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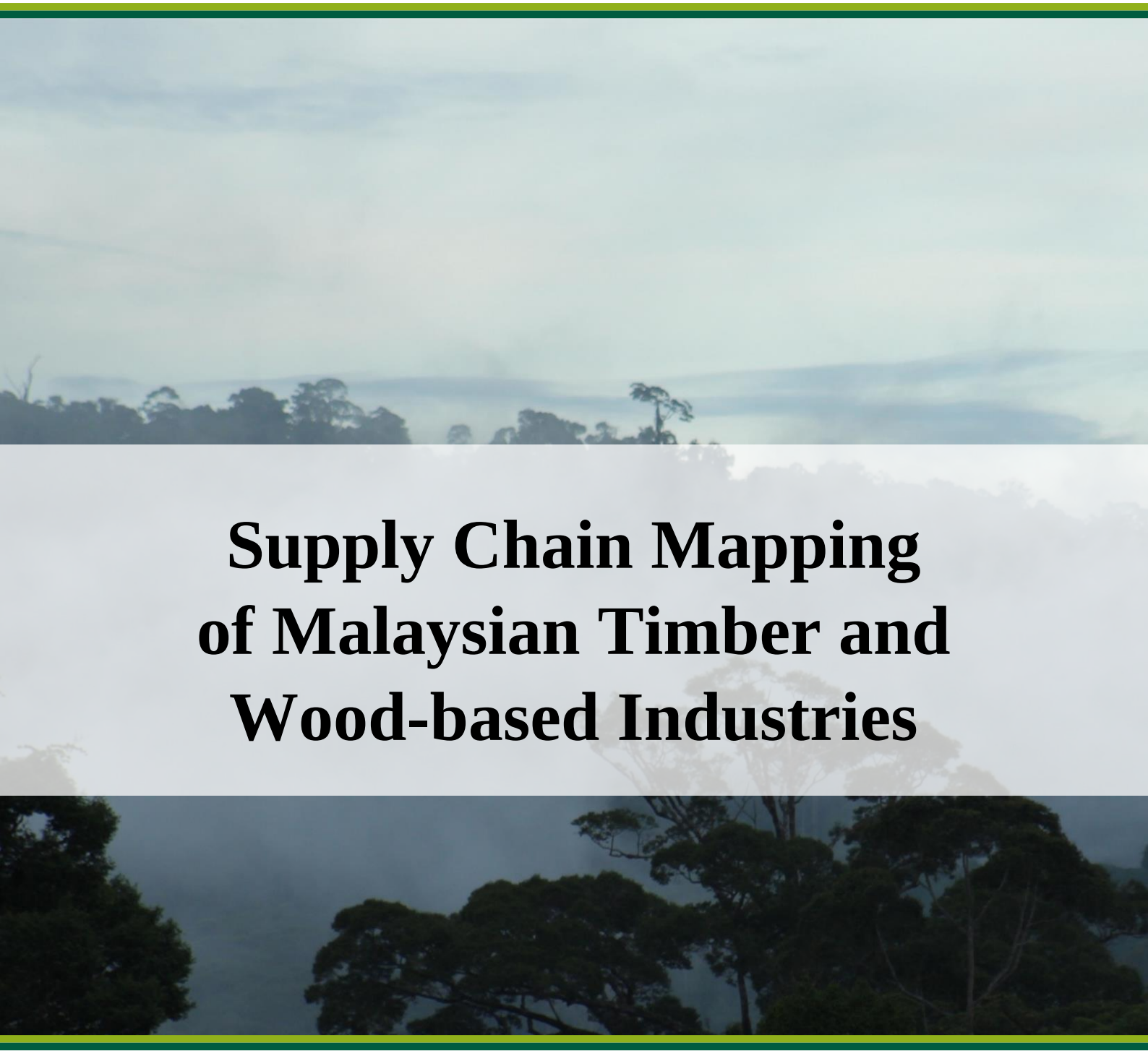

Supply Chain Mapping of Malaysian Timber and Wood-based Industries

This report has been produced by NEPCon, on behalf of WWF-Malaysia. Field research was conducted in collaboration with the Malaysian Wood Industries Association (MWIA).

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Contents

1. List of Abbreviations

AILPA	Australian Illegal Logging Prohibition Act
BJC	Builders' Joinery and Carpentry
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPI	Corruption Perceptions Index
DDS	Due Diligence System
EIA	Environmental Impact Assessment
EUTR	European Union Timber Regulation
FDPM	Forestry Department Peninsular Malaysia
FDS	Forest Department Sarawak
FELCRA	Federal Land Consolidation and Rehabilitation Authority
FELDA	Federal Land Development Authority
FLEGT	Forest Law Enforcement, Governance and Trade
FM/CoC	Forest Management/ Chain of Custody
FRIM	Forest Research Institute Malaysia
FSC	Forest Stewardship Council
GFR	Global Forest Registry
GTA	Global Trade Atlas
HCVF	High Conservation Value Forest
IUCN	International Union for Conservation of Nature
LVL	Laminated veneer lumber
MACC	Malaysian Anti-Corruption Commission
MPIC	Ministry of Plantation Industries and Commodities
MPPMA	Malaysian Pulp & Paper Manufacturers Association
MTCC	Malaysian Timber Certification Council
MTCS	Malaysian Timber Certification Scheme
MTC	Malaysian Timber Council
MTH	Mixed Tropical Hardwoods
MTIB	Malaysian Timber Industry Board
MWIA	Malaysian Wood Industries Association
MYTLAS	Malaysian Timber Legality Assurance System
NCR	Native Customary Rights
NGO	Non-Governmental Organisation
OLB	Origine et Légalité des Bois
PEFC	Programme for the Endorsement of Forest Certification
PRF	Permanent Reserved Forest
RISDA	Rubber Industry Smallholders Development Authority
SFC	Sarawak Forestry Corporation
SFD	Sabah Forestry Department
SFM	Sustainable Forest Management
SSI	Semi-Structured Interview
STIDC	Sarawak Timber Industry and Development Corporation
TLAS	Timber Legality Assurance System
TLTV	Timber Legality and Traceability Verification
VLC	Verification of Legal Compliance
VLO	Verification of Legal Origin
VPA	Voluntary Partnership Agreement
WWF	World Wildlife Fund

2. Introduction

2.1 Background

Malaysia is a major contributor to global timber trade flows and consumption. Timber and wood-based products also serve as important contributors to Malaysia's economy, and utilisation of natural resources has become an integral part of meeting the country's goal of becoming a self-sufficient industrialised nation by the year 2020 – known as 'Vision 2020'. Indeed, in 2011 the timber and wood-based industries contributed the equivalent of 2% of Malaysia's gross domestic product and employed more than 210,000 people (Hoare, 2015). Malaysia is one of the world's largest exporters of tropical timber and is the world's third largest producer of rubber and second largest producer of oil palm (ANZ, 2015; MPIC, 2009). Together with cocoa, tobacco and pepper these commodities dominate the growth of the natural resources sector.

As Malaysia's utilisation of domestic and imported natural resources has increased, so too has scrutiny over the legality and sustainability of this trade. Concern over deforestation and degradation is particularly acute in a country where forest covers more than 50% of the land area, or more than 18 million hectares (Transparency International, 2015). This vast expanse of forest harbours a wealth of biodiversity and is home to a number of Indigenous communities[1] and can be threatened by unsustainable natural resource extraction. Clearance of forest land for oil palm and rubber can be a major threat to natural forest ecosystems, as can degradation of forests through unsustainable timber extraction, which acts as a stepping stone to deforestation. These threats are not unique to Malaysia but occur around the world wherever fierce economic growth competes with the presence of valuable natural resources.

As such, commercial companies operating in the timber and wood products sector face a number of stakeholders concerned about sustainability and legality risk. These stakeholders include, *inter alia;* governments, non-governmental organisations (NGOs), local communities, concerned buyers and financial investors. Each of these stakeholders can variously impact upon organisations operating in the timber sector.

To address these concerns, and to ensure the continued commercial viability of the timber sector, the Malaysian Government introduced the National Timber Industry Policy (2009–2020). This policy was aimed at ensuring the long-term sustainability in terms of environmental resources, human capital and technology development. The Malaysian Government has also supported the uptake of forest certification, especially in Peninsular Malaysia where eight states have achieved Malaysian Timber Certification Scheme (MTCS) certification – a national certification scheme recognised under the Programme for the Endorsement of Forest Certification (PEFC) (PEFC, 2015b).

On the demand side, governments around the world have sought to tackle deforestation by introducing illegal logging legislation and responsible public procurement policies. Legislation has been introduced in the EU, USA and Australia to halt the sale of illegally harvested timber products. This places extra obligations on Malaysian companies to provide supply chain information downstream to buyers who are legally obliged under the regulations to demonstrate that their purchases are at low-risk of having been illegally harvested. Public procurement policies in key markets such as the Netherlands and the UK have also served to promote responsible forest management and sustainability certification. The Dutch parliament is currently discussing recognition of the MTCS system under the national timber procurement policy, which is designed to ensure utilisation of responsibly sourced timber by the Dutch public authorities (MTCC, 2014).

NGOs have also played a key role, by raising the profile of alleged unsustainable environmental practices, poor working conditions and abuse of traditional and civil rights. Global Witness investigations have proved integral in highlighting illegal harvesting in Sarawak timber concessions (Global Witness, 2012, 2013), whilst research

[1] Malaysia has 3.5 million Indigenous people, many of whom still rely on forests for their livelihoods (Yong et al. 2014).

by Friends of the Earth Malaysia has reported potential customary land rights violations (FOE, 2013). Local communities also engage in the debate by direct action; disrupting commercial activities (sometimes violently) to protest for their right to free, prior and informed consent and customary land rights (Borneo Post, 2011a, 2011b; Survival International, 2009). As well as the direct revenue losses from inability to harvest, such community conflicts also generate unwanted media attention and negatively impact the public image of timber companies, causing pressure for the industry to move towards legal and sustainable practices.

Forest certification has played a key role globally, with end-users and large retailers increasingly choosing to source wood products certified to internationally recognised sustainability schemes. For example, the Forest Stewardship Council (FSC) certification logo was reported in 2015 to be recognised by 50% of individuals sampled in the UK, 20% in Australia and 17% in Sweden (FSC, 2013, 2014) whilst large retailers such as Marks & Spencer and IKEA seek FSC certified wood in preference to other sources and both have the long-term aim to source 100% of their products from sustainably certified forests (IKEA, 2015; M&S, 2015).

Pressures for proof of legal and sustainable practices also come from financial institutions. These stakeholders have moved towards imposing stricter rules as a prerequisite to companies obtaining funding over the past 20 years. For example, HSBC has implemented a Forestry Policy aimed at avoiding investment in illegal logging. This includes avoiding funding companies that are directly involved in illegal practices but also avoiding companies involved in the purchase of illegally harvested products (HSBC, 2014b). Indeed, there are now a number of initiatives and tools available to the financial sector aimed at raising awareness of ethical investment in the timber industry. In 2010, Pricewaterhouse Coopers released their Sustainable Forest Finance Toolkit aimed at financial institutions (PwC, 2010) and in 2012 WWF released their Guide to Responsible Investment in Agricultural, Forest, and Seafood Commodities (Levin et al., 2012). In addition, a plethora of NGOs promote integration of Environmental, Social and Governance practices in financial decision-making (Brotto & Cupit, 2014; Global Witness, 2012; Stampe et al., 2015).

These various groups of stakeholders require robust and transparent data on supply chains on which to assess companies' performance – data which are often not easily available or collated in a way which can be utilised by stakeholders for meaningful assessment.

2.2 Forest governance in Malaysia

Malaysia has an estimated 18.06 million hectares of forested land (MPIC, 2014a). The largest portion of this (7.8 million ha, 43%) is located in Sarawak. Another 5.83 million hectares (32%) are located in Peninsular Malaysia and 4.43 million hectares (25%) in Sabah. Many of the wood and paper products consumed and exported by Malaysia derive from the country's own domestic and often natural forest areas.

It is thought that up to 80% of the forest in Sarawak and Sabah has been heavily impacted by commercial harvesting operations; with the annual deforestation rate between 2000 and 2012 standing at 1.6% (Hoare, 2015). The main drivers of degradation and deforestation are expansion of agricultural plantations for oil palm and rubber as well as timber harvesting and commercial tree plantation for timber and pulp production (Hoare, 2015). The Ministry of Plantation Industries and Commodities (MPIC) estimated that by 2014, 5.4 million ha of land in Malaysia would be planted with oil palm and over 1 million ha with rubber (MPIC, 2014c).

Malaysia operates a federal governance system, whereby implementation of forest policy and management falls under the jurisdiction of each of the 13 states (11 in Peninsular Malaysia, plus Sabah and Sarawak on Borneo). However, the federal government is responsible for providing overall policy direction for the forestry sector, towards which the states must work. The National Forestry Policy of 1978 was developed to harmonise forest management in Malaysia and led to the National Forestry Act (1984), which was replaced by the National Forestry (Amendment) Act (1993). These policies and acts are aimed at protecting forests from illegal logging, unauthorised settlement and other unpermitted activities. Forestry policy is governed by two bodies at the federal level: the Ministry of Natural Resources and Environment and the MPIC. Technical assistance is also provided to the states by the federal body, the National Land Council (previously the National Forestry Council

or NFC). This body was tasked with harmonising approaches to Sustainable Forest Management (SFM) within Malaysia.

Forest land in Malaysia is divided into four main categories:

(1) Permanent Reserved Forest (PRF)
(2) State land & alienated land
(3) National Parks/ Wildlife & Bird Sanctuaries (collectively known as protected areas)
(4) Plantations forests

Permanent Reserved Forest (PRF) is forested land managed by state governments for either commercial production or as protection forest. Around 78% of the total PRF area is utilised commercially according to SFM practices, whilst the remaining area is designated as protected. Such protected forest includes: non-harvestable forest (areas above certain altitudes and slopes), virgin jungle reserves, recreational forest, catchment forest and reservoirs and forest for federal purposes (MTC, 2010). State land and alienated land can be either publicly or privately owned and can be used for timber harvesting in the process of conversion to other land-uses. National Parks/ Wildlife & Bird Sanctuaries are managed by state governments and are totally protected. Plantation forests may be publicly or privately owned and are allocated for the production of commercial tree plantations.

In Peninsular Malaysia, there is common legislation and regulation for forest management, whilst regulations in Sabah and Sarawak differ somewhat. In Sabah, the State Forest Policy of 1954 and the Forest Enactment policy of 1968 are the most important laws governing the forestry sector. In Sarawak, the Statement of Forest Policy of 1954 (currently undergoing revision) and the Forest Bill of 2015 govern the forestry sector.

The Forestry Department of Peninsular Malaysia (FDPM) and the State Forestry Departments in Peninsular Malaysia are responsible for the management of its forests. The Sabah Forestry Department (SFD) is responsible for the management of forests in Sabah, control of harvesting operations and the requirement for payments of royalties in line with the Forest Enactment 1968. The Forest Department Sarawak (FDS) and the Sarawak Forestry Corporation (SFC) are responsible for the management of forests in Sarawak. The FDS is responsible for forest management whilst operational aspects are the responsibility of the SFC.

Under Malaysian law, all forest management areas in Malaysia require an SFM plan for each concession or harvest area in order to ensure sustainability of operations. In addition, all logging operations in areas larger than 500 ha and pulp and paper mills producing more than 50 tonnes per day, require an Environmental Impact Assessment (EIA) to operate[2]. To extract wood from the PRF an operator must have a valid harvesting license, which is issued by the relevant authority in each state. Each lorry load of felled logs is inspected by relevant authorities for payment of royalties and issued with a Removal Pass before the logs can be transported to the sawmill. Mills are required to maintain Removal Passes and a log book of volumes purchased and processed. Import and export licenses (where applicable) are issued for timber products by the relevant authority e.g. Malaysian Timber Industry Board (MTIB), SFD or Sarawak Timber Industry and Development Corporation (STIDC).

A non-exhaustive list of documentation to demonstrate compliance with applicable legislation can be seen in Figure 1.

2.3 Legality and sustainability risk in timber supply chains

A risk-based approach is increasingly being used by companies in the timber sector to assess legality and sustainability risk. This approach is the same as that which is adopted by timber regulations, such as the European Union Timber Regulation (EUTR) and Australian Illegal Logging Prohibition Act (AILPA) and

[2] In Sarawak, logging operations require an EIA for: (i) Extraction or felling of timber from any area exceeding 500 hectares which have previously been logged or in … coupes have previously been declared to have been closed by the Director of Forests, and/or (ii) Extraction or felling of any timber within any area declared to be a water catchment area.

involves companies conducting 'Due Diligence' on timber supply chains. However, more and more companies are also applying the same risk-based approach to sustainability issues. Such an approach allows organisations to allocate their time and resources to those areas where risks are perceived to be highest.

The process of collecting information on supply chains and assessing this information to identify where risk may be present is called 'due diligence'. The due diligence process follows a stepwise approach, as depicted in Figure 2. First, relevant information on timber supply chains is collected from direct and indirect suppliers (e.g. species, origin, volumes, certification status), public sources (e.g. news reports, NGO research, lists of endangered species) and any other sources that may provide relevant information. This information is then assessed to determine the level of risk present in the specific supply chain. Finally, if any risks are identified these should be mitigated to a level where they can be considered negligible.

Figure 1. The due diligence process

This due diligence approach is increasingly being employed by commercial organisations whether or not they are subject to mandatory requirements under national laws. It is an approach that is also used by large retailers and financial institutions to avoid reputational risk as well as being used by NGOs to contextualise risk and by governments as part of responsible public procurement schemes.

When assessing legality and sustainability risk in timber supply chains, buyers and investors should take into account any risks identified at the macro-level, related to country of harvest, documented illegal/unsustainable harvesting of species, etc. They should then specify whether any of the risks are applicable and present in the particular sub-national region or forest concession from which their suppliers/fund-recipients source their products. If risks are present they should be mitigated or avoided, to ensure only legal and/or sustainable timber is sourced. Often it is possible to implement mitigation actions and then reassess the risk. In the process, either risks are effectively mitigated or they continue, in which case further specification and mitigation should occur, until risks are reduced to negligible levels. Thus risk assessment is an iterative process.

Risks in the forestry sector are many and diverse, and can be broadly split into two forms: legality risk and sustainability risk (see Figure 3).

Definitions

Where **'risk'** is identified in timber supply chains this may take two forms:

- **Legality risk** – Risk that timber and wood products were not harvested in compliance with applicable laws in the country of harvest
- **Sustainability risk –** Risk that timber and wood products were harvested in a way that depletes or diminishes the capacity of natural ecosystems to regenerate and support life.

Figure 2. Definitions

Compliance with government legislation is a minimum requirement for all companies. Yet many companies aim to exceed legal requirements and implement sustainable practices that go above and beyond national laws. Companies must avoid legality risk, both due to the legal penalties that may be incurred due to infringements, but also due to the possible brand damage resulting from association with illegal practices. Whilst many sustainability requirements are voluntary, non-conformance with these requirements may also risk brand damage.

3. Objective and Research Questions

This research aims to provide an overview of the Malaysian timber trade and offer an insight into specific supply chain issues in the timber sector. This is done to aid evaluation of legality and sustainability issues relevant to a variety of stakeholders; and specifically to support stakeholders in the Malaysian timber sector itself in moving towards ensuring timber legality (at a minimum) and sustainability (as standard practice). This will allow industry stakeholders to focus on addressing the most pertinent issues and communicate their legality and sustainability achievements, to obtain ethical investment and trade.

To meet these aims, an overall objective and a number of research questions have been formulated.

3.1 Objective

The overall objective of this research study is to provide a detailed understanding of the Malaysian timber industry, through characterisation of (i) the key Malaysian timber and wood-based industry supply chains, (ii) identification of legality and sustainability risks within these supply chains and (iii) perspectives on potential future trends in the Malaysian wood industry and trade.

3.2 Research questions

To meet this objective, a number of research questions have been formulated in three broad groupings:

Supply Chain Mapping

- What are the key timber and wood-based products produced and traded in Malaysia?
- Who are the key companies in Malaysian timber and wood-based industry supply chains?
- What are the current production and trade volumes of certified and non-certified products?
- What is the typical structure of timber and wood-based industry supply chains?

Legality and Sustainability Assessment

- What information can be obtained to assess risk in supply chains and what are the key gaps in supply chain information?
- What are the main legality and sustainability risks in supply chains?
- What are the potential mitigation options to address these legality and sustainability risks?
- What policy options may be employed to increase legality and sustainability of Malaysian timber and wood-based product supply chains?

Future Trends

- What are the expected future trends relating to the points above?

4. Limitations of the Study

There were a number of limitations encountered during this research study. The main challenges are outlined below.

4.1 Challenge to engage the timber industry

A large number of companies were contacted regarding participation in this research study and many decided not to engage for reasons relating to confidentiality and fear of being accused of illegality. Those companies that did engage may therefore represent the most aware players in the industry, wishing to participate to gain feedback on their current sourcing strategies.

The furniture industry in Malaysia is a particularly closed section of the market. None of the largest companies approached wished to participate and obtaining access to data on this sector was difficult.

It is similarly difficult to obtain data on the pulp and paper sector. Statistics are compiled by the Malaysian Pulp & Paper Manufacturers Association (MPPMA), but these are based on estimates from members' self-reporting rather than officially reported production figures verified by government. Data are also not published (freely available) by the MPPMA and the latest available data are from 2013.

Additionally, many companies were wary to engage in a study on legality funded by WWF-Malaysia, for fear of being highlighted in a publicly available report. As such, the researchers were constrained somewhat by the need to assure companies that specific supply chain information would not be divulged without prior consent.

4.2 Limited on-site time

All companies visited as part of this study are thanked for their participation. However, due to the voluntary nature of the study, the minimal perceived benefit, and commercial pressures, many companies were not able to afford a great deal of time to researchers and wished only to provide very high-level information on supply chains. This made detailed risk analysis extremely difficult for researchers.

4.3 Barriers between regions

Barriers were found to be incredibly high between the different regions of Malaysia (Peninsular, Sabah and Sarawak) with each having its own forestry authorities and timber industry associations. As a result, reporting from each region is different and the level of available data varies widely. Trade associations and companies in each region are protective of their own interests and in some cases the research partner MWIA (which is also a trade association in Peninsular Malaysia) did not participate in either of the visits made to companies in Sabah due to these sensitivities.

4.4 Poor national trade data (by volume)

Good trade data (imports and exports, measured by value) are available for different wood products at the national level. However, there are gaps in the available data measured by volume. For some product groups (e.g. logs, plywood, veneer, etc) data is reported in cubic metres. Whilst other products (e.g. wooden frames and BJC) are recorded by weight (kilograms). Furniture typically is reported based on number of units/pieces, making comparison between product groups extremely difficult. This is unfortunate, as comparison of volumes and values of exports is useful to identify low value/high volume exports as well as high value/low volume exports.

5. Methodology

To answer the research questions and reach the overall objective, a number of methods were employed, combining qualitative and quantitative data. The research was comprised of two distinct components: a desk-based research component followed by on-site research in Malaysia.

Component 1: Desk-based research

The initial component focussed on collection and review of publicly available information, such as trade data, scientific literature, NGO and government reports as well as interview of key informants with knowledge of the Malaysian timber sector. As part of this component, leading commercial producers and exporters in the Malaysian timber and wood-based products industry were identified and contacted.

Component 2: On-site research

The second research component focussed on engaging ten (10) key commercial companies that provided in-depth information on supply chains – 11 companies were finally engaged (see Table 1). These companies were selected based on their export value/volume, and strategic influence/profile in the timber and wood-based products sector. Methods used as part of Component 2 included: review of publicly available literature on each company and their supply chains; completion of a supply chain questionnaire by each participating company; and semi-structured interview (SSI) and supply chain mapping session with each participating company.

Eleven Companies Engaged for On-Site Component of Research				
No.	**Company Name**	**Main Export**	**Location of Main Site**	**Estimated Value of 2014 Exports (million USD)**
1	Dongwha Fibreboard Sdn Bhd	Fibreboard	Peninsular	60
2	Sabah Forest Industries Sdn Bhd	Paper	Sabah	53
3	Carl Ronnow Sdn Bhd	Sawn timber	Sabah	36
4	Heveaboard Bhd	Particleboard	Peninsular	24
5	Robin Resources Sdn Bhd	Fibreboard	Peninsular	19
6	Marcoco Furniture Industries Sdn Bhd	Furniture	Peninsular	14
7	Finesse Moulding Sdn Bhd	Wooden frames	Peninsular	14
8	Costraco Sdn Bhd	Sawn timber	Peninsular	14
9	Maran Road Sawmill Sdn Bhd	Sawn timber	Peninsular	10
10	Jin Sheng Furniture Industry Sdn Bhd	Furniture	Peninsular	2
11	United Woodwork and Construction (M) Sdn Bhd	Furniture	Peninsular	2
Total				248

Table 1. Companies engaged for on-site component of research (MTIB, 2015; SFD, 2015; own elaboration)

Details of each participating company can be found in Appendix 1; with an overview of some of the relevant features of the companies provided in the Case Study View (Figure 4). .

Case Study View: Companies in Numbers

- The 11 companies visited as part of this study have a combined annual sales turnover of >USD 399 million and employ >4800 people.
- Four companies are classed as primary manufacturers, five secondary manufacturers and two traders.
- Nine companies are primarily located in Peninsular Malaysia, one in Sabah and one in both Sabah and Peninsular.
- Companies were selling: sawn timber (four companies), mouldings (3), furniture (3), plywood (2), fibreboard (2), particleboard (1), logs (1), BJC (1), pulp and paper (2) and veneer (1).
- Six companies held valid FSC Chain of Custody certification, five held PEFC certification, one VLC verification, one NEPCon LegalSource and one SGS Generic Chain of Custody certification.
- Nine companies declared awareness of the EUTR, US Lacey Act and the AILPA.
- Five companies declared that they operated a Due Diligence System (DDS) for their wood products (however, see discussion in 'Legality and Sustainability Risk Section') and two companies declared using external expertise to support their due diligence.

Figure 4. Case study view: companies in numbers

5.1 Research methods

The research methods used in both components of the research can be grouped into three categories:

5.1.1 Literature review

A variety of sources and types of data were drawn upon for literature review. At the macro-level, trade flow data in the form of import and export statistics from a number of trade and government sources were compared (GTA, 2015; MPIC, 2014b; MTIB, 2015a, 2015b). In addition, NGO and government reports as well as peer-reviewed scientific literature were reviewed to gather information on national and sub-national trends and identified risks.

Trade associations in Peninsular Malaysia (MWIA), Sabah (Sabah Timber Industries Association) and Sarawak (Sarawak Timber Association) provided information on the key exporting companies in each region, with this information used as the basis to contact companies regarding their participation in the study. Companies were approached primarily based on the value of their exports; however due to the sensitive nature of the study and information required, a high proportion of companies approached did not wish to participate due to fears over commercial confidentiality and reputational risks. As such, whilst best efforts were made to engage the largest companies in each region, this was reliant on company willingness to participate.

Once companies were engaged, web searches were conducted to gather background information on each. From here, company websites were reviewed, as well as information entered into certification portals (e.g. www.info.fsc.org) and any NGO or government sources relating to the participant company.

5.1.2 Questionnaire

A supply chain questionnaire was emailed to each of the 11 companies engaged for the on-site research. This was completed and returned via email by each company prior to the researchers visiting the companies' offices.

The questionnaire gathered information about the participating company (primary activity, annual turnover, location of offices, etc.), its environmental and social governance (certified status, responsible sourcing strategy, due diligence procedures, etc.) and basic information on supply chains (types of products purchased/sold, sales markets, species and names of suppliers). The questionnaires provided valuable information to the researchers, and this information was further explored during the company visits.

A copy of the questionnaire template can be found in Appendix 2.

5.1.3 Semi-structured interview (SSI) and supply chain mapping

Each participating company was visited, following the return of the completed questionnaire. During these company visits, SSIs with key informants were conducted alongside supply chain mapping for timber products.

SSIs were used to clarify information presented in the returned questionnaires as well as to discuss, in more detail, supply chains and risk. SSIs are a flexible form of interview where new questions are formed during the course of the conversation, and only guiding questions are prepared in advance.

Supply chain mapping was conducted during interviews, with company staff providing information on the structure of supply chains, companies involved, harvest origins and also information gaps. This allowed researchers to record information on supply chains and verify this with respondents during interview.

A list of SSI questions can be found in Appendix 3.

5.2 Methodological framework

The three methods employed as part of this research were used to collect information regarding all research questions. Through this multi-method approach, data were triangulated and layered to build a picture of current and future trends in wood industry supply chains. The methodological framework is depicted in pictorial form below (Figure 5).

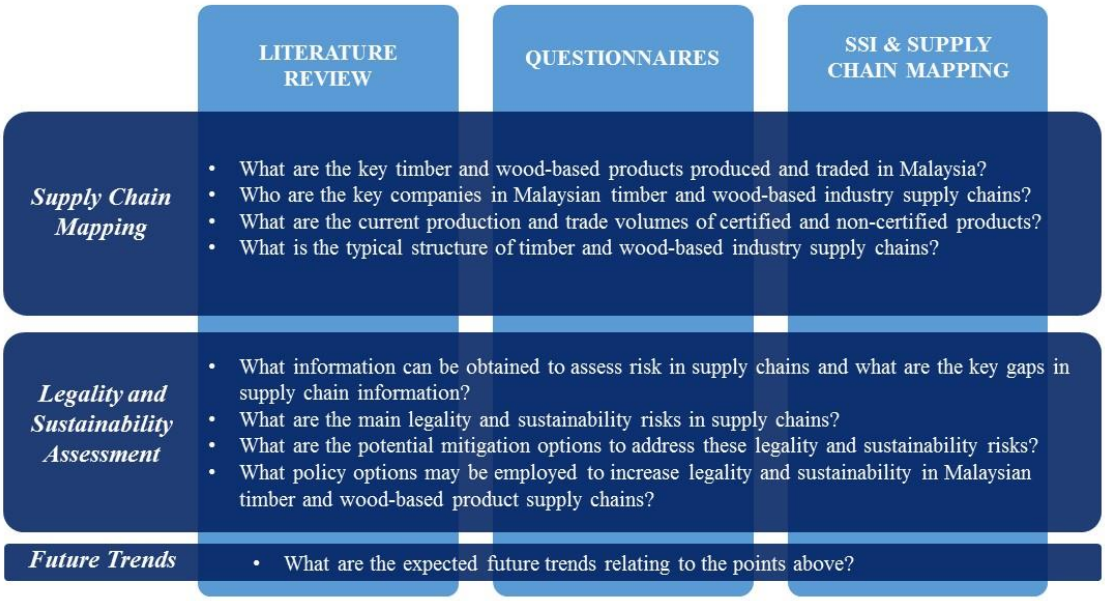

Figure 5. Methodological framework

6. Results and Discussion

6.1 Domestic production, import and export in Malaysian timber and wood-based industries[3]

Key findings:

- Malaysia imports USD 2.8 billion and exports USD 7.1 billion worth of wood products
- Sixty per cent of timber from natural forest is harvested in Sarawak, 28% in Peninsular and 12% in Sabah
- Pulp and paper are the most important import products – 73% total imports, by value
- Wooden furniture and plywood are the most important export products – 26% and 22% of exports by value, respectively
- Asia is the main export market – Japan consumes 20% of total wood exports and 50% of plywood exports

Malaysia is both an importer from and exporter to global markets for timber and wood products. The total value of timber and wood-based product exports[4] in 2014 was USD 7.1 billion. This figure has increased since 2001 but trade was hit by the global financial crisis, with exports heavily affected in 2009 after years of steady growth. Exports recovered steadily from 2009 and reached a high in 2011 of USD 7.6 billion (see Figure 6). In 2014, export values were down compared to 2011 mainly due to continuing volatility of global economic markets (MTC, 2015a). The value of timber imports has grown slowly and steadily over the same time and a

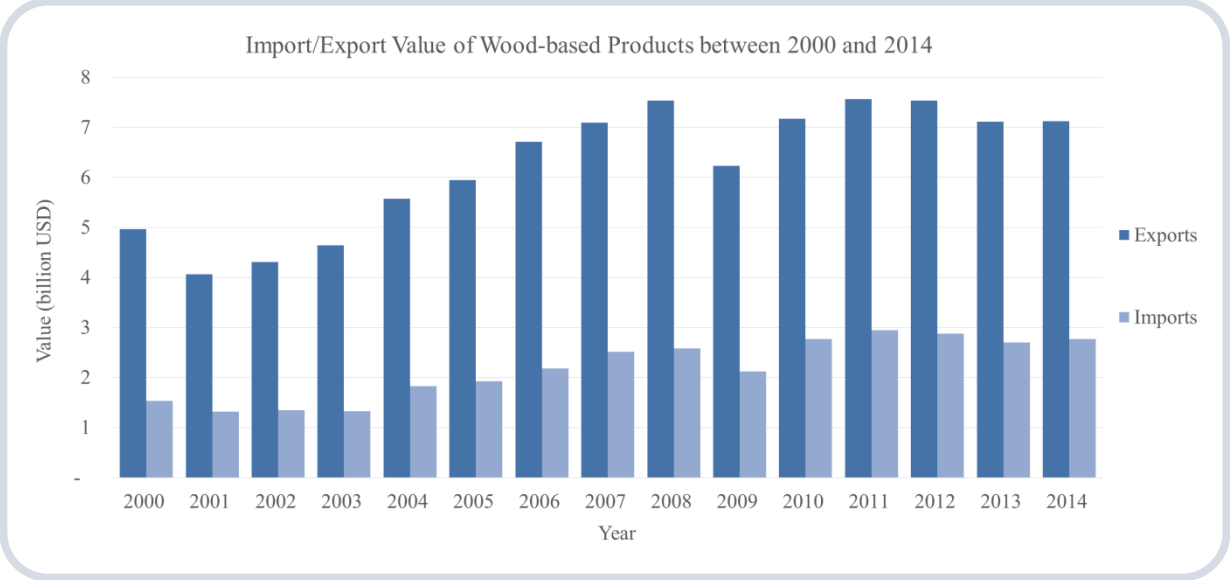

Figure 6. Import/ export value of wood-based products between 2000 and 2014 (GTA, 2015)

[3] Data used in this section originate from a number of sources, including the Global Trade Atlas (GTA) (GTA, 2015) (based on data reported by national statistics departments), MTIB website (MTIB, 2015a, 2015b), Malaysian Timber Council website (MTC, 2015a), MPIC website (MPIC, 2014b) and annual reports from and direct requests to Forest Departments of Peninsular Malaysia, Sabah and Sarawak (FDPM, 2013; FDS, 2012; SFD, 2013). Due to the variety of different entities creating and amalgamating data, figures often vary slightly. For the purposes of transparency, these discrepancies are described where applicable.

Where possible, GTA data have been used preferentially as this is based on actual import/ export figures from national statistics departments. GTA figures tend to be higher than figures reported from other sources. This may be due a variety of causes; in some cases statistics from different regions omit values for certain product types. For example, no export values for fibreboard were reported from Sabah in MTIB statistics for 2014. This leads to under-reporting of exports. Most figures for timber and wood products also omit pulp and paper values (e.g. MTIB data), whilst these are incorporated in the GTA figures shown.

Whilst data on the value of products imported/ exported are readily available from a number of sources, information on the volume of exports is harder to obtain. MTIB maintains a limited set of data on volume of products traded; however this does not include volume figures for furniture or pulp and paper products. Where volumes are recorded, the unit of measurement used for different product types makes comparison difficult. For example, Builders' Joinery and Carpentry (BJC) products and Wooden Frames are recorded in kilograms, whilst other products are recorded in cubic metres. However, the data available are provided in Table 5 (for imported volumes) and Table 7 (for exported volumes) for informational purposes.

A full list of commodity codes used to capture product types (especially grouped figures e.g. 'Other products') is provided in Appendix 6, to aid transparency and scrutiny of the figures presented.

[4] This figure includes wooden furniture and pulp and paper.

drop in imports was also seen in 2009. After this point imports recovered to reach USD 2.8 billion in 2014.

6.1.1 Domestic production

The availability and quality of data on domestic production and consumption varies widely between the different regions of Malaysia. The total production of logs in 2013, was 4.1 million m^3 in Peninsular Malaysia (FDPM, 2013), 3.38 million m^3 in Sabah (SFD, 2013) and 8.2 million m^3 in Sarawak (FDS, 2015).

Peninsular Malaysia

In Peninsular Malaysia most log production is from natural forest, State land and clearance of rubber plantations. The total production of logs in 2013 was 4.1 million m^3, whilst sawn timber production stood at 2.5 million (FDPM, 2013). Between 2011 and 2015, average annual log production from natural forests accounted for just over half of the total production, one-third derived from rubber plantations and the rest came from timber plantations (Hoare, 2015). At the country level in 2012, 28% of all production from natural forests derived from Peninsular Malaysia (Hoare, 2015).

The production of logs, sawn timber, plywood and mouldings all decreased from 2012 to 2013. Production of mouldings decreased 69%, from 244,000 m^3 to 77,000 m^3. According to the FDPM, 2013 saw a huge increase in the production of veneer: up 49%, from 62,000 m^3 to 92,000 m^3 (FDPM, 2013). However, this jump is not reflected in whole-of-Malaysia production figures reported for the same time period by the International Tropical Timber Organisation (ITTO, 2015), which show steady veneer production. It is therefore unclear what caused this increase or indeed whether the figures show real increased production or a change in product classification or calculation by the FDPM.

Sabah

In Sabah, the total production of logs in 2013, from both natural and plantation forest, was 3.38 million m^3. This dropped slightly to 3.33 million m^3 in 2014. Of this total, 2.1 million m^3 derived from natural forest harvesting, whilst 1.3 million m^3 derived from timber plantations (SFD, 2013). In 2013 the top three producers of plantation logs were Sabah Forest Industries Sdn Bhd, Hijauan Bengkoka Plantation Sdn Bhd and Sabah Softwoods Bhd (SFD, 2013). A list of companies producing the largest quantities of plantation logs in Sabah is presented in Table 2.

2013 Production of Plantation Logs in Sabah	
Company	**Total (m^3)**
Sabah Forest Industries Sdn Bhd	759,211
Hijauan Bengkoka Plantation Sdn Bhd	283,156
Sabah Softwoods Bhd	98,823
Benta Wawasan Sdn Bhd	60,075
Other Private Tree Planters (Smallholders)	46,191
Lega Kekal	7,470
Lembaga Industri Getah Sabah (LIGS)/ Other Rubber Smallholders	7,159
H & L Enterprise	6,897
Excella Construction	6,351
Rinibina Construction	743
Global Test	656
Kekal Jaya Enterprise	313
Total	1,277,045

Table 2. 2013 production of plantation logs in Sabah (SFD, 2013)

In 2012, 12% of all natural forest production in Malaysia occurred in Sabah (Hoare, 2015). Whilst Sabah still relies heavily upon production from natural forests, by 2013 over one-third of logs came from plantations (Hoare, 2015). Plantation logs are generally used as an input for pulp production.

Sarawak

Nearly all timber production in Sarawak is from natural forests and, in 2012, 60% of all natural forest production in Malaysia occurred in Sarawak (Hoare, 2015).

The total production of logs in 2012, from both natural and plantation forest, was 9.8 million m^3. Only 127,000 m^3 was derived from timber plantations, with the remainder being harvested from natural forest (FDS, 2012).

Estimated Concession Areas in Sarawak, by Company	
Company	**Concession Area (ha)**
Samling Group	1,288,389
RH Group	1,001,877
Shin Yang Group	500,904
Ta Ann Group	433,003
WTK Group	357,017
KTS Group	144,485

Table 3. Concession areas in Sarawak by company (Tawie, 2015)

Timber production in Sarawak is dominated by six big companies that collectively hold concession licenses for around 3.7 million hectares of land. These companies and the amount of land for which they hold concession licenses is shown in Table 3. The area of land licensed to these companies equates to around 70% of the forest used for timber production in Sarawak. The 'Big Six' companies are typically vertically integrated, conducting forest management and harvesting activities, sawmilling, secondary processing and export. As a result these companies are expected to be the largest log producers as well as exporters of forest products from Sarawak.

6.1.2 Imports

In 2014, Malaysia's imports of wood products reached USD 2.8 billion – up from USD 1.5 billion in 2000. In 2014, the top import by value was pulp and paper (73%), followed by plywood (5%), wooden furniture (5%), sawn timber (5%) and veneer (3%) (see Figure 7). These products composed 91% of Malaysia's total imports by value (GTA, 2015).

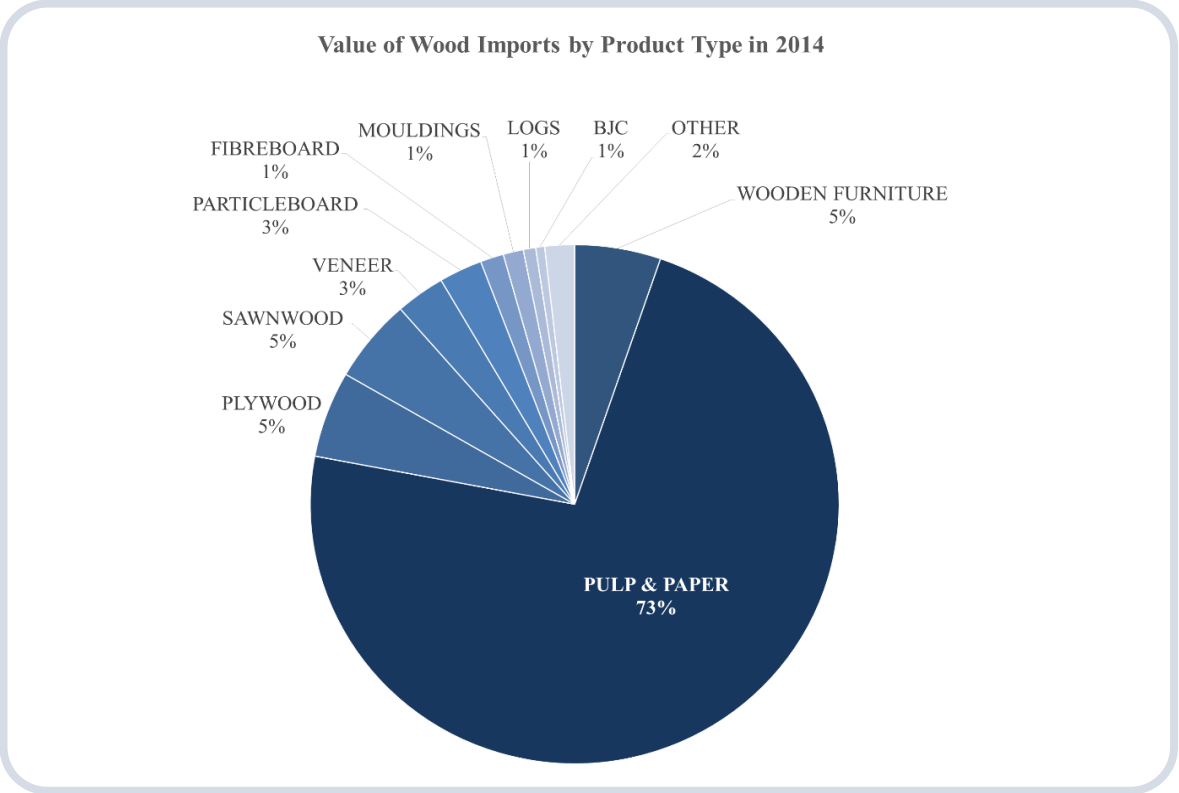

Figure 7. Value of wood imports by Malaysia by product type in 2014 (GTA 2015)

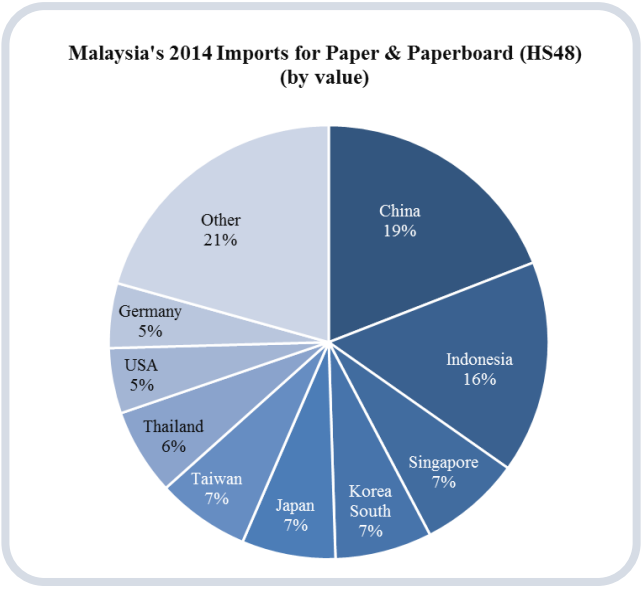

Figure 8. Malaysia's 2014 imports for paper & paperboard (HS48) (by value) (GTA, 2015)

In total, 92% of Malaysia's pulp and paper imports (by value) are composed of paper and paperboard (e.g. newsprint, toilet paper, wallpaper, envelopes, notebooks, etc.) (HS code 48); whilst the remaining 8% is made up of wood pulp and recovered paper and paperboard (HS code 47).

Malaysia's 2014 paper and paperboard imports (HS48) totalled USD 1.9 billion (excluding pulp [HS47]). China provided 19% of these imports, whilst another 16% was from Indonesia, with Singapore, South Korea, Japan and Taiwan contributing 7% each (see Figure 8). In the same period, pulp imports totalled USD 163 million; 43% of this was imported from the USA, followed by New Zealand (13%), Brazil (6%) and Singapore (5%).

A full list of product types imported in 2014 is shown in Table 4 (by value) and Table 5 (by volume).

Import Value of Timber and Wood-based Products in 2014	
Product Type	**Value (USD)**
Pulp and paper	2,015,066,128
Plywood	148,826,093
Wooden furniture	145,911,342
Sawn timber	144,334,994
Veneer	83,671,977
Particleboard	73,412,213
Fibreboard	39,594,875
Mouldings	34,243,227
Logs	21,033,963
BJC	15,046,256
Other products	50,306,647

Table 4. Import value of timber and wood-based products in 2014 (GTA, 2015)

Import Volumes of Timber and Wood-based Products in 2014		
Product Type	**Unit**	**Quantity**
BJC	kg	12,314,974
Wooden frames	kg	1,145,919
Chipboard/ particleboard	m^3	440,415
Plywood	m^3	427,193
Sawn Timber	m^3	252,944
Veneer	m^3	196,596
Fibreboard	m^3	125,621
Mouldings	m^3	78,452
Logs	m^3	50,206
Wooden furniture	Data deficient	
Pulp and paper		
Other products		

Table 5. Import volumes of timber and wood-based products in 2014 (MTIB, 2015a)

In the first three months of 2015, 65% of Malaysia's total timber imports (excluding pulp and paper products), derived from Asia, 16% from the Americas, 8% from Europe, 10% from Oceania and 1% from Africa (MTIB, 2015c). Within Asia, China is the major import origin, contributing 27% of all products by value. The major import is wooden furniture, but also significant supplies of plywood, veneer, and mouldings. In total, 14% of imports come from Indonesia, with these imports predominantly of plywood. Another 12% of imports derive from Thailand; (chipboard/particleboard being the major product type imported from this country); whilst 6% of total imports derive from Vietnam – mainly plywood and some furniture. Of the total international imports, 12% derive from the USA, 2% from Brazil and 2% from Canada. Imports from these countries are mainly of sawn timber, veneer and mouldings. In Oceania, New Zealand contributes 5% of imports and Australia 5%, with veneer and sawn timber being the major imports. The dominant source of imports from Europe is Germany (2% of total imports), most of which is sawn timber. It is also worth noting that an estimated 11% of Malaysia's sawn timber is imported from Myanmar, where illegal logging is rife. Illegal practices include systemic corruption, weak legal framework, poor law enforcement, lack of oversight, and ongoing conflict (see Section 6.5.2 for further discussion) (MTIB, 2015c; NEPCon, 2015b).

There is also trade of timber and wood products amongst states. Most important to mention in the context of this report (because of the higher-risk status of timber harvested from Sarawak) is the trade of products from Sarawak to both Sabah and Peninsular Malaysia. In 2014, Sabah Forest Department recorded almost 65,000 m^3 of imports from Sarawak, including 41,000 m^3 of veneer, 16,500 m^3 of sawn timber and 7,000 m^3 of log imports. This equates to 58% of Sabah's total imports of veneer, sawn timber and round log imports in 2014. In addition, Sabah imported 20,500 m^3 of veneer, sawn timber and round logs from Papua New Guinea (18% of total imports) and 10,000 m^3 from Indonesia (9%) (SFD, 2015).

6.1.3 Exports

In 2014, Malaysia's top five exports (by value) were wooden furniture (26%), plywood (22%), pulp and paper (13%), sawn timber (11%) and logs (9%) (see Figure 9, below). These products composed 81% of Malaysia's total wood exports by value (GTA, 2015). From 2000 to 2015, the value of wood exports increased from USD 5.0 billion to USD 7.1 billion (GTA, 2015). However, the volume of exports over the same period decreased – to around 22 million m^3 (roundwood equivalent) (Hoare, 2015). This has been due to a move away from export of logs and sawn timber and towards higher-priced value-added goods such as furniture and mouldings. In addition, exports of paper have continued to increase since 2000 (Hoare, 2015).

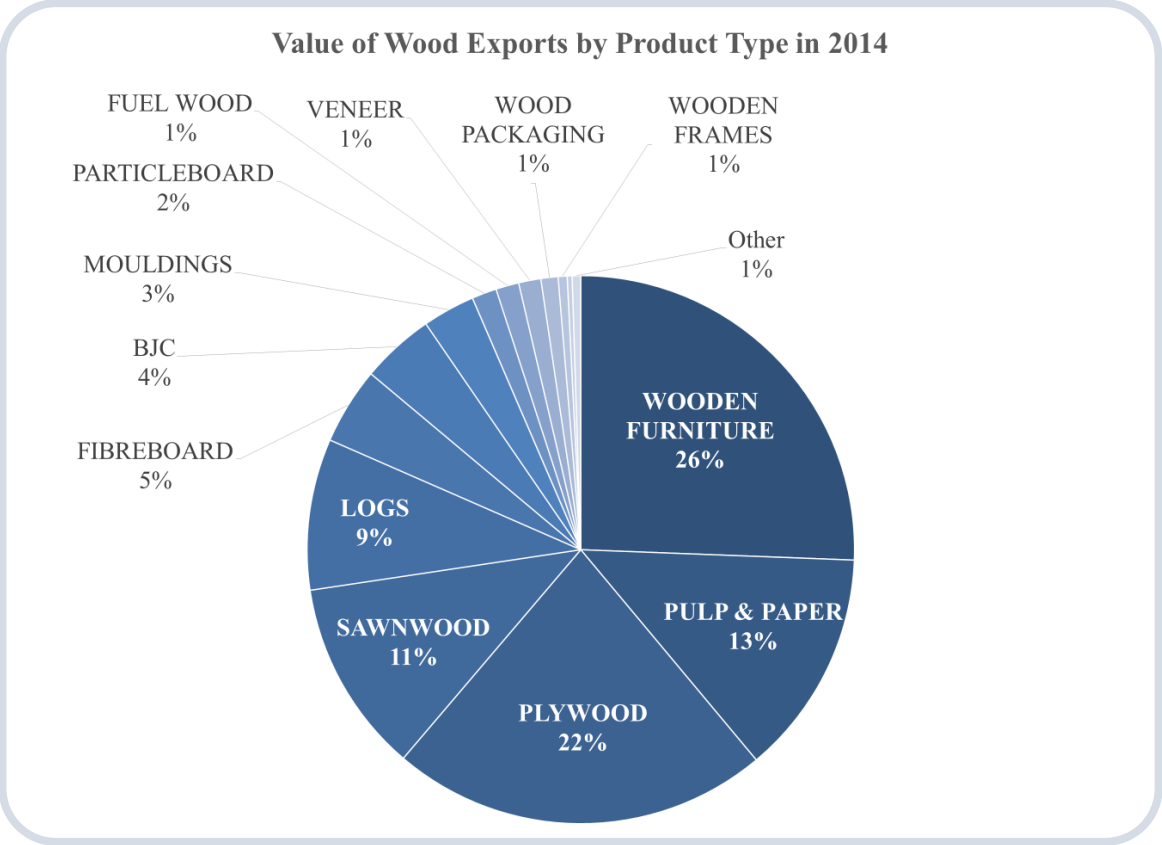

Figure 3. Value of wood exports by product type in 2014 (GTA, 2015)

Malaysia's wooden furniture exports grew steadily from 2001 to 2008, increasing from USD 894 million to USD 1.8 billion, and overtaking plywood to become Malaysia's leading wood export. Despite the value of exports being hit heavily in 2009 by the global financial crisis (down to USD 1.6 billion), exports recovered to a record high of USD 2 billion in 2012. By 2014 exports had dropped again to USD 1.8 billion. However, from 2008 to 2014 furniture has been Malaysia's largest-value wood export. Estimates indicate that in 2014, 31% of Malaysian furniture exports went to the USA, followed by Japan (9%), Australia (7%), Singapore (6%) and the UK (5%) (MTIB, 2015b).

Overall, 66% of Malaysia's wood exports (excluding pulp and paper) go to Asia, 15% to the Americas, 11% to Europe, 5% to Oceania, 3% to Africa. Of sales to Asia, Japan consumes 20% of Malaysia's timber and wood exports – mainly plywood, most of which is sourced from Sarawak. Indeed, Japan consumes just over 50% of Malaysia's total plywood exports, showing heavy reliance on this market. India (9%), Taiwan (5%), South Korea (5%), Singapore (4%) and China (4%) are major export markets for logs, sawn timber and plywood (Hoare, 2015; MTIB, 2015b). In Oceania, Australia is the major market, consuming 4% of Malaysian timber exports. The USA makes up 12% of the overall sales to the Americas and exports are mainly of furniture and plywood products. The EU also dominates the export markets for furniture, sawn timber and plywood (Hoare,

2015). The UK (4% of total exports) is the single largest EU destination for exports (MTIB, 2015b) whilst the Netherlands is also a key EU market. Both US and EU exports predominantly derive from Peninsular Malaysia (Hoare, 2015).

A full list of product types exported in 2014 is shown in Table 6 (by value) and Table 7 (by volume).

Export Values of Timber and Wood-based Products in 2014	
Product Type	**Value (USD)**
Wooden furniture	1,823,392,388
Plywood	1,588,428,424
Pulp & paper	948,251,399
Sawn timber	812,222,204
Logs	635,317,538
Fibreboard	323,399,313
BJC	308,188,066
Mouldings	220,795,543
Particleboard	104,493,608
Fuel wood	97,008,511
Veneer	93,462,001
Wood packaging	72,008,864
Wooden frames	37,916,181
Wood charcoal	20,489,149
Other products	35,800,553

Table 6. Export values of timber and wood-based products in 2014 (GTA, 2015)

Export Volumes of Timber and Wood-based Products in 2014		
Product Type	**Unit**	**Quantity**
BJC	kg	198,157,385
Wooden frames	kg	9,764,979
Logs	m^3	3,218,515
Plywood	m^3	3,099,371
Sawn timber	m^3	1,893,949
Fibreboard	m^3	952,975
Chipboard/ Particleboard	m^3	570,282
Mouldings	m^3	256,961
Veneer	m^3	216,926
Wooden furniture	Data deficient	
Pulp & paper		
Other products		

Table 7. Export volumes of timber and wood-based products in 2014 (MTIB 2015)

Peninsular

The top three exports from Peninsular Malaysia in 2014 were wooden furniture (55% of total), sawn timber (14%) and BJC products (8%), closely followed by fibreboard at 7% of exports (MTIB, 2015b)[5] (see Figure 10).

A total of 2,749 wood-based processing mills was licensed in Peninsular Malaysia in 2013. A large proportion of these (1,829) were classed as Furniture/ Wood Working/ Carpentry & Joinery Mills (FDPM, 2013). This reflects the dominance of furniture production in Peninsular Malaysia, which contributes USD 1.5 billion in exports from Peninsular Malaysia (MTIB, 2015b).

Table 8 shows the leading exporters of wood products (by value) in Peninsular Malaysia. Company names and rankings are based primarily on information provided by the MTIB. Seven of these companies were visited as part of this study (Dongwha Fibreboard Sdn Bhd, Carl Ronnow Sdn Bhd, Heveaboard Bhd, Robin Resources Sdn Bhd, Finesse Moulding Sdn Bhd, Costraco Sdn Bhd and Maran Road Sawmill Sdn Bhd (see Table 1).

[5] MTIB export statistics do not include figures for pulp and paper exports.

Top 20 Exporters from Peninsular Malaysia (excluding pulp, paper and furniture)			
No.	**Company Name**	**Main Export**	**Estimated Value of 2014 Exports (million USD)**
1	Dongwha Fibreboard Sdn Bhd	Fibreboard	60
2	Evergreen Fibreboard Bhd	Fibreboard	48
3	Carl Ronnow Sdn Bhd	Sawn timber	36
4	Asia Plywood Co Sdn Bhd	Plywood	24
5	Heveaboard Bhd	Particleboard	24
6	Mentakab Veneer & Plywood Sdn Bhd	Plywood	24
7	Mieco Manufacturing Sdn Bhd	Chipboard	19
8	Robin Resources Sdn Bhd	Fibreboard	19
9	MK Pro Trade	Sawn timber	19
10	Evergreen Fibreboard (Nilai) Sdn Bhd	Fibreboard	19
11	Finesse Moulding Sdn Bhd	Wooden frames	14
12	Pan Resources Sdn Bhd	Sawn timber	14
13	Costraco Sdn Bhd	Sawn timber	14
14	Segamat Panel Boards Sdn Bhd	Fibreboard	12
15	EC Moulding Sdn Bhd	Wooden frames	12
16	GRV Logistic (M) Sdn Bhd	Sawn timber	10
17	Great Bonanza Timber Sdn Bhd	Sawn timber	10
18	Mediarex Sdn Bhd	Mouldings	10
19	Provencal Cord Sdn Bhd	Sawn timber	10
20	Maran Road Sawmill Sdn Bhd	Sawn timber	10
Total			408

Table 8. Top 20 exporters from Peninsular Malaysia (excluding pulp, paper and furniture) **(**MTIB, 2015 MWIA, 2015)

Sabah

Sabah produces around 20% of Malaysia's total plywood and around 10% of Malaysia's sawn timber (Hoare, 2015). It is therefore natural that these products also dominate the export markets. Plywood (49% of total), sawn timber (21%) and logs (8%) were the top three exports from Sabah in 2014 (MTIB, 2015b) (see Figure 10).

Table 9 (below) shows the leading exporters of wood products (by value) in Sabah. Company names and rankings are based on information provided by SFD. The companies visited in the state of Sabah were, Sabah Forest Industries Sdn Bhd and Carl Ronnow Sdn Bhd. While most Carl Ronnow exports are shipped from Peninsular Malaysia, the company operates both in Peninsular Malaysia and Sabah (where the head office is located).

Sarawak

In 2014, 54% of Sarawak's exports (by value) were plywood, followed by logs (26%) and sawn timber (8%) (MTIB, 2015b)[6] (see Figure 10, below). This is unsurprising, considering that 70% of all Malaysian plywood is produced in Sarawak (Hoare 2015).

[6] MTIB export statistics do not include figures for pulp and paper exports.

Top Ten Exporters from Sabah (excluding furniture)			
No.	**Company Name**	**Main Export**	**Estimated Value of 2014 Exports (million USD)**
1	Sabah Forest Industries Sdn Bhd	Paper	53
2	Focus Lumber Bhd	Plywood	31
3	Ikut Maju Sdn Bhd	Plywood/ veneer	28
4	Sabah Berjaya Sdn Bhd	Logs	21
5	Sinora Sdn Bhd	Plywood	21
6	Arus Borneo Sdn Bhd	Various (broker/trader)	21
7	Sabajuta Industries Sdn Bhd	Plywood	19
8	Fu Yee Corporation Sdn Bhd	Plywood	17
9	Perusahaan Khosinar Sdn Bhd	Veneer/ plywood	16
10	Khaspermata Sdn Bhd	Veneer/ plywood	16
Total			243

Table 9. Top ten exporters from Sabah (excluding furniture) (SFD, 2015)

In 2012, 34% of Sarawak's wood exports went to Japan, whilst 16% were destined for India, 10% for Taiwan, 9% to unspecified Middle East nations and 8% to South Korea (STIDC, 2012)[7]. However, product types imported by these countries differ markedly. Japan consumes the vast bulk of the plywood exported from Sarawak ≥50% of the 2.6 million m^3 exported in 2012. India imported 63% of Sarawak's 3.3 million m^3 of log exports. (Meranti makes up the largest proportion of Sarawak's log exports, along with other tropical hardwoods.) For sawn timber, Thailand is the major export destination, receiving fully 29% of the 817,000 m^3 of sawn timber exports in 2012 (STIDC, 2012).

It was not possible to obtain accurate figures for export values for the 'Big Six' companies in Sarawak. However, the approximate concession areas held by each company are presented in Table 3 (above).

No companies from Sarawak agreed to take part in the questionnaire and supply chain mapping section of the study to provide information on their timber supply chains. Many of the companies have been the subject of criticism by NGOs over the past 20 years for alleged illegal practices and – at the time of conducting this study – the Malaysian Anti-Corruption Commission (MACC) was undertaking an investigation into illegal logging that saw 375 bank accounts frozen and logs confiscated from a range of companies in Sarawak (Ling, 2015). Due to the negative focus on the Sarawak timber sector at the time of writing it is perhaps unsurprising that none of the 'Big Six' companies listed in Table 3 decided to participate.

Furniture[8]

Researchers approached the Malaysian Furniture Promotion Council and Malaysian Furniture Council for figures on the leading furniture exporters. These bodies were not willing to provide export figures or rankings for companies in the furniture sector. The companies in Table 10, however, were highlighted as the leading exporters in Malaysia. Peninsular Malaysia is the main hub for furniture manufacturers. The furniture manufacturers listed below were approached to take part in the questionnaire and supply chain mapping stage of the study, however none wished to participate. With a recognition of the importance of representing the furniture sector in the study (due to the product type being one of Malaysia's dominant exports by value), the researchers engaged three furniture companies not in the list below who were willing to participate: Marcoco Furniture Industries Sdn Bhd, Jin Sheng Furniture Industry Sdn Bhd and United Woodwork and Construction (M) Sdn Bhd (see Table 1).

[7] STIDC export statistics do not include figures for all furniture or pulp & paper exports.
[8] Data for the furniture and pulp & paper sectors are not held by MTIB, MWIA or forest departments. As such, data for these sectors vary in quality and format and is presented separately.

Leading Furniture Exporters from Malaysia (Unranked)		
Company Name	**Main Export**	**Estimated Value of 2014 Exports (million USD)**
Yeo Aik Wood Sdn Bhd	Furniture	No data available
Li Hen Furniture Sdn Bhd	Furniture	No data available
LB Furniture Sdn Bhd	Furniture	No data available
Sern Kou Furniture Industries Sdn Bhd	Furniture	No data available
SHH Furniture Sdn Bhd	Furniture	No data available
Green River Wood & Lumber Manufacturing Sdn Bhd	Furniture	No data available
Latitude Tree Sdn Bhd	Furniture	No data available

Table 10. Leading Malaysian furniture exporters (unranked) **(**MWIA, 2015 MFC, 2015 and MFPC, 2015)

Pulp and Paper

The figures in Table 11 were provided by the MPPMA and show the major paper manufacturers in 2013 (the latest available figures). Sabah Forest Industry Sdn Bhd was visited as part of this study, as one of Malaysia's leading paper manufacturers (see Table 1).

Leading Paper Manufacturers from Malaysia in 2013			
No.	**Company Name**	**Main Export**	**Total Production / annum (mt)**
1	Muda Paper Mills Sdn Bhd	Paper	325,000
2	GS Paper & Packaging Sdn Bhd	Paper	280,000
3	Malaysian Newsprint Industries Sdn Bhd	Paper	250,000
4	Sabah Forest Industry Sdn Bhd	Paper	165,000
5	Nibong Tebal Paper Mill Sdn Bhd	Paper	156,000
6	Pascorp Paper Industries Sdn Bhd	Paper	150,000
7	United Paper Board (M) Sdn Bhd	Paper	75,000
8	Kimberly Clark	Paper	35,000
9	Cita Peuchoon Paper Mills Sdn Bhd	Paper	24,000
10	Harta Packaging Industries Sdn Bhd	Paper	23,000
11	Theen Seng Paper Manufacturing Sdn Bhd	Paper	11,500
12	Johmewah Maju Paper Mill Sdn Bhd	Paper	8,000
13	Yeong Chaur Shing Paper Mill Sdn Bhd	Paper	3,600
14	Pembuatan Kertas (Perak) Sdn Bhd	Paper	3,000
15	Taiping Paper Mills Sdn Bhd	Paper	2,400
Total			1,511,500

Table 11. Leading Malaysian paper manufacturers in 2013 (MPPMA 2015)

Figure 10 shows the different trends in wood exports from each of the regions of Malaysia in terms of the dominant product types exported (excluding pulp and paper exports). This shows the variation in manufacturing and processing within the country. Whereas Peninsular Malaysia focusses on exports of wooden furniture and sawn timber, Sarawak and Sabah both focus on plywood. In Sarawak the export of logs is the second largest earner, whereas in Sabah it is sawn timber. In all regions, exports of the primary product type comprise around half of total exports.

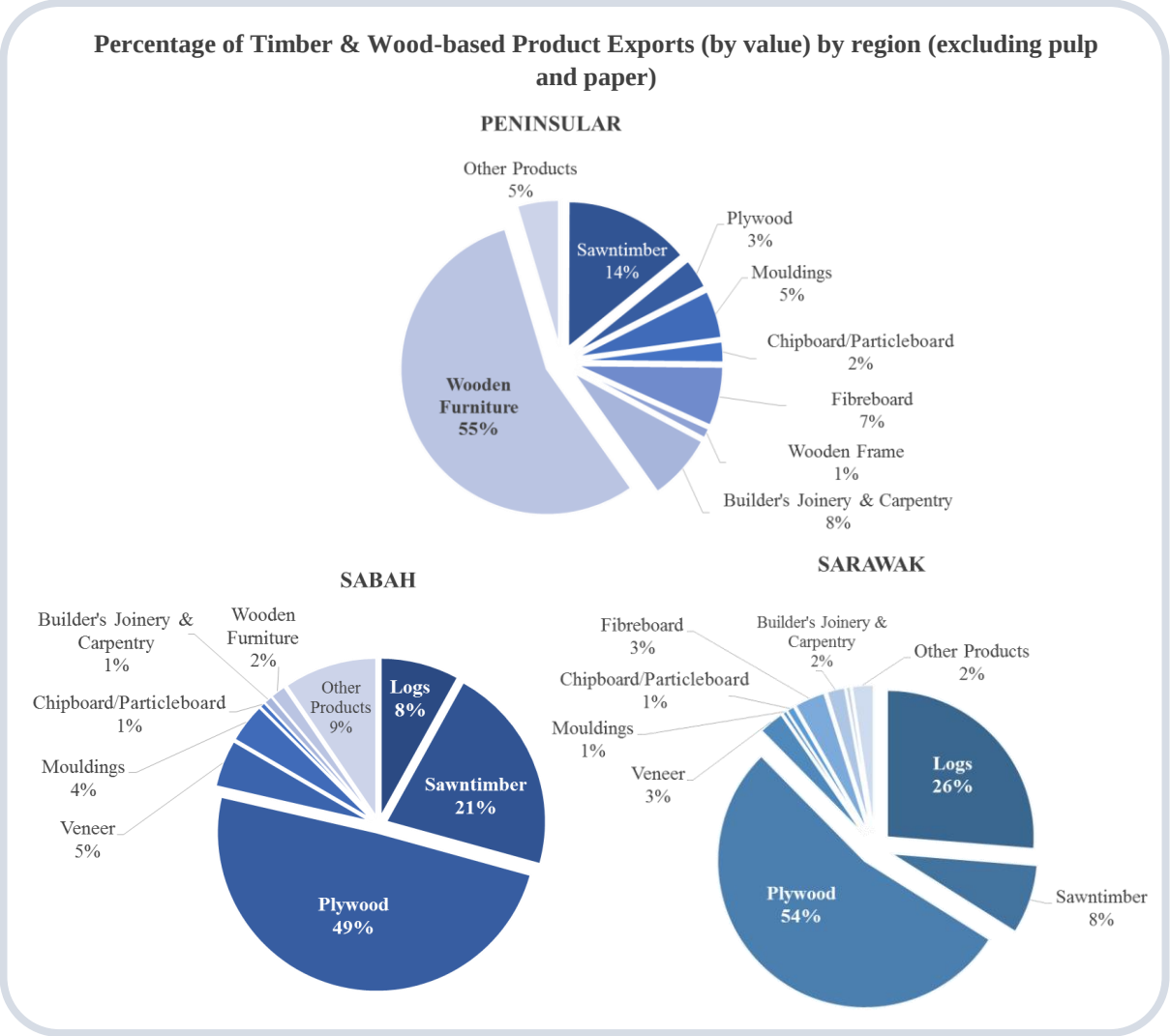

Figure 4. Percentage of timber and wood-based product exports (by value) by region (MTIB, 2015b)

Due to the lack of pulp and paper industry data held by MTIB, it was not possible to accurately identify regional differences in this sector. However, exports are likely to be minimal for this sector due to its predominant use in domestic markets.

Figure 11 (below) provides a breakdown of the companies visited as part of this study, showing the relative emphasis of their export trade and main markets. Overall, these case studies reflected the more general industry trend, with export trade predominantly focussing on Asia. In many cases companies selling to Europe *either* sold small volumes *or* focused a large proportion of their exports on these markets – an 'all or nothing' approach.

It should also be noted that Middle Eastern markets acted as substantial export markets for some of these companies. These markets were noted as typically having low or no sustainability requirements and buyers do not typically request evidence of legal compliance for forest products.

Case Study View: Export Destinations

Of the 11 companies visited as part of this study, all were selling to countries in Asia; with sales to these countries varying between <1% of overall sales (by volume) to around 95%. Three of the companies visited were selling >90% by volume to the Asian market. Six of the ten companies were selling to the Malaysian market and these domestic sales typically composed between 30% and 80% of each company's total sales. Other key Asian sales markets were China, India, South Korea, Japan and the Philippines.

Five companies made sales to the European market in 2014. Three of these were selling >80% of their wood products to Europe. The Netherlands was the biggest market within Europe with two companies selling 60–70% of their total sales volume into this market. Belgium was another key market, with one company selling almost 80% of total export volume to this market. The UK and Germany were the next biggest markets for companies selling to Europe.

Five companies were exporting to countries in the Middle East. For three of these companies the Middle East constituted major sales markets (30%, 45% and 61% of total sales, respectively). Three companies were selling to North America (USA and Canada) – comprising 4%, 13% and 30% of total sales, respectively. Four companies were exporting to countries in Africa and these sales comprised between 2% and 12% of the organisations' total sales. African export destinations included South Africa, Mauritius, Ghana and Nigeria.

No sales to South America were reported by any company.

Figure 5. Case study view: Export destinations

6.2 Timber species used in Malaysian timber and wood-based industries

Key findings:

- Common domestic hardwoods are: Red Meranti, Yellow Meranti and Keruing
- Common domestic plantation species: Rubber Wood (*Hevea brasiliensis*), Acacia and Eucalyptus
- Common imported species: Sapelli (*Entandrophragma* spp.)
- Malaysia has 673 vulnerable, endangered or critically endangered and two Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)-listed tree species.
- Protections/ prohibitions over harvesting: 32 species in Peninsular Malaysia, >45 in Sarawak and 20 in Sabah.

The Malaysian timber sector utilises a huge range of native and non-native species. The species utilised varies depending on the product type, often due to the intrinsic properties of the species (e.g. tensile strength, density, workability) or market demand. For example, Rubber Wood (*Hevea brasiliensis*) is used widely in the Malaysian furniture sector as it dries and machines relatively easily, as well as being widely available.

Twenty of the most commonly utilised species in Malaysia are listed below (MTC, 2015b):

- Balau (*Shorea* spp.)
- Bintangor (*Calophyllum* spp.)
- Chengal (*Neobalanocarpus heimii*)
- Dark Red Meranti (*Shorea* spp.)
- Gerutu (*Parashorea* spp.)
- Kasai (*Pometia* spp.)
- Kelat (*Syzygium* spp.)
- Keledang (*Artocarpus* spp.)
- Keruing (*Dipterocarpus* spp.)
- Mengkulang (*Heritiera* spp.)
- Merbau (*Intsia* spp.)
- Nyatoh (*Palaquium* spp.)
- Kembang Semangkok (*Scaphium* spp.)
- Kempas (*Koompassia malaccensis*)
- Red Balau (*Shorea* spp.)
- Yellow Meranti (*Shorea* spp.)
- Sepetir (*Sindora* spp.)
- Mersawa (*Anisoptera* spp.)
- Merpauh (*Swintonia* spp.)
- Rubber Wood (*Hevea brasiliensis*)

6.2.1 Threatened species

Whilst many of the species utilised by the timber trade are not endangered, there are many closely related species that are threatened or endangered in Malaysia. In 2015, the International Union for Conservation of Nature (IUCN) Red List of threatened species catalogued 673 Malaysian tree species as vulnerable (385), endangered (101) or critically endangered (187) (IUCN, 2015). Of those species listed as critically endangered, 73 are of the genus *Shorea*, 24 are of the genus *Dipterocarpus*, four of the genus *Anisoptera* and four of the genus *Parashorea.* This illustrates the need for timber and paper companies to know which species of tree are included in their products. Most companies visited as part of this study knew the trade or common name of tree species and some knew the scientific name to genus level (e.g. *Dipterocarpus* spp.). Few, however, could identify the precise species (e.g. *Dipterocarpus obloglofolius*). Knowledge of the full scientific name (including the specific epithet or species name) is required to distinguish between threatened and non-threatened species within the same genus. This would allow companies to demonstrate that the wood contained within products is not derived from endangered species but from closely related but abundant commercial species. Such information is available in forest management documents (e.g. forest management plans) and, for some species, can be deduced by laboratory analysis (e.g. anatomical or DNA analysis).

The IUCN Red List can provide an overview of the sustainability risks of tree species and it is often used as an initial identifier of legality risk by companies conducting due diligence for compliance against the EUTR or AILPA. This is often due to the correlation between scarcity and value of timber species (and hence risk of illegal logging). However, it should be noted that listing on the IUCN Red List does not necessarily imply prohibition of trade under national law. A species may be listed in the IUCN Red List and still be legally

harvested under national law unless specific legislation prohibits harvesting. For sustainability purposes, however, the IUCN Red List is a clear indicator of risk as sustainable harvesting of critically endangered species is rarely possible *in situ*.

6.2.2 Protected/ prohibited species

The forest departments in each region of Malaysia do maintain lists of prohibited/ protected species of plants, for which harvesting is banned or restricted in Permanent Reserved Forest. In Peninsular Malaysia there are more than 32 such species and these are conserved for their medicinal value, importance in faunal food chains and for their traditional use by Indigenous communities. In Sarawak more than 45 plant species are protected under Section 31 of the Wildlife Protection Ordinance 1998 and in Sabah, any tree marked for retention by the Director of Forestry is protected, along with a list of more than 20 species (GoA & GoM, 2014a, 2014b, 2014c). Extraction of such species requires a license from the relevant forest department (protected species) or may not be licensed for extraction (totally protected species).

In addition, it should be noted that these prohibitions apply only in PRF and do not apply to species harvested from State land or alienated land and forest plantations outside PRF. Thus, where these species are present on the market it is necessary to demonstrate from which type of forest land they originated.

For a full list of protected/ prohibited species see Appendix 4.

6.2.3 Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES)-listed species

CITES is an international agreement adhered to by many governments which aims to avoid the trade in endangered species. At the time of writing, 181 countries have enforced the CITES Convention under national law (CITES, 2015b). CITES works by the regulation of listed species that may be traded only through an authorised licensing system. Species are listed in one of three appendices, according to the degree of protection required. Appendix I includes species threatened with extinction and trade in these is permitted only in extraordinary circumstances. Appendix II includes species that may be traded, but the trade is regulated to avoid progression towards extinction. Appendix III includes species that are protected in at least one nation, with that nation asking other CITES countries for assistance to regulate the trade. Malaysia ratified the CITES Convention in 1977 (Keong, 2004).

The following tree species are found in natural forest in Malaysia and covered by CITES (Appendix II):

- Agarwood (*Aquilaria* spp.)
- Ramin (*Gonystylus* spp.).

Both have export quotas and trade is prohibited without a valid CITES export permit. For Peninsular Malaysia and Sabah, MTIB is the Management Authority responsible for the issuance of CITES export permits for the export of any CITES species of wood. For Sarawak the Management Authority for CITES is Sarawak Forestry Corporation (NEPCon, 2015b).

Ramin was listed on CITES (Appendix II) in 2004, following concern over cross-border illegal trade from Indonesia. This illegal trade was thought to be promoted by Indonesia placing restrictions on the harvest of Ramin by listing *Gonystylus* species in CITES (Appendix III) in 2001 (Cooney, Meibom, & Keong, 2012). Despite the CITES listing of Ramin, there were concerns that the harvest/ export volumes put in place by Malaysia were not stringent enough. In 2007 this continued concern led to the EU suspending all Ramin imports (IHB, 2007). As the EU was a major export market for Ramin, this move placed huge pressure on Malaysia to reduce its harvest quotas and improve management of Ramin. In less than a year the Malaysian CITES authorities revised and justified the harvest quotas and the suspension was lifted in Peninsular Malaysia and Sabah (and in 2009 in Sarawak).

The largest importers of Ramin from around the world are the EU and USA. The Netherlands was, by far, the largest importer of Ramin in the EU between 2002 and 2011 (Ferriss, 2014). In Malaysia, *Gonystylus bancanus* is the most prominent commercial species. Export prices for Ramin in 2011 were stated to average $995 per cubic metre (Ferriss, 2014). Malaysia has set export quotas for the entire *Gonystylus* genus in Peninsular Malaysia and Sabah and for the species *G. bancanus* in Sarawak. The quotas in Peninsular Malaysia and Sabah decreased from 23,000 m^3 in 2006 to 10,000 m^3 in 2015 for the former; and for the latter from 22,000 m^3 in 2006 to 3,178 m^3 in 2015 (CITES, 2015a; Ferriss, 2014).

In recent years a number of initiatives have commenced, to support CITES enforcement and improve sustainable trade in Malaysia. The first is a project to build a genetic database, to support DNA testing of Ramin species with a view to aiding law enforcement, both in terms of specification of the species and origin of timber. The second is a focus on research to propagate Ramin species for plantation growth to reduce the pressure on wild populations from illegal harvesting and unsustainable quotas (ITTO-CITES, 2013).

Aquilaria species were listed on CITES (Appendix II) in 2004. Malaysia is home to seven species of the genus *Aquilaria* (Teck Wyn, 2010). In 2015 the quotas in Peninsular Malaysia and Sabah were 200,000 kg and in Sarawak, 5,000 kg (CITES, 2015a). *Aquilaria malaccensis* is the most commonly traded species of the genus. Also known as Agarwoods, these species are commonly utilised for their medicinal values or role as perfumes and in religious practices. This is due to the presence of a dark aromatic resin produced by the heartwood in response to fungal infection.

The species has always been utilised for domestic use and, from the 1970s, international demand grew rapidly. The wood is in high demand from Middle East (especially Saudi Arabia and UAE) and north-east Asian markets (China and Japan). In Peninsular Malaysia, harvesting by foreign nationals entering from Thailand was cited as a cause of unsustainable extraction from the 1990s onwards. Similar over-exploitation by small-scale harvesters also reduced populations in Sabah and Sarawak (CITES, 2003). The CITES listing of these species followed a similar scenario as described for Ramin (see above), with reduced international trade and improved enforcement of CITES-listed species occurring after 2007. Illegal harvesting persists, however, and the Malaysian Government has acknowledged that domestic trade has not received enough focus (Teng, 2015). Much of the continuing small-scale trade in Agarwood feeds the tourist souvenir trade. This is particularly problematic in Peninsular Malaysia in the states of Penang, Perak, Pahang and Johor as well as Selangor (Teng, 2015).

Efforts to improve management and detect illegal Agarwood trade have been developed in Malaysia in recent years. Such efforts include the construction of a genetic database, to support DNA testing of Agarwood species with a view to aiding law enforcement (ITTO-CITES, 2013). In addition, the area of planted *Aquilaria* species now stands at around 2,368ha (Teng, 2015), with private investment increasing: recently Asia Plantation Capital Sdn Bhd announced a joint venture with the Islamic University in Gombak to cultivate *Aquilaria sinesis* in Malaysian plantations (PRNewswire, 2015).

Management of both CITES-listed species had significantly improved since 2004 when grave concerns were raised (Cooney et al., 2012); however some problems persist in the trade of Ramin and Agarwood. These risks are discussed further in Section 6.5.

Case Study View: Species

The 11 companies visited as part of this study utilised a wide variety of timber species. The number and variety of species differed markedly depending on the product type in question (see Table 12 below). Sawn timber was the product type utilising the highest variety of different species (mostly domestic hardwoods). Similarly a variety of hardwoods was utilised to manufacture mouldings, wooden frames and veneer. Few companies were aware of the full scientific name of species that they purchased – only the genus e.g. *Shorea* spp.

One company reported that the top-selling species (by volume) in 2014 were: Red Meranti, Yellow Meranti (*Shorea* spp.), Keruing (*Dipterocarpus* spp.), Nemesu (*Shorea* spp.), and Seraya (*Shorea* spp.). Rubber Wood (*Hevea brasiliensis*) was by far the most heavily utilised species for furniture production as well as being a major input for board manufacture (particleboard, fibreboard, plywood). Other plantation species (mainly Eucalyptus and Acacia) were heavily utilised for pulp and paper and board manufacture.

Sapelli (*Entandophragma cylindricum*) was the most commonly cited imported species, in all cases originating from West Africa. This was sold as sawn timber as well as being used as veneer in the manufacture of frames and boards. Temperate species (including Oak, Beech, Cherry, Ash and Maple) were also typically used as veneers.

No companies reported trade in CITES-listed species. One company mentioned previous trade in CITES species which had ceased when CITES-listing came into effect.

Product	Imported Species (Inputs obtained from outside Malaysia)	Species obtained from within Malaysia (including inputs of indigenous species)
Sawn timber	Sapelli (*Entandrophragma cylindricum*) Sapelli (*Entandrophragma candollei*)	Meranti (*Shorea* spp.), Keruing (*Dipterocarpus* spp.), Merbau (*Instia* spp.), Mersawa (A*nisoptera* spp.), Mengkulang (*Heritiera* spp.), Mempening (*Lithocarpus* spp.), Pelawan (*Tristaniopsis merquensis*), Kempas (*Koompassia malaccensis*), Selangan Batu (*Shorea inappendiculata*), Keranji (*Dialium indum*), Mangilan (*Agathis borneensis*), Medang (*Lauraceae*), Binuang (*Octomeles sutatrana*), Kembang (*Heritiera simplicifolia*), Melapi (S*horea* spp.), Red Seraya (*Shorea ovata*), Red Seraya (*Shorea platyclados*), Geronggang (*Cratoxylum arborescens*), Simpoh (*Dillenia borneensis*), Terentang (*Campnosperma* spp.), White Seraya (*Parashorea malaanonan*), Yellow Seraya (*Shorea faguetoides*), Mersawa (*Anisoptera* spp.), Nyatoh (*Palaquium* spp.), Kapur (*Dryobalanops* spp.), Gagil (*Hopea sangal*), Magas (*Duabanga moluccana*), Laran (*Neolamarckia cadamba*), Obah (*Eugenia* spp.), Pisang-pisang (*Polythia lateriflora*), Acacia (*Acacia* spp.)
Furniture	Rubber Wood (*Hevea brasiliensis*) Hemlock (*Tsuga* spp.)	Rubber Wood (*Hevea brasiliensis*) Nyatoh (*Palaquium* spp.)
Pulp and paper	N/A	Acacia (*Acacia* spp.) Eucalyptus species (*Eucalyptus* spp.)
Veneer	Sapelli (*Entandrophragma cylindricum*), Oak (*Quercus* spp.), Cherry (*Prunus* spp.), Ash (*Fraxinus* spp.), Zebrano (*Microberlinia* spp.), Maple (*Acer* spp.), Okoume (*Aucoumea* spp.),	Eucalyptus species (*Eucalyptus* spp.) Various Tropical Hardwoods
Mouldings/ Frames	Oak (*Quercus* spp.) Beech (*Fagus* spp.) Sapelli (*Entandrophragma cylindricum*)	Dark Red Meranti (*Shorea* spp.), Penarahan (*Myristica* spp.), Jelutong (*Dyera costulata*), Mempisang (*Alphonsea* spp.), Merpauh (*Swintonia* spp.), Durian (*Durio* spp.)
Particleboar/ Fibreboard/ Plywood	N/A	Rubber Wood (*Hevea brasiliensis*), Durian (*Durio* spp.), Acacia (*Acacia mangium*), Eucalyptus species (*Eucalyptus* spp.), Mixed Tropical Hardwoods (MTH)

Table 12. Species traded by case study companies by product type

6.3 Sustainability and legality certification in the Malaysian timber and wood-products industries

Key findings:

- About 26% of Malysia's forest is certified to PEFC (MTCS) or FSC standards.
- About 168,094 m^3 of MTCS/ PEFC-certified wood products were exported from Malaysia in 2014.
- Companies visited during this project declared sales of >80,000 m^3 of wood products with certification claims (n=9).
- Companies visited during this project sold 99% of all pulp and paper without any form of certification claim (n=9).

Certification is the dominant voluntary tool used to demonstrate sustainable forestry. By 2013 the proportion of global roundwood supply from certified forests was estimated at 28% (501 million m^3) (FAO, 2014). Forest certification schemes all adhere to the same basic structure: each forest management unit must be certified to demonstrate that it meets the requirements of the certification standard. In addition each subsequent organisation in the supply chain requires certification to demonstrate that the chain of custody of certified products from the forest to the end-consumer remains unbroken.

There are two dominant forest certification schemes: the Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC). Together these two schemes have certified 444,223,317 ha of the world's forests. Both operate globally and, as of 2014, national FSC certification standards had been elaborated in 39 countries around the world, and 32 national standards had been endorsed by PEFC (FAO, 2014). Globally 263 million ha of forest are certified under PEFC endorsed schemes (PEFC, 2015c), whilst 181 million ha are certified under FSC certification (FSC, 2015).

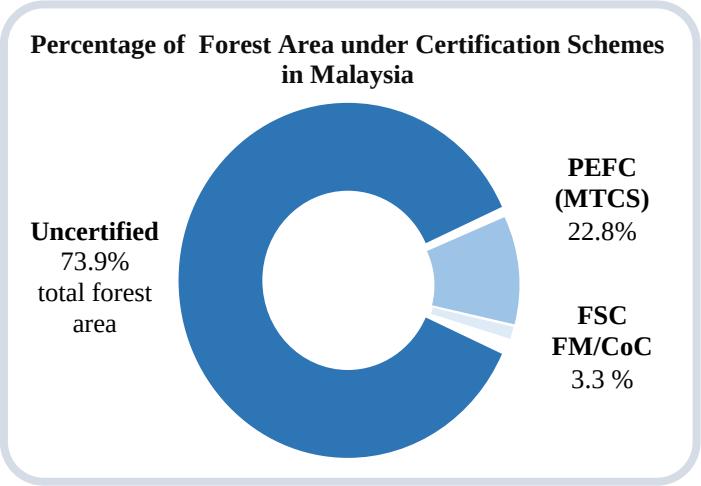

Figure 6. Percentage of forest area under certification schemes in Malaysia (NEPCon, 2015)

Both schemes are used in Malaysia and total certified area here amounts to 5,335,150 ha. This constitutes roughly 26% of total forest area in Malaysia (NEPCon, 2015b). Almost 23% of this is PEFC certified under the recognised national scheme (MTCS) and only 3% is FSC certified (see Figure 12).

FSC and PEFC certification are key tools for demonstrating sustainable management of forests and provide assurance to buyers that forest products derive from well-managed forests that have been independently audited by a third-party certification body. Certification can also be taken into account when assessing legality risk. The FSC system has its Controlled Wood scheme which ensures that any non-certified materials entering FSC supply chains are subjected to a minimum level of legality assurance. In addition, the PEFC scheme now requires that all certificate holders conduct due diligence on PEFC-certified materials to ensure that legality requirements are met.

There are a number of reasons why companies may become sustainability- or legality-certified. One is the potential for a per unit price premium on certified products. A study conducted in Sabah in 2005 found that the value of certified logs in Malaysia was 5–77% higher than for non-certified logs, depending on the species (Kollert & Lagan, 2007). In addition, the Director of SFD stated that FSC certification adds a 100% price premium per cubic metre of timber sold from certified Deramakot forest management units (NEPCon, 2015c).

Additionally, selling products certified against robust certification standards can reduce the legality risk of products – a key benefit when selling to buyers who conduct due diligence on timber supply chains.

However the major driver for obtaining certification is access to markets where certification is a key demand. Thus even where there is no price premium for products, many companies use certification to gain access to key markets or buyers. One company interviewed as part of this study (Carl Ronnow Sdn Bhd) stated that increased market access is the driver of certification for their business (see Figure 13).

Another reason cited for the use of sustainability and legality certification schemes was to access financial investment. Sabah Forest Industries Sdn Bhd mentioned this as a prerequisite for financial investors seeking to fund investments in the timber sector.

> "*It is difficult to get a higher price for MTCS/ PEFC product, but it enables us to continue accessing markets. Everything we send to EU at the moment is PEFC-certified and we use the fact that it is certified to demonstrate to our buyers that there is a minimal chance of illegality at forest level because the forest is certified*"
>
> Dick Anning (Environmental Manager), Carl Ronnow Sdn Bhd

Figure 7. Case study quotation

6.3.1 Programme for the Endorsement of Forest Certification (PEFC)

As of August 2015, there were 4,661,816 ha of PEFC-certified forest in Malaysia. This area is certified under 12 individual forest management certificates (MTCC, 2015; PEFC, 2015c). Eight of these PEFC Forest Management Units are located in Peninsular Malaysia. These certificates are held by State forestry departments and apply to the forest estate managed by the forest departments. As such most of the commercial forest estate in Peninsular Malaysia is PEFC-certified. In addition there are three PEFC-certified Forest Management Units in Sarawak and one in Sabah (PEFC, 2015a).

Malaysia's PEFC-certified area constitutes 1.8% of the global area of PEFC-certified forest but 88% of Asia's PEFC-certified forest. The country has the largest PEFC-certified forest area in Asia, followed by Indonesia, which has 610,798 ha (PEFC, 2015c).

Table 13 shows a list of all PEFC-certified forest management and FM/CoC certificate holders in Malaysia.

Company Name	Region	Area (ha)	Certificate Code
Johor State Forestry Department	Peninsular	351,302	SGS-MTCS/FM-0102
Kedah State Forestry Department	Peninsular	307,046	FMC 003
Kelantan State Forestry Department	Peninsular	424,497	FMC 005
Negeri Sembilan State Forestry Department	Peninsular	154,676	FMC 002
Pahang State Forestry Department	Peninsular	1,524,827	SGS-MTCS/FM-0104
Perak State Forestry Department	Peninsular	991,436	FMC 004
Selangor State Forestry Department	Peninsular	238,747	SGS-MTCS/FM-0105
Terengganu State Forestry Department	Peninsular	516,697	SGS-MTCS/FM-0103
KTS Plantations Sdn Bhd	Sabah	57,247	FMC 001
Zedtee Plywood Sdn Bhd	Sarawak	83,535	FMC 0006
Shin Yang Plywood Sdn Bhd	Sarawak	1,007	FPMC 0001
Syarikat Samling Timber Sdn Bhd	Sarawak	10,800	FPMC 0002

Table 13. PEFC-certified forest management and FM/CoC certificate holders in Malaysia (MTCC, 2015; PEFC, 2015a)

The Malaysian timber industry also has 338 PEFC Chain of Custody certificates – the most of any country in Asia (PEFC, 2015c). This likely reflects the volume of PEFC-certified materials from domestic sources available on the Malaysian market.

The Malaysian Timber Certification Council (MTCC) reported exports in 2014 of 168,094 m^3 of MTCS/ PEFC-certified wood products from Malaysia. These exports comprised sawn timber (65%), plywood (26%) and mouldings (8%), with <1% composed of paper, laminated scantlings and blocks and finger-jointed products (Pers. Comm. Mustapha., 2015).

The Netherlands and the UK were the major export markets for MTCS-certified materials – receiving 27% and 18% of Malaysia's total MTCS exports, respectively. These markets were followed by Germany (8%), Saudi Arabia (7%), Australia (7%), Belgium (5%) and UAE (5%).

It is worth noting that the FDS stated in 2015 that the 'Big Six' companies operating in Sarawak (see Table 3) – as well as STIDC – must achieve certification for at least one of their forest license areas by 2017 or face licenses being terminated (MTC, 2015c). This is being sought as part of the Sarawak Government's strategy to reduce illegal harvesting practices and rebuild the State's image.

6.3.2 Forest Stewardship Council (FSC)

As of July 2015, there were 673,334 ha of FSC-certified forest in Malaysia. This certified area is under 12 individual Forest Management or joint Forest Management and Chain of Custody (FM/CoC) certificates. Ten of these certificates are for forest in Sabah and two in Peninsular Malaysia. There is no FSC-certified forest in Sarawak. Malaysia's FSC-certified area constitutes only 0.37% of the global area of FSC certified forest and 8% of Asia's FSC-certified forest. The country has the fifth largest FSC-certified forest area in Asia, behind Turkey, Indonesia, China and India (FSC, 2015).

Table 14 shows a list of all FSC-certified Forest Management and FM/CoC certificate holders in Malaysia.

Company Name	Region	Area (ha)	Certificate Code
Kumpulan Pengurusan Kayu Kayan Terengganu Sdn Bhd	Peninsular	106,697	SCS-FM/COC-00108N
Pesama Timber Corporation Sdn Bhd	Peninsular	20,243	SCS-FM/COC-004167
Boonrich Sdn Bhd	Sabah	628	RA-FM-007006
Hijauan Bengkoka Plantations Sdn Bhd	Sabah	20,665	SCS-FM/COC-00142P
Sabah Forestry Department	Sabah	55,139	SGS-FM/COC-000065
Sabah Forestry Department – North Gunung Rara	Sabah	61,330	SCS-FM/COC-005059
Sabah Forestry Department – Pin Supu	Sabah	4,696	SCS-FM/COC-005060
Sabah Forestry Department – Timimbang-Botitian	Sabah	13,610	SCS-FM/COC-005061
Sabah Forestry Department – Trusmadi & Sg Kiluyu	Sabah	75,804	SCS-FM/COC-005062
Sabah Forestry Department FMU 17A	Sabah	50,070	SCS-FM/COC-00136N
Sabah Forestry Department – USM FMU	Sabah	241,198	SCS-FM/COC-00141N
Sabah Softwoods Berhad	Sabah	23,254	SCS-FM/COC-00101P

Table 14. FSC-certified forest management and FM/CoC certificate holders in Malaysia (FSC, 2015e)

The Malaysian timber industry also has relatively few FSC Chain of Custody certificates – only 173 (at July 2015). This likely reflects the dominant supply of wood materials from domestic sources, most of which is *not* FSC-certified.

6.3.3 Malaysian Timber Legality Assurance Systems

Malaysia now operates Timber Legality Assurance Systems (TLAS) in Peninsular Malaysia and Sabah (and a Sarawak TLAS is currently under development). Many timber-producing countries now have similar systems in place. Most have arisen out of negotiations with the EU as part of its Forest Law Enforcement, Governance and Trade (FLEGT) initiative. This initiative seeks to form Voluntary Partnership Agreements (VPAs) with producer countries allowing, with minimal regulation, for the free trade of timber and wood products to the EU. To implement a VPA and achieve this goal, the producer country must implement a TLAS to demonstrate the

legality of timber product exports, through a third-party annual auditing and licensing scheme. Once a producer's TLAS has been reviewed by the EU and found to be robust enough to eliminate illegal products from supply chains, it will be approved, after which point FLEGT licenses may be issued to cover export of timber products to the EU under the VPA.

Six countries have signed a VPA with the EU and are working towards implementing a functioning TLAS system for approval under the VPA process. These include Cameroon, Central African Republic, Ghana, Indonesia, Liberia and the Republic of Congo. In addition, nine more countries (including Malaysia) are in negotiations with the EU to become part of the VPA process (EFI, 2015b).

Malaysia operates a TLAS in Peninsular Malaysia (known as MYTLAS) and Sabah (known as the Sabah TLAS). Malaysia's MYTLAS was created originally as part of its ambition to participate in the VPA process and be able to deliver FLEGT-licensed timber. Although negotiations as part of the VPA process started in 2007 (EFI, 2015a), these stalled, not least due to the rejection of the VPA process by Sarawak (FERN, 2015). NGOs have also criticised Malaysia's VPA process for insufficiently recognising Indigenous peoples' rights. These criticisms include the use of an inadequate legality definition that does not fully recognise Native Customary Rights (NCRs); and insufficient recognition of judicial rulings on NCRs (FERN, 2015; FOE, 2013; JOANGOHutan & JOAS, 2009; JOANGOHutan, 2010). Discussions to include only Peninsular Malaysia and Sabah in the VPA process were mooted by Malaysia and discussions are ongoing as to whether a VPA would be signed between the EU and these two regions, pending time-bound commitments for Sarawak to develop a TLAS (EFI, 2014). As such the Malaysian TLAS schemes have developed in-line with EU requirements but outside the VPA negotiations. The MYTLAS scheme, which is operated by MTIB, is in place and issuance of a TLAS license is subject to inspection of the timber consignment by MTIB. MYTLAS certificates are therefore being issued for exports on a voluntary basis. The Sabah TLAS is also operating and being implemented by the SFD. However neither the MYTLAS nor the Sabah TLAS is yet approved under the FLEGT VPA process.

6.3.4 Voluntary legality verification schemes

In addition, there is a growing number of voluntary legality verification schemes being used by Malaysian companies. The growth of this type of certification has been driven by the demand for a minimum legality verification, in and of itself, but also as a stepping stone towards sustainability certification. With the implementation of timber legality legislation in the USA, EU and Australia, demand for such types of verification is increasing. Such schemes (being implemented in various parts of the world) include, *inter alia*, NEPCon's LegalSource certification, Rainforest Alliance's Verification of Legal Compliance (VLC), Bureau Veritas' Origine et Légalité des Bois (OLB), SGS' Timber Legality and Traceability Verification (TLTV), and CertiSource Legality Assessment for Verified Legal Timber. Whilst a detailed comparison of the many different voluntary legality schemes will not be provided here, it is important to state that the focus of schemes varies as do the specific requirements included in the legality standard used[9]. Therefore it is important for any stakeholder considering risk in supply chains to assess not only the presence of legality certification schemes but the *content.*

Almost all companies visited as part of this study had some experience with these different types of certification and verification schemes. Use of certification schemes, however, was more prevalent for companies focussing on exports, especially those selling to Europe and the USA. Adherence to voluntary certification systems also differs according to the product type being sold. Notably, none of the furniture companies visited adhered to any form of sustainability certification or legality verification schemes. Neither were these companies as aware of sustainability principles as other companies visited. This contrasts with other product sectors. All other companies visited, from timber traders to frame manufacturers, adhered to some form of certification or verification scheme.

[9] An overview of those schemes used by participants of this study is included in Appendix 5.

Case Study View: Forest Certification

Of the 11 companies visited as part of this study, nine held some form of certification: six held a valid FSC Chain of Custody certificate and six held a valid PEFC Chain of Custody certificate. Some of the companies visited are the market leaders in certified exports. One company, Carl Ronnow Sdn Bhd, stated that their company was 'responsible for 46% of the PEFC sawn timber exported [from Malaysia] under the MTCS scheme during 2014'; and '100% of Maran Road Sawmill's sales were certified (either to PEFC, FSC or TLTV) in 2014' according to this latter company. The companies visited as part of this study sold upwards of 80,000 m^3 of timber and wood products. However, 99% of pulp and paper sold was uncertified, with only <1,500 metric tonnes of pulp and paper products sold as certified (n=9).

Certificate holders were found to trade a wide range of different species, with organisations higher up the supply chain (closer to the forest) found to have the highest number of certified species. The most common certified species from Malaysian forests were reported to be: Dark Red Meranti (*Shorea* spp.), Yellow Meranti (*Shorea* spp.), White Seraya (*Parashorea* spp.), Merbau (*Intsia* spp.), Kapur (*Dryobalanops* spp.), Mengkulang (*Heritiera* spp.), Keruing (*Dipterocarpus* spp.), Nyatoh (*Palaquium* spp.), Acacia (*Acacia* spp.) and Eucalyptus (*Eucalyptus* spp.).

Sapelli (*Entandrophragma cylindricum*) from Cameroon, Republic of Congo and Gabon was cited by a number of companies as a commonly used, non-native certified species. In addition, certified *Pinus radiata* from New Zealand was used by one company and Hemlock (*Tsuga* spp.*)* from Canada by another.

Of the companies participating in the study, only the three furniture companies did not hold any form of certification. One of these reported purchasing PEFC- and Verification of Legal Origin (VLO)-verified inputs to their furniture manufacture (although none of the PEFC certificates matched those listed on the PEFC database and the VLO certificate was found to have expired). This may be due to the organisation not being certified and not knowing how to check the validity of PEFC and VLO certification online – underlining the importance of full Chain of Custody certification to ensure sustainability and legality claims.

In addition to FSC and PEFC, two companies were certified against legality standards. The first, Sabah Forest Industries, was certified against the Rainforest Alliance VLC and NEPCon LegalSource schemes (NEPCon, 2015d; Rainforest Alliance, 2015). The second, Maran Road Sawnmill, reported generic Chain of Custody verification for the transmission of claims under SGS' TLTV scheme.

Figure 8. Case study view: Forest certification

6.4 Structure of timber and wood product supply chains in Malaysia

Key findings:

- Traceability back to forest of harvest difficult for Rubber Wood but region of harvest may be deduced.
- Supply chains for composite products are opaque and may change frequently depending on availability.
- Even consignments of solid wood may originate in some cases from up to 15 forest concessions.
- Variable levels of information on supply chains – certification improves access to information.

The Malaysian timber industry is characterised by both upstream and downstream activities. Upstream activities include logging, sawmilling and other primary manufacturing, whilst downstream activities include value-adding through secondary manufacturing for the production of, for example, furniture, flooring, panels, doors, etc. An overview of the structure of the Malaysian wood industry is provided in Figure 15. This shows the inter-linkages between many of the sub-sectors but masks considerable complexity and changes over time.

In the year 2000, 70% of Malaysia's export earnings were generated from the sale of primary processed products and 30% from secondary processed products. This trend has shifted a little up to 2014, with 66% of export earnings deriving from primary products and 33% from secondary products. The 4% shift towards the secondary processing industry has been largely due to the increasing role of the furniture sector (GTA, 2015). In 2013 there were 1,829 Furniture/ Wood Working/ Carpentry & Joinery Mills registered with FDPM in Peninsular Malaysia, 671 sawmills and 167 moulding mills (FDPM, 2013); whilst in Sabah in 2013, 142 sawmills and 118 moulding mills were licensed.

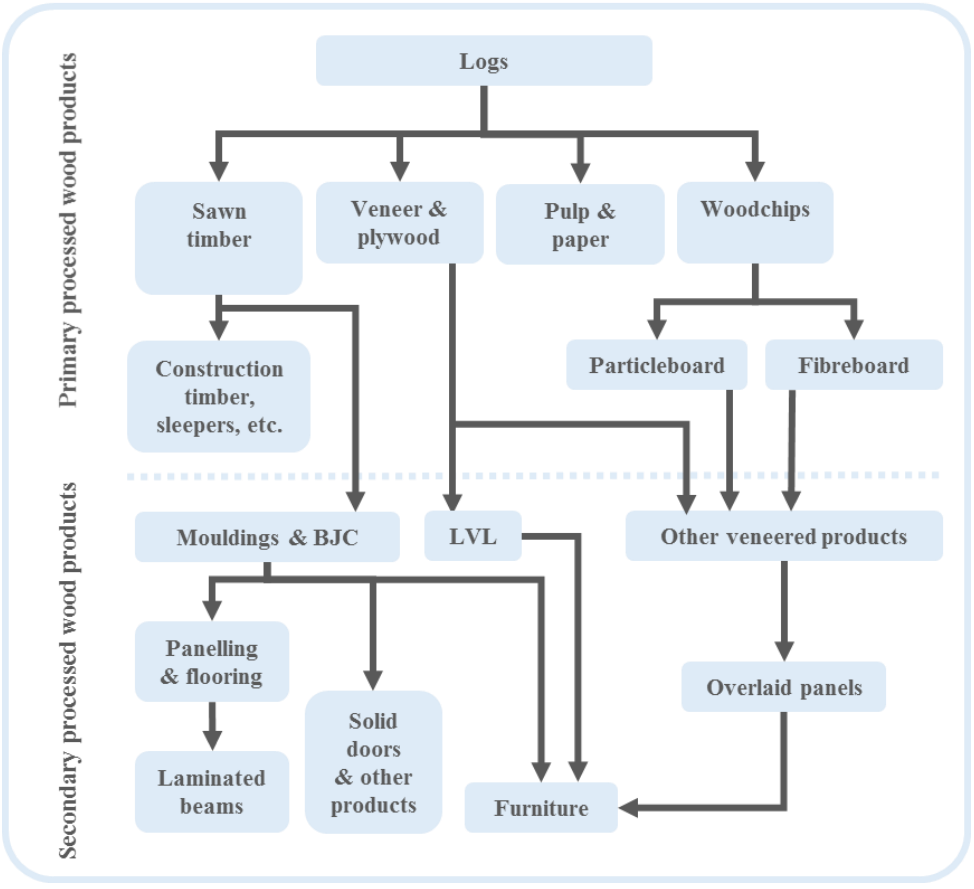

Figure 9. Overview of the Malaysian wood industry structure (adapted from MPIC, 2009)

The structure and complexity of supply chains is a key consideration when assessing risk, as it often has ramifications for the availability of information, transparency and stasis of supply chains. Long supply chains and those where suppliers are fluid and ever-changing increases risk associated with sustainability and legality.

As part of this study, the structure of supply chains for the 11 participating companies was assessed to gain an overview of complexity, length and fluidity. The following supply chain maps have been created – based on combined data from similar companies – to provide the reader with a 'typical' structure for the product type in question.

Figure 16 gives just one example of a supply chain for sawn timber. Visits to a number of companies selling sawn timber, however, showed that information on the supply chain structure and access to documentation to verify supply chain structures was generally good. This is thought to be a symptom of two factors: The first is the length of the supply chain upstream from the company in question. Companies selling sawn timber from Malaysian forests were typically two tiers (or fewer) away from the forest management company. For imported timber, or instances where timber is sourced through a trader/ agent, the supply chain is typically longer (at least by one tier) and less transparent – with traders generally wishing to retain confidentiality of suppliers. The second reason for good information in timber supply chains is the prevalence of certification. Timber deriving from Peninsular Malaysia, where MTCS certification is widespread (see Section 6.3 on certification), was often seen to be PEFC-certified. In addition, high-value imported species such as Sapelli from Africa were commonly cited as being sourced as certified. Certified supply chains almost always provide greater access to information as this is maintained as a key requirement of the certification scheme.

Case Study View: Sawn Timber

This example demonstrates a typical supply chain structure for Keruing (*Dipterocarpus* spp.) sawn timber harvested from Permanent Reserved Forest in Peninsular Malaysia and certified under the MTCS. The sawn timber was exported to the Netherlands for use by a manufacturer as well as installation of various products within the commercial sector. Thus the Tier 1 company is the final organisation in the supply chain fitting the products for end-use. The supply chain is therefore composed of four tiers. The Malaysian company purchases from two to four suppliers, which tend to be sawmills located close to the Forest Management Units (FMU). In this example, three FMUs were identified as the origin of products (under the MTCS, FMUs in Peninsular Malaysia cover the whole PRF in a State). Within one of the FMUs studied by the researcher, inputs derived from four licenses (licenses for other FMUs were not investigated by researchers). One company remarked that for large customer orders it is not unusual for materials to derive from up to 15 concessions.

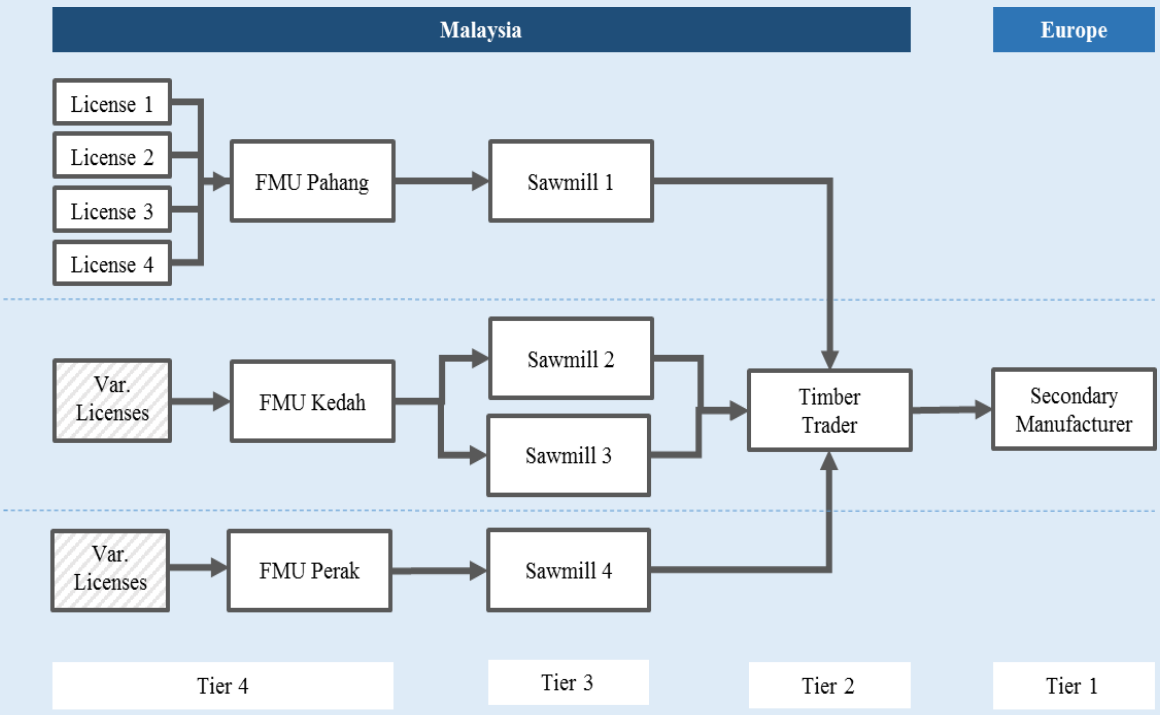

Figure 10. Supply chain diagram: Sawn timber

A similar trend was observed with supply chains for mouldings (i.e. architraves, skirtings and doors). The supply chain example below (Figure 17) shows a certified supply chain for African hardwoods. Despite the forest of origin being located outside of Malaysia, the FSC certification allowed the tiers in the supply chain to be verified, back to the particular concession of harvest for two of the three suppliers.

Case Study View: Mouldings

This example demonstrates a supply chain structure for mouldings made from imported tropical timber, declared to be harvested from Cameroon and the Republic of Congo. The supply chain is composed of at least four tiers. The Malaysian company buys from three companies (Tier 3). The supply chain was declared to carry full FSC certification and the researcher was able to verify the validity and scope of the FSC certification for the Tier 2 company and all three (Tier 3) suppliers as well as for the Forest Management Units in Congo. The mouldings were exported to an undisclosed market and it is not known how many more tiers exist in the supply chain before the products reach the end user.

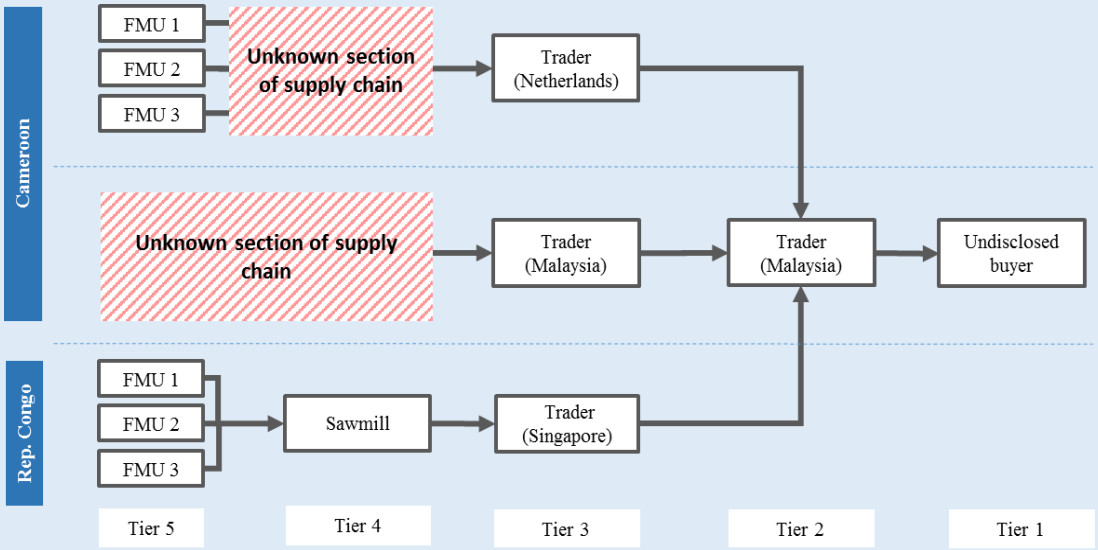

Figure 11. Supply chain diagram: Mouldings

The supply chain structures for single component products are typically much simpler than for composite products such as MDF, particleboard, plywood and pulp and paper, and this was found to be the case for the composite product supply chain analysed as part of this study. It was typically harder to allocate a particular batch of inputs to a particular supplier due to the much higher volumes of inputs, the higher number of suppliers of the same product/ species, and the nature of the manufacturing process.

Unlike solid wood products, suppliers of composite products had less understanding of the upstream supply chain structure. Whilst they typically had an idea of who supplied their suppliers, it was not possible to clearly identify companies involved in particular supply chains. It was also observed that there is a greater range of sourcing strategies for inputs to composite products (as shown by Figure 18). This is usually due to the need to maintain a constant supply of inputs to almost continuous manufacturing processes. As such, supply chains are much more fluid for composite products.

Rubber Wood is extracted from a species (*Hevea brasiliensis*) that is widely used, not only in the manufacture of board products, but also as a dominant input to the furniture industry in Malaysia. It is thought that Rubber Wood contributes 80% of the total export value of Malaysian wooden furniture exports (Ratnasingam, Ioraş, & Wenming, 2011). All three board manufacturers and all three furniture companies visited as part of this study used Rubber Wood as the major input to their products. Figure 18 shows a supply chain for production of Rubber Wood board products of one company visited as part of this study.

Case Study View: Board Products

This example demonstrates a typical supply chain structure for particleboard/ fibreboard products, declared to be harvested from Malaysia. The major input to these products was found to be Rubber Wood. However this was often mixed with MTH – predominantly waste wood left from commercial logging operations. For the supply chain shown below it was stated that Rubber Wood constitutes 75–80% of input volume, with the remainder being MTH. The supply chain is composed of at least five tiers and is uncertified.

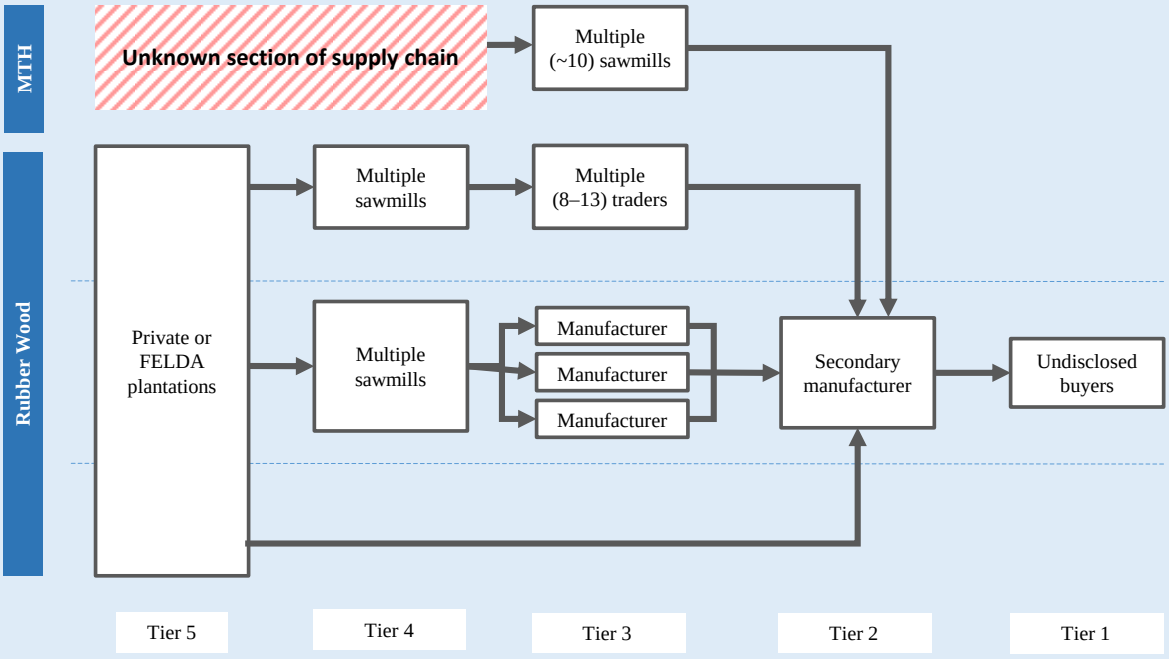

Figure 12. Supply chain diagram: Board products

The origin of harvest for all inputs was declared to be within 50–60 km of the Tier 2 company (respondent). This is due to the prevalence of Rubber Wood from many local sources and because the MTH and Rubber Wood utilised is typically waste and offcuts sourced from local sawmills. For both MTH and Rubber Wood supply chains there was little traceability by batch, due to the huge volumes used as inputs.

Mixed Tropical Hardwoods (MTH)

The company sourced from around ten sawmills for MTH inputs. All sawmills were located within the same State and/or within close proximity and supplied offcuts and branches too small for sawn timber processing. Not all species were not known but the company declared that the sawmill could provide this information. It was presumed by the company that Meranti (*Shorea* spp.) was the dominant MTH used. The supply chain upstream from the sawmills was opaque but the company expected it to be easily mapped due to the local nature of sourcing.

Rubber Wood

For Rubber Wood there were three different routes for sourcing utilised by the company. In around 5% of cases the company itself would take a mobile chipper to a Rubber Wood plantation site and chip materials on site. In 95% of cases the company would buy from traders or from three large manufacturing companies within the same State or purchase from around ten local wood traders. These traders would either buy from independent mills or have their own mills from which materials were sourced. In all cases the materials utilised are offcuts and waste wood from sawmilling processes (typically trunks too small to be milled for sawn timber). All Rubber Wood was declared to originate from private plantations or FELDA plantations (government-backed smallholder programme).

Due to the number of different suppliers utilised, lack of segregation of inputs from different suppliers, lack of Chain of Custody system and almost continuous processing, supply chain traceability is likely to be a challenge.

The dominant role of Rubber Wood in the Asian timber industry means that focus should be given to the sustainability and legality of this species. Almost 70% of the world's Rubber Wood plantations are located in Malaysia, Indonesia and Thailand (Ratnasingam et al., 2011). The huge supply of Rubber Wood derives from plantations established primarily for latex tapping which, after 25–30 years, decline in productivity and are harvested for timber. Typically rubber plantations are then re-established on the same land for further latex and timber production. This trend, along with the fact that Rubber Wood is effectively a by-product of the latex production process and is now utilised instead of being disposed of, means that many now see Rubber Wood as an eco-friendly timber product. From a sustainability perspective, this argument is valid so long as the original establishment of the rubber plantation occurs on already degraded land and not on forested (or other areas of high biodiversity) land.

In Malaysia, rubber plantations are predominantly found on private estates and smallholdings. There are currently over 250,000 smallholdings in Malaysia with an average size of 1.5 ha (MFPC, 2015). Most smallholder plantation areas have been established under one of the government-backed schemes, namely the Rubber Industry Smallholders Development Authority (RISDA), Federal Land Development Authority (FELDA) or Federal Land Consolidation and Rehabilitation Authority (FELCRA) schemes.

Ratnasingam *et al.* (2011) indicate that the area under cultivation for Rubber Wood is actually decreasing due to smallholders favouring more profitable agricultural crops such as oil palm. This claim is supported by companies visited as part of this study, who stated that ten years ago it was possible to purchase large diameter trunks of Rubber Wood but increasingly now companies are purchasing small diameter branches and offcuts from sawmills to maintain the level of inputs required for production processes due to the reduced availability of Rubber Wood stocks. One company visited had also resorted to importing Rubber Wood from Thailand to secure its production - a trend also observed in the wider sector (Puasa, Rahman, Ahmad, Fui, & Roda, 2010).

Traceability in Rubber Wood supply chains is typically more challenging than for other species, due to the use of traders who typically tour a State buying up any waste wood from sawmills and aggregating this into a single load which is sold to a single or multiple customers. Despite challenges in identifying specific supply chains, the low value of Rubber Wood inputs used in furniture and board manufacture typically mean that materials are not transported long distances as it becomes an uneconomical practice. One respondent stated that each large-scale board manufacturer dominates the local sourcing of Rubber Wood surrounding their manufacturing facility and will typically source from the same subset of sawmills which will source from the same local plantations. It can therefore be assumed that most Rubber Wood originates within 60–80 km of the area of manufacture. Thus, even where supply chains are opaque, buyers may derive an indicative area of origin based on their manufacturer's location. For imports of Rubber Wood the situation is less clear and the one respondent importing stocks from Thailand was unaware of the supply chain structure upstream from the exporter. Further research is recommended to characterise imported Rubber Wood supply chains.

The only paper and pulp producer visited as part of this study was Sabah Forest Industries. This company is one of the largest paper producers in the country and is vertically integrated, leasing concessions and operating its own pulp and paper mill (as well as integrated timber complex) near to the forest of harvest. Timber from its leased concessions is used predominantly, with some inputs also being sourced from local sawmills and farms. As such the supply chains for domestic materials used by this company were very short and the company is able to provide a high level of information about its harvest areas. However, not all pulp and paper manufacturers source from their own concessions. As discussed in the sections above, imports of pulp and paper (HS codes 47 and 48) exceed USD 2 billion in value. This indicates a huge volume of imports for which the supply chains are expected to be significantly more complex. Further research is recommended to characterise imported pulp and paper supply chains.

6.5 Legality and sustainability risk in Malaysian supply chains

The analysis of timber supply chains presented in the previous sections has characterised the main trends in the Malaysian timber and wood-product sector. In this section the opportunities and risks will be highlighted and discussed in further depth. Information on risk is derived not only from visits to companies but is also based on information in the public domain relating to country-level risk and to documented cases of illegality/ unsustainability in the timber sector.

At the end of this section, a Risk Matrix (Table 16) summarises identified risks, the supply chains to which they are most relevant, and the potential mitigations actions that may be used to address each.

6.5.1 Risks and mitigation measures for domestic products

i) Corruption

Malaysia scored 52 out of 100 on the Corruption Perceptions Index (CPI) scale in 2014 (Transparency International, 2014). This scale indicates the overall level of corruption within a country. It is commonly used as an indicator of risk in the timber sector due to the recognised correlation between overall level of corruption within a country and the level of suspicious log supply within a country (Marmon, 2006). A score of 52 indicates medium risk level. This reflects a general level of corruption and lack of transparency which is also documented specifically in regards to the timber sector, especially in Sarawak.

In addition, the Global Forest Registry (GFR), a database rating risk in the forestry sector in different countries, identifies legality risks at the national level (FSC & NEPCon, 2015). These risks relate to a number of issues highlighted by NEPCon (NEPCon, 2015b):

- Documented corruption in the award of timber concessions and logging licenses including preferential non-competitive allocation (Transparency International, 2011);
- Corruption related to forest zoning changes, establishment and excision of Permanent Reserved Forest and unlawful clearance of natural forest for establishment of plantations. Notably, Wyn (2013) reviewed 52 cases of alleged illegal forest clearance for plantations, of which 38 included allegations of corruption (Sam Lawson, 2014; Transparency International, 2011; Wyn, 2013);
- Corruption in the control of harvesting and restrictions on re-entry logging in Permanent Reserved Forest areas (Transparency International, 2011, 2012).

Many of Malayia's legality issues result from forest management operations in Sarawak. Whilst responsible forest management is generally perceived as fair in Peninsular Malaysia and Sabah, corruption and illegality is still reported to be systemic in Sarawak. These problems have been highlighted by many commentators over the last ten years. Long-serving Chief Minister Abdul Taib Mahmud was implicated in the widespread corruption plaguing the Sarawak timber sector (Global Witness, 2012, 2013; Straumann, 2015). New Chief Minister Sri Adenan Satem has also recognised the problem of engrained corruption and nepotism in the Sarawak timber sector (see Figure 19) and in 2014 vowed to tackle it head-on. The historic problems with corruption have been a major barrier for Malaysia moving forwards in the FLEGT VPA process (FERN, 2014, 2015) and have led to Sarawak being characterised as a hub for illegal and unsustainable logging (FOE, 2013; Global Witness, 2012, 2013; Lawson, 2011; Ling, 2015; Straumann, 2014).

> *"Some, of course not all, pretend they don't know. The reason is very simple; either they are stupid, cowards or corrupt…"*
>
> Sri Adenan Satem (Sarawak Chief Minister)

Figure 13. Quote from Sarawak's Chief Minister on corruption in the Sarawak forest authorities

Companies located in any countries subject to timber legality legislation would find it difficult to argue that any timber from Sarawak can be concluded to be at low-risk of illegality without implementing stringent risk mitigation

actions. As such, many companies within Europe, US and Australia avoid imports from Sarawak altogether. This is partly why both the EU and USA favour imports from Peninsular Malaysia. It is also likely the reason why no companies from Sarawak wished to participate as part of this study.

The legality and sustainability risks posed by Sarawak are troubling, not only because Sarawak is home to 43% (or 7.8 million hectares) of Malaysia's forested area but also because of the sustained trade the State has with Japan. This trade drives the unsustainable utilisation of Sarawak's forests, predominantly for production of tropical plywood for the Japanese construction industry (Global Witness, 2013).

For companies wishing to purchase from or invest in the Malaysian timber industry, Sarawak is currently considered a high-risk area for which robust mitigation options are required. Independent third-party verification of legality and sustainability criteria is recommended throughout the supply chain to minimise the risks at the forest level. Even when employing such mitigation action, organisations should be mindful of the underlying risk of corruption and bribery and employ a number of mitigation actions concurrently. This may include verifying the validity of documentation, ensuring the objectiveness of third parties, employing robust legality/ sustainability certification standards and using multiple independent sources of evidence.

ii) Lack of traceability

It was found through company visits and requests for information from companies that the level of detail on timber supply chains varied widely depending on the type of operation, species utilised, position in the supply chain and certification status of the company. This is a typical situation in all countries and does not necessarily indicate illegality or unsustainability but it does inhibit robust assessment of supply chain risk.

Confidentiality was a key concern of almost all companies visited as part of the study and is the reason why many organisations declined to participate. Even where organisations did have good access to information on supply chains they stated reluctance to provide this to buyers for fear of identifying their suppliers and subsequently being cut out of supply chains. A number of companies also mentioned that accessing information on the supply chains was significantly more difficult when the supplier was a trader/broker. This is to be expected as these companies may be more likely to be cut out of supply chains.

Confidentiality is a common concern that also inhibits the free flow of information. It may be mitigated through the use of independent, third-party assessment of supply chains against legality requirements or by sourcing certified products (under a scheme where each entity is independently audited). However, where legal liability rests on a particular organisation, e.g. a company deemed as an 'Operator' under the EUTR, supply chain confidentiality may not be realistic if risk assessment is to be robust.

Organisations that were closer to the source of materials had a much greater level of understanding of supply chains. In addition, companies certified to forest certification or legality verification schemes were found to have a much greater level of information available on supply chains. And even when certified companies did not have complete supply chain traceability, certification standards were found to include requirements that made this information available upon request – so traceability is likely to be much easier for certified supply chains. Companies in the furniture sector were found to have less detail as to supply chains and/ or be reticent to provide this information to researchers due to confidentiality concerns.

iii) Lack of awareness

Staff awareness of sustainability and legality issues varied widely. One company visited was operating a robust DDS, independently audited and certified by a third party. This company had a strong ethical and sustainability focus throughout the company, driven by management. However, even within this company the DDS was limited in scope and did not cover most of the volume of inputs processed by the company. Other companies had a good level of awareness of due diligence issues but were not actively implementing robust due diligence checks. Many companies relied solely on certification as proof of legality, without considering the need to

mitigate the risk of corruption. Many companies also relied solely on the Removal Pass to indicate legality and were reluctant to conduct further due diligence due to increased work load.

At the extreme of the awareness spectrum, staff at one large company visited were almost completely unaware of PEFC/ FSC certification or due diligence (despite sister companies within the same group holding FSC certification). Another non-certified company visited as part of this study claimed to purchase PEFC-certified and VLO-verified products from its suppliers. However, when the validity of the certificates was checked on the PEFC database and Rainforest Alliance website, these certificates were found to be invalid (although it appears valid PEFC certificates do exist for other related subsidiaries of the supposedly certified supplier). This issue demonstrates the risk of relying on supply chains with broken Chain of Custody (where not all companies in the supply chain are certified) and highlights the need for capacity building in sectors where certification is not the norm, to help companies understand the utility of Chain of Custody certification.

iv) Harvesting of threatened species

It has been highlighted that, at the national level, requirements for endangered/ rare and threatened species are not always observed by some forest management enterprises, with issues compounded by poor levels of accessibility and field monitoring by authorities due to remote locations (NEPCon, 2015b).

The one forest management enterprise visited as part of this study (Sabah Forest Industries) was found to have detailed information on species harvested, being able to specify scientific names to the species level. However, the majority of companies visited (further down the supply chain) could not identify the scientific name to the species level (e.g. *Shorea macrophylla)* but only to the genus level (i.e. in this case *Shorea* spp.).

This is a particular problem when considering tropical hardwoods from natural forest, as many species in PRF are prohibited from felling or are threatened. Of those species listed on the protected/ prohibited lists maintained by the forest departments, a number of species belong to the same genus as commonly harvested species. These include *Shorea* spp., *Calopyllum* spp., *Artocarpus* spp., *Dipterocarpus* spp. and *Koompassia* spp. Due to the presence of harvesting prohibitions it may be necessary for organisations to know the taxa producing the wood materials they are purchasing down to the species level. This way companies can reduce legality risk by ensuring that, for example, whilst they source *Sterculia* species from the PRF in Peninsular Malaysia, they can confirm that the particular species utilised is neither the protected *Sterculia parvifolia* nor *S. foetida*. Similarly, because of the regional protection lists, different species may be protected in different regions. For example, *Koompassia malaccensis* is protected in Sarawak and Sabah but not in Peninsular Malaysia.

Information on species was a particular problem for manufacturers of composite products. For these sectors it is common to utilise a small amount of MTH for which individual species were not known. This is a particular risk when considering that seven of the top 15 exports from Peninsular Malaysia are board manufacturers likely to be utilising large amounts of unknown MTH species.

Supply chain documentation at forest level, e.g. harvest plans and Environmental Impact Assessments, may be used to verify that certain species were present/ absent at the forest origin. However, the full scientific name of species is not commonly used on other documentation e.g. the Removal Pass. As such, relevant mitigation actions may include collection of information on species from forest management documentation, combined with assessment of prevalence of harvesting of threatened, prohibited or CITES-listed species at the sub-national level (e.g. State level) – for example, media reports of illegalities or consultation with State forest departments.

For CITES-listed species there are a number of risks that should be taken into account. For Ramin species, major discrepancies exist between the volume of exports declared by Malaysia and the volume of imports declared by importing countries. This is expected to be due to under-reporting of CITES-listed exports by Malaysia (Ferriss, 2014). In addition, documented illegalities should be taken into account; these can be found in reports on seized CITES-listed products (e.g. Ferriss 2014). For example, in 2007, 281,355 dowels from Malaysia were seized in the Netherlands en-route to Belgium as they included the CITES-listed species Ramin

but were not accompanied by CITES documentation (Ferriss, 2014). Organisations can avoid unsustainable and illegal trade in CITES species by ensuring that only products with the correct permits and CITES export license issued by MTIB are exported.

Whilst large-scale over-harvesting of *Aquilaria* species has been effectively tackled since 2007, ongoing problems persist with domestic use and small-scale traders illegally exporting product. This has been recently highlighted in Peninsular Malaysia, where the Forestry Department recognised illegal logging in Penang, Perak, Johor, Pahang and Selangor (Teng, 2015). This trade is thought to be largely driven by the tourist souvenir trade and due to foreign nationals entering across the Thai border due to exhaustion of stocks of Agarwood in neighbouring countries. This risk requires a robust response from government to stem the trade in illegal *Aquilaria* harvesting.

Timber companies can mitigate the risks of purchasing illegally harvested *Aquilaria* species by ensuring that all stocks are accompanied by a valid license issued by MTIB. The correct CITES export license should be available for all products exported from Malaysia. In addition, companies sourcing from States where there are documented concerns over the legality of CITES-listed species (e.g. Pahang for *Aquilaria*) should ensure full supply chain mapping and verify the legitimacy of licenses with MTIB.

Companies trading in CITES species or closely related species may also utilise species and origin identification using genetic methods. Specialists at the Forest Research Institute Malaysia (FRIM) sequenced microsatellite markers for *Aquilaria malaccensis* in 2012 which can be used to distinguish between this and other species (Tnah et al., 2012). Since this time FRIM has developed DNA markers for seven more *Aquilaria* species[10] for the purposes of species identification. In addition, a genetic reference map is being built for *A. malaccensis* (based on 17 populations across Malaysia) that will allow for specification of origin of harvest and timber tracking. In addition, reference data for the CITES species *Gonystylus bancanus* is also available for the purposes of timber tracking[11] (Pers. Comm. Mustapha., 2015). Genetic testing may provide additional information to support the risk assessment alongside documentation to validate claims of species and origin.

General mitigation actions for all threatened species include sourcing from supply chains certified to a credible sustainability/ legality standard. This will ensure information is independently verified at the forest management level and that this information is made available to customers down the supply chain. Where sufficient reference data are available, laboratory testing using microscopic or genetic methods may be employed to identify species included within products.

v) Origin identification

In most cases in Malaysia it is necessary to be able identify the origin of products. Most companies stated that they were aware of the origin of products but only a handful were conducting sufficient due diligence to verify this. It is necessary to specify the origin – as corruption and illegality vary among the regions of Malaysia. For example, it may be necessary to prove the previous land-use of plantations (see 'Plantations and Forest Conversion' below) and because protected/ prohibited species and threats vary geographically. For example, as part of this study, one organisation cited the use of Durian wood – a species that is protected/ prohibited in Permanent Reserved Forest (PRF) in Peninsular Malaysia and Sabah. The company stated that the species was not harvested from PRF and as such the harvesting prohibition did not apply. For due diligence purposes it would be necessary to demonstrate the tenure of the harvest origin to verify such claims.

Without traceability back to the forest of harvest it may be difficult to mitigate risk. Suitable mitigation actions may be for organisations to work with their suppliers to map the supplied products back to the forest of origin and monitor supply chains. Sourcing from supply chains certified to a credible sustainability/ legality standard

[10] *Aquilaria malaccensis, A. microcarpa, A. hirta, A. sinensis, A. beccariana, A. crassna* and *A. subintegra.*
[11] Genetic reference data for timber tracking is also available for *Neobalanocarpus heimii, Shorea platyclados* and *Koompassia malaccensis.*

may ensure origin information is independently verified and that this information is made available to customers down the supply chain.

vi) Risk of mixing

It has been mentioned above that supply chain traceability is an issue in many supply chains. Below, risks associated with imported materials are discussed. Where timber sources change frequently or inputs are aggregated from different origins, then a risk exists that high-risk timber may be mixed with low-risk timber.

This is not just a problem when considering timber imported from high-risk countries. Domestic trade is also relevant. In 2014, 65,000 m^3 of wood products were traded from Sarawak to Sabah and (as discussed above) Sarawak is a high-risk origin. One company visited as part of this study stated use of small volumes of materials sourced from Sarawak. This is identified as a high risk, as potentially illegal materials from Sarawak may be mixed with low-risk materials from Sabah and sold onwards.

vii) Non-compliance with harvesting regulations

Although not detected with any of the companies visited as part of this study, non-compliance with harvesting regulations is a recognised risk for domestic produce – which is another reason why full supply chain information is vital. Non-compliance with harvesting regulations is a concern in relation to riparian zones, High Conservation Value Forest (HCVFs), and slopes. In the case of Sarawak there is often a failure to prepare and submit Environmental Impact Assessments. Logging outside concession boundaries and non-compliance with harvesting regulations, including logging on excluded land classes (such as steep land), logging of protected species and under-sized logs, clear cutting along roads and cutting in stream buffers, have been documented. In 2013, Global Witness reported on illegalities by Samling Global and Shin Yang Group in regards to logging in a proposed national park and area of high biodiversity; and logging outside licensed concession areas (Global Witness, 2013). In the neighbouring state of Sabah, according to SFD, the government lost approximately USD 10.4 million in revenue due to illegal logging in 2014 (NEPCon, 2015e).

viii) Tenure rights abuses

Although not detected with any of the companies visited as part of this study, there are many documented cases of tenure rights disputes and violations of customary rights (Sam Lawson, 2014; Wyn, 2013; Yong, 2010). This includes more than 300 NCR cases pending hearing in Sarawak courts in 2014 (Bian, 2014). In 2013, Global Witness also reported on illegalities by Samling Global and Shin Yang Group in regards to customary land rights abuses (Global Witness, 2013)[12].

Companies should ensure that they are not sourcing from any area currently disputed in the Malaysian courts by Indigenous groups. Another mitigation option is to source certified materials. Certification against credible sustainability standards, such as FSC, ensures verification of customary tenure rights during auditing and may serve as an adequate mitigation action. However, when using certification as a mitigation action, companies should be aware of the scope and coverage of the certification standard itself, to ensure mitigation is effective. For example, the MTCS Forest Management Standard (endorsed under the PEFC scheme) has recently been criticised by NGOs, including Friend of the Earth Malaysia, Greenpeace Netherlands, Netherlands Centre for Indigenous Peoples and WWF Netherlands for a number of reasons (FOE, 2013; Greenpeace Netherlands, Netherlands Centre for Indigenous Peoples (NCIV), & WWF Netherlands, 2013).These include criticism that free, prior and informed consent in regards to forest management is only afforded to Indigenous peoples who have legal ownership of land. In many cases Indigenous peoples may have usufruct rights but not legal

[12] All companies alleged to have committed illegal or unsustainable practices by other stakeholders should be mindful of the fact that such information will be taken into account by any buyer conducting rigorous due diligence. It is therefore recommended that companies effectively communicate improvements to their practices and work actively with all stakeholders (including those who raise allegations) to highlight progress. Participation in studies such as this allows companies to reply to allegations and communicate improvements achieved since allegations were made. Companies in Sarawak, especially, are recommended to engage with the NGO sector to benchmark progress as the State authorities attempt to improve the image of the Sarawak timber sector.

ownership of land and may thus be excluded from the management of MTCS-certified forest. Such criticisms are relevant to consider in the risk assessment process when choosing how to mitigate identified risks.

ix) Illegal employment

Although not detected with any of the companies visited as part of this study, a significant share of the workforce in Malaysia is comprised of illegal foreign workers from Indonesia, Bangladesh and the Philippines (Wyn, 2013). Therefore, Malaysian timber companies may need to provide evidence of legal employment of staff to mitigate this risk.

x) Plantations and forest conversion

Rubber Wood is touted as an eco-friendly source of timber that derives its environmental credentials from the fact that it is a cyclically replanted plantation species. This is likely to be true in many cases, however a number of caveats should be borne in mind by investors and buyers of products containing this species:

- The first relates to legality risk and poor access to information on Rubber Wood supply chains. Rubber Wood is generally grown on smallholder and estate plantations in Malaysia. It is generally accepted that plantation-grown species are at lower risk of illegality than species harvested from natural forests, partly due to the reduced ecosystem complexity allowing for simpler planning and monitoring. This reduced risk is often offset by the informal nature of smallholder management, with reduced or poor record-keeping. In addition, as Rubber Wood is typically a lower value species (compared to domestic tropical hardwoods), there is less risk of illegal trade as the benefits do not outweigh the risks. It was also noted as part of this study that many board manufacturers utilise by-products (offcuts and branches) left behind at felling sites or generated during sawmilling (for the furniture sector). Such sourcing typically aggregates volumes from a number of sources and, as a result, supply chains become extremely complex, hampering full traceability.

- The second issue relating to Rubber Wood surrounds sustainability. Whilst a rubber plantation may be legally established and managed in compliance with all applicable laws, there may be questions regarding the sustainability of rubber plantations if they are established on land cleared of natural forest for the purpose of plantation establishment. Under the National Forestry Act 1984 (GoM, 1984) State authorities may excise a section of the permanent forest estate where the reason for its reservation no longer applies or where it is required for an economic use that is higher than that offered by the existing forest. Under this process of excision, Permanent Reserved Forest may be degazetted and its tenure changed to State land (Transparency International, 2011). It can then be developed for agriculture (including rubber and oil palm plantations), property or industrial purposes. Indeed, between 2001 and 2005, 40,000 ha of forest reserve was excised in Peninsular Malaysia alone (MNS, 2012) – although it should be noted that this was by no means all for use as rubber plantation. Therefore, whilst establishment of rubber plantations may be perfectly legal under Malaysian law, investors and buyers wishing to consider sustainability issues (above and beyond legal compliance) should be able to identify the previous land-use and demonstrate that their products do not derive from an area of previously natural forest. This is an approach increasingly taken by concerned companies. For example, the UK retailer John Lewis currently considers the sustainability risks associated with forest conversion for rubber plantations as part of its Sustainable Sourcing Policy (John Lewis, 2015); as does the bank and investor in forest and agricultural commodities, HSBC (HSBC, 2014a). This consideration is also particularly relevant for Malaysia due to the fact that Rubber Wood is the major input to the furniture sector and this sector composes 26% of Malaysia's wood exports by value.

Buyers, financial institutions and investors can mitigate these risks by gaining access to information on supply chains and assessing this in detail. For legality purposes, organisations should assess the level of information available on Rubber Wood supply chains, but not be discouraged if information is lacking from smallholders. Supply chains should be identified as domestic or imported. For domestic supply chains the companies involved in the supply chain should be identified at least back to the manufacturer. As Rubber Wood is typically not transported more than 60–80 km, an approximate area of harvest may be inferred. Further risk assessment may

be made on this basis for both legality and sustainability purposes. Narrowing the area of harvest allows the general level of compliance at the State level to be checked and for documented cases of illegal harvesting to be detected. For sustainability purposes, the levels of excision from State forest reserves can be identified to determine the risk that plantations have been established at the expense of high biodiversity forest.

xi) Over-reliance on certification

Certification of supply chains can offer an increased level of confidence that legality and sustainability requirements are conformed to. However, certification should not be used blindly. The particular standard used by each scheme should be evaluated to assess if it contains requirements covering issues highlighted as part of the risk assessment. A number of certification/ verification schemes were used by companies visited as part of this study; with these including PEFC, FSC, VLC, LegalSource and TLTV. Each scheme has a different set of requirements and if any are to be used as part of risk assessment, it is important for companies to assess the relevant certification standard.

xii) Non-compliance with health and safety regulations

Although not detected with any of the companies visited as part of this study, lack of awareness and non-compliance with health and safety requirements is recognised. This is especially a risk for forest management operations relating to workers wearing Personal Protective Equipment as this is where occupational hazards are greatest. Certification against occupational health and safety standards or sustainability standards such as FSC and PEFC, which include requirements covering health and safety regulations, may be a possible mitigation action to minimise this risk.

6.5.2 Risks and mitigation measures for imported products

Review of import statistics and meetings with companies identified a number of key importing countries for wood products. When aiming to assess legality of forest products for imported materials it is necessary to consider the legislation relating to the country of harvest for all imports. The following section provides a discussion of risks and potential mitigation measures that may be used for non-domestic sources. It should be noted, however, that the country from which products have been imported is not always the country of harvest and, particularly for processed products, there may be long supply chains with inputs originating from a variety of countries. In this case it is necessary to assess a wider range of national contexts and legality and sustainability issues.

Major Importing Countries	**CPI Score**
China	36
Indonesia	34
Thailand	38
USA	74
Vietnam	31
Myanmar	21
Australia	80
Import Countries cited by Companies	**CPI Score**
Cameroon	27
Republic of Congo	23
Gabon	37
Canada	81

Table 15. CPI score of major import countries (Transparency International, 2014)

From national import statistics, it can be seen that Malaysian timber products are mainly imported from China, Indonesia, Thailand, USA and Vietnam (MTIB, 2015). In addition, Myanmar and Australia supply notable amounts. On top of these significant import countries, companies participating in this study also declared imports from Cameroon, Republic of Congo, Gabon and Canada (see Table 15).

i) Lack of traceability

Access to information for some imported supply chains was an issue. In a number of cases companies were using a wide variety of imported veneers of which the origin of only a few was known. Although veneer may be a minor component of products by weight, the species utilised may often be high value and, as in this case, be imported. One company mentioned imported Oak from China but was unsure of the country of harvest, having never enquired (several cases have shown that illegally harvested Russian Oak is often declared and sold as Oak

from China (EIA, 2013)). Extra information should be sought to identify the origin or products before moving to assessing such supply chains.

Another company importing FSC-certified mouldings from West Africa was found to have incomplete information on the supply chain and relied on the fact that certification was in place. In countries where corruption is high, extra measures should be taken to check even certified supply chains; for example, through supply chain mapping, volume reconciliation, laboratory species testing, etc.

There is very little publicly available data on the pulp and paper sector in Malaysia. One pulp and paper manufacturer was engaged as part of this study and this was helpful in characterising the domestic production of these commodities. Pulp and paper constitutes 73% of total imports by value; yet it was not possible to obtain accurate information on the origin of these imports, as the sector is not included within figures maintained by the trade associations and government departments concerned with other timber and wood products (MTIB, MTC, MPIC and Forest Departments).

ii) Imports from high risk countries

China, Thailand, Vietnam, Myanmar, Cameroon, Republic of Congo and Gabon all have CPI scores below 50 (the common threshold used to filter low- and high-risk countries) (see Table 15). Malaysia receives 10% of its sawn timber imports from Myanmar. Illegal logging is a systemic problem in Myanmar, with high levels of corruption, a weak legal framework, poor law enforcement, large-scale overharvesting, lack of oversight and ongoing social and political conflict (MTIB, 2015c; NEPCon, 2015b). A log export ban enacted in 2014 has done little to stem the illegal flow of timber; and a minister even stated that the government is powerless to stop the vast illegal timber trade (Chatham House, 2014). Even with much illegal trade escaping detection due to corruption, the levels of illegal logging are so high that large amounts are still captured. In 2014, Myanmar's authorities seized more than 15,000 tonnes of illegally harvested timber in just two months (The Nation, 2014). In September 2015, the NGO Environmental Investigation Agency reported on huge volumes of trade across the Myanmar–China border (EIA, 2015). As such, legality risks associated with timber imported from Myanmar are extremely high and sourcing low-risk timber from this country is almost impossible at the current time.

China is a major manufacturing hub that imports enormous amounts of timber products from countries around the world. As such, many products imported to Malaysia from China are unlikely to originate from Chinese forests. Malaysian stakeholders should be aware of the possibility that imports from China may themselves derive from high-risk countries and should mitigate these risks. For example, China imports high volumes of timber from countries with known problems of illegal logging, such as Myanmar (see discussion above) and Russia. The Russian Far-East is known to have huge problems with illegal harvesting. Trade data discrepancies and trade flow analysis continue to indicate that trade with high-risk countries makes up a significant portion of Chinese imports. In 2014, Chatham House reported that imports of high-risk products have declined since 2000 but still comprise 17% of total imports by volume (Wellesley, 2014).

Even if Chinese suppliers declare that products derive from lower-risk countries, there is also a risk of illegal products being mixed with low-risk products in supply chains passing through China. This risk of mixing has been highlighted, especially for composite products. In 2015, the UK National Measurement Office conducted a supply chain study on plywood from China. This study showed that in many cases the lists of species declared to be included in plywood products were incorrect or incomplete. This is a key risk, as robust due diligence cannot be conducted if the full variety of species included within a product is not known (Pillet & Sawyer, 2015). Risks associated with Oak species have also been demonstrated in China. In 2013 the Environmental Investigation Agency highlighted the problem of known, illegally harvested Russian Oak (*Quercus mongolica*) being transported over the border to China and being mixed in supply chains (EIA, 2013).

Cameroon also suffers from a high level of corruption and well-documented illegality in the forest sector. Whilst timber originating from the larger FMUs in Cameroon may be considered lower-risk, risks are still significant (NEPCon, 2015a). As much as 40–61% of timber production in Indonesia is thought to be illegal, as well as 70% in Gabon (WWF, 2015). In 2014, 10,000 m^3 of imports from Indonesia entered Sabah and although

illegal smuggling of timber from Indonesia to Sabah and Sarawak has decreased, it is still a risk (Dave Currey, Doherty, Lawson, Newman, & Ruwindrijarto, 2001; Seneca Creek, 2004; Siahaan, 2011). Thailand, Vietnam, Republic of Congo and Gabon also all suffer from similar risks in the forest sector. A precautionary approach should be taken when sourcing from any of these countries.

Mitigation actions should be robust when sourcing from countries where corruption is high and illegality in the forest sector is well-documented. Actions may include sourcing FSC-certified products, conducting on-site field verification using an independent third-party auditor at all steps in the supply chain, rigorous checks of volumes throughout the supply chain and/ or conducting laboratory testing to periodically verify species and origin of products. Implementing a number of these in unison may be the only effective way to mitigate risk in some cases. The organisations visited as part of this study, sourcing from West Africa, were all using certified products, which is a key risk mitigation strategy.

iii) Pulp and paper

There is very little publicly available data on the pulp and paper sector in Malaysia despite pulp and paper constituting 73% of total imports by value. One pulp and paper manufacturer was engaged as part of this study and this was helpful in characterising the domestic production of these commodities. Trade statistics show that Malaysia imports significant volumes of paper from abroad. China is the largest importer (19% of imports by value). As mentioned in the previous section, China is known to have problems with mixing of legal and illegal materials to 'legalise' materials during manufacturing. The complexity of paper supply chains and the continuous nature of the paper manufacturing process makes traceability extremely difficult in this industry. Similarly, Malaysia's second biggest import partner is Indonesia (16% by value), where the pulp and paper industry has been implicated in illegal logging and deforestation for over a decade, including the harvesting of highly endangered species such as CITES-listed Ramin (Greenpeace, 2014; Greenpeace, 2015). More information is required on this sector in particular, due to the huge value of Malaysia's imports and the high-risk countries from which these materials derive/ are traded through.

6.5.3 Legality and sustainability risk matrix

The risks discussed in this section are amalgamated in a consolidated Risk Matrix (Table 16) overleaf, which summarises the risks, the supply chains to which they are most relevant, and the potential mitigation actions that may be used to address each.

Legality and Sustainability Risk Matrix

Risk Headline	Risk Detail	Relevant Supply Chains	Example Mitigation Actions
Lack of traceability	• Low level of supply chain traceability in some cases, inhibiting robust risk assessment.	All supply chains But most relevant for the following supply chains/companies: • Non-certified supply chains • Long supply chains • Supply chains including traders and unwilling suppliers • Imported material supply chains (in some cases) • Furniture supply chains • Pulp and paper sector • Rubber Wood supply chains	• Supply chain mapping • Volume reconciliation • Laboratory species testing (microscopic/ genetic) • Use of independent third-party assessment of supply chains against legality requirements or by sourcing certified products (under a scheme where each entity is independently audited).
Lack of Awareness	• Low level of awareness regarding legality requirement and sustainability risks in some cases. • Lack of awareness on how to implement robust due diligence. • Lack of awareness on how to check certification claims.	All supply chains But most relevant for the following supply chains/companies: • Sectors where certification and supply chain traceability are not the norm (furniture, paper, board, plywood) • Companies not selling to EU, US or Australia • Sarawak	• Capacity building on Due Diligence and legality requirements in EU, USA and Australia • Capacity building in sectors where certification is not the norm to help companies understand the utility of Chain of Custody certification.

Risk Headline	Risk Detail	Relevant Supply Chains	Example Mitigation Actions
No or low quality risk assessment	• Non-engagement with process of due diligence. • Lack of awareness on how to implement robust due diligence.	All supply chains	• Capacity building on Due Diligence as part of responsible sourcing (as well as meeting buyers'/ investors' requirements). • Information sharing with buyers and suppliers to map supply chains and implement cost-efficient due diligence. • Adherence to legality certification scheme (e.g. LegalSource) to demonstrate compliance.
Corruption	• CPI score of 52 • GFR specified risk rating; • Systemic corruption at political and administrative levels of government, including forest departments • Corruption in the award of timber concessions and logging licenses • Corruption related to forest zoning changes, establishment and excision of PRF and conversion of natural forest to plantation forest. • Corruption in the control of harvesting and restrictions on re-entry logging in PRF	All supply chains But most relevant for the following supply chains/companies: • All supply chains originating from or passing through Sarawak.	• Ensure full traceability of supply chains back to forest of origin. • Certification to a credible third-party scheme. • Consultation with authorities and to verify validity of issued documentation in line with regulations. • Consultation with non-government stakeholders. • Forest-level legality verification audits by an independent third party.
Non-compliance with harvesting regulations	• Non-compliance with harvesting regulations, e.g. harvesting in riparian zones, HCVF and on slopes. • Failure to prepare and submit Environmental Impact Assessments (in Sarawak) • Logging outside concession boundaries • Logging of protected species and under-sized logs and overharvesting of approved species. • Clear cutting along roads	All supply chains But most relevant for; • All supply chains originating from Sarawak • Supply chains for high value tropical hardwoods.	• Certification to a credible third party sustainability scheme. • Forest-level legality verification audits by an independent third party (where applicable).

Risk Headline	Risk Detail	Relevant Supply Chains	Example Mitigation Actions
Tenure rights abuses	• Tenure rights disputes and violations of customary rights	Supply chains originating from areas where Indigenous/ customary rights claims are made	• Mapping of supply chains back to forest origin, to assess whether Indigenous/ customary rights claims exist. • Consultation with experts, NGOs, forest department and relevant communities to verify relevance of claims to forest of origin. • Cease sourcing from any areas subject to ongoing court cases over rights. • If claims exist and are valid, consultation with communities required to mediate process. • Certification to a credible third-party sustainability scheme. • Forest-level legality verification audits by an independent third party (where applicable).
Non-compliance with health & safety regulations	• Non-compliance with health and safety requirements	Most relevant to forest management companies but also to any manufacturing company in supply chain.	• Second- or third-party auditing of companies to verify use of personal protective equipment and compliance with other H&S laws.
Illegal employment	• Use of illegal foreign workers	Relevant to all companies in the supply chain. But most relevant for: • Forest management companies.	• Checking presence and validity of work permits for foreign workers.

Risk Headline	Risk Detail	Relevant Supply Chains	Example Mitigation Actions
Harvesting of endangered/ protected species	• Insufficient recognition regarding requirements for endangered/ rare and threatened species and protected sites/ habitats. • Inability to identify full scientific name of species beyond genus level may lead to substitution in the supply chain of non-prohibited species with prohibited species. • Documented cases of illegal harvesting of CITES-listed species.	Relevant to all companies in the supply chain. But most relevant for: • Forest management companies, to avoid harvesting such species. • All other companies in the supply chain, to be able to verify that no threatened/ prohibited species are included in materials sourced. • Companies using MTH where few checks are conducted on species. • Companies trading CITES-listed species or closely related species.	• Supply chain mapping to establish forest origin. • Assessment of prevalence of harvesting of threatened, prohibited or CITES-listed species at the sub-national level. • Check harvest plans and EIA to verify threatened/ prohibited species were present/ absent at the forest origin. • Certification at the forest management level to legality and/ or sustainability standards (and chain of custody certification throughout supply chain). • Increase volume of certified products from already certified companies. • Laboratory testing (genetic) to verify/identify species.
Origin	• Origin risk varies based on, *inter alia*; ▪ Corruption level in the region/ State, ▪ Threatened/ protected status of species in the region ▪ Previous land-use (for plantations)	Relevant to all supply chains.	• Supply chain mapping to establish forest origin. • Sourcing from supply chains certified to a credible sustainability/ legality standard. • Laboratory testing (isotopic) to verify origin.

Risk Headline	Risk Detail	Relevant Supply Chains	Example Mitigation Actions
Mixing	• Risk of mixing and 'legalisation' of illegal materials from Sarawak and imports from high-risk countries.	Relevant to all supply chains, including those certified under the MYTLAS scheme. But most relevant for: • Supply chains using inputs from Sarawak. • Supply chains in Sabah and Sarawak where illegal smuggling from Indonesia is a problem. • Any supply chain using imported inputs that have not been rigorously risk assessed.	• Require increased level of documentation for Sabah supply chains to verify absence of illegally imported timber. • Supply chain mapping to establish forest origin.
Conversion of natural forest for plantations	• Sustainability risk that natural forest land was cleared for plantation establishment. • Legality risk of corruption in establishment and excision of PRF and conversion of natural forest to plantation forest.	All supply chains including plantation materials But most relevant for: • Furniture supply chains • Pulp and paper supply chains	• Supply chain mapping to establish forest origin. • Identification of the levels of excision from PRF at the State level. • Consultation with forest authorities to establish previous land-use of plantation. • Source from FSC-certified plantations (where forest conversion is covered under stringent FSC requirements).
Over-reliance on certification schemes	• Lack of assessment of requirements included under various legality and sustainability standards to ensure they offer robust legality/ sustainability assurance.	All supply chains where certification is used as part of risk assessment – including for the following commonly used certification schemes: • MTCS • PEFC • MYTLAS • FSC • NEPCon LegalSource	• Conduct assessment of the certification scheme to be used in risk assessment or review existing assessments of certification schemes in the public domain. • Identify gaps in certification scheme (against legality/ sustainability requirements) and further mitigate risks.

Risk Headline	Risk Detail	Relevant Supply Chains	Example Mitigation Actions
High risk imports	• Importation of significant amounts of timber and wood products from high-risk countries (at the national level).	All imports from countries with CPI <50 and countries where illegal/ unsustainable practices are well documented. But most relevant for imports from: • Myanmar • Indonesia • China • Thailand • Vietnam – especially when wood derives from natural forests (rather than plantations) in these countries.	• Avoid sourcing any products from Myanmar. For other import countries: • Supply chain mapping to establish forest origin, species and structure. • Sourcing from FSC-certified supply chains • Laboratory testing to verify origin (isotopic) and species (microscopic/ genetic). • Conducting on-site field verification using an independent third-party auditor • Rigorous checks of volumes throughout the supply chain.

Table 16. Legality and sustainability risk matrix

7. Future Trends

7.1 Domestic production and trade

Malaysia's domestic production of timber is set to decline over the coming years. In 2006, the average annual log production was estimated at 19.4 million m^3 and this was predicted to fall to 14 million m^3 by 2010. Log production from forest plantations is predicted to rise to 16.7 million m^3 by 2020 (MPIC, 2009). In recognition of this, the Malaysian Government implemented the National Timber Industry Policy in 2009, to guide the Malaysian timber trade towards production of value-added products. Since the start of the century, most growth in secondary processed products has been driven by the furniture sector. Exports, however, have suffered since the start of the global financial crisis and due to strong competition from countries such as Vietnam and China. Therefore the move towards a timber sector based on secondary processed products is likely to continue but at a reduced pace.

Growth may also be expected in the pulp and paper sector. In 2012 there were 700,000 ha of land under timber plantation for pulp production. This is predicted to double by 2020 (Hoare, 2015).

Annual production of logs from Rubber Wood plantations is also expected to decline to 1.8 million m^3 by 2020 (from 2.1 million m^3 in 2006). Respondents visited as part of this study have already commented on the declining availability of quality Rubber Wood. If the furniture sector continues to grow, it is expected that higher volumes of Rubber Wood will be used in this sector, further reducing available inputs to the manufacture of board products.

Despite years of strong trade between Sarawak and Japan, which has bolstered illegality in the State, recent events may indicate a turning point for Sarawak. The appointment of Chief Minister Sri Adenan Satem in 2014, saw a new, stronger approach to the illegal logging in Sarawak. The Chief Minister has vowed to rout out corruption from the government as well as illegality in the timber sector (ENS, 2014). This process has already begun, with the MACC freezing 375 bank accounts and seizing suspected illegal logs in June 2015 (Ling, 2015). In addition, Sarawak companies operating within the Heart of Borneo[13] were told to achieve certification in their concessions by 2017 or risk losing their licenses (MTC, 2015c).

As promising as these early indications are they do not change the current situation or level of risk in Sarawak. For companies wishing to purchase from or invest in the Sarawak timber industry, the recommendations in Section 6.5.1 (i) should be followed.

7.2 Imports and exports

Along with the recent indicators of change in Sarawak, Japan has also made recent overtures in regards to timber legality. In July 2015 it was reported that Japan's Government is moving to propose legislation preventing the sale of illegal timber without prior checks being conducted by companies (Yusuke, 2015) – a law it is thought will closely follow the format of the EUTR. This is likely a response to mounting international pressure regarding Japan's imports from Sarawak, the fact that it currently has no such legislation requiring private companies to conduct due diligence on timber purchases, and the increased PR threats this poses with the 2020 Tokyo Olympics approaching. Indeed NGOs are already pressuring the Japanese government to expedite these plans to stamp out illegal logging once and for all (Global Witness et al., 2015).

Whilst China is set to continue to dominate the world's manufacture of timber products, there will be major reductions in the amount of Chinese domestic timber on markets from 2016 onwards. With increasing recognition of the current unsustainable utilisation of domestic forests, China has moved to phase out commercial logging in natural forest by 2017. A trial phase in April 2014 saw commercial logging banned in the

[13] The Heart of Borneo is a vast inland area on the island of Borneo that straddles the borders of Brunei, Malaysia and Indonesia and is home to undisturbed and highly biodiverse rainforest and the Indigenous forest-dwelling Dayaks.

natural forests in states in the north-east of the country (IHB, 2014). This will be followed by a total ban on all commercial logging in natural forest on State-owned forest farms and areas from 2016. This ban will be extended in 2017 to harvesting of natural forest by collectively owned and private forest farms. This will affect 198 million ha of China's natural forest and drastically reduce China's 50 million m^3 annual production from natural forests (China Daily, 2015).

These changes will undoubtedly impact upon Malaysia's imports from China, which currently stand at 27% of the total. It is uncertain to what extent, however, as it is unclear what proportion of these wood imports originate from China and how many are imported products which are simply processed in or traded through China.

7.3 Certification

PEFC (MTCS) certification has recently been approved (provisionally) under the Netherlands' public procurement programme. When this is approved unconditionally it is expected that the demand for PEFC-certified products will grow and thus the number of Chain of Custody certificates and export volumes will also increase. In 2014, 8% of Malaysia's total sawn timber exports and 21% of mouldings exports were destined for the Netherlands (MTIB, 2015b). So this recognition will boost trade further.

In addition, the MTCC – in conjunction with trade associations such as MWIA – are currently conducting a scheme to train timber companies for PEFC certification. Companies with strategic influence in supply chains, such as Carl Ronnow Sdn Bhd, were also noted to be working with their own suppliers to build capacity for certification. Such initiatives are likely to see PEFC continue to dominate in Malaysia.

Whilst FSC is making movements towards developing a national standard for forest management in Malaysia, this process is not so advanced. In addition, difficulty will be encountered for Forest Management Units in achieving FSC certification in many parts of Malaysia. Where there is minimal productive natural forest area available, companies commonly allocate more than a 'limited portion' to industrial tree plantations in attempts to present a viable business plan – a move that conflicts with FSC requirements against conversion of natural forest.

There is mixed evidence as to whether timber legality legislation has supported uptake of certification in Malaysia. Two companies explicitly stated that buyers had increasingly started to request certified materials due to the onset of the EUTR. One of the largest companies stated that their customers do not currently request any form of certification and, if they did, these requests would be referred to a certified sister company based in Oceania. The drive towards certification is likely to depend on the particular sector and how much produce is sold to markets with timber legality laws in place.

However, one company did remark that the larger buyers in the Middle East have also started to request information on timber supply chains for due diligence purposes. These are buyers located in countries where legislation is not in place requiring companies to conduct due diligence. It is therefore likely that reputational risk for large companies will continue to grow as consumers in all markets become increasingly aware of the impacts of their purchasing choices.

8. Recommendations

8.1 Capacity building

The provision of training and awareness-raising within all parts of the timber industry is essential. Most companies were found to be aware of the concept of due diligence but few were implementing robust risk assessment of their supply chains.

Capacity building for industry should focus on:

- Understanding the risk assessment process being conducted by buyers in EU, Australia and USA and why supply chain information is requested;
- Collaboration between buyers in EU, Australia and USA and suppliers in Malaysia to avoid duplication of efforts and avoid increased costs (see Recommendation 8.2, below);
- Development of a DDS and related support by timber trade associations that may be offered to members;
- Awareness-raising in sections of the market currently unaffected by calls for risk assessment: furniture trade, paper trade, non-EU/ Australia/ US trade.
- Awareness-raising of the available tools that can be utilised by EU, US and Australian importers for legality purposes. Tools such as NEPCon forestry risk profiles (http://www.nepcon.net/forestry-risk-profiles) – that identify relevant supply chain documentation that can be used in risk assessments – are particularly useful.
- Training to financial institutions (banks, building societies, pension funds, etc.) on legality and sustainability issues in the Malaysian forestry sector (see Recommendation 8.10 below).

8.2 Collaboration within and across supply chains

When making requests for information, companies located in markets subject to illegal timber regulations should be aware of the challenges faced by Malaysian suppliers. Malaysian companies have buyers requesting varying types and levels of information. Companies in buyer markets should be sensitive to the increased time-cost of providing supply chain information and work closely with suppliers to build capacity, avoid duplication of effort, and reduce costs.

Malaysian suppliers may consider working concurrently with all buyers in markets subject to illegal timber regulations to coordinate and agree a common approach to the risk assessment process and information provided in relation to Malaysian supply chains. This could benefit both suppliers and buyers by allowing for costs to be split among a number of parties, covering the following:

- Document collection for the purposes of risk assessment by Malaysian suppliers;
- Translation of supply chain documentation by independent third parties;
- Annual legality and/ or sustainability certification audits of Malaysian suppliers and upstream suppliers;
- Periodic microscopic, genetic or isotopic testing to verify species/ origin of products;
- Changes to supply chains and replacement of upstream suppliers.

Some or all of these activities may already be being conducted by numerous different companies in supply chains. Within the EU, importers are slowly

starting to see the benefits of collaborating with suppliers and competitors (who use the same suppliers), to reduce the costs of due diligence.

8.3 Support SFM in Sarawak

The recent changes in the Sarawak administration have signalled a renewed commitment to ending corruption and illegality in the timber trade. This is, however, a nascent process that should be supported by all stakeholders.

NGOs and government should highlight the expected move towards implementation of illegal timber legislation in Japan because if such legislation were to be implemented this would effectively exclude much of the import trade from Sarawak due to very high risk of illegality.

Support should be provided to both industry and government in Sarawak to ensure that the State may make meaningful steps towards the FLEGT VPA process, which will likely remain stalled without such commitment. This may include the development of a robust TLAS and audit checklist for Sarawak.

8.4 Certification

Increased use of supply chains certified to a credible and internationally recognised standard will greatly help to reduce the risk in Malaysian supply chains and for imported materials. Currently the most widely recognised schemes are PEFC and FSC. Focus should be on two main areas:

- Increasing the number of certified companies: Initiatives being run by MTCC and MWIA have sought to increase the uptake of certification by supporting and training companies. Such initiatives should be supported also from the NGO sector and by government.
- Increasing the volume of certified sales: Whilst many companies visited as part of this study were certified to either PEFC or FSC, the sales volume of certified products was usually low when compared to non-certified sales.

Focus should be placed on the role of certification in the risk assessment process and how supplying certified materials reduces many forms of legality and sustainability risk. However, focus should also be placed on improving certification systems:

MTCS has received much focus due to concerns over recognition of Indigenous rights. This was highlighted during a process whereby the MTCS scheme was assessed against the Dutch public procurement guidelines and the concerns addressed in order to achieve recognition as a robust sustainability scheme. Continued scrutiny and improvement of the MTCS standards is required in order to ensure it delivers legal compliance, because it is by far the most dominant certification scheme in Malaysia.

Independent third-party evaluation should also be applied to a range of different certification schemes (FSC, VLC, LegalSource) in order to assess their alignment with national legality requirements in order to support businesses in identifying non-compliances with national laws and to help standard-setting bodies close gaps in certification standards.

FSC is now revising its approach towards forest conversion, which currently prevents certification of plantation forest established by conversion of natural or

semi-natural forest after November 1994. This effectively precludes FSC from the Malaysian market and is a major reason for the small area of FSC-certified forest. A more measured approach is required to encourage sustainable forest certification in markets such as Malaysia whilst still retaining rigorous standards.

All standard-setting bodies should be aware that, stakeholders conducting due diligence will increasingly focus on evaluating the rigour of the certification scheme and documented incidences of failure of the systems. Therefore addressing concerns in the public domain is paramount if standard-setting bodies wish to maintain integrity and be able to reduce supply chain risk.

8.5 Building reference databases for species and origin testing

Laboratory testing is becoming an increasingly important tool in the due diligence process, used to verify supplier claims on species and origin of materials. Both genetic and isotopic methods, carried out by independent laboratories, can be used to verify such claims. Genetic analysis can often identify the full scientific identity of timber species – allowing stakeholders to distinguish between species within a genus. Genetic and isotopic analyses may be used to verify or identify the origin of materials, sometimes to the level of the forest concession.

A necessary prerequisite for utilising such technologies, however, is the availability of reference data for the comparison of test samples. It is therefore recommended that steps be taken – in collaboration with government, certification schemes, industry and laboratories – to create a publicly available reference database of timber samples from Malaysia that may be utilised by labs around the world. In addition, expanding skills in these techniques to Malaysian labs will be useful for conducting analyses in-country.

FRIM has a laboratory with technicians able to conduct microscopic and genetic analysis of timber samples. This may be utilised for cases where species' require verification/ identification. Laboratories able to conduct microscopic analysis to verify taxa (to the genus level) are now prevalent around the world and may be utilised by importers in EU, USA and Australia, e.g. Kew Gardens in the UK and Von Thunen Institute in Germany. In addition, labs such as the Von Thunen Institute and Agroisolab specialise in DNA and stable isotope testing, respectively.

8.6 Further research into the furniture and paper industry

Further research is required both into the furniture industry and the paper industry, due to the dominance of these two product types in Malaysia's exports and imports, respectively.

For both of these sectors there is a dearth of publicly available information. Companies in this sector are also reticent to provide information to independent stakeholders. There is, therefore, a need for more research on paper supply chains originating from outside Malaysia. Engagement of, and research on, furniture companies is also required to provide more detailed risk assessment of this sector.

8.7 Standardised reporting of trade data

Inter-agency co-operation would greatly help improve the quality and coverage of timber trade data. Currently forestry departments in each of the regions (Peninsular, Sabah and Sarawak) produce production and trade statistics at varying intervals and in different formats (mainly through their annual reports).

Definition of a common set of reporting parameters would greatly facilitate comparison between regions. In addition, collaboration on reporting trade volumes among the regions could help highlight and reduce discrepancies in reported trade. The frequency of such reporting should be (at least) annually.

Currently, MTIB produces import and export figures for a range of products throughout each year. These data provide a wealth of information and are well presented. However, the data could be improved through the addition of:

- Figures for products from the pulp and paper industry;
- Improved data on the furniture trade to measure volumes traded;
- Clarification of which products are included within each category using an unambiguous classification scheme (such as HS codes).

Forest Departments, MTIB, MPIC, MTC and any other government agencies/ quasi-autonomous government agencies that are producing statistics on wood industries should collaborate to reduce redundancy and to create a single dedicated portal for information. Currently, Forest Departments, MTIB, MPIC and MTC all have various trade figures and analyses on their websites. Efficiency and effectiveness could be greatly improved by centralising this data collection, storage and reporting.

8.8 Certification of Rubber Wood

Due to the fact that Rubber Wood is a dominant input to furniture and board manufacturing processes, development of Rubber Wood certification would be a key tool for providing legality and sustainability assurance. A current project under the PEFC system is seeking to explore the opportunities associated with smallholder group certification (PEFC, 2015d). Such initiatives should be supported by all stakeholders to provide the most robust verification under whichever certification system is used.

8.9 Due diligence regulations

The implementation of illegal timber regulations in various consumer markets has shown the effectiveness of such laws in curtailing trade of illegal timber. However, it is likely that a large portion of risky trade has simply been shifted to markets without due diligence regulations. Thus there is a need for a greater number of markets to implement laws that mirror the EUTR and AILPA. Placing legally binding requirements on the timber sector to conduct due diligence would serve as a powerful tool in the international fight against illegal logging and help boost Malaysian sales by reducing legality risk for buyers in regulated markets. Putting regulations in place in Malaysia would also support the timber sector to meet the requirements of key markets already subject to illegal logging legislation (EU, USA and Australia).

8.10 Environmental sustainability criteria for financial institutions

Whilst international financial institutions have begun to consider environmental sustainability in decision-making, uptake by domestic financial institutions has been much more limited in Malaysia. To motivate responsible companies in the wood industry, sustainability criteria should be explicitly considered when deciding on loans and investment to companies in the forestry sector.

To reach this point, a number of initiatives should be pursued:

- Domestic financial institutions should be provided with training on risk identification in the forestry sector so that key decision-makers are given the skills to conduct legality and sustainability assessments for forest-sector

investments;

- Support to create ‘best-in-class’ and/ or negative screening procedures/ guidelines that may be used internally by decision-makers in domestic financial institutions;
- Assistance to financial institutions on reporting of legality and sustainability decision-making for forest-sector investments in a way that is clearly understandable to concerned investors;
- Support to companies within the wood industry on reporting of legality and sustainability achievements to meet financial institutions’ screening criteria and enhance inward investment;
- Pressure on, and assistance to, policy-makers to integrate sustainable development issues into capital market policy-making.

8.11 Tackling corruption

A necessary step underpinning all other moves towards improving legality and sustainability, is the need to reduce corruption within the public sector. This is especially pertinent in the case of Sarawak. Independent oversight should be encouraged wherever possible and the MACC strengthened to reduce corruption.

9. Conclusion

Malaysia plays a key role in the international timber trade, supplying domestic and imported products to a range of countries around the world. Furniture, pulp and paper, plywood and sawn timber are the key exports. Many of these products, especially furniture and sawn timber, are sold into markets such as the EU and USA, where timber legality legislation is in place and governments adhere to strict public procurement policies; whilst other major markets such as Japan are predicted to implement similar legislation over the next few years. Ensuring that timber supply chains are legal and sustainable is therefore integral to ensuring continued growth in the timber sector. Forest management certification in Peninsular Malaysia and Sabah along with continued implementation of TLAS schemes are key steps towards demonstrating low risk in supply chains. However, corruption, environmental infringements and abuse of NCRs are continuing concerns, especially in Sarawak. As a result, it is necessary to gather a high level of information on timber supply chains (even where certification is in place) to conduct robust risk assessment. It may be necessary to provide this information to buyers downstream or to ethical investors concerned about legality and sustainability.

Currently, companies have a mixed awareness of how to conduct due diligence; with some conducting in-depth risk assessment and mitigation of risks and others completely unaware of the due diligence concept. Awareness was found to be higher in companies exporting to the EU, USA and Australia, and also in companies seeking financial investment. Whilst most companies had information on supply chains, there was a reluctance to divulge this information or to implement a DDS due to the perceived confidentiality risks and increased workload, respectively. Some key opportunities exist in the utilisation of Rubber Wood and other plantation species; however conversion of natural forest to plantations is a sustainability risk that should be addressed. Utilisations of hardwoods from natural forest is common in Malaysia, and at present few companies can provide supply chain information to prove threatened/ protected species are excluded from supply chains. Traceability was typically lower for imported goods and this risk is compounded when imports derive from high-risk countries.

Capacity building is required to actively engage the timber sector. Buyers are encouraged to support Malaysian suppliers in accessing information and be aware of the increased burden upon companies. Along with support to Malaysian companies international buyers should also include legally-binding commitments in contracts with Malaysian companies to provide *accurate* supply chain information. Suppliers are encouraged to engage fully with the process to facilitate the free flow of information through supply chains; whilst priorities for government are to continue tackling corruption and support the uptake of sustainability certification. NGOs have a key role to play in training the private sector, highlighting illegality and providing scrutiny of certification schemes.

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11. Appendices

Appendix 1 – Company Overview

Information presented here is taken from publicly available sources and – for confidentiality reasons – does not include all details provided by companies as part of this study.

Company Name:	Carl Ronnow Sdn Bhd
Primary Activity:	Timber Trader
Locations:	Kota Kinabalu, Port Klang
Website:	www.carlronnow.com
Input products:	Logs, Sawn timber, Plywood
Output Products:	Logs, Sawn timber, Plywood
Species used:	Meranti, Kapur, Keruing, Selangan batu, Acacia, Teak, Merbau, Nyatoh, etc.
FSC certification:	RA-CoC-000864
PEFC certification:	SGS-MTCS/COC-0036

Company Name:	Costraco Sdn Bhd
Primary Activity:	Timber Trader
Locations:	Selangor
Website:	http://www.costraco.com/
Input products:	Sawn timber, Mouldings
Output Products:	Sawn timber, Mouldings
Species used:	Gerutu, Durian, Meranti, Seraya, Selangan-batu, Merbaur, Merpauh, Majau, Keruing, Kapur, etc.
FSC certification:	SCS-COC-000564
PEFC certification:	SGS-MTCS/COC-0010

Company Name:	Dongwha Fiberboard Sdn Bhd
Primary Activity:	Fibreboard Manufacturer
Locations:	Nilai, Kulim, Merbok
Website:	http://www.dongwha.com.my/
Input products:	Logs
Output Products:	Fibreboard, Paper
Species used:	Rubber Wood, etc.
FSC certification:	CU-COC-838151
PEFC certification:	N/A

Company Name:	Finesse Moulding Sdn Bhd (subsidiary of Classic Scenic)
Primary Activity:	Picture Frame Manufacturer
Locations:	Rawang
Website:	http://www.classicscenic.com/
Input products:	Sawn timber, Veneer, Wooden Dowels
Output Products:	Wooden Frames
Species used:	Pinus radiata; Pinus taeda, etc.
FSC certification:	SGS-COC-005702
PEFC certification:	N/A

Company Name:	Heveaboard Bhd
Primary Activity:	Particleboard Manufacturer
Locations:	Gemas
Website:	http://www.heveaboard.com.my/
Input products:	Logs
Output Products:	Particleboard
Species used:	Rubber Wood, etc.
FSC certification:	N/A
PEFC certification:	SIRIM-COC 0068

Company Name:	Jin Sheng Furniture Industry Sdn Bhd
Primary Activity:	Furniture Manufacturer
Locations:	Kedah
Website:	www.jinsheng-furniture.com
Input products:	Sawn timber, Laminated Board
Output Products:	Furniture
Species used:	Rubber Wood, etc.
FSC certification:	N/A
PEFC certification:	N/A

Company Name:	Maran Road Sawmill Sdn Bhd
Primary Activity:	Sawmill
Locations:	Kuala Lumpur, Kuala Berang, Temerloh
Website:	http://www.maran.com.my/
Input products:	Logs, Sawn timber
Output Products:	Sawn timber, BJC, Mouldings
Species used:	Meranti, Merbau, Keruing, Mersawa and Kempas, Sapelli, etc.
FSC certification:	SGS-COC-002827
PEFC certification:	SGS-MTCS/COC-0019

Company Name:	Marcoco Furniture Industries Sdn Bhd
Primary Activity:	Furniture trader
Locations:	Penang
Website:	http://www.marcoco.com.my/
Input products:	Wooden Furniture
Output Products:	Wooden Furniture
Species used:	Rubber Wood, etc.
FSC certification:	N/A
PEFC certification:	N/A

Company Name:	Sabah Forest Industries Sdn Bhd (subsidiary of Avantha Group)
Primary Activity:	Sawmill & Pulp/Paper Mill
Locations:	Sipitang
Website:	http://www.avanthagroup.com/
Input products:	Logs
Output Products:	Pulp & Paper, Sawn timber, Plywood, Veneer
Species used:	Meranti, Merbau, Keruing, Mersawa, Kempas, Acacia, Eucalyptus, etc.
FSC certification:	SW-COC-005412, SCS-COC-004438, SCS-COC-004890,
PEFC certification:	SCS-PEFC/COC-004890
LegalSource Cert:	NC-LS-021672
VLC Certification:	RA-VLC-005726

Company Name:	United Woodwork & Construction (M) Sdn Bhd
Primary Activity:	Furniture Manufacturer
Locations:	Penang
Website:	http://www.united-woodwork.net/
Input products:	Sawn timber, Plywood
Output Products:	Wooden Furniture
Species used:	Rubber Wood, Nyatoh
FSC certification:	N/A
PEFC certification:	N/A

Appendix 2 – Sample of Supply Chain Questionnaire

Supply chain mapping Questionnaire

Thank you for participating in the MWIA, WWF & NEPCon study and agreeing to complete this questionnaire! The following questions ask about your company's wood-product supply chains and sourcing strategy. If you have any questions please contact pc@nepcon.net

Q	Information about you	
1	Your full name:	
2	Your work address:	
3	Your email:	
4	Your telephone number:	

Q	Information about your company	
1	Company name:	
2	Company website:	
3	What is the primary activity of your company?	<Select One>
4	Address (where your company HQ is legally incorporated):	
5	In which other countries does your company have legally incorporated offices? (please list all locations)	
6	What is the total number of staff employed by your company?	
7	What is the total annual turnover of your company? (Please specify in either Malaysian Ringgit OR US Dollars)	<Select One>
8	What is the annual sales turnover of wood-based products? (Please specify in either Malaysian Ringgit OR US Dollars)	<Select One>
9	What is the annual sales volume of wood-based products only? (please specify units of measurement)	units: <Select One>

Q	Information about your Environmental & Social Governance				
10	Does your company have a dedicated Quality Control or Environmental Department/ staff member(s)?		☐ Yes (go to Q12)	☐ No (go to Q13)	
11	Please provide details for the head of your Quality Control or Environmental Department		Name: Telephone No: Email:		
12	Does your business have a policy on responsible sourcing of timber or timber products?		☐ Yes If 'Yes', please send a copy of the policy to us when returning this questionnaire.	☐ No	☐ Don't know
13	Does your company hold a valid Chain of Custody certificate? (If so, please specify the certificate code)		☐ FSC	Cert:	
			☐ PEFC	Cert:	
14	Does your company trade in or produce products that are certified/ verified according to *any other* standards for legal and/or sustainable forestry? (e.g. VLO, LegalSource, etc)		☐ Yes (please list):	☐ No	☐ Don't know
15	Have you heard of the following timber legality laws?	EU Timber Regulation (EUTR)	☐ Yes	☐ No	
		US Lacey Act	☐ Yes	☐ No	
		Australian Illegal Logging Prohibition Act (AILPA)	☐ Yes	☐ No	
16	Does your company operate a compliant Due Diligence/ Due Care system?		☐ Yes	☐ No	☐ Don't know
17	Has your company used any external organisations/ consultants/ NGOs to provide support on timber legality laws (EUTR, Lacey Act, AILPA)?		☐ Yes (please list):	☐ No	☐ Don't know

Appendix 3 – Semi-Structured Interview Questions

Supply Chain (upstream)

- How many direct (tier 1) suppliers do you have?
- Where are they located?
- What products does each supplier supply?
- How often are suppliers changed?
- How long have the current supplier been supplying products to your company?
- Do you know who/where your tier 1 suppliers get their products from?

Supply Chain (downstream)

- How many buyers did you have in 2014?
- What type of companies are your buyers (traders, retailers, manufacturers)?

Origin

- Do you know the origin of timber included in products supplied to you, to the level of;
  - i) Country
  - ii) Sub-national region
  - iii) Forest Concession
- Do you know how many steps there are in the supply chain back to the forest?
- Do suppliers always use the same forest origin to supply these products to you?
- What evidence do you have of the origin of products supplied to you?
- What percentage of your purchases come from different countries (please specify)?

Species

- Do you know the species of timber included in the products supplied to you?
- What evidence do you have of the species of products supplied to you?
- Do suppliers always provide products with the same species of timber to you?

Certification

- Is your company certified to any sustainability or legality standard?
- Do you buy any products as certified/ verified? (whether or not your company is certified)
- What percentage of your annual purchase volumes are certified? (please specify if multiple standards are used)
- If so, what percentage of your annual sales volumes are certified? (please specify if multiple standards are used)
- Do you foresee you certified purchases/sales increasing or decreasing in the next 5 years?

Supply Changes

- Have the type of products you sell or supply chains you use changed in the last 5 years?
- Do you expect the type of products or supply chains you use to change in the next 5 years?
- Has your company been affected by timber legislations coming into effect in consumer markets?
- If so, which markets?
- If so, which have been the hardest to deal with?

Due Diligence

- Have you heard of EUTR, Lacey Act, AILPA?
- What has been you experience dealing with these legislations?
- What are the major obstacles in dealing with these legislations?
- Where are your major information gaps in regards to your supply chains?

Appendix 4 – Protected/ Prohibited Tree/ Plant Species in Malaysia

Peninsular Malaysia		**Sarawak**		**Sabah**	
Scientific Name	**Local Name**	**Scientific Name**	**Local Name**	**Scientific Name**	**Local Name**
Archidendron bubalirum	Kerdas	*Rafflesia* spp.	Bunga pakma	*Shorea macrophylla, Shorea gysbertinana, Shorea pinangah*	All Tengkawang/ Kawang species
Archidendron jiringa	Jering	*Dipterocarpus obloglofolius*	Ensurai	*Mangifera* spp.	All Asam family - Mangga or Macang Hutan
Durio zibethinus	Durian	*Shorea macrophylla*	Engkabang jantong	*Durio* spp.	Durian
Mangifera indica	Mangga	*Shorea splendida*	Engkabang bintang	*Triomma* spp., *Daryodes* spp. *and Santiria* spp., except *Canarium spp*.	All Kedondong species
Baccaurea maingayi	Tampoi	*Shorea helmsleyana*	Engkabang gading	*Drancontomelon* spp.	Langsat
Baccaurea sumatrana	Tampoi	*Shorea simins*	Engkabang terendak	*Bacaurea* spp.	Tampoi,Rambai and Belimbing Hutan
Artocarpus rigidus	Temponek	*Shorea palembanica*	Engkabang asu	*Artocarpus* spp.	Terap, Buruni, Pulutan/Cempedak
Dysoxylum spp.	Mersindok	*Shorea stenoptera*	Engkabang rusa	*Nephelium* spp.	Meritam and Rambutan
Nephelium lappaceum	Rambutan Hutan	*Shorea pinanga*	Engkabang langai bukit	*Paranephelium spp*.	Mata Kuching
Garcinia artoviridis	Asam Gelugor	*Shorea ochracea*	Raru	*Aquilaria* spp.	Gaharu
Boucea macrophyla	Kundang Hutan	*Ficus* spp.	Pokok Ara	*Koompassia spp*.	Mengaris/Tualang
Barringtonia spp.	Putat	*Sonneratia alba*	Perepat	*Eusideroxyln zwageri*	Belian
Sandoricum koetjape	Sentul	*Sonneratia caseolaris*	Pedada	*Protoxylon malagangai*	Belian Malagangai
Ardisia spp.	Mata Pelanduk	*Avicennia alba*	Api-api hitam	*Intsia palembanica* and *Sympetalandra borneensis*	All Merbau species including Merbau Lalat
Artocarpus heterophyllus	Nangka	*Avicennia lanata*	Api-api	N/A	All mangrove species
Aglaia spp.	Bekak	*Avicennia marina*	Api-api merah	N/A	Any trees marked by the Director for retention
Koompassia excelsa	Tualang	*Avicennia officinalis*	Api-api sudu	N/A	Any trees from the general stipulated in Schedule I - Forest Rules 1969, if the diameter is less than the specified limit except if marked by the Director for felling.
Ficus spp.	Ara	*Lumnizera littorea*	Teretum merah		
Mangifera	Machang	*Koompassia excelsa*	Tapang / Tualang		

longipetiolata					
Parkia spp.	Petai	*Koompassia malaccensis*	Menggris / Kempas		
Podocarpus spp.	Podo	*Actoxylon sympetalum*	Kayu gahru		
Dialium spp.	Keranji	*Aquilaria beccariana*	Kayu gahru, engkaras (I)		
Sterculia foetida	Kelumpang Jari	*Aquilaria malaccensis*	Kayu gahru		
Lithocarpus cyclophorus	Mempening Gajah	*Aquilaria microcarpa*	Kayu gahru		
Knema spp.	Basong	*Didesmandra aspera*	Rhu Laut		
Myristica spp.	Basong	*Casuarina equisetifolia*	Rhu Laut		
Sterculia parvifolia	Kelumpang	*Rhododendron* spp.	Rhu Laut		
Santiria laevigata	Kedondong Gergaji Daun Licin	*Nepenthes* spp.	Periok Kera /Pitcher plants		
Castanopsis spp.	Berangan	*Orchidaceae* spp.			
Irvingia malayana	Pauh	*Salacca magnifica*			
Artocarpus integer	*Cempedak*	*Johannesteysmannia altifrons*	Ekor buaya		
Eugenas spp.	Kelat Jambu Laut	*Areca triadra*	Pinang		
		Areca jugahpunya	Pinang		
		Pinanga mirabilis	Pinang		
		Areca subcaulis	Pinang		
		Licuala orbicularis	Biris		
		Eurycoma longifolia	Tongkat cili, sengkayap		
		Goniothalamus velutinus	Kayu hujan panas		
		Monophyllaea spp.			
		Antiaris toxicaria	Ipoh		
		All peat swamp species of *Madhuca*	Ketau		
		Calophyllum lanigerum	Bintangor		
		Calophyllum teysmanii	Bintangor		
		Cycas rumphii	Paku gajah, paku laut		
		All epiphytic *Lycopodium species*	Ekor tupai		
		Begonia spp.	Riang, telinga gajah		
		Aeschynanthus spp.			
		Cyrtandra spp. and *Didymorcarpus* spp.	Melebab		
		N/A	*All species of listed in CITES appendices I & II*		

Appendix 5 – Legality Verification/ Certification Schemes

LegalSource Certification

LegalSource certification is a scheme created by NEPCon which provides third-party endorsement of the ability of an organisation to exercise due diligence through a well-functioning DDS.

LegalSource auditing is carried out against the NEPCon LegalSource Standard, which is aligned with the EUTR, the US Lacey Act and the AILPA. The standard sets out requirements that companies seeking LegalSource certification need to comply with. It includes criteria for a quality system covering forest product sourcing and/or production as well as requirements for supply chain evaluation, risk evaluation and risk mitigation. Appendixes specify requirements related to chain of custody, group certification, and supply chain and forest level legality audits.

The LegalSource standard can be applied to any organisation in the supply chain.

Website: http://www.nepcon.net/certify-your-due-diligence

Verification of Legal Origin (VLO)

and

Verification of Legal Compliance (VLC)

Rainforest Alliance's Verification of Legal Origin (VLO) scheme verifies that timber comes from a source that the harvester has a documented legal right to harvest, pursuant to the laws and regulations of the government of the jurisdiction. Suppliers of VLO timber must follow and maintain a documented generic chain-of-custody system to pass on VLO claims. The Rainforest Alliance has begun to phase out VLO certification and will eventually discontinue it altogether, although active VLO certificates will be maintained for those companies that applied prior to 1 July 2012.

VLC ensures that the administrative requirements of permitting, planning, taxes or fees, and harvesting, as well as a broad range of applicable and relevant laws and regulations related to forestry, have been met.

Whilst legal origin verification signifies that a company has met the administrative requirements of permitting, planning, taxes or fees, and harvesting in defined areas only, legal compliance encompasses a broad range of laws on environmental protection, wildlife, water and soil conservation, harvesting codes and practices, worker health and safety, and fairness to communities.

Website: http://www.rainforest-alliance.org/forestry/verification/legal

Timber Legality and Traceability Verification (TLTV)

SGS' TLTV scheme is aimed at verifying forestry companies' compliance against the TLTV Legality of Production Standard. The legal timber trail to the markets is then controlled through chain of custody audits of the processing or trading companies. The TLTV legality of production and chain of custody statements issued by SGS provide independent assurance to customers, stakeholders, and investors on the legality of the company, its operations, activities and products

Website: http://www.sgs.com/

Appendix 6 – List of HS Codes Used for Trade Analysis

The following tables outline the product groups and corresponding HS codes that were used for data analysis of GTA data contained within the body of this report. Where the source 'GTA' is referenced in the body of the text, the following groups have been used. Where data in the body of the text references 'Other' products, this refers to any product groups listed below not elsewhere specified or indicated in the text:

HS 44 – Wood and Articles of Wood	
4412	Plywood, Veneered Panels & Similar Laminated Wood (PLYWOOD)
4407	Wood Sawn Or Chipped Length, Sliced Etc, Ov6Mm Th (SAWN TIMBER)
4403	Wood In The Rough, Stripped Or Not Of Sapwood Etc (LOGS)
4411	Fiberboard Of Wood Or Other Ligneous Materials (FIBREBOARD)
4418	Builders' Joinery And Carpentry Of Wood (BJC)
4409	Wood, Continuously Shaped (Tongued, Grooved Etc.) (MOULDINGS)
4410	Particle Board & Similar Board Of Wood Etc. (PARTICLEBOARD)
4401	Fuel Wood In Logs Etc; Wood In Chips, Etc. (FUEL WOOD)
4408	Veneer Sheets Etc, Not Over 6 Mm Thick (VENEER)
4415	Packings Etc, Wood; Pallets, Collars Etc, Of Wood (WOOD PACKAGING)
4414	Wooden Frames Paintings, Photographs, Mirrors, Etc (WOODEN FRAMES)
4402	Wood Charcoal, Whether Or Not Agglomerated (WOOD CHARCOAL)
4421	Articles Of Wood, Nesoi[14]
4406	Railway Or Tramway Sleepers (Cross-Ties) Of Wood
4404	Hoopwood; Split Poles; Pickets And Stakes Etc
4413	Densified Wd Blocks/Plates/Strips/Profile Shapes
4420	Wood Marquetry Etc; Jewel Case Etc & Wd Furn Nesoi
4419	Tableware And Kitchenware, Of Wood
4416	Casks, Barrels, Vats, Etc. And Parts, Of Wood
4417	Tools/Tool & Broom Bodies Etc Shoe Last/Trees Wood
4405	Wood Wool (Excelsior); Wood Flour

HS 47 & 48 – Pulp & Paper	
4703	Chemical Woodpulp, Soda Or Sulfate, Not Dissoly Gr
4707	Waste And Scrap Of Paper Or Paperboard
4706	Pulps Of Fibers From Recovered Ppr, Oth Cell Mat'L
4705	Woodpulp From Mechanical/Chemical Pulp Processes
4704	Chemical Woodpulp, Sulfite, Not Dissolving Grades
4701	Mechanical Woodpulp
4702	Chemical Woodpulp, Dissolving Grades
4810	Paper & Paperboard, Coated With Kaolin Etc, Rl Etc
4802	Paper, Uncoat, For Writing Etc, Rolls; Hndmd Paper
4811	Paper, Paperboard, Wad Etc, Coat Etc Nesoi, Rl Etc
4804	Kraft Paper & Paperboard, Uncoat Nesoi, Rolls Etc
4805	Paper & Paperboard, Uncoat, Nesoi, Rolls Or Sheets
4823	Paper, Paperboard, Cellul Wad To Size & Arts Nesoi
4819	Cartons Etc Paper; Office Box Files Etc, Paper Etc
4801	Newsprint, In Rolls Or Sheets
4821	Labels Of Paper Or Paperboard, Printed Or Not
4803	Toilet Etc Hshld/Santry Stock Paper Roll Or Sheets
4818	Toilet Paper, Towels, Sim Hh/Hospital Art Of Paper
4806	Veg Parchment, Greaseproof Papers Etc, Rolls Etc
4809	Paper, Carbon, Self-Copy Etc, Rolls Etc
4813	Cigarette Paper, Cut To Size Etc Or Not
4820	Registers, Notebooks, Binders, Bus Forms Etc, Papr
4808	Paper And Paperboard, Corrugated Etc, Rolls Etc

[14] NESOI: Not Elsewhere Specified or Indicated

HS 47 & 48 – Pulp & Paper (Continued)	
4814	Wallpaper Etc.; Window Transparencies Of Paper
4822	Bobbins, Spools Etc. Of Pap Pulp, Paper & Paperbd
4807	Composite Paper & Paperboard, No Surf Coat, Rl Etc
4816	Paper, Carbon, Self-Copy Etc Nesoi, Boxed Or Not
4817	Envelopes, Postcards Etc & Boxes Etc Of Stationary
4812	Filter Blocks, Slabs And Plates, Of Paper Pulp
4815	Floor Coverings, Ppr/Pprboard Base, W/N Cut To Sz

Selected HS 94 codes – Wooden Furniture	
940360	Wooden Furniture, Nesoi
940169	Seats W Woodn Frames, Not Upholstered, Nesoi
940350	Wooden Bedroom Furniture, Except Seats
940340	Wooden Kitchen Furniture, Except Seats
940600	Prefabricated Buildings
940330	Wooden Office Furniture, Except Seats

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