EUROPEAN FOREST INSTITUTE
NORTH EUROPEAN REGIONAL OFFICE – EFINORD

Market based and regulatory/enforcement mechanisms- assessment of impacts on timber trade between South-east Asia and Europe

Photo: Hari Priyadi Rusantoyo;View of Dipterocarps forest in Malinau, Indonesia Borneo

Alexandru Giurca

Supervisors: Hari Priyadi R (Swedish University of Agricultural Sciences - SLU)
Ragnar Jonsson (European Commission - JRC)
Mika Mustonen (European Forest Institute - EFINORD)

Swedish University of Agricultural Sciences

Master Thesis no. 214

Southern Swedish Forest Research Centre

Alnarp 2013

MSc European Forestry
ERASMUS MUNDUS

Market based and regulatory/enforcement mechanisms- assessment of impacts on timber trade between South-east Asia and Europe

Photo: Hari Priyadi Rusantoyo;View of Dipterocarps forest in Malinau, Indonesia Borneo

Alexandru Giurca

Supervisors: Hari Priyadi R (Swedish University of Agricultural Sciences - SLU)
Ragnar Jonsson (European Commission - JRC)
Mika Mustonen (European Forest Institute - EFINORD)

Examiner: Ola Sallnäs

Swedish University of Agricultural Sciences
Master Thesis no. 214
Southern Swedish Forest Research Centre
Alnarp 2013

MSc Thesis in Forest Management – Euroforester Master Program,
30 ECTS, Advanced level (A2E), SLU course code EX0630

Abstract

Raised public concern in the European Union (EU) about the legality of its timber imports, the need to combat illegal logging and deforestation, and for promoting sustainable forest management practices, have pushed the EU commission to raise its standards and legality demands for wood imports. Combining literature review, structured interviews of importers and end-users of hardwood timber, and trade data analysis this study assesses the combined potential influence from the policy mechanisms FLEGT, the EU Timber regulation (EUTR), and different third party verification schemes on the timber trade between tropical countries and Europe. As this combined impact is more readily traced at national level, this study focuses on the implications of the abovementioned policy instruments on the trade in tropical timber between Indonesia and the UK, being important suppliers and consumers of tropical timber respectively. The results indicate that FLEGT and EUTR could reinvigorate the, until now, rather ineffective (in the narrow sense of stopping illegal timber trade) third party verification schemes. The literature as well as answers from interviews and questionnaires indicates that FLEGT and the EUTR could reinforce the current trend of decreasing imports of tropical timber to EU. The substitution of oak lumber for tropical hardwood lumber mentioned in the literature as well as in interviews and questionnaires is confirmed by the results of econometric analysis. The interviews also indicate a diversion of exports of tropical timber to destinations with less stringent regulatory framework than the EU.

Contents

List of figures

List of tables

List of acronyms

CITES- Convention on International Trade in Endangered Species of Wild Fauna and Flora

DDS- Due Diligence Systems

EU -European Union

EUTR- European Union Timber Regulation

FAO-Food and Agriculture Organization of the United Nations

FLEGT- Forest Law Enforcement, Governance and Trade

FSC- Forest Stewardship Council

GTFN- Global Forests and Trade Network

ITTO- International Tropical Timber Organization

ITTO-TTM- International Tropical Timber Organization's Tropical Timber Market Report

IUCN- International Union for Conservation of Nature

LEI- Indonesia Ecolabel Body(*Lembaga Ekolabel Indonesia*)

LPI - Independent Assessors Body (*LembagaPenilaiIndependen*)

MO- Monitoring Organization

NGO- Non Governmental Organization

PEFC- Programme for the Endorsement of Forest Certification

SVLK - TimberLegalityVerification Information System(*SistemVerifikasidanLegalitasKayu*)

TTF- Timber Trade Federation

UK- United Kingdom

UN- United Nations

UN COMTRADE- United Nations Commodity Trade Statistics Database

VPA- Voluntary Partnership Agreement

WWF- World Wide Fund

1. Introduction

1.1 Reasoning and objectives

Illegal logging and trade of illegal timber is a major problem for environmental, economic and social reasons raising serious concerns about over-exploitation and poor forest management. Extra wood, coming from illegal sources, that ends up on global markets can depress prices, undermine the competitiveness of legitimate forest industry and discourage sustainable forest management (Li *et al.*, 2008; Moiseyev *et al.*, 2010). Imports of illegal wood to the EU represent 10% of total production from countries where illegal logging rates are high (Moiseyev *et al.*, 2010).

Raised public concern in Europe about the legality of its timber imports, the need to combat illegal logging and deforestation, and for promoting sustainable forest management practices, have pushed the EU commission to raise its standards and legality demands for wood imports coming from its partners in the tropics. (Eba'aAtyi *et al.*, 2013; Heeswijk and Turnhout, 2012). Europe comprises some major tropical hardwood importers, notably the United Kingdom (UK) (ITTO, 2011a). Like all major EU importing countries, the UK reports reduced tropical sawnwood imports (ITTO-TTM, 2013a). Newly imposed trade related initiatives and policies by the EU, international and national certification schemes, and international conventions should reinforce this trend (UNECE/FAO, 2011; ITTO-TTM, 2013a).

Hence, trade related initiatives such as the Forest Law Enforcement Governance and Trade (FLEGT), binding legislations as the EU Timber Regulation (EUTR), third party verification schemes (the Forest Stewardship Council) , and international conventions on trade (Convention on International Trade in Endangered Species of Wild Fauna and Flora) may have unintentional implications for timber trade flows. These policy efforts, if successful, could result in a significant reduction in the supply of natural forest timber within participating countries (Putz *et al*., 2008; Jonsson *et al.*, 2012), which could in turn result in price increases. This price increase might induce a supply response outside project boundaries (Murray, 2008; Jonsson *et al.*, 2012), provided timber markets in tropical and non-tropical regions are co-integrated. Indeed, there is empirical evidence to the effect that prices changes in tropical and non-tropical timber are linked (Chimeli *et al.*, 2012).

Actual trade patterns - oak has consolidated its dominant market position in the European flooring and joinery sectors while tropical hardwoods have continued to lose market shares (UNECE/FAO, 2011) - could be a result of such *market leakage*(for a discussion of *market leakage*, see, e.g., Schwarze *et al.*, 2002; Aukland *et al.*, 2003). In addition, these policy schemes, by raising transactions costs (for the influence of transaction costs on trade, see, e.g., Krugman, 1980), could possibly divert trade in tropical timber from Europe to other destinations.

Recently published studies on FLEGT focus on the Central African region, since it has the largest number of countries engaged in the process (see e.g. Eba'aAtyi *et al.*, 2013 or Carlsen *et al.*, 2012).Given Indonesia's fairly recent engagement with FLEGT's voluntary partnership agreement (VPA)system, different policy-analysis studies have approached the issue (see e.g. Heeswijk and Turnhout, 2012) or offered conceptual approaches to legality verification and certification (see Cashore and Stone, 2012). Studies addressing the impacts of curbing illegal logging in general (see Li *et al.*, 2008) or more specifically under the impact of FLEGT (see Moiseyev *et al.*, 2010) model different scenarios for the wood product market, assuming that these policy initiatives are effective. Further, these studies generally deal with timber species, types and assortments at an aggregated level. The current study, however, is concerned with the actual impact of FLEGT, the EUTR and third party verification schemes on the trade in hardwood timber.

Thus, this thesis aims to assess the combined potential influence from the policy mechanisms FLEGT, the EU Timber regulation, and different third party verification schemes on the timber trade between tropical countries and Europe looking to the near future. FLEGT, EUTR, and third party verification schemes, even if slightly different in their basic formation and approaches, could reinforce and/or complement each other. This potential combined impact should be more readily traced at national/regional level. With a leading role on the international timber trade market, Indonesia makes an interesting case study for assessing the impact of FLEGT, EUTR, and third party verification schemes on the supply of tropical timber. Further, the EU (and the UK specifically) is a very important market for tropical timber (ITTO, 2011a).Hence, this study focuses on the implications of the abovementioned policy instruments on the trade in tropical timber between Indonesia and the UK.

The study provides assessments of the most likely outcomes on the demand (Europe) and supply side (tropical countries) respectively. In doing so, the study addresses issues such as whether the sourcing of timber by European countries and the pattern of exports from tropical countries are likely to change, and if so, how? Will temperate timber such as oak substitute for tropical timber in Europe? Will exports of tropical timber be diverted from Europe to other destinations, and if so, which destinations? The focus of this study is on the hardwood lumber market, also referred to as sawnwood throughout the paper.

1.2 Background: trade between two major consumer-producer countries. The case studies of UK and Indonesia

As much as 40% of the wood-based products imported into the EU from South-east Asia (including China) were estimated to originate from illegal sources. Imports from these region mainly consist of furniture and other finished wood products (plywood and veneer, sawnwood, roundwood, pulp) (Hirschberger, 2008).The UK is one of the biggest tropical timber importers in the EU (ITTO, 2011a) and it is also within the top ten European countries as regards imports of high amounts of illegal wood (Hirschberger, 2008). Thus, like other major European importers, UK's importing companies and manufacturers using timber from the tropics, have been faced with increased scrutiny on their timber supply chains over the last decades and encountered high standards from various groups of stakeholders such as Non-Governmental Organizations (NGOs), government, and an ever-growing consumer awareness (Lawson and MacFaul ,2010).

During the past two decades- largely due to industry and government pressures- a number of different incentives, focused on promoting sustainability (and thus legality) through trade, have developed in the UK (Sann and Thornber, 2003). Networks of companies and organizations in the country, such as buyers and producer groups, have focused on buying and selling certified timber. Thus the Word Wide Fund's (WWF) Global Forests and Trade Network (GTFN) within the UK became one of the largest and most influential buyers groups that support the Forest Stewardship Council's (FSC) certification scheme (Sann and Thornber, 2003; WWF, 2013).Government procurement policies within the UK together with codes of conduct, like the UK Timber Traders' Federation (TTF), which represents the majority of UK importers, have been committed to legality and sustainability starting from 2002 (Sann and Thornber, 2003; TTF, 2013). A further effort towards combating illegal logging came in 2003 with EU's FLEGT Action plan and more recently, in 2010 (fully implemented in 2013), through the EUTR legislation.

On the supply side, we consider Indonesia, which is one of the most important producing countries in South-east Asia and an important export partner supplying different markets in Europe and Asia (ITTO, 2011a). Almost 29% of Indonesia's sawn-hardwood exports were destined for Europe in 2011 (EU COMTRADE data analysis).

As much as 46% of the forest area in South-east Asia is designed for production, one of the highest in the tropical world (FAO/ITTO, 2011) and Indonesia is the country with the largest forest area in the region with 94.4 million ha as estimated by FAO (2010). Nowadays, more than half of the forest area (49, 7 million ha) is designated for production purposes whereas 37,8 million ha are designated for soil and water protection or set aside for conservation of biodiversity (FAO, 2010). All forest land in Indonesia is owned by the government and the management right can be given to local communities, private

corporations or institutions. Around 30 % of these forests are managed by the state and 40 % by private corporations and institutions. (FAO, 2010).

Indonesian forests contain around 4000 different tree species, 267 of which are traded. The most valuable trees are from the *Dipterocarpaceae* family (ITTO, 2011b) and most species from this family are selected for their valuable wood qualities and have high value on the European market. According to international reports and trade data (ITTO 2011a; ITTO 2011b; UN COMTRADE), one of the most commonly traded species is *Shoreaspp*, known as *meranti* (sometimes *luan*or*bangkirai*).

Indonesia's policy and management of forest resources has been long influenced by a turbulent political history that resulted in high rates of illegal logging (Heeswijk and Turnhout, 2012) which is one of the biggest problems leading to high deforestation rates in the country (Luttrell *et al.*, 2011).It is estimated that illegal logging accounts for more than 40% of the country's total wood supply leading to the assumption that illegal logging might even exceed legal production (Luttrell *et al.* 2011).

In the fight against illegal logging and its associated trade, Indonesia became the first Asian country to initiate VPA with the EU (FLEGT, 2013) and raised efforts to meet EU timber regulation (EUTR) demands. Two major certification schemes are active in Indonesia: the Forest Stewardship Council (FSC) and a national certification programme, Lembaga Ekolabel Indonesia (LEI). LEI and FSC developed a joint certification programme (LEI, 2013; ITTO, 2011b).

Like many other forest-rich, developing countries, Indonesia faces intense scrutiny, participation and higher requirements from its importing partners on the EU market. Hence, Indonesia is an interesting case study for analyzing the impacts of the above mentioned initiatives on international timber-trade patterns.

2. Materials and methods

The thesis builds on literature review, analysis of trade data as well as complementary primary data collection and analysis. Scientific papers, trade papers, official statistics, government reports and studies regarding policy developments and trade are reviewed in order to assess the combined impact of the policy mechanisms FLEGT, the EU Timber regulation 2013, different third party verification, and international agreements on the future timber trade between tropical countries and Europe, looking about ten years ahead. Finally, interviews with representatives of importers of tropical and temperate hardwood and exporters of tropical hardwood are conducted to complement and enrich the analysis. Complementing the literature review and trade statistics analysis with data from questionnaires sent out

to stakeholders, assessments of the likely future outcomes on the demand and supply side will be provided.

2.1 Literature search

The current study consults international reports (UN, UNECE, FAO, ITTO, and EU commission), government reports as well as scientific papers. As for the scientific papers, the literature search was conducted using *Science Direct* and *Scopus* databases between January 2011 and March 2011. Following search-term sequence was used for both databases: "illegal logging" (this search resulted in 288 articles). These results were filtered by using following query: "timber market" OR market* (91 results) with subsequent search in these results for FLEGT OR VPA AND Certification*, resulting in 8 articles. Related references from the relevant articles within the search results were further reviewed. The search for international reports was conducted during the same period using *Google Scholar*and by further exploring each of the relevant organization's and institution's official web-pages and publications.

2.2 Trade data analysis

Trade data from the UN COMTRADE[1] and ITTO[2] databases are analyzed to detect potential changes in trade patterns and to assess whether these possible changes can be traced to policy instruments. In addition, basic econometric analysis of sawnwood imports is conducted in order to assess the degree of substitutability between oak and tropical timber.

2.2.1 Econometric analysis

Econometric analysis is conducted to assess whether oak is substituting for tropical timber in European imports of hardwood lumber. The UN COMTRADE database is the source of data as to imports and value of imports of tropical (HS1996 classification 440729) and oak lumber (HS2002 classification 440791). Based on this information, import unit values (in US$) are calculated and subsequently deflated to provide estimates of real (constant) import prices. Historical macroeconomic data, gross domestic product (GDP) in constant US$ and deflators, was collected from the World Bank[3].

The following equation is defined for sawnwood (lumber) imports:

$$Q^M = f\left(P_{tropical}, P_{oak}, D^M\right) \quad (1)$$

[1] UN COMTRADE database: http://comtrade.un.org/db/mr/rfCommoditiesList.aspx?px=H1&cc=4407
[2] ITTO database: http://www.itto.int/annual_review_output/
[3]World Bank data: http://data.worldbank.org/indicator/

Where, Q^M = import demand for tropical sawnwood, $P_{tropical}$ = real tropical sawnwood import price, P_{oak} = the real oak sawnwood import price, D^M= Real gross domestic product (GDP), in constant US$, used as demand shifter. The functional form of the model is log-linear, allowing for direct interpretation of estimated coefficients in terms of elasticities. In equation (1), modeling import demand for tropical sawnwood, the price elasticity for tropical sawnwood is expected to have a negative sign, whereas the price elasticity for oak sawnwood, i.e., the cross-price elasticity, is expected to have a positive sign when tropical sawnwood and oak sawnwood are substitutes.

Due to short time series for tropical and oak lumber imports, with the earliest data as late as year 1996, equation (1) was estimated with a time series cross-section (TSXS) approach - for details about the method, see, e.g., Buongiorno (1977, 1978).The countries included in the analysis – Austria, Belgium, France, Germany, Italy, the Netherlands, Spain, Sweden and the UK – comprise some of the major importers of tropical lumber.
The analysis is conducted by means of ordinary least squares (OLS) regression. The statistical software used is IBM SPSS Statistics 21.

2.3 Questionnaires

There are two main methodological approaches in social sciences, nomothetic and idiographic. The nomothetic approach emphasizes quantitative analysis of a few aspects to test hypotheses and make statistical generalizations. The idiographic approach, in contrast, relies on a case-study approach to achieve the in-depth understanding of complex phenomena, and is the preferred strategy when little is known about a phenomenon (Yin, 1984; Eisenhardt, 1989). In this instance an idiographic approach to data gathering was consequently used. Observational units (Ragin, 1987) were thus selected for theoretical reasons rather than for representativity (Glaser and Strauss, 1967).

For this paper, two sets of structured interviews were conducted (Annexes 1.1 and 1.2): one set for the UK (during March-May 2013) with experts and representatives of importers of tropical and temperate hardwood and floor covering manufacturers (representing final uses of tropical and temperate hardwood). Most of the structured interviews for the UK were conducted via E-mail or per telephone and finally, in-person, during the" Global Timber Trade and Legality Legislation" conference held in Cologne, Germany on 15th of May, 2013. The second set of interviews (during April-May 2013) was directed to experts, exporters of tropical hardwood, and civil society representatives from Indonesia. All the structured interviews for Indonesia were conducted via E-mail.

3. Results and Discussion

3.1International agreements and policy developments

International policy mechanisms have the potential to alter international timber trade flows either by influencing national and/or international forest policy and governance or by promoting sustainable forest management and nature conservation (Eba'aAtyi *et al.*, 2013).

Growing endorsement of sustainable forest management and thefight against illegal logging and its trade, has pushed numerous NGOs, conservation groups, international organizations, industries and governments to promote policies to address these issues (Li*et al.*, 2008).These policy measures and incentives range from market-based incentives (certification) to regulatory /enforcement measures (Forest Law Enforcement and Governance) and measures that include both market and enforcement mechanisms (Forest Law Enforcement, Governance and Trade-Voluntary Partnership Agreements) (Luttrell *et al.*, 2011).

Hence, a review of certification schemes, trade related policies and agreements follows below .Particular attention is given to Indonesia as a supplier and the UK as a consumer of tropical timber.

3.1 .1 Forest certification schemes

In the forestry sector, a number of market-based instruments provide commercial incentives to promote sustainable resource management. One of these instruments is third-party verification schemes, which include certification (Sann and Thornber, 2003). Forest certification schemes provide a way of defining sustainable forest management as well as third party, independent verification that a timber source meets the definition of sustainability (EFI, 2013). There are a number of international and national third party certification schemes, two of the most internationally recognized forest certification schemes being: the Forest Stewardship Council (FSC) and Programme for Endorsement of Forest Certification (PEFC).

Forest certification emerged at a global scale in 1993 with the creation of FSC in response to two main issues: firstly, domestic governments failing to curb deforestation and neglecting environmental and social aspects; and secondly, due to promotion from the world's leading environmental groups (Sann and Thornber, 2003; Cashore and Stone, 2012).

One of these leading environmental groups, the WWF, set up the first and biggest buyers group in the UK called the "95 Group +" which later became part of a more extended network of groups known as the Global Forest and Trade Network (GFTN). The WWF 95 Group+ was committed to sustaining, promoting and trading certified FSC wood. More recently, the WWF's GFTN also included producer

groups such as GFTN-Indonesia launched in 2003 which aims to support forest certification and sustainable trade between member companies (Sann and Thornber, 2003; WWF, 2013).

Although in terms of certified forest area PEFC is the largest programme, it encompasses very few forest areas in the global south (UNECE/FAO, 2011; PEFC, 2013). FSC is by far the most broadly accepted sustainability standard in major timber markets (Luttrell *et al.*, 2011)and has more certified forest area in tropical countries than any other scheme encompassing: 12 countries in Africa, 12 countries in Asia and 17 countries in Latin America & Caribbean (FSC, 2013) .Nevertheless, at a global scale, the certified forest area in the tropical world is still small, representing only 11%, compared to 89% in the northern hemisphere (UNECE/FAO, 2011).These regions in the global south, with low certification, are generally the ones with the highest deforestation and forest degradation rates and are also characterized by weak forest governance at a state level- a contradiction with the initial scope of forest certification to address exactly these issues in the tropical world (Carlsen*et al*., 2012). The weak uptake of certification in the developing countries was the reason that initially sparked attention on trade-related legality issues, pushing governments in importing countries to take further initiative (a more extensive discussion on this follows in chapter 3.1.2).

Starting from 2002, the Indonesian Government adopted a mandatory certification approach (Lembaga Penilai Independen-LPI) based on holder's independent assessments of criteria & indicators (ITTO, 2011b). More so, the area of certified forest land in Indonesia has been growing during the past decade (Figure 1).

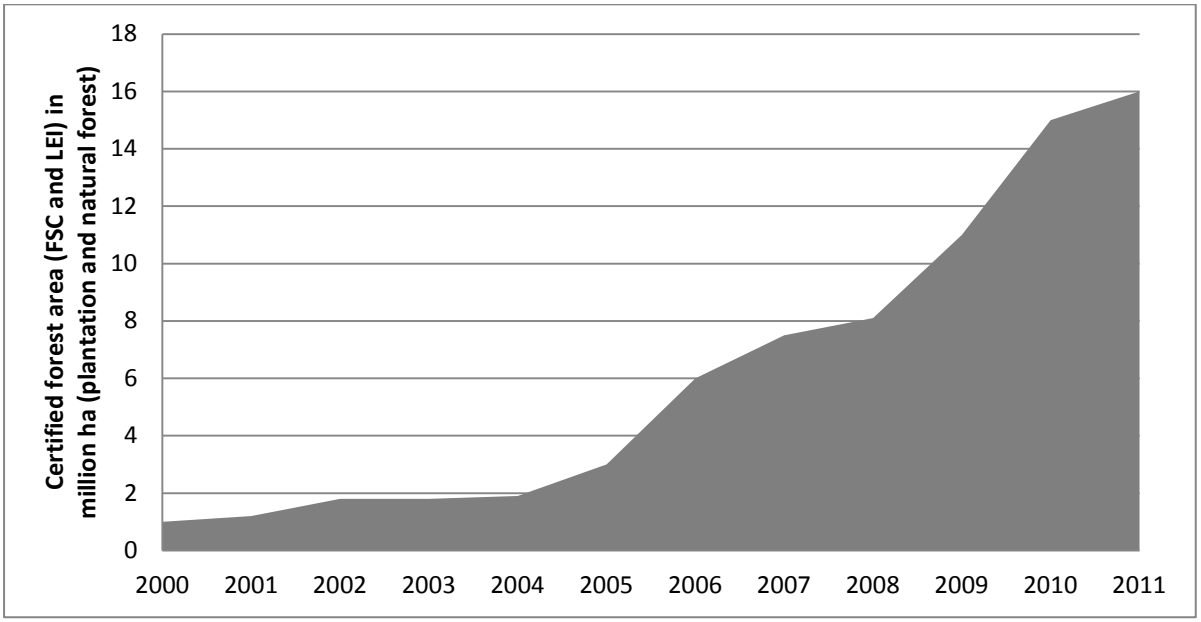

Figure 1 Progress to date of certification in Indonesian forests (adapted after IDH, 2013)

More recent data, from the beginning of 2013, showed thatFSC certified around 1.6 million ha in Indonesia, one of the biggest certified areas in Asia (FSC, 2013). Indonesia also has a national

certification programme, Lembaga Ekolabel Indonesia (LEI) which came into being in the 1980s, voicing concerns from scientists, national and international NGOs, and developed countries. The scheme's criteria and indicators were agreed upon in 1997 and combined FSC and ITTO performance requirements (Sann and Thornber, 2003). Since both schemes, FSC and LEI, were similar in their certification model, they developed a joint certification programme; this way FSC requirements must also meet LEI requirements and vice versa (Sann and Thornber, 2003;LEI, 2013).

3.1.2 Trade related policies and agreements

Trade related policies are part of a series of global forest governance agreements that focus on influencing and improving policy-making in timber producing/exporting countries and their importers (Eba'aAtyi*et al.*, 2013).

The recent growing interest in timber procurement policies is seen by Bernstein & Cashore (2000) as part of an internationalization process through which national/domestic policies are confronted with increased scrutiny, participation, and influence from international actors and institution's various legality demands. Thus, raised public concern in consumer countries have pushed timber merchants to raise demands and assure that their products come from legal (and sustainable) sources so that timber trade can maintain credibility in the public view (Eba'aAtyi*et al.*, 2013).

As already mentioned, certification initially failed to achieve one of its key goals- to reduce deforestation in the tropical world (Sann and Thornber, 2003). Cashore and Stone (2012) point out that partly due to certification's limited uptake in the tropical world, various development agencies- within the UK, Germany and the EU, together with the World Bank- began to focus on promoting capacity building and forest policy networks in order to help reinforce, rather than challenge, domestic policies. This resulted in the Forest Law Enforcement and Governance (FLEG) initiative. Within the East Asian region, the Bali declaration in 2001 represented a commitment to promote the FLEG initiative, enforce forest policy and combat corruption (SCA & WRI, 2004). Criticism was that in the absence of trade or market incentives, FLEG would be unable to sustain good forest governance and combat degradation. This way, due to concerns regarding the reduced effectiveness and impact of certification schemes and FLEG initiatives, "legality verification" came forth as a new leading policy instrument to combat forest degradation and illegal logging (Cashore and Stone, 2012).

3.1.2.1 FLEGT

The EU's response to illegal logging came into being in 2003 with the "EU FLEGT Action Plan", acknowledging that the EU is an important export market for countries where levels of illegality and poor governance in the forest sector are high (FLEGT Action Plan, 2003).Thus, European companies

acknowledge that by purchasing large amounts of wood and wood products from suppliers in Africa, Asia or South America, they exert a significant impact on illegal logging.

FLEGT combines market and enforcement mechanisms, with its main objective to ensure that only timber coming from legal sources enters the EU market. All timber products exported from partner countries are prohibited unless they are covered by a FLEGT or CITES license (Heeswijk and Turnhout, 2012; Cashore and Stone, 2012). These objectives are achieved by developing Voluntary Partnership Agreements (VPAs). VPAs are bilateral trade agreements developed between the EU and timber producing -partner countries that are initially engaged in the process on a voluntary basis and afterwards, if ratified, become legally-binding (Heeswijk and Turnhout, 2012).

By acknowledging and trying to control the problem of illegal logging and its associated trade, Indonesia became the first Asian country to initial a Voluntary Partnership Agreement (VPA) with the EU, signing a memorandum in 2011. However, signing the VPA agreement itself was delayed already twice in 2012 and has been deferred several times in 2013 (Jakarta Post, 2013).

3.1.2.2 EUTR

In 2010 the EU took an additional step to combat global illegal logging by requiring importers to demonstrate "due diligence". This made European importers accountable for the products they bring into the EU and encouraged adequate documentation that wood products come from legal sources (Cashore and Stone, 2012). The new binding legislation, called the "EU Timber Regulation" *(Regulation (EU) No 995/2010 of European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market*) came into force in March 2013.

VPAs and the EU Timber Regulation (henceforth) EUTRare meant to reinforce each other. Again, the EUTR states that timber and timber products coming to the EU from partner countries in the topics are legal only if covered by FLEGT licenses or CITES permits. This way, each member state of the EU is responsible to determine how to control the legality of the shipment and how sanctions are applied if necessary (FLEGT, 2013).

The EUTR sets out three requirements for EU operators (Carden*et al.*, 2012):

1. Prohibition- meaning that it prohibits placing illegally harvested timber or products on the EU market. The definition of legality is based on the context of the country of harvest.
2. Due Diligence System (DDS) -implying that operators can apply Due Diligence by themselves or by associating with Monitoring Organizations (MO) that apply the DDS. Operators need to provide access to information on the timber (country of harvest, concession, species,

sizes, quantities), implement risk assessment (evaluate the risk of occurrence of illegally harvested products) and implement risk mitigation measures and procedures to minimize risk.

3. Traceability Obligation- implying that after placing timber on the market for the first time, the other operators, called "traders" in the regulation, have to keep records with information from whom they bought and to whom they sold the timber.

In order to meet the new requirements of EUTR the Indonesian government launched a national Timber Legality Verification Information System (SVLK). All wood products manufacturers in Indonesia were required to comply with SVLK and secure third party verification. By the beginning of 2013 almost 1.500 nationwide had already received SVLK certification (ITTO-TTM, 2013a). The EU Delegation in Indonesia had confirmed that operators placing timber on the EU market from Indonesia backed-up by a V-Legal certificate (indicating compliance with SVLK) also acquiesce with EUTR (FLEGT Asia, 2013).

3.1.2.3CITES

Pre dating the above mentioned international initiatives is the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which already provides a mechanism to regulate international trade in timber species and products (Chen, 2006).Although not a policy mechanism in itself - rather an international agreement between governments aiming to ensure that the international trade of wild animals and plants does not threaten their existence (CITES, 2013)- CITES is of relevance here due to its capacity to limit trade for certain tree species. More so, imports of tropical timber followed by CITES permits comply with FLEGT's legality requirements.

Thus, international trade in specimens of selected species are subjected to certain controls and all import, export, re-export and introduction of species has to be authorized through a licensing system. Each Party that adhered to the Convention designates management authorities and scientific authorities responsible for administering the licensing system. A number of 177 parties worldwide adhere to the convention's rules on trade of listed species (CITES, 2013).

Timber species covered by CITES are listed in three Appendices, according to their protection status, as follows: Appendix 1- includes the timber species most endangered and threatened with extinction thus prohibiting their commercial-international trade; Appendix 2- includes timber species which are not threatened with extinction but may become so unless trade is subjected to strict regulations in order to avoid over-exploitation; Appendix 3- is used when at least one party is already regulating the trade of one particular species and seeks cooperation with other countries to prevent illegal trade (CITES,2013; USDA, 2012). By 2012, following numbers of CITES listed timber species, used for lumber or other wood

products, were cited in the three Appendixes: 6 species in Appendix 1;13 species in Appendix 2; and 120 species in Appendix 3 (USDA, 2012).

Particularly interesting for Indonesian timber trade are: *ramin* (*Gonystylus bancanus*), *merbau/kwila* (*Intsia spp.*), *meranti/luan* and *bangkirai* (*Shorea spp*). All these species are economically important for the international trade and were mentioned by respondents when asked about the most important Indonesian timber species (Annexes 1.1 and 1.2).

Ramin is a very important traded species used for plywood, interior woodwork, furniture, joinery, molding, flooring and general utility wood (Hapla and Mohr, 2009). *Ramin* was listed on Appendix 3 in 2001 but evidence reflecting a lack of political will in Indonesia pushed CITES controls to increase scrutiny and moved the species to Appendix 2 in 2005. More so, reports point out that there has been evidence of large scale laundering of Indonesian *ramin* to Malaysia and Singapore even after the Appendix 2 listing (Hewitt, 2007). Looking at trade data specifically for this species, it becomes obvious how a CITES listing on Appendix 2 (timber species which are not threatened with extinction but may become so unless trade is subjected to strict regulations in order to avoid over-exploitation) impacted on Indonesian *ramin* exports to the EU, which seems to have completely stopped in 2006 as soon as the *ramin* was listed on the CITES appendix (Figure 2).

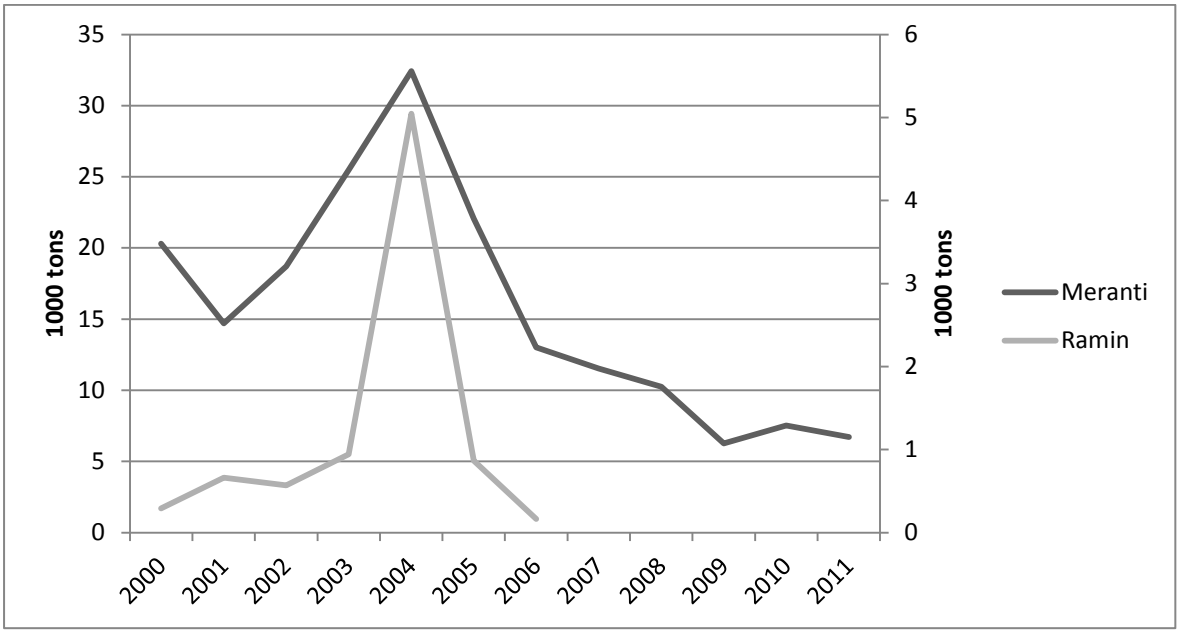

Figure 2 Two important Indonesian hardwood species exported to the EU. UN COMTRADE (2013) trade data analysis

Regarding *Merbau/Kwila*, a species primarily used for flooring and external joinery, proposals by the Netherlands to list the species on Appendix 3 have been initially rejected but more recently the listing is again under discussion (Hewitt, 2007).

Trees belonging to *Shorea spp.* (*Dipterocarpaceae* family) are very important for Indonesian timber trade and were also mentioned by almost all respondents (Annexes 1.1 and 1.2).There are four groups of *meranti*, usually separated on the basis of hardwood color: dark red *meranti* (also called *tanguile*), light red *meranti* (also called red *seraya*), white *meranti* (also called *melapi*), and yellow *meranti* (also called yellow *seraya*). Interestingly, the wood properties (strength and shrinkage) of the *meranti* groups compare favorably with that of oak (Hapla and Mohr, 2009).

Recently, NGOs have been raising public attention on Indonesia's depleting low-land *meranti* forests, especially since some red *meranti* species have already become extinct and others placed on the IUCN Red List (IUCN, 2013; Hewitt, 2007).

A CITES listing of red *meranti* species is a particularly controversial topic considering the specie's large share in Indonesian timber exports. Trade data shows that Indonesian *meranti* exports have been also declining during the past decade (Figure 2). This decline can be explained either by factors such as an uptake in certification and legality verification but also due to a possible substitution with other temperate hardwood species such as oak (a more extensive discussion on this follows in chapter 3.2.1). Nonetheless, listing red *meranti* might have significant impact on international timber trade.

3.1.3 Interactions between market-based and regulatory/enforcement mechanisms: potential combined effect on international trade.

Some of the most important factors for impacting the international tropical timber trade cited are: a progress towards sustainable forest management in tropical exporting countries (UNECE/FAO, 2011) combined with a growing interest in the development of policy initiatives to improve law enforcement concerning illegal logging and exports (EFI, 2011; UNECE/FAO, 2011). In fact it seems that third party verification schemes and legality verification have been gaining momentum.

All the reviewed policy measures, incentives and agreements are dealing directly or indirectly with combating illegal logging, and thus should have some degree of impact on international trade.

FSC sets criteria based on an international set of standards for Sustainable Forest Management (Sann and Thornber, 2003). Legality is part of the sustainability definition and therefore, forest certification schemes can provide evidence of legal and sustainable timber (EFI, 2011). The main objective of FLEGT and its VPA system is to ensure that only timber coming from legal sources enters the EU market (Heeswijk and Turnhout, 2012) whereas EUTR further reinforces FLEGT's endeavors by requiring importers to demonstrate "due diligence" and prohibits timber imports if not followed by FLEGT licenses or CITES permits. EUTR also promotes certification and chain of custody (Pepke, 2013). Further, CITES offers opportunities for increasing means to combat illegal logging either by monitoring and insistence

on sustainable harvests or by requiring that harvested species are in line with laws for the protection of fauna and flora in exporting countries (Chen, 2006).

Assuming that all these initiatives are somewhat effective, they would individually result in a reduction of illegally sourced wood being placed on the market. Their combined effect could be even greater. These initiatives seem to have resulted in both increasing support of legality verification and certification uptake in South-east Asian nations driven by market pressure and the need for compliance with EU standards (Durst *et al.*, 2006; Carlsen *et al.*, 2012; Cashore and Stone, 2012) but how these initiatives actually affect the timber trade is yet to be seen.

Forest certification and trade in South-east Asia

We have seen how certification schemes initially, at the beginning of the millennium, failed to approach one of their key goals: of curbing deforestation and degradation in tropical countries. This in turn resulted in increased scrutiny and requirements from "environmental sensitive markets" such as the EU, triggering government law enforcement initiatives and an uptake in legality verification. Interestingly, a recent "unanticipated consequence of EU legality verification on imports has been the reinvigoration of market-based, third party certification" (Cashore and Stone, 2012); thus, introduced measures to control illegal wood were re-boosting interest in certification as another means of meeting legality requirements (UNECE/FAO, 2011). During 2012 the number of Indonesian companies receiving FSC certificates had been growing and was expected to continue doing so (EUWID, 2013). These trends can be seen in Indonesia's certification uptake over the past years.

Further, if we compare Indonesian exports to the EU with the growing area of certified forest land in the country we can assume that certification might have already had a certain degree of impact on Indonesian exports. Thus, as the certified forest area in Indonesia was growing, exports to the EU were decreasing (Figure 3).

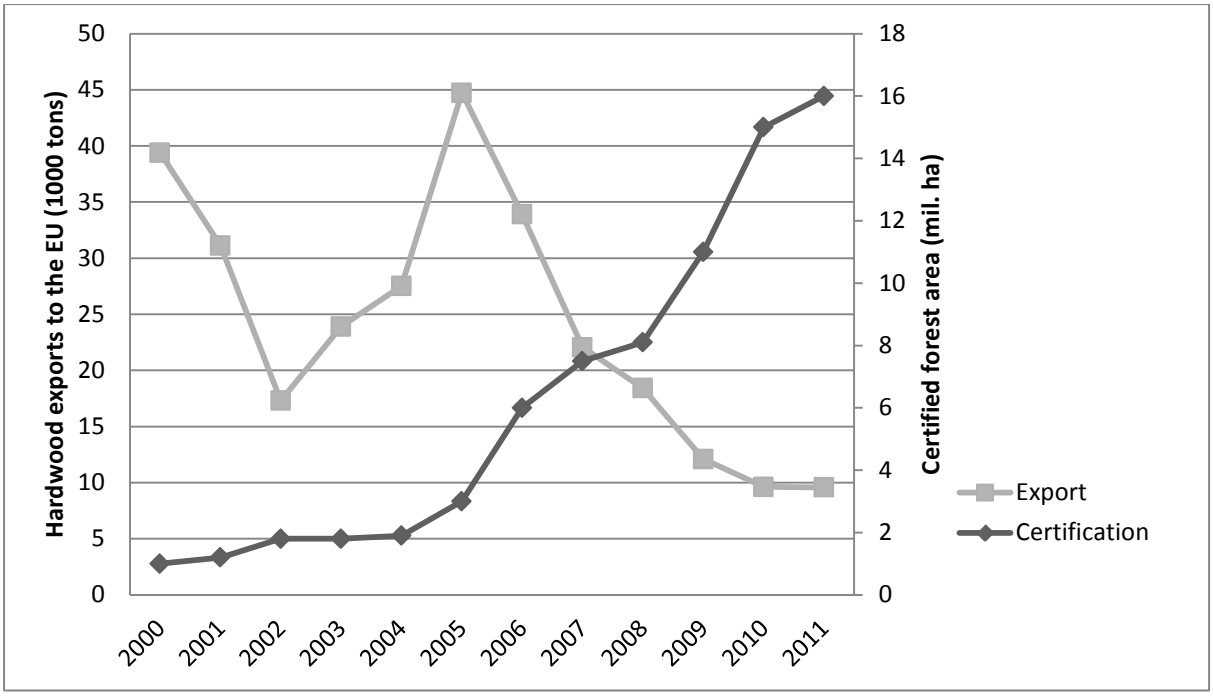

Figure 3 Indonesian exports to the EU vs. certified forest area (adapted after IDH, 2013 and UN COMTRADE, 2013)

The majority of Indonesian respondents considered "a better company image" to be one of the main reasons behind companies opting for certification (Annex 1.2), this representing a further effort to comply with the sustainability demands of importers in the West. It is noteworthy that none of the respondents had cited certification as a reason for changing trade patterns but most Indonesian respondents saw certification as an effort to encourage Indonesian exports to the EU (Annex 1.2). Yet, trade data analysis shows the opposite, with Indonesian exports declining even though the certified forest areas are growing.

However, one should not automatically conclude that certification uptake in Indonesia is the only, or the most influential, reason behind decreasing exports. Furthermore, the production from certified areas, constitute only a small fraction of the overall forest production in Indonesia and include natural forest as well as community and private plantations managed and/or owned by different size concessionaires and operators (Luttrell *et al.*, 2011).

Forest certification has apparently yet not had the intended impact, and the future development remains uncertain; some predict that deforestation will eventually outpace certification (IDH, 2013) while respondents expect certification in South-east Asia to continue growing (Annex 1.1).Whether certification will become a mainstream practice in the tropics is debatable (IDH, 2013) and factors that hinder a more intensified uptake are various, whether they are related to high costs and lack of incentives, westernized high and biased standards or lack of understanding the complex land-use issues in the tropical world (Sann and Thornber, 2003; Carlsen *et al.*, 2012).

Nevertheless, pressure on producing countries has been apparently growing, especially in the case of Indonesia. The EU asked Indonesia to agree to third party verification as another means of monitoring legality for the VPA agreement even if certification alone does not ensure compliance (Cashore and Stone, 2012). Thus, the uptake in Indonesia's certification can be the result of increased pressure from buyers groups (e.g. UK 95 Group) complemented by legality verification. If such pressures from buyers continue to increase, certification uptake might end up having an even more momentous impact on Indonesian timber exports although, according to trade data and international reports, it seems that certification uptake has not necessarily been encouraging trade, at least not for the time being.

Legality verification and trade

Recent changes in international policy developments have put legality verification at the forefront as a new leading instrument for combating illegal logging. In a country where illegally sourced wood holds a large share of its international exports, legality verification is expected to be of substantial impact on Indonesian international trade.

Indonesia recently joined the VPA system, thus the effects of this agreement on the country's exports are difficult to quantify in numbers. For now, such incentives are more readily traced at a domestic-policy level where they are encouraging the Indonesian government to promote good forest governance, forest legality and increase compliance with EU standards.

EUTR is a new legislation and its impacts on international timber trade are yet to be known. However, by enforcing and promoting firstly FLEGT but also certification, this new legislation is expected to be a "game changer" by regulating timber markets (Pepke, 2013). One UK respondent also considered that "EUTR will probably increase certification because it helps mitigating the risk" of buying illegal timber (Annex 1.1).
However, this cannot be traced yet in international trade data. More visible signs to EUTR's effect are that smaller importers withdraw from direct tropical hardwood imports, instead opting to purchase from larger European companies, who are taking the specialist role of due diligence (ITTO-TTM, 2013a).

It is noteworthy that by 2013, there was no fully FLEGT licensed timber on the market and criticism has been that tropical timber markets were exposed to additional risks due to the timing of the EUTR introduction which came before any tropical timber supplier was able to offer FLEGT licensed timber. This gap in timing between introduction of EUTR and supply of FLEGT licensed timber was considered to create uncertainty in the market (a more extensive discussion on this follows in chapter 3.2.1) and that the bad timing of the implementation was expected to lower the already weakened European market after the economic downturn (ITTO-TTM, 2013b).

Nevertheless, whether due to improved forest law enforcement or growing market demand for legal timber products, studies suggested that there was a clear decline in illegal logging in Indonesia staring from 2003 (Lawson and MacFaul, 2010) which coincides with the period when GTFN Indonesia was born and a more momentous uptake in certification took place. The EU FLEGT Action plan also came into being in 2003. Other studies have indicated that by 2009 the rate of illegal logging in Indonesia was estimated to have halved to about 40% (ITTO, 2011b).

Thus, trade data and international reports suggest that legality verification efforts are becoming more effective and that the share of illegally sourced timber being placed on the international market is declining. Figure 4 illustrates the comparison between the illegal logging rate in Indonesia with Indonesian hardwood exports to the EU. Hence, by reducing the amount of illegal wood exported, one can assume that exports would also decline. Yet, most UK respondents did not consider that new legislations such as the EUTR will have a significant impact on the tropical timber market, and predicted the share of tropical timber to remain unchanged in the UK during the following decade. Some respondents pointed out that an effective implementation of the FLEGT Action Plan, including the EUTR will help restore consumer confidence while others saw the EUTR as a "much welcomed fundamental advancement" that is expected to further reduce illegal logging (Annex 1.1).

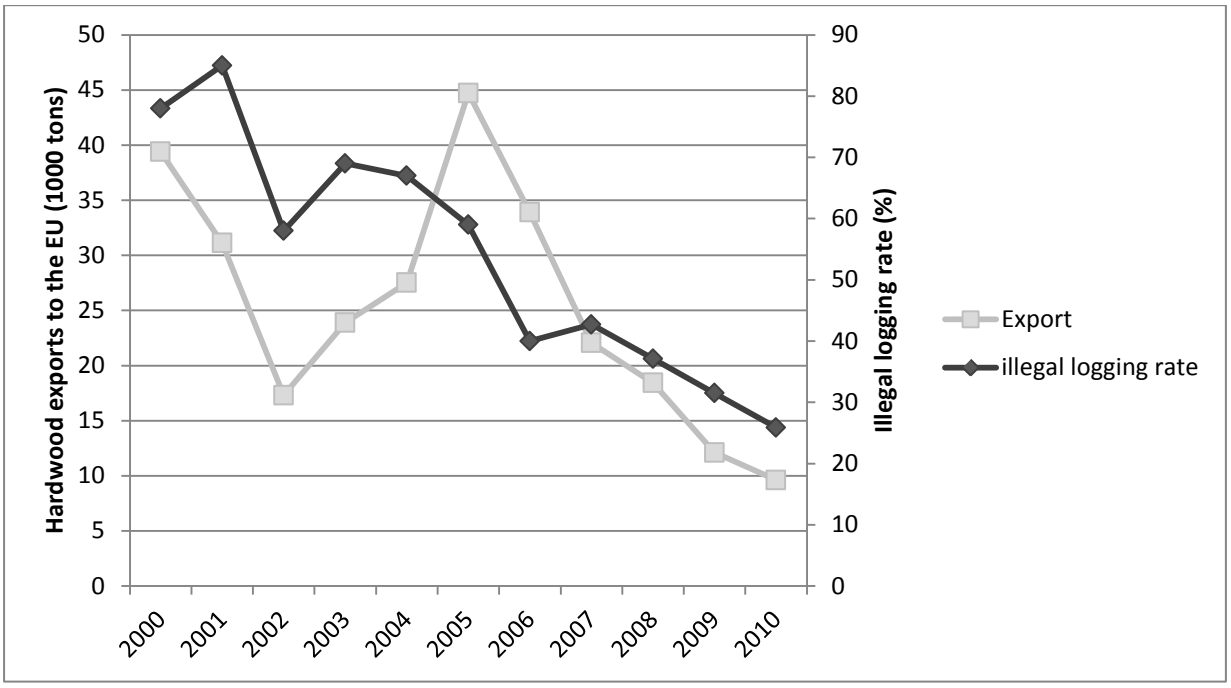

Figure 4 Indonesian exports to the EU vs. illegal logging rate (adapted after Lawson and MacFaul, 2010 and UN COMTRADE, 2013)

Indonesian respondents had similar views upon weather FLEGT or EUTR will encourage or discourage Indonesian timber exports to Europe and their opinions were clearly divided: two respondents

considered that the mechanisms will encourage exports to Europe, while other two respondents felt the mechanisms are discouraging exports; the company representative considered that these mechanisms will have no effect on Indonesian exports to Europe. Nonetheless, the majority of Indonesian respondents considered that the extent of European regulations on tropical timber imports over the past decade had been growing as a result of increased consumer awareness (Annex 1.2).

However, one should bear in mind that these statistics do not capture the whole supply-demand gap thus, making estimations on the scale of illegal logging very uncertain (Luttrell *et al.*, 2011). Furthermore, illegal trade is not recorded in the trade databases (Meyfroidt, 2010), perhaps notably in the case of Indonesia where existing supply-demand assessments are based on official statistics that only register large and medium wood industries, not considering small-scale operations and informal trades (Luttrell *et al*., 2011).

3.2International timber-trade trends

After reviewing and discussing the most relevant international policy developments, in this chapter we will analyze timber-trade trends as indicated by international trade data and statistics, with the aim of exemplifying and discussing around the impacts that these policy developments might have on the international tropical timber market. Particular attention is given to the hardwood lumber market due to its importance in the international trade in tropical timber and the interesting changes that this sector has undergone during the past decades. The analysis focuses two important consumer-producer countries: the UK and Indonesia.

Trade data analysis shows a clear overall decline in EU's tropical timber imports (roundwood, sawnwood, plywood and veneer) (Figure5).

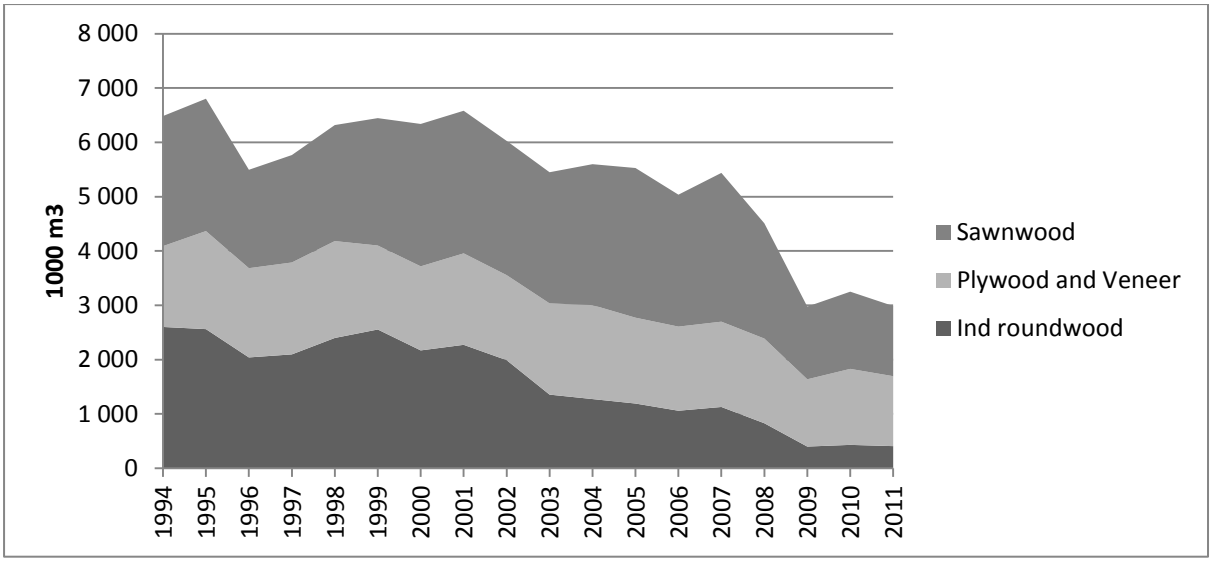

Figure 5 EU imports of tropical non-coniferous industrial roundwood, sawnwood, plywood and veneer. Source: ITTO (2013) trade data analysis

The EU is a very important tropical timber importer. Hence, around 33% of the world's tropical sawnwood imports were destined to the EU in 1998. However, trade data analysis shows a clear decline in European imports over the past decades and EU's share of world imports has been continuously declining, reaching only 18% in 2011 (Figure 6).

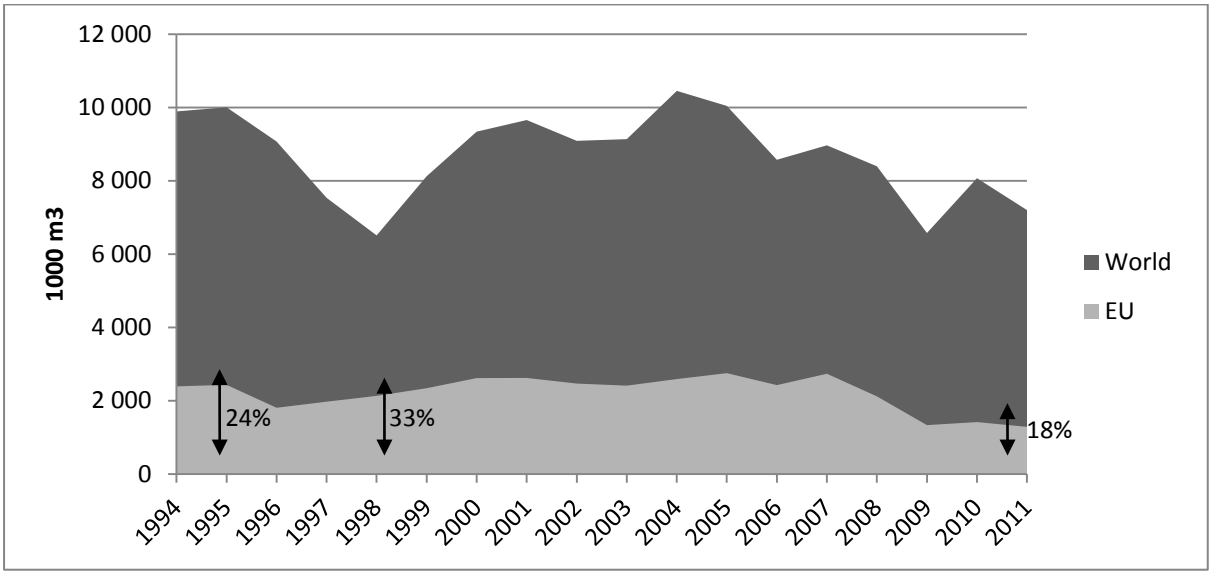

Figure 6 EU's share of tropical sawnwood imports. Source: ITTO (2013) trade data analysis

Looking specifically at the EU's most important trade partners in the tropics (Democratic Republic of the Congo, Congo, Cote d'Ivoire, Cameroon, Gabon, Ghana, Brazil, Malaysia and Indonesia), an analysis of trade data over the past decade clearly shows the same trends, with tropical sawnwood imports steadily declining (Figure 7).

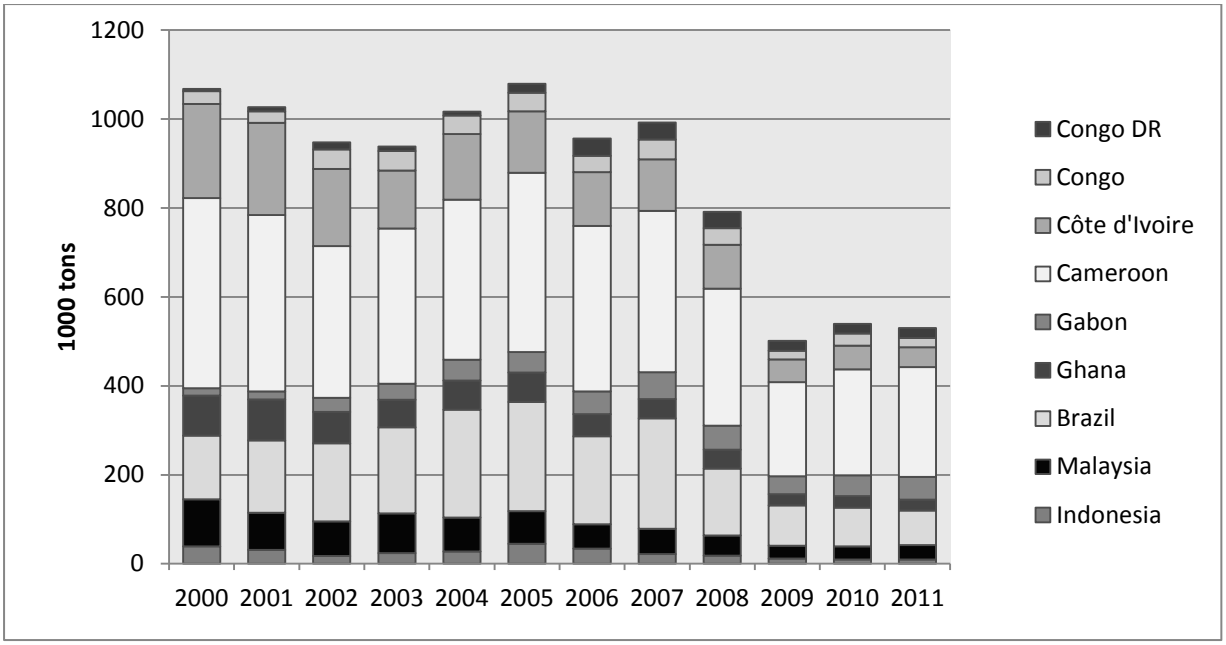

Figure 7 EU imports of tropical sawnwood from major producers. Source: UN COMTRADE (2013) trade data analysis

Trade data for the UK follows the same pattern of declining imports. As shown in figure 8, the UK accounted for 14% of the total EU tropical sawnwood imports in the 90's but its imports have been continuously declining to 9% in 2011.

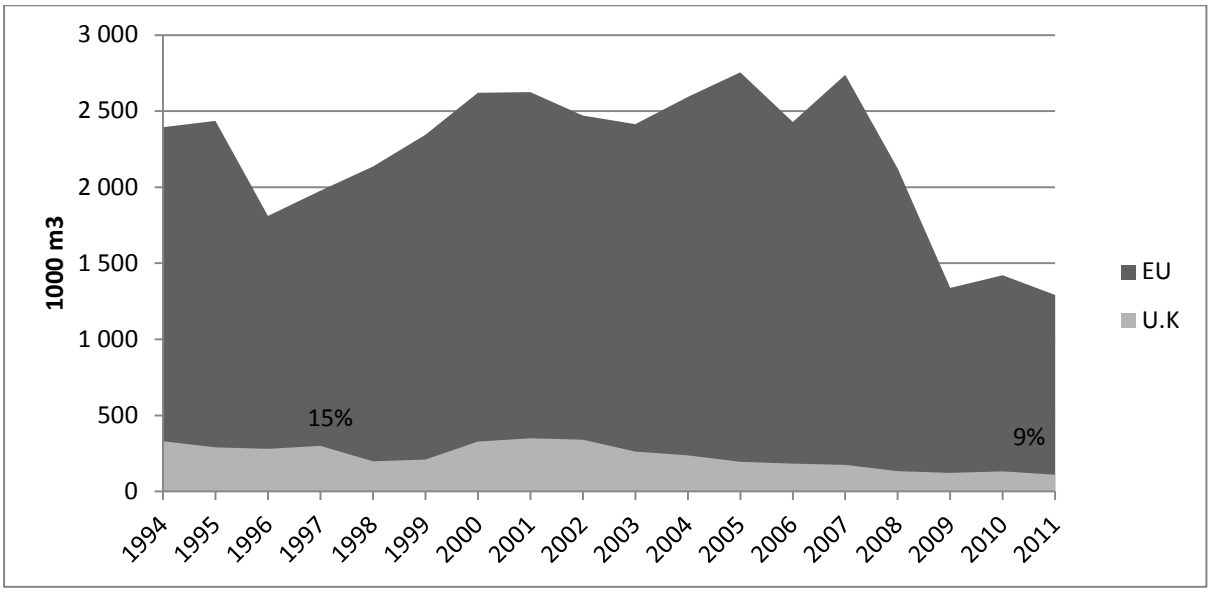

Figure 8 UK tropical sawnwood imports vs. EU tropical sawnwood imports. Source: ITTO (2013) trade data analysis

Considering our study case on the supply side, Indonesia, trade data shows that sawnwood exports to the UK have been declining over the past decades (Figure 9).

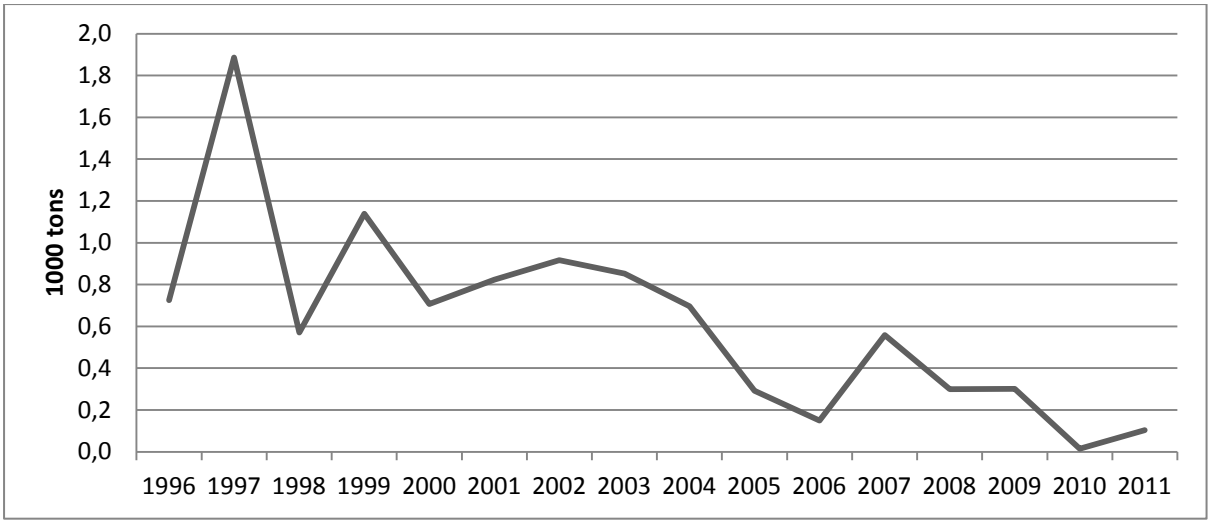

Figure 9 UK imports of tropical sawnwood from Indonesia. Source: UN COMTRADE (2013) trade data analysis

The majority of respondents from both UK and Indonesia have noticed the trend of declining imports of tropical timber. The reasons given for the declining imports vary: global recession, limited forest resources, domestic and international law enforcement to combat illegal logging, or competitiveness from other exporting countries in Asia, Africa or South America (Annex 1.1 and Annex 1.2). When asked about the future (looking ten years ahead) of tropical timber in their country, predictions were very uncertain and contradictory. The opinions among UK respondents differed: three respondents felt imports will decrease; other three felt it will remain unchanged while only one respondent thought imports will increase in the future (Annex 1.1). Similar answers came from Indonesian respondents, when asked about the future of Indonesian exports to Europe: three respondents felt exports will decrease, two thought exports will remain unchanged while only one respondent was optimistic and felt exports will increase in the next ten years (Annex 1.2).

3.2.1 Substitution: comparing oak and tropical lumber imports

International reports point that in the last few years, oak has consolidated its dominant market position in the European flooring and joinery sectors while tropical hardwoods have continued to lose market shares (UNECE/FAO, 2011).

Figure 10 shows how oak sawnwood imports in the EU increased over the last decade, relative to tropical timber imports to the EU, having almost the same market share as tropical hardwoods. It is also important to mention that production of sawn temperate hardwood has increased steadily in 2011, particularly in Eastern Europe with Croatia and Ukraine leading the charts (UNECE/FAO, 2011). Croatia was most often named by UK respondents when asked about their main suppliers of temperate hardwoods (Annex 1.1).It is noteworthy that all UK respondents named the USA as the main and most important oak supplier from outside Europe (Annex1.1).

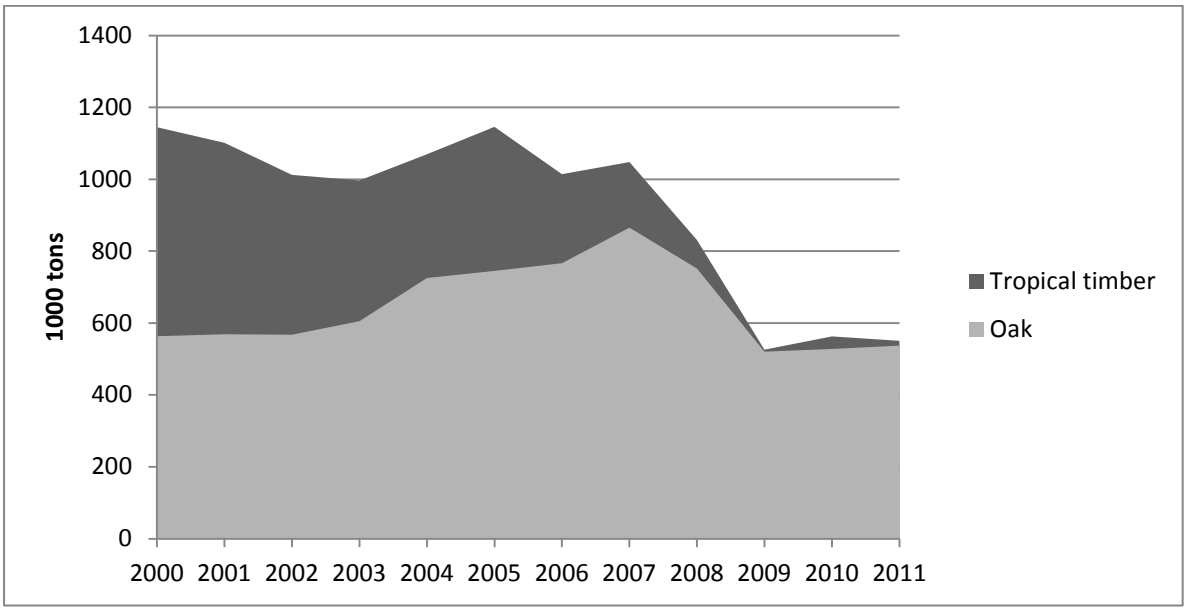

Figure 10 EU imports of oak sawnwood vs. tropical sawnwood. Source: UN COMTRADE (2013) trade data analysis

Looking specifically at trade data from the UK, the trend is quite evident and it gained momentum at around the same period as in the rest of the EU, in the early 2000s. Soon after that oak sawnwood imports seem to have overtaken tropical sawnwood imports, and have been on a steady rise ever since, as indicated in figure 11.

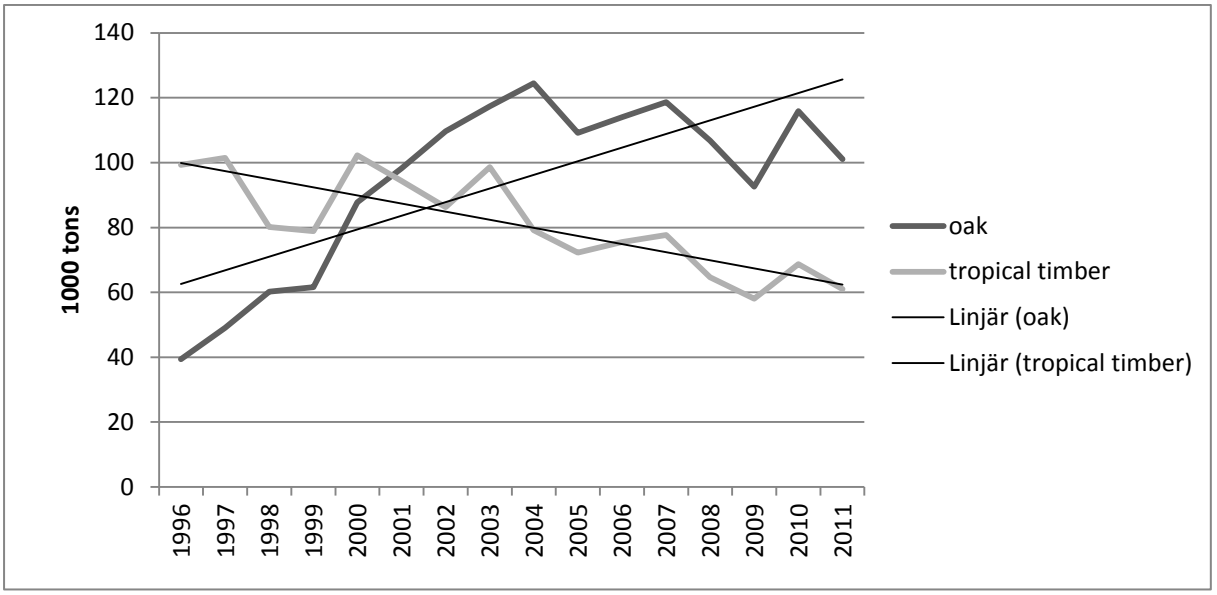

Figure 11 UK's oak imports vs. tropical timber imports. Source: UN COMTRADE (2013) trade data analysis

There are various explanations for this decline in tropical lumber imports. Thus, in addition to imminent factors such as the continued depressed housing market (ITTO, 2011a; UNECE/FAO, 2011), one of the

major reasons cited for the decline in tropical imports is the development of temperate hardwood products marketed as alternatives for tropical hardwoods (ITTO, 2011a).

All interviewed specialists from the sector confirmed this: ”Oak now dominates European temperate hardwood trade” (Annex 1.1). Respondents pointed out that there seems to be a “strong fashion for oak” .This is echoed by international reports mentioning a strong consumer preference for oak, which further benefits from a range of new treatments that make the timber applicable for a wider range of uses (UNECE/FAO, 2011). Oak seems to have similar properties as many of the tropical species e.g., the Indonesian *meranti* (Hapla and Mohr, 2009). In addition to this, respondents mentioned that oak is more readily available (shorter supply chains) and can be purchased "little and often" in the furniture and flooring sector. Other reasons behind the shift were: “obvious geographical benefits” from trading within Europe and “environmental awareness and validity of documentation” or even “risk avoidance” (Annex 1.1). These reasons can be interpreted as a strong consumer confidence in certified timber from temperate hardwoods imported from the Nordic hemisphere as opposed to uncertified timber from the tropics. As already mentioned, 89% of the global certified forest area is within the Northern hemisphere, thus making exporters in this region the primary, most reliable choice for importers, as opposed to producers in the global south, where certification has just recently experienced a more momentous uptake and where the legality of exports is still questionable. Moreover, one should also consider that, as already mentioned, EUTR was introduced before there was any FLEGT licensed timber available on the market. Thus, it is likely that EUTRis further discouraging EU importers from buying from VPA countries due to legal uncertainties and instead pushing them to seek substitutes for tropical timber imports. These trends should be seen against the EUTR background which seems to provide yet another reason for EU importers to switch to less contentious products (ITTO-TTM, 2013b).

In that event, one could argue that although legality verification has been raising awareness and has been fairly contributing in the fight against illegal logging and trade, at the same time it seems to have been lowering consumer confidence in exports coming from producers in the tropics, pushing European retailers to opt for more reliable timber sources from within their “own continent” or from North America.

Consequently, one can further assume that timber markets in Europe are likely to be subject to leakage from efforts to raise legality demands and certification in producing countries in the tropics further resulting in increased timber production in the Northern hemisphere (EU 27, Eastern Europe and North America). Such implications could result directly or indirectly from *market effects leakage*.
Market effects leakage occurs when policy actions in one place indirectly create incentives for third parties to increase activities elsewhere (Jonsson *et al.*, 2012) and is caused by a shift in market

equilibrium, e.g., legality verification and certification reducing the share of illegally sourced timber on the market and thus increasing prices and pressures on temperate forests, e.g., hardwoods coming from Eastern Europe or North America.

Equation (1) in section 2.2.1 is used to econometrically model import demand for tropical sawnwood. It was analyzed by means of OLS regression. The model explains 65% of the variation. Income as well as price elasticities are all significant at the 1% level. While tropical lumber import demand is inelastic to changes in GDP, it is elastic to changes in the price of tropical lumber as well as changes in the price of oak lumber (cross-price elasticity).The positive sign of the cross-price elasticity for oak indicates that oak lumber is a substitute for tropical lumber (Table 1). Further details can be found in Annex 2.

Table 1 Tropical lumber import demand elasticities

GDP	**$Price_{Tropical}$**	**$Price_{Oak}$**
0.768	-1.798	1.233

3.2.2 Trade diversion

Reports suggest that China sources timber from more than 80 different nations and is the world's second largest timber importer after the USA. More so, China imports more tropical timber than any other country in the world (Global Witness, 2009; Chunquan *et al.*, 2004). With most of the global tropical sawnwood trade concentrated in the Asian region, China consolidated its position as the dominant market for tropical timber imports (ITTO, 2011a). Figure 12 compares China's tropical sawnwood imports with EU imports. Our trade data analysis shows that China's imports over the last decade have almost doubled accounting for 41% of world imports in 2010. However, estimations on trade statistics coming from China are difficult to quantify.

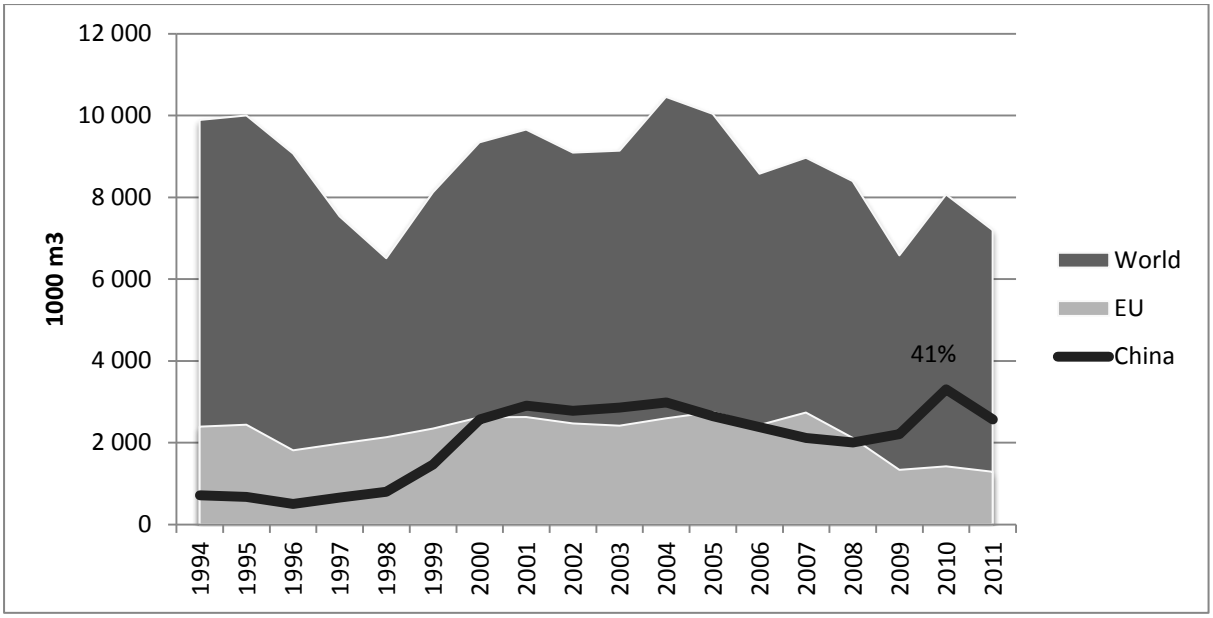

Figure 12 China's growing sawnwood imports. Source: ITTO (2013) trade data analysis

The quantity of illegal timber being imported into China was estimated to represent almost half of total timber imports. China also consolidated its position as a major tropical timber exporter and it is possible that as much as 40% of China's timber exports comprise illegal timber (Global Witness, 2009).

As the legality demands in the EU importing countries were growing, producing countries in South-east Asia, e.g., Indonesia and Malaysia were increasing their exports to other regional markets in Asia and the Middle East (ITTO-TTM, 2013a). This was also mentioned by respondents from Indonesia: "EU has too many regulations! Indonesia will see other potential countries for trading timber which have fewer regulations but are continuously buying the products" (Annex 1.2). Additionally, when asked which countries other than Europe are targeted for timber exports, Indonesian respondents named: "China, Japan, USA, Malaysia, Middle East, India, Singapore, and Africa" (Annex 1.2).

These developments are already apparent, as trade data shows that, during the past years Indonesia's exports to China have recovered, overtaking exports to the EU in the last years (Figure 13).

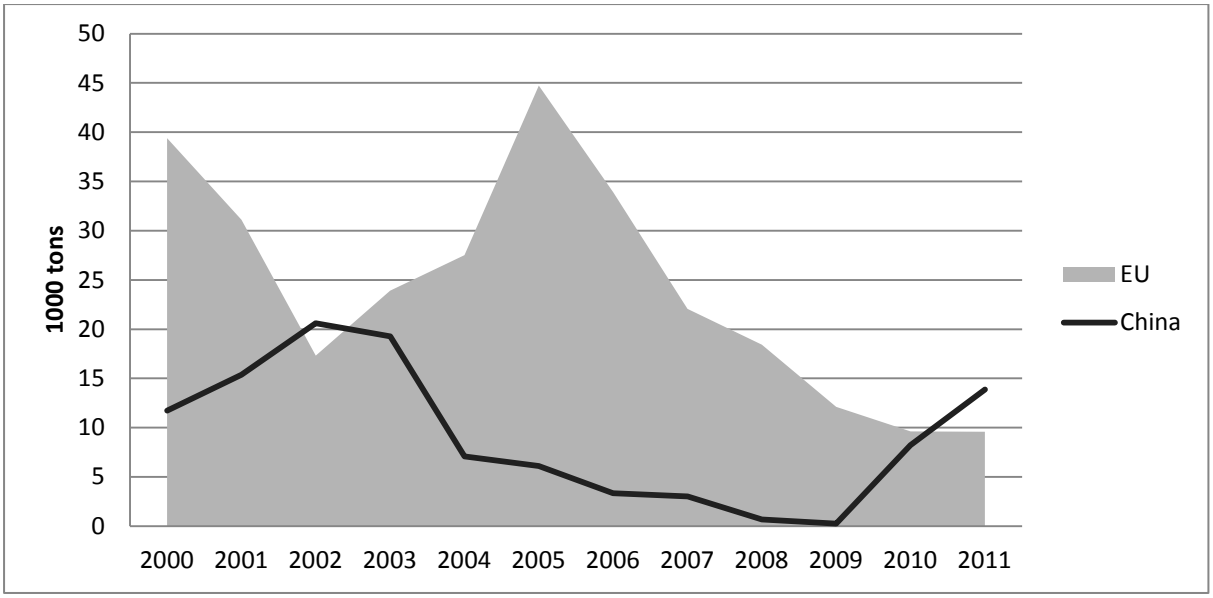

Figure 13 Indonesia's sawnwood exports to EU and China. UN COMTRADE (2013) trade data analysis

It is noteworthy that China imports significant amounts of tropical timber from most of FLEGT-VPA countries; thus, when timber exports to Europe from its VPA countries were declining, exports from China to Europe have been increasing (Global Witness, 2009; ITTO-TTM, 2013a; UNECE/FAO, 2011). This was also mentioned by UK experts who mentioned that it is "important to stress that China is a major and growing influence in global tropical wood trade flows and the recent decline in EU trade in tropical wood needs to be seen against this background" (Annex 1.1).

Studies point out that the EU FLEGT- VPA suffers from weaknesses: covering only the EU and its VPA partner countries; illegally sourced wood products can be redirected to markets outside EU, e.g., Indonesia directing exports to China and countries in the Middle East; the system may be omitted by exporting illegally sourced wood firstly to a non-VPA country, and afterwards exporting it legally to the EU as a further processed products, e.g., the high quantities of illegally sourced timber that are being imported into China, are processed, manufactured and afterwards exported to the EU as finished products such as plywood and veneer (Moiseyev *et al.*, 2010).

These loop-holes in the system have been detected and in 2009 the EU Commission has raised efforts to solve these issues by signing an agreement with China, "the EU-China Bilateral Coordination Mechanism on Forest Law Enforcement and Governance", in order to ensure the "integration of FLEG in EU and Chinese policies on development, trade & customs and other policies" (Global Witness, 2009). The effectiveness of these efforts is yet to show.

4. Conclusions

International market-based and regulatory/enforcement mechanisms such as third party verification schemes (FSC), the EU FLEGT Action Plan (through its VPA system and binding legislation EUTR) and international agreements on trade (CITES), are designed to combat illegal logging and its associated trade. Further, these mechanisms seem to be complementing and reinforcing each-other as there are indications to the effect that FLEGT and EUTR could reinvigorate the until now rather ineffective third party verification schemes. These efforts have been gaining momentum and have mobilized governments in producing countries, such as Indonesia, to increase efforts with regards to legality enforcement, sustainability and good forest governance.

Trade statistics show an obvious decline of tropical hardwood imports to the EU in general, and the UK in particular. Some of the reasons behind this decline could be:

(1) *A reduction of illegally sourced tropical hardwood* being placed on the international market. Reports point that this could be the case, although estimations on the scale of illegal logging are still very uncertain. This reduction in illegal logging could be associated with initiatives such as international conventions (CITES), the FLEGT Action Plan (with its two parts: VPAs and EUTR) or third party verification schemes (FSC). However, to what extent these initiatives have been effective is somewhat ambiguous and cannot be traced in the trade data.

(2) *Substitution*. Faced with decreasing imports of tropical timber, importers and manufacturers within the UK are opting for temperate hardwoods as a substitution for tropical hardwoods, e.g., Indonesian *meranti* being replaced in the flooring and joinery sectors by temperate hardwoods with similar properties, such as oak. The substitution of oak lumber for tropical hardwood lumber mentioned in the literature as well as in interviews and questionnaires is mirrored by the results of simple econometric analysis. Consequently, efforts to raise certification in producing countries in the tropics are likely to result in *market effects leakage*, i.e., increasing pressure on temperate forests. As a matter of fact, countries in Eastern Europe and North America have increased production and exports of temperate hardwoods. It is not unlikely that this development will continue in the near to medium term.

(3) *Fashion & Consumer confidence*. Interviews show that this substitution is related to a strong consumer preference and fashion for oak, but it is also the result of beneficial logistics and costs from trading within the continent. It is noteworthy that answers from UK respondents suggest that retailers within the EU are avoiding risks by buying hardwoods instead of tropical timber. Thus, the recent attention given to legality verification and certification seems to lower consumer confidence in timber coming from the tropics, rather than encouraging trade. Furthermore, the EUTR came in a time when tropical imports were already declining and European countries were still suffering from the economic

downturn. Even if EUTR was meant to encourage good forest governance and stir trade in legally sourced timber, the law is apparently, at least at this early stage, generating additional uncertainty and is likely to have an even more detrimental impact on imports of tropical hardwoods to the EU.

(4) *Trade diversion*. Interviews indicate that the growing number of regulations imposed by the EU has been discouraging trade on the supply side, in Indonesia, pushing exporters to seek other markets outside the EU, particularly in the Middle East and Asia. Thus, we are witnessing a diversion of exports of tropical timber to destinations with less stringent regulatory framework than the EU. Results from interviews and trade data analysis show that one of these destinations is China, recently becoming the biggest tropical timber importer in the world, and as well a manufacturer and exporter of tropical wood products to the EU. This exemplifies one weakness in the EU FLEGT- VPA system, namely that it can be omitted by exporting illegally sourced wood firstly to a non-VPA country, and afterwards exporting it legally to the EU as further processed products. However, the EUTR is intended to address this loophole in the regulatory framework.

Thus, the decreasing trend in the tropical timber trade can be associated with, on one hand, efforts to raise good forest governance and sustainable management in producing countries, on the other hand however, these tendencies can be a result of unintentional implications generated by these trade related initiatives. These include uncertain consumption patterns combined with an unstable European market weakened by economic downturn, increased risk advertence of European importers, and trade diversion to other markets. Therefore, it not unlikely that trade in tropical hardwoods in the near future will continue to be diverted from Europe to other regions.

Acknowledgments

My studies were supported by the European Commission through the ERASMUS MUNDUS scholarship for the double degree MSc Programme “European Forestry” between the *University of Eastern Finland* (Joensuu, Finland) and *Swedish University of Agricultural Sciences* (Alnarp, Sweden). Additional support came from the European Forest Institute and its regional office EFINORD in Copenhagen, Denmark. Further support was offered by the European Commission’s Joint Research Center (JRC) in Ispra, Italy. I gratefully acknowledge my supervisors Ragnar Jonsson, Hari Priyadi Rusantoyo, and Mika Mustonen.
I’d like to give a heartfelt, special thanks to Ulla Jansson for welcoming me into her bellowed family and for showing me the beauty of living “lagom” and for giving me an encouraging “kick-start” for my life in Sweden.
Last but not least, I am grateful to all my bellowed colleagues and friends: Ida Wallin, Andreas Magnusson, Maja Dietrich, Giulia Attocchi and Emma & Emil Sandell Festin. I couldn’t have done it without your support.

References

Aukland L., Costa P.M. and Brown S. (2003).A conceptual framework and its application for addressing leakage: the case of avoided deforestation. *Climate Policy*. 3: 123-136

Bernstein S. and Cashore B. (2000). Globalization, Four paths of internationalization and domestic policy change: the case of EcoForestry in British Columbia, Canada. *Canadian Journal of Political Science*.33: 67–99

Buongiorno J. (1977). Long-term forecasting of major forest products consumption in developed and developing economies. *Forest Science*. 23: 13–25

Buongiorno J. (1978). Income and price elasticities in the world demand for paper and paperboard. *Forest Science*. 24: 231–246

Carden C., Wijers R. and Zambon P. (2012). FLEGT, VPA, EUTR and their possible impact on the Bolivian timber sector. Final Report. CBI Policy Intelligence: FLEGT. CBI Ministry of Foreign Affairs of the Netherlands. CBI FLEGT, Bolivia

Carlsen K., Hansen C.P. and Lund J.F. (2012). Factors affecting certification uptake - Perspectives from the timber industry in Ghana. *Forest Policy and Economics*. 25: 83-92

Cashore B. and Stone M.V. (2012). Can legality verification rescue global forest governance? Analyzing the potential of public and private policy intersection to ameliorate forest challenges in Southeast Asia.*Forest Policy and Economics*. 18: 13-22

CITES (2013). What is CITES? http://www.cites.org/. Accessed 15 March 2013

Chen H.K. (2006). The Role of CITES in Combating Illegal Logging-Current and Potential. TRAFFICInternational, Cambridge, UK

Chimeli A.B., Boyd R.G. and Adams D.M. (2012).International timber markets and tropical deforestation: the evidence from prices. *Applied Economics*.44:1303-1314

Chunquan Z., Taylor R. and Guoqiang F. (2004).China's Wood market, Trade and the Environment. Science Press USA Inc. Monmouth Junction, New Jersey, USA

Durst P., McKenzie P.J., Brown C.L. and Appanah S. (2006).Challenges facing certification and eco-labeling of forest products in developing countries. *International Forestry Review*. 8: 193-200

Eba'aAtyi R., Assembe-Mvondo S., Lescuyer G. and Cerruti P. (2013).Impacts of international timber procurement policies on Central Africa's forestry sector. The case of Cameroon. Forest *Policy and Economics*.32: 40-48

Eisenhardt K.M. (1989). Building Theories from Case Study Research*. The Academy of Management Review*.14: 532-550

EFI (2011). Support study for development of the non-legislative acts provided for the Regulation of the European Parliament and of the Council laying down the obligations of operators who place timber and timber products on the market. Final report. Joesuu, Finland

http://www.efi.int/files/attachments/projects/timber_regulation/eutr-final_report.pdf. Accessed 05 February 2013

EFI (2013).Governance Research Agenda. Towards global forest governance, research and action. http://www.euflegt.efi.int/files/attachments/euflegt/publications_2013/flegt-in-action_research_agenda_280113_b.pdf . Accessed 06 February 2013

EUWID (2013). Area of FSC-certified forests in Indonesia raised to 1.2m ha. http://www.euwid-wood-products.com/news/roundwoodsawnwood/single/Artikel/area-of-fsc-certified-forests-in-indonesia-raised-to-12m-ha.html. Accessed 17 March 2013

FAO (2010). Global Forest Resources Assessment 2010. Country Report: Indonesia. Rome, FAO

FAO/ITTO (2011). The state of Forests in the Amazon Basin, Congo Basin and Southeast Asia. A report prepared for the Summit of the Three Rainforest Basins Brazzaville, Republic of Congo

FLEGT Action Plan (2003). Communication from the Commission to the Council and the European Parliament. Commission of the European Communities: Brussels, Belgium. http://www.euflegt.efi.int/files/attachments/euflegt/01flegtactionplanenfinalen.pdf. Accessed 05 February 2013

FLEGT Asia (2013). Indonesia and the EU adopt new timber trade legality rules in a move expected to boost bilateral timber trade. http://www.euflegt.efi.int/portal/news?bid=988. Accessed 28 February2013

FLEGT (2013).VPA Partner Countries. http://www.euflegt.efi.int/portal/home/vpa_countries/. Accessed 04 February 2013

FSC (2013). Facts & Figures. https://ic.fsc.org/facts-figures.19.htm . Accessed 20 February 2013

Glaser B. G and Strauss A. (1967). The Discovery of Grounded Theory: Strategies for Qualitative Research. Aldine Publishing Co, Chicago, USA

Global Witness (2009).A Disharmonious Trade. China and the continued destruction of Burma's northern frontier forests. A review by Global Witness. http://www.globalwitness.org/sites/default/files/import/a_disharmonious_trade_pages_1_15.pdf. Accessed 20 May 2013

Hapla F. and Mohr E. (2009). Identification and Description of Selected Tropical Timbers. Unpublished manuscript

Heeswijk L. van, and Turnhout E. (2012). The discursive structure of FLEGT (Forest Law Enforcement, Governance and Trade): The negotiation and interpretation of legality in the EU and Indonesia. *Forest Policy and Economics*. 32: 6-13

Hewitt J. (2007). An assessment of tree species which warrant listing in CITES. Milieudefensie (Friends of the Earth, Netherlands). http://www.illegal-logging.info/uploads/cites-report.pdf. Accessed 14 March 2013

Hirschberger P. (2008). Illegal wood for the European market. An analysis of the EU import and export of illegal wood and related products. WWF Germany, Frankfurt am Main http://assets.wwf.org.uk/downloads/european_market_wood_1.pdf . Accessed 03 March 2013

IDH (2013). Position Paper: Mainstreaming sustainability in tropical timber. Legality, sustainability and the business case for frontrunner collaboration. http://www.idhsustainabletrade.com/timber. Accessed 17 March 2013

ITTO (2011a).Annual Review and Assessment of the World Timber Situation 2011. Division of Economic Information and Market Intelligence: Yokohama, Japan.

ITTO (2011b).Status of Tropical Forest Management 2011.ITTO Technical Series No 38.International Tropical Timber Organization, Yokohama, Japan.

ITTO-TTM (2013a) Tropical Timber Market Report. Vol 17, Nr2, 16th-31st January 2013. http://www.itto.int/mis_download/ . Accessed 01 February 2013

ITTO-TTM (2013b) Tropical Timber Market Report. Vol 17, Nr10, 16th-31st May 2013. http://www.itto.int/mis_download/. Accessed 03 June 2013

IUCN (2013).The IUCN Red List of Threatened Species. http://www.iucnredlist.org/search. Accessed 14 March 2013

Jakarta Post (2013). Timber certification moves on despite EU agreement delay. http://www.thejakartapost.com/news/2013/05/28/timber-certification-moves-despite-eu-agreement-delay.html. Accessed 29 May 2013

Jonsson R., Mbongo W., Felton A. and Boman M. (2012). Leakage Implications for European Timber Markets from Reducing Deforestation in Developing Countries .*Forests*.3:736-744

Krugman P. (1980). Scale Economies, Product Differentiation, and the Pattern of Trade. *The American Economic Review*. 70: 950-959

Lawson S. and MacFaul L. (2010) Illegal logging and related trade indicators of the global response. Chatham House, London, UK http://www.chathamhouse.org/sites/default/files/public/Research/Energy,%20Environment%20and%20Development/0710pr_illegallogging.pdf. Accessed 13 March 2013

LEI (2013).Study of LEI and FSC. http://www.lei.or.id/comparability-study-of-lei-and-fsc. Accessed 12 March 2013

Li R., Buongiorno J., Turner J.A., Zhu S. and Prestemon J. (2008). Long-term effects of eliminating illegal logging on the world forest industries, trade, and inventory. *Forest Policy and Economics*.10: 480-490

Luttrell C., Obidzinski K., Brockhaus M., Muharrom E., Petkova E., Wardell A. and Halperin J. (2011). Lessons for REDD+ from measures to control illegal logging in Indonesia. United Nations Office on Drugs and Crime and Center for International Forestry Research, Jakarta and Bogor, Indonesia

Meyfroidt P., Rudel T.K. and Lambin E.F.(2010). Forest transitions, trade, and the global displacement of land use. Proceedings of the National Academy of Science U.S.A. 107: 20917–20922

Moiseyev A., Solberg B., Michie B., Kallio I. and Maarit A. (2010). Modeling the impacts of policy measures to prevent import of illegal wood and wood products. *Forest Policy and Economics*.12: 24-30

Murray B.C. (2008). Leakage from an Avoided Deforestation Compensation Policy: Concepts, EmpiricalEvidence, and Corrective Policy Options. Nicholas Institute for Environmental Policy Solutions, Duke University: Durham, NC, USA

PEFC (2013).Facts & Figures. http://www.pefc.org/about-pefc/who-we-are/facts-a-figures. Accessed 20 February 2013

Pepke E. (2013).European Timber Market Developments to Prevent Illegal Trade. Powerpoint presented at the Small Log Conference in Coeur d'Alene, Idaho, USA

Putz F.E., Zuidema P.A., Pinard M.A., Boot R.G.A., Sayer J.A., Sheil D., Sist P., Elias and Vanclay J.K. (2008). Improved tropical forest management for carbon retention. *Plos Biology*.6: 1368-1369

Ragin C. (1987). The comparative method: moving beyond qualitative and quantitative strategies. University of California Press, Berkeley, CA, USA, p. 185

Sann K. And Thornber K. (2003). Impact of market-based instruments and initiatives on the trade in forest products and sustainable forest management. Global Project: Impact Assessment of Forest Products Trade in the Promotion of Sustainable Forest Management .LTS International Ltd.http://foris.fao.org/static/data/trade/pdf/lts.pdf. Accessed 21 April 2013

SCA & WRI (2004)."Illegal" Logging and Global Wood Markets: The Competitive Impacts on the U.S. Wood Products Industry. http://www.illegal-logging.info/uploads/afandpa.pdf . Accessed 14 March 2013

Schwarze R., Niles J.O. and Olander J. (2002).Understanding and managing leakage in forest–basedgreenhouse–gas–mitigation projects. *Philosophical Transactions of the Royal Society of London*. 360:1685–1703

TTF (2013).Responsible Sourcing.http://www.ttf.co.uk/Environment/Responsible_Sourcing.aspx. Accessed 08 April 2013

UNECE/FAO (2011). Forest Products Annual Market Review 2010–2011. Geneva, Switzerland, UNECE and Rome, FAO

UN COMTRADE (2013). http://comtrade.un.org/db/mr/rfCommoditiesList.aspx?px=H1&cc=4407 (13.02.2013)

USDA(2012).CITES I-II-III Timber Species Manual. http://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/cites.pdf. Accessed 14 March 2013

WWF (2013).Why We Need the GFTN and How it Works. http://gftn.panda.org/about_gftn/ . Accessed 04 March 2013

Yin K. (1984).Case study research. Sage, Beverly Hills, CA, p. 160

Annex 1: Questions & answers

Annex 1.1 Questions and answers from the UK

The interviews have been conducted either online, via E-mail, per telephone (one respondent) or during the"Global Timber Trade and Legality Legislation" conference in Cologne, Germany, during March-May 2013. The questionnaires were directed to respondents coming from various organizations (EFI FLEGT facility, Forest Industries Intelligence Ltd. in the UK), independent consultants and timber companies within different umbrella organizations (the UK Timber Trade Federation and the London Hardwood Club).

We have received 7 answers from respondents in Europe: 4 responses from experts (marked here as: a1, a2, a3 and a4) and 3 responses from companies (marked as: b1, b2, and b3).

1. Which countries are your main suppliers of tropical hardwood?

a1: Africa, Asia, South America

a2: Main tropical wood suppliers to EU are Cameroon, Malaysia, Brazil, Gabon, Indonesia

a3: Congo/Cameroon, Indonesia, Brazil, Gabon

a4: Malaysia, Cameroon, Ivory Coast, Brazil, Indonesia

b1: Malaysia, Cameroon, Congo

b2: Indonesia, Malaysia, Brazil, Peru, Ghana, Cameroon, Congo Rep., CAR

b3: Africa, South America, Asia

2. Provided that you import and/or use tropical hardwood from Indonesia; which is the main species?

a1: ramin

a2: Don't trade personally - however main Indonesian species are bangkirai for decking and a wide range of meranti species plus keruing for plywood

a3: Meranti, Keruing

a4: Meranti

b1: Bangkirai

b2: Bangkirai

b3: -

3. Which countries are your main suppliers of temperate hardwood?

a1: USA

a2: Main internal EU suppliers are France and Germany, main external suppliers are the USA, Croatia and Ukraine

a3: USA, Croatia

a4: USA, EU member states

b1: USA/Croatia/Hungary/France/Germany/Poland

b2: USA/Canada/Germany/France

b3: USA, all over Europe

4. Which is the most important temperate hardwood species?

a1: White oak

a2: Oak now dominates European temperate hardwood trade - beech is generally "out of fashion"

a3: White Oak, White Ash, Poplar, Black Walnut, Hard Maple, Black Cherry

a4: Oak, beech

b1: Oak

b2: Ash/Oak (White)/Maple/Cherry/Tulipwood/Walnut

b3: White oak

5. Have you noticed any shift in the ratio between tropical and temperate hardwood imports?

a1: YES

a2: YES

a3: YES

a4: YES

b1: NO

b2: NO

b3: NO

5a.If YES, how has the ratio changed?

a1: EU imported 31% of global tropical timber in 2007

a2: Trade statistics show clear that share of sawn wood imported into the EU from tropical regions declined from 53% to 42% between 2003 and 2012. This probably underestimates the loss of share because domestic (internal EU) supplies of sawn hardwood (particularly European oak) have also increased their share of the market.

a3: 10 years ago, the split was 55% tropical / 45% temperate.

It is now 30% tropical / 70% temperate

a4: Imports of tropical timber have declined

b1: -

b2: -

b3: no shift, absolutely nothing, same ratio

5b.Can you offer any explanation(s) for this shift?

a1: EU imported 31% of global tropical timber in 2007, but only 19% in 2011. I think this was influenced by multiple factors, including the global economic recession in 2008 and 2009. Also I suspect, but cannot justify with statistics, that tropical timber buyers are concerned with deforestation and illegality, and hence they buy temperate...or worse, non-wood.

a2: Combination of factors including: declining availability of tropical wood due to past over-harvesting and increasing proportion now being diverted to China, lack of competitiveness of tropical wood due to long supply chains, high commercial and financial risk associated with dealing with and stocking tropical wood, the strong fashion for oak which is more readily available and can be purchased "little and often" in the furniture and flooring sector, increasing availability of substitutes - e.g. cheap "Mixed Light Hardwood" plywood from China, new panel products that can be used in outdoor applications formerly dominated by tropical wood, heat treated hardwoods for external applications, wood plastic composites, new artificial surfaces replacing hardwood veneers etc., also move to pre-fabricated factory finished units in the joinery sector means there's less of a need for easily worked "jack of all trades" wood on construction sites - a niche formerly occupied by tropical wood.

a3: Environment awareness / fashion / validity of documentation.

a4: Recession, risk avoidance by major importers.

b1: -

b2: -

b3: fashionable shifts.

6. What do you think about the future (looking ten years ahead) of tropical timber in your country?

a1: Increasing

a2: Decreasing

a3: Decreasing

a4: Unchanged

b1: Unchanged

b2: Decreasing

b3: Unchanged

6a.If you foresee a change in the role/importance of tropical timber, can you please offer an explanation for this change?

a1: Hopefully a restoration of consumer confidence, in part driven by an effective implementation of the FLEGT Action Plan, including the EUTR**.**

a2: As above - I suspect that tropical wood will be increasingly restricted to a very narrow niche market in the EU. Important to stress that China is a major and growing influence in global tropical wood trade flows and the recent decline in EU trade in tropical wood needs to be seen against this background.

a3: -

a4: Most of it is now already FSC and PEFC certified, a decrease due to excluding illegal products might become offset by an increase of tropical timber that becomes more acceptable when illegal exports to China and elsewhere in East Asia reduce.

b1: -

b2: Tropical Hardwood volumes have decreased in UK& Europe during recent years, poor economical outlook could be main driver but there is also a fashion for "lighter" colored hardwoods which temperate species fulfill. Availability through supply chain is also a factor with better access to raw material from temperate supply regions as well as obvious geographical benefits trading within our own continent.

b3: -

7. Which effect do you expect that the European Union Timber Regulation (EUTR) will have on the share of tropical timber in total hardwood usage in your country the next ten years?

a1: increasing

a2: -

a3: -

a4: unchanged

b1: unchanged

b2: decreasing

b3: unchanged

7a.Could you please provide a brief explanation of why you foresee this effect of the EUTR?

a1: Restoration of consumer confidence.

a2: -

a3: Demand for more transparency of legality.

a4: Prices may rise due to low availability of FSC /PEFC (certified but users of tropical timber are/or might be) insensitive to price (see also 6). EUTR will probably increase certification because it helps mitigating the risk- provided it really does (chain of custody/traceability to stump/ source remains a problem).Also, certification in SE Asia is increasing, mainly in Sabah region.

b1:-

b2: EUTR is a fundamental advancement & should be welcome by all responsible operators, it is expected & sincerely hoped to reduce illegal logging which adversely affects indigenous populations & that must be the aim of every trader of forest product.

b3: Absolute nonsense since they don't recognize FSC and PEFC.

Annex 1.2 Questions and answers from Indonesia

The interviews for Indonesia have been conducted online, via E-mail during April-May 2013. The questionnaires were directed to experts, civil society representatives and timber companies.

We have received 5 answers: 3 responses from experts (marked here as: c1, c2 and c3) 1 response from a civil society representative (marked as: d1) and one response from a timber company (marked here as e1).

1. Which European countries are the main importers of Indonesian tropical timber?

c1: Netherlands

c2:UK, Netherlands, France

c3: UK, Netherlands, France, Belgium, Spain

d1: Netherlands

e1: Netherlands

2. Other than Europe, which countries are targeted for tropical timber exports?

c1: China, Japan, Middle East

c2: Japan, USA, China, Malaysia, Singapore, India, Africa

c3: US, Japan, China and Middle East

d1: Japan

e1: America (USA)

3. Which Indonesian tropical timber species are exported to Europe?

c1: Shorea, Intsia

c2: Teak, Shorea, Merbau, Ramin

c3: Most of Depterocarp (Shoreasp)

d1: Dipterocarp sp.

e1: Meranti

4. How is the trend of European demand for Indonesian tropical timber over the last decade?

c1: Decreasing

c2: Decreasing

c3: Decreasing

d1: Unchanged

e1: Decreasing

4a.Can you provide a brief explanation on this change?

c1: global crisis in Europe

c2: Decreasing due to several reasons e.g. strict regulations from Indonesia government/law enforcement, international regulations and not to mention because of economic crisis in Europe. Don't forget to mention that illegal timbers were flooding in the international market in 2000s. Illegal logging activities are sponsored by people from neighboring countries i.e Malaysia. Then Malaysia produced its timber to be exported to the international market including to Europe. But domestic market is actually increasing or at least quite stable.

c3: For the last five years exports timber product to European was decreasing with the many reasons: Illegal Logging Issue, number of EU country has problem for financial and other new competitive from Russia and South America and also Africa (Liberia, Gabon).

d1: -

e1:I am currently working in the timber company in the field so I don't exactly to which countries Indonesia timbers are exported

5. What is the trend, regarding the extent of European regulations on tropical timber imports, over the last decade?

c1: Increasing

c2: Increasing

c3: Unchanged

d1: Unchanged

e1: Increasing

5a.Can you provide a brief explanation on this change?

c1: European community realize the importance of timber legality or timber origin

c2: European need tropical timber but their regulations are always changing. Too many regulations! Indonesia will see other potential countries to trade their timber with less regulations but continuously buying the products.

c3: -

d1: -

e1: Too many regulations from EU regarding with tropical timber trading that create disincentives for the companies e.g. increasing production costs while the timber price is not increasing**.**

6. What impact do you think the following mechanisms will have on Indonesian (tropical) timber exports to Europe (1- encouraging; 2- unchanged; 3- discouraging)

FLEGT: encouraging (c1, c3) ; unchanged (e1) ; discouraging (c2, d1)

EUTR: encouraging (c1, c3) ; unchanged (e1) ; discouraging (c2, d1)

FSC/Certification: encouraging (c1,c2, c3) ; unchanged (e1) ; discouraging (d1)

6a.Can you provide a brief explanation for why you foresee these effects?

c1: will change the mind-set of forest concessions owner in Indonesia

c2: EU develops lots of regulations while still purchasing timbers from the tropical countries that are less enforced regulations.

c3: The market has a guarantee that timber product come from legal source and well managed forest and sustained.

d1: -

e1: Seemingly that by increased number of regulation on timber trading, the production of tropical timber is decreasing, the price is also declining, so the economic principal on supply and demand of timber is not well applied here.

7. What do you think about the future (looking ten years ahead) of Indonesian exports to Europe?

c1: Unchanged

c2: Decreasing

c3: Increasing

d1: Decreasing

e1: Decreasing

Can you provide a brief explanation for this change?

c1: will change when global crisis in Europe finished

c2: if regulations are too many, this will discourage Indonesia timber market. Then Indonesia will seek other countries. That's logic!

c3: Most of Indonesia timber industry now modified the factory structure to capture EU market with special product from Indonesia Hard Wood timber like outdoor furniture where the lest competitive from other country

d1: No more resources left or at least very limited.

e1: Due to declining trend on tropical timber export to Europe, the market there is not interesting anymore. The private company will change their core business on timber into other sectors. If it is the case, there is big worry that forest area will be converted to non-forested area (i.e. mining, plantation etc.), so the forest area will be significantly reduced. So, be aware of it.

8. By having SFM certified status, the timber companies get:

c1: Better company image

c2: Better company image

c3: More market access

d1: Better company image

e1: Better company image

Annex 2: Regression results

Model	Variables Entered	Variables Removed	Method
1	Poak, GDP, Ptrop[b]	.	Enter

a. Dependent Variable: P_tropical

b. All requested variables entered.

P_{oak} = the real oak sawnwood import price

$P_{tropical}$ = real tropical sawnwood import price

GDP = Real gross domestic product, in constant US$, used as demand shifter

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,810[a]	,657	,649	,844810218205661

a. Predictors: (Constant), ln_Poak, lnGDP, lnP_trop

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	172,057	3	57,352	80,358	,000[b]
	Residual	89,927	126	,714		
	Total	261,983	129			

a. Dependent Variable: lnM_tropical

b. Predictors: (Constant), ln_Poak, lnGDP, lnP_trop

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-6,170	2,913		-2,118	,036
	lnGDP	,768	,092	,457	8,389	,000
	lnP_trop	-1,798	,181	-,541	-9,911	,000
	ln_Poak	1,233	,216	,316	5,711	,000

Significant

a. Dependent Variable: lnM_tropical