. Could you describe to me your approach to overcoming the lack of transparency or over-complexity in the supply chain?
 - a. Could you describe to me how you see operators approach overcoming the lack of transparency or over-complexity in the supply chain?
5. Could you describe to me some issues you dealt with and your approach towards overcoming smallholder involvement issues?
6. Could you describe to me some issues you see operators dealing with and your approach towards overcoming smallholder involvement issues?

Part 2

7. Could you describe to me how you have heard about the EUDR?
8. How would you approach EUDR compliance?
 - a. Could you walk me through the possible approach you plan to take to obtain information on geolocation coordinates of timber and how you would show that the timber is deforestation-free? Could you describe your possible approach to assessing the risk of product mixing?

APPENDIX C: Data Structure

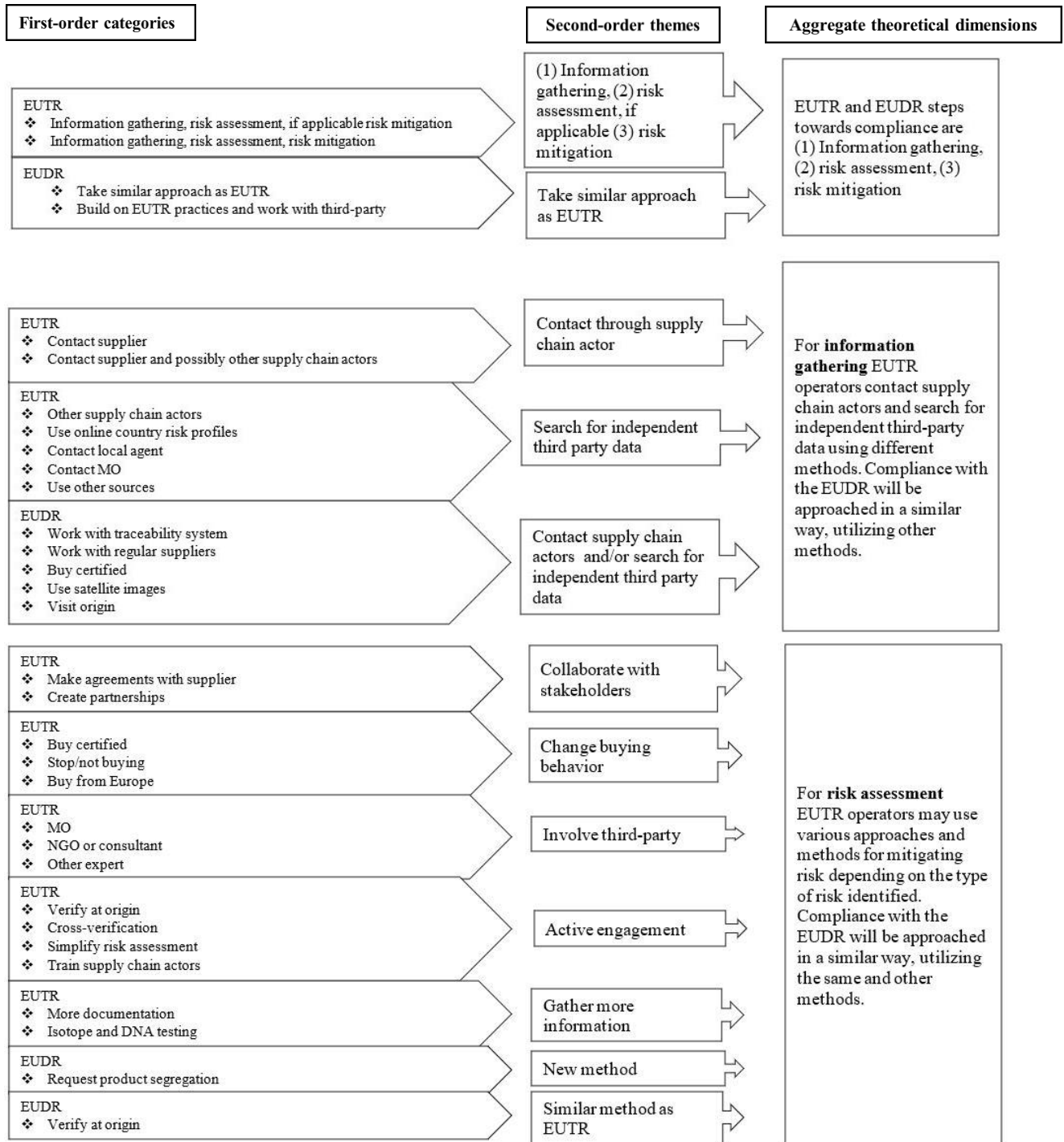


Figure C1. First-order categories, second-order themes and aggregate dimensions.

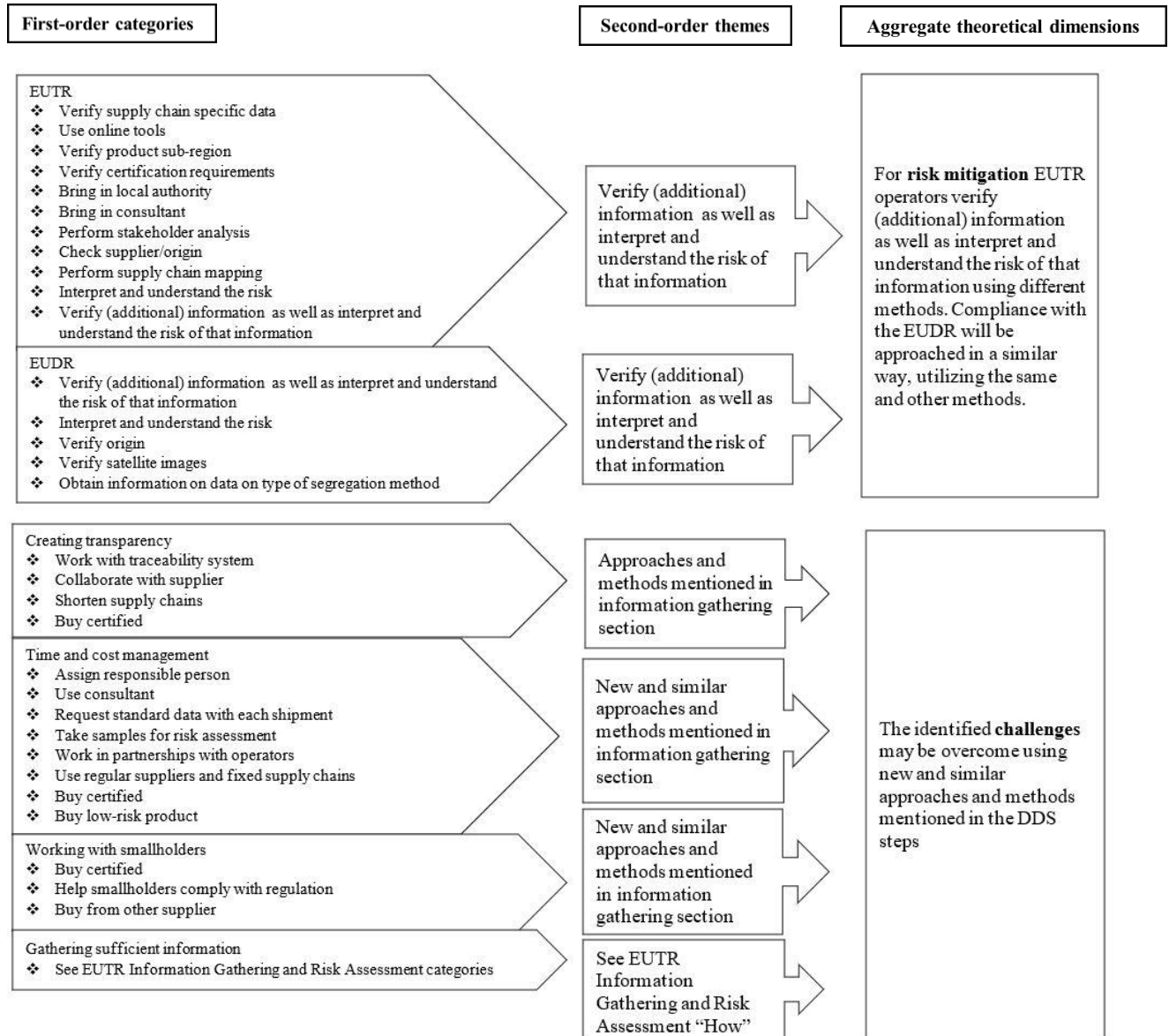


Figure C1. Continued.

APPENDIX D: Representative Data

Table D1

Example quotes, first-order categories, second-order themes, and overarching dimensions.

- This Appendix has not been attached for confidentiality reasons.
If you are interested in this Appendix, please email the author of the paper.