

Promoting REDD+ compatible timber value chains

The teak value chain in Myanmar and its compatibility with REDD+



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Foreword

Myanmar in the eastern Himalayan region is the meeting point of the Himalayan range with the Indo-Burma Landscape. This landscape is biodiversity hotspot of global significance that links and extends all the way to other South East Asian Countries. Given the ecological significance and diversity richness of this landscape, Myanmar's has taken various initiatives to address habitat loss and promote forest conservation and sustainable management of forest resources. While teak timber trade plays a significant role in the national economy, there is a call to make this trade more sustainable and limit the negative externalities. The global policy on result based payment under the REDD+ instrument is one initiative that the country can tap into for financing forest restoration and rehabilitation. This report provides information and a strategy on how to balance economic needs with preserving tropical forest by improving the timber value chain for Teak. The guidance provided by this report is expected to make the value chain more transparent, equitable, promote better governance while simultaneously maintaining environmental integrity. The suggestions made in this report point towards improving the process for adopting more efficient value chain in the timber industry that will take a time and policy adjustments. By adopting a more sustainable value chain for teak timber will also ease the process for qualifying for REDD+ finance.

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Acronyms and abbreviations

AAC	Annual Allowable Cut
CT	Commercial Tax
EIA	Environmental Investigation Agency
EMM	Export Marketing and Milling (department of the MTE)
EU	European Union
EU-FLEGT	European Union's Forest Law Enforcement, Governance and Trade
EUTR	European Union's Timber Regulation
FD	Forest Department
FEQ	First European Quality
FMU	Forest Management Unit
FRI	Forest Research Institute
GHG	Greenhouse Gas
Ha	Hectare
HT	Hoppus Ton
ITTO	International Tropical Timber Organization
LEB	Log Export Ban
LMM	Local Marketing and Milling (department of the MTE)
MSS	Myanmar Selection System
MTE	Myanma Timber Enterprise
MTMA	Myanmar Timber Merchants Association
NEPcon	Nature Economy and People connected
NGO	Non-Governmental Organization
REDD+	Reducing Emissions from Deforestation and Forest Degradation, plus sustainable management of forests, conservation and enhancement of forest carbon stocks
RIL	Reduced Impact Logging
SG	Sawing Grade
SGT	Special Goods Tax
SMEs	Small and Medium Enterprises
SOE	State-Owned Enterprise
UN-REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation (REDD) in developing countries
VPA	Voluntary Partnership Agreement
WBFA	Wood-Based Furniture Association
WBI	Wood-Based Industry (department of the MTE)

Executive summary

Efficient and sustainable value chains of forest products are important for sustainable forest management, improved rural livelihoods, and poverty alleviation. However, in most tropical developing countries, these value chains are not well developed and governed effectively to ensure the equitable distribution of income and benefits from the trade in timber; thus, they provide less incentive for sustainable forest management. Inefficiencies and inequitable distribution of benefits in the timber value chains can contribute to forest degradation. Timber value chains that are well developed and sustainable are thus important for the objectives of market-based climate governance mechanisms such as REDD+, and as such, REDD+ initiatives can provide pathways and direct interventions for developing equitable and sustainable timber value chains. This, however, requires a clear understanding of the functioning and distribution of benefits in the value chain. Thus, this study assesses the teak timber value chain in Myanmar with the aim of identifying the bottlenecks that require interventions for REDD+ compatibility.

Using focus group discussions and individual interviews with the Myanmar Timber Enterprise (MTE) and Forest Department (FD) officials in timber extraction sites, as well as with timber traders in two urban markets, the study finds that the teak timber value chain has both positives and negatives that are of consequence for REDD+ compatibility. The strengths of the value chain which are found mostly in the timber production and extraction stages include: the use of scientific forest management techniques for timber production and the reduced impact logging (RIL) method for timber extraction. In terms of policy on timber trade, the decentralization of the auction system and the ban on log export are seen as positive measures.

However, there are several weaknesses and threats that need to be addressed for value chain sustainability and REDD+ compatibility. The weaknesses include: illegal timber trade; export orientation and inadequate supply of timber to the domestic market; little in-country value addition; lack of a globally recognized certification scheme; barriers in institutional environment and value chain governance; state monopoly over timber trade; lack of diversity in timber supply sources; and the inability of the local people to benefit from timber trade. The threat to the timber value chain and REDD+ compatibility include: insurgency and political/ethnic conflicts; illegal logging; the trend of increasing timber prices; natural forest loss; and low investment in community forestry and smallholder teak plantations.

There are some opportunities that can be leveraged for policy action and interventions for a sustainable timber value chain in the country, including: the democratization of the country and the efforts to reform forest policy; the Voluntary Partnership Agreement (VPA) negotiation process; the increasing interest shown by the private sector; and the high potential of community forest enterprises across multiple products. As a matter of concern, the following recommendations are necessary for a sustainable and REDD+ compatible timber value chain:

- Promoting community forest enterprises, smallholder plantations, and private commercial teak plantations to ensure diversity in timber production and supply
- Tackling illegal timber logging and trade through better law enforcement and market-driven timber pricing/trade policies
- Promoting the participation of forest-based small and medium enterprises (SMEs) in the value chain by increasing the allocation of timber for domestic trade and simplifying the auction processes and requirements for the SMEs' participation in tenders
- Deregulating timber trade by corporatizing the MTE. Giving the MTE autonomous status and corporatizing it to run as a business enterprise will increase its efficiency and effectiveness in delivering the necessary profits.
- Promoting in-country value addition by encouraging further processing which will help create jobs and increase the contribution of the forest sector to the economy
- Improving and quickening the progress and efforts in timber certification in the country
- Review of forest policy and regulations to give commercial forest rights (including on teak) to private individuals, smallholders, and local communities
- Finding a lasting solution to insurgency and ethnic/political conflicts through dialogue and other mediation processes is important for sustainable forest management and timber supply in the country

Introduction

Background

The value chain development of forest products is important for sustainable forest management, especially in tropical and subtropical developing countries where the livelihoods of several people directly depend on timber and non-timber forest products (Schure, Dkamela, Goes, & McNally, 2014; von Geibler, Kristof, & Bienge, 2010). Poor governance and various other externalities at play in the forest products value chains can undermine sustainable forest management which is central to the sustainable livelihoods of the forest-dependent rural poor and to climate change mitigation mechanisms such as REDD+ (Ingram, 2014; Mitchell, Coles, & Keane, 2009). In most tropical and subtropical countries, forest products value chains are not well developed and governed to enable adequate and equitable distribution of income and benefits from timber trade; thus, they provide less incentive for the sustainable management of forest resources (Ingram, 2014). Issues such as illegal timber logging and trade, as well as the development of oligopolies within the timber value chains are very common in most (sub)tropical developing countries where timber trade is leveraged for the improvement of rural livelihoods (Aryal et al., 2016; Zhang, et al., 2016). Hoermann, Choudhary, Choudhury, & Kollmair, (2010) note that in the Hindu Kush Himalayan region, forest products value chains are dogged by a myriad of problems, including secretive and disorganized markets, lack of value chain coordination, weak institutional policy support, and limited market capacity of producers and service providers, all of which prevent the rural people from benefitting adequately and equitably from the forest resources they are endowed with.

However, governance interventions and value chain approaches can address these externalities and deficiencies in forest products value chains for poverty alleviation and rural development (Hoermann et al., 2010; von Geibler et al., 2010). For transnational market-based climate governance approaches such as REDD+, timber value chains that ensure the sustainable management of forests are important for achieving the objectives of climate change mitigation, biodiversity conservation, and sustainable rural livelihoods (Aryal et al., 2016; Springate-Baginski, Thein, Neil, Thu, & Doherty, 2014). Thus, REDD+ initiatives, synergized with value chain development and efficient governance, can provide pathways and direct interventions for timber value chain development and governance to ensure adequate and equitable distribution of benefits to forest-dependent communities in order to help promote sustainable forest management (Aryal et al., 2016; Schure et al., 2014; Springate-Baginski et al., 2014)

Against this backdrop, this study was undertaken to assist in the REDD+ readiness phase by making available information and analysis on the important subjects related to REDD+. Myanmar stands to be a high deforestation and forest degradation country; it is a major timber-exporting country; and at the same time, it is preparing for a result-based payment structure under the REDD+ framework. While Myanmar prepares for REDD+, it needs to take cognizance of how to continue with the timber business in a sustainable, equitable and efficient manner, and value chain analysis is one tool to address these objectives simultaneously for REDD+ and timber business. Thus, this study contributes to a better situational analysis for understanding the value chain of teak timber, a major export commodity of Myanmar. By developing a sustainable, equitable and efficient value chain for timber, we can address better the drivers of deforestation and forest degradation, and thus prepare a country like Myanmar for REDD+.

This report is organized into six sections. The first Section introduces the general context of timber value chains and REDD+, defines the research problem, and highlights the research questions and significance of the study. Section two reviews the relevant literature on value chain and develops an analytical framework for research. Section three presents the methodology of the research and the selection of the timber species and the study area. Section four contains the analyses and findings of the study which are then discussed in section five as a basis for the conclusion and recommendations in section six.

Problem statement

Legal and illegal logging of timber from state-managed (natural) forests has caused deforestation and forest degradation in Myanmar, resulting in a ban on logs export, which was announced by the Government of Myanmar in April 2014 (Woods, 2013). The timber market structure is a key determinant of timber extraction, and as such, equitable and efficient timber value chains are essential for sustainable timber extraction and sustainable forest management (Aryal et al., 2016; Sierra, 2001), which are the major objectives of market-based climate governance approaches such as REDD+. Forest products value chains that are characterized by informal practices and inequitable distribution of benefits are disincentives for sustainable harvesting, and can cause forest degradation, thereby undermining the objectives of REDD+ (Schure et al., 2014). To ensure sustainable forest management and the enhancement of carbon stocks, the practice of sustainable timber extraction is crucial, while issues of equity and efficiency in timber markets are important considerations for REDD+ programmes since the market structure is inexorably influential in shaping timber extraction. A value chain analysis is essential for identifying the issues that require interventions in order to ensure that the markets and value chains are equitable and efficient (Kaplinsky & Morris, 2001).

However, there is a paucity of information on the operation and distribution of benefits in the timber value chain and on its implications for REDD+ in Myanmar, as there seem to be no scientific studies that comprehensively analyse this aspect of timber value chain in the country. There are a few studies on timber trade in Myanmar, such as those of Springate-Baginski, Treue, and Htun, (2016), and Woods, (2013), but these studies do not assess the compatibility of timber trade with REDD+. Meanwhile, the International Centre for Integrated Mountain Development (ICIMOD) and the Government of Myanmar are collaborating for the implementation of a REDD+ programme in the country. Thus, this study assesses the timber value chain and its implications for the implementation of REDD+ in Myanmar using a case study approach. With the aim of identifying issues of REDD+ incompatibility, this study considers the following factors: the sourcing of timber; the governance structure; the institutional environment; the actors involved; and the distribution of consumer price and benefits among the actors in the chain.

Research questions

The main objective of this study is to assess the implications of the timber value chain for REDD+ in Myanmar and the interventions needed for a REDD+ compatible timber value chain. To achieve this, the following research questions will guide the study:

- Who are the actors involved in the timber value chain and what roles do they perform?
- How does the timber value chain operate? And how does the distribution of consumer prices and benefits take place along and among the different stages and actors of the timber value chain in Myanmar?
- What institutional environment and governance mechanisms or dynamics exist for the timber value chain in Myanmar? What are the policy gaps that need to be addressed to institute an efficient and equitable timber value chain?
- What are the bottlenecks militating against the efficient and equitable functioning of the timber value chain?
- What interventions can be made to ensure a REDD+ compatible timber value chain in Myanmar?

Literature review

Value chains, timber extraction, and REDD+

The value chain of a product “describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use” (Kaplinsky & Morris, 2001:4). This definition, seemingly comprehensive and applicable to a variety of products’ value chains, refers to a simple value chain and might be limited in describing forest products value chains which can be much more complex, entailing several links in the chain, and thus are best described in the context of extended value chains (Kaplinsky & Morris, 2001). The timber value chain comprises various activities, processes, governance mechanisms, and actors in the production, extraction, transportation, processing, and the consumption of timber and its products shown in Figure 1 (Schure et al., 2014; von Geibler et al., 2010). The value chain of timber thus starts from the growing of trees through to the consumption of the timber and its products, and generally encompasses various inputs such as seeds, chemicals, equipment, and land and water for the forest sector (for timber production), as well as inputs from the machinery sector (for harvesting and sawing), and also draws on design and branding skills from the service sector (Kaplinsky & Morris, 2001:4).

Figure 1: A simple timber value chain



Source: Adapted from Schure et al. (2014)

The extraction of timber can be greatly influenced by the market structure, and an inefficient and inequitable timber value chain can lead to unsustainable logging which causes deforestation and forest degradation (Schaafsma et al., 2014; Sierra, 2001). Unsustainable timber extraction and trade are believed to contribute to over two-thirds of tropical and subtropical deforestation in Asia and Latin America (Kissinger, Herold, & de Sy, 2012), a phenomenon that poses a threat to climate change mitigation efforts such as reducing emission from deforestation and forest degradation, conservation and enhancement of carbon stocks, and sustainable management of forests (REDD+). Sustainable forest management is integral to REDD+ because it could ensure a sustainable supply of forest products while providing employment to forest communities, and revenue to forest owners and governments of tropical developing countries; but this requires incorporating sound logging systems because the prevailing logging practices have been responsible for rapid forest degradation in these countries (Sasaki, Chheng, & Ty, 2012).

For the achievement of sustainable forest management and REDD+ objectives, the practice of sustainable forest products extraction is critically important as unsustainable logging practices degrade forests, leading to carbon losses (Sasaki et al., 2012; Schure et al., 2014). Thus, in terms of climate change mitigation measures, achieving sustainable forest management is not possible if maintaining a sustainable wood supply is not a core goal of forest management (Sasaki et al., 2012). However, in most tropical countries, illegal logging and, in some cases, unsustainable legal logging have caused deforestation and forest degradation with the attendant adverse consequences for carbon sequestration (FAO, 2015). This deforestation in tropical and subtropical countries can partly be attributed to inefficient and inequitable timber value chains that tend to preclude local and small-scale traders from participating in the formal trade, leading to illegal logging and trade in forest products (Cerutti & Tacconi, 2008; Tacconi, 2012). Efficiency, equity, and transparency in the distribution of benefits and cost in the forest products value chains can significantly contribute to reducing carbon emissions through reduced deforestation and forest degradation; thus, the implementation of REDD+ can be leveraged for sustainable timber value chains if REDD+ initiatives make interventions to ensure effective governance, sound market mechanisms, and favourable institutional and policy environment for trade in forest products (Schure et al., 2014).

Timber value chains, sustainability, and local livelihoods

Efficient and effective timber markets can play a central role in delivering income and livelihood benefits to the local people (Aoudji et al., 2012), but institutional bottlenecks, unfavourable regulations, and inefficient governance structures in forest products value chains in most tropical developing countries have led to the emergence of parallel informal timber value chains which have been created by small-scale timber loggers and traders in their bid to circumvent the burden of regulatory compliance and because of their incapacity to participate in the formal timber value chains (Cerutti & Tacconi, 2008; Kishor & Lescuyer, 2012; Pulhin & Ramirez, 2016; Tacconi, 2012; Weng & Putzel, 2017). These informal timber value chains mostly supply to the domestic timber markets and might even be several times larger than the formal export-oriented value chains (Bickel & Cerutti, 2017; Cerutti, Tacconi, Lescuyer, & Nasi, 2013; Kishor & Lescuyer, 2012). They contribute significantly to the livelihoods and economic welfare of the local people, and even though these chains may be illegal in the context of national and international laws, they may be acceptable and legal in the context of informal local institutions and customs of forest-dependent communities (McElwee, 2008; Weng & Putzel, 2017). However, these informal value chains fed by small-scale logging raise sustainability concerns as illegal logging often results in unsustainable timber extraction and is perceived to pose a significant threat to sustainable forest management objectives (Kishor & Lescuyer, 2012). Unsustainable extraction of timber and other forest products poses a significant threat to the achievement of REDD+ objectives and sustainable development in general, and as such, there is a need for optimizing timber and other forest products value chains to ensure compatibility with REDD+ and sustainable development objectives (Schure et al., 2014; von Geibler et al., 2010).

Contextualizing timber value chain for REDD+ compatibility in Myanmar

Uncontrolled legal and illegal logging of teak and other hardwood for export have led to deforestation and forest degradation in Myanmar (Kollert & Walotek, 2015). Myanmar has the third highest rate of annual forest loss, only behind Brazil and Indonesia (FAO, 2015), which has exposed and exacerbated the country's vulnerability to the deleterious impacts of climate change such as extreme disasters in the form of flood, droughts, and diseases (Ko, 2016; Kollert & Walotek, 2015). Treue, Springate-Baginski and Htun, (2016, p. 15) note that "a major reason for forest degradation in Myanmar is systematic over-exploitation of Reserved as well as Public Protected Forests at the political orders of former governments"; most of which happens to be in the form of excessive timber extraction, primarily teak, but also other high-value hardwoods. Consequently, the Government of Myanmar took steps to control deforestation and forest degradation by instituting a log export ban, on 1 April 2014, with the additional intentions of gaining greater control over the international timber trade and to promote domestic processing and export of more finished products while also addressing illegal timber logging and trade (Kollert & Walotek, 2015; Treue et al., 2016). Signing up for the UN-REDD programme in December 2011, Myanmar's commitment to the implementation of REDD+ provides an opportunity for tackling and reversing forest degradation and its adverse climatic consequences. This commitment, as captured in Myanmar's REDD+ readiness road map, clearly states that:

. . . whilst undertaking political reform and aiming at rapid economic development, Myanmar is striving to reduce its greenhouse gas (GHG) emissions. The government of Myanmar has recognized the potential of the REDD+ initiative to contribute to green development by protecting global environmental resources (forest carbon stocks, but also biodiversity), helping to reverse land degradation, helping to improve the livelihoods of the rural poor and aiding adaptation to climate change.

(UN-REDD Programme 2013, p. 5)

The REDD+ readiness road map also identifies the overexploitation of timber through legal and illegal logging and trade as a major driver of deforestation and forest degradation in Myanmar (Oo n.d.; UN-REDD Programme, 2013). As inefficiencies and limitations in effective governance are the major reasons for forest loss

in Myanmar (Environmental Investigation Agency–EIA–2015; Woods, 2013), it is critically important that necessary considerations are given to streamlining and upgrading the timber value chain to ensure compatibility with REDD+ objectives. Improvements in the timber value chain, especially at the extraction stages of timber, by adopting sustainable forest management practices such as RIL techniques can greatly reduce carbon emission from logging in tropical developing countries (Sasaki et al., 2012). Sustainable forest management and timber supply in Myanmar can be promoted through the liberalization of the production and marketing conditions (Springate-Baginski et al., 2016); this is true in the case of other woods too. Thus, the implementation of REDD+ provides an opportunity for interventions in the forest products value chain to achieve sustainable timber supply and forest management in Myanmar.

Analytical framework

The analytical framework for this study is drawn from existing guidelines and literature on value chain analysis such as: Gereffi, Humphrey, and Sturgeon, (2005); Humphrey and Schmitz, (2004); and Kaplinsky & Morris, (2001). There are four main elements in this value chain analysis: the value-added sequence from production to consumption; a territorial structure, i.e., the geographical concentration and/or dispersion of the activities; a governance structure that refers to the power relations which determine how financial, material and human resources are allocated within the chain; and an institutional framework that identifies how local, national and international contexts influence activities within chains (Gereffi, 1994, as cited in Aoudji et al., 2012, p.99). Even though the value chain analysis has thus far been primarily used as an analytical tool for understanding the way in which firms and countries participate in the global economy, it is also useful as an analytical tool in understanding the policy environment which provides for the efficient allocation of resources within a domestic economy (Kaplinsky & Morris, 2001, p.2). However, there are different ways of analysing the value chains (Kaplinsky & Morris, 2001); thus, what is covered in each analysis is dependent on the needs of the researcher (Aoudji et al., 2012). This study focuses on the teak timber trade in Myanmar—looking into the governance structure, the institutional environment, the actors involved, and the distribution of profits and benefits among the actors in the timber value chain.

Value chain mapping and equity in value chains

To assess the evolution and performance of value chains, a common element used is value chain mapping, which helps to identify the variety of actors, activities, flows, inputs, and outputs in the value chain (Arato, Speelman, Dessein, & van Huylbroeck, 2017; Lusby & Panlibuton, 2007). This timber value chain analysis starts with a mapping of the chain to get an overview of the product flow, the actors and the kind of relationships and interactions that exist between and among the actors of the chain from the production to the consumption stages of the product (Tallec & Brockel, 2005, p.7). This is necessary because “by mapping the range of activities in the chain it provides the capacity to decompose total value chain earnings into the rewards which are achieved by different parties in the chain” (Kaplinsky & Morris, 2001, p.41). The value chain mapping could be a vertical representation (i.e., a linear description of the input and output product flows, and of the actors and economic activities involved at each stage) or horizontal mapping, or a combination of both (Arato et al., 2017). Whilst the vertical mapping helps to evaluate the optimization and efficiency of value chains, the “mixed mapping provides a visual representation of the connection with other value chains, as well as, a description of the social relationships of trust and cooperation between groups and organisations with a view to identifying obstacles and opportunities” (Arato et al., 2017). This study draws from a combination of vertical and horizontal mapping to enable the evaluation of efficiency, and the identification of obstacles and opportunities within the value chain. This also enables the determination of equity in the distribution of profits among the value chain actors and along the various stages of the chain.

Governance and coordination in value chains

The effective and efficient functioning of a value chain depends to a large extent on some degree of governance (Kaplinsky & Morris, 2001, p.25). Thus, governance is key to the value chain approach and it is used “to express that some firms within the chain set and/or enforce the parameters under which others in the chain operate” (Kaplinsky & Morris, 2001, p.2), even though these product and process parameters can also be set by external

agents such as government agencies and international organizations (Kaplinsky, 2000:125, cited in Humphrey & Schmitz, 2004, p.2). In other words, value chain governance “refers to the inter-firm relationships and institutional mechanisms through which non-market coordination of activities in the value chains is achieved” (Humphrey & Schmitz, 2004, p.5). It must be noted that value chain governance in the aspect of facilitating the non-market coordination of activities is not a necessary feature of these chains (Humphrey & Schmitz, 2004). That is to say, governance is not synonymous with the coordination of activities by the various actors within the chain, but the role of coordination is complemented by “the role of identifying dynamic rent opportunities and apportioning roles to the players which reflects an important part of the act of governance” (Kaplinsky & Morris, 2001, p.29).

There are three forms of value chain governance identified by Kaplinsky & Morris, (2001): the basic set of rules defining the conditions for participation in the chain (legislative governance); the coordination of the conformance to the set parameters (judicial governance); and the provision of assistance to the value chain participants in meeting the operating rules (executive governance). Gereffi et al., (2005), however, identifies five types of value chain governance—market, hierarchical, relational, modular, and captive—which could be at high or low levels of coordination and power asymmetry; but a good and effective value chain governance ensures efficiency in the interactions between the firms along the chain (Aoudji et al., 2012; Gereffi et al., 2005). Thus, this analysis looks into the governance of the timber value chain because it is important for understanding the distribution of gains along the chain and for identifying the leverage points for policy interventions; it also provides a funnel for technical assistance (Humphrey & Schmitz, 2004).

Institutional environment for timber value chains

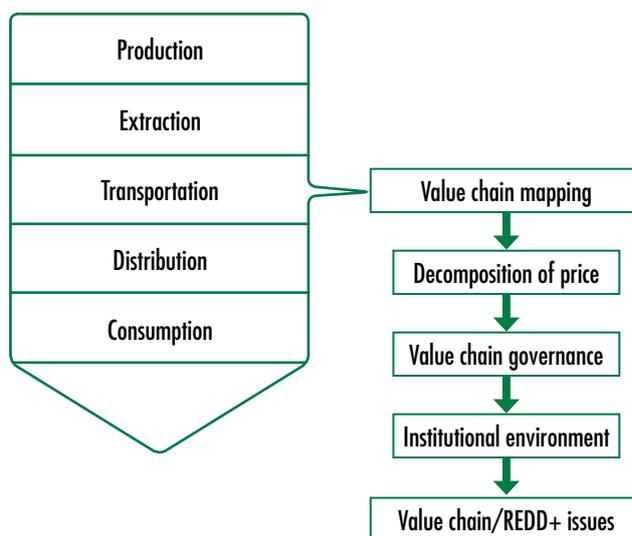
The institutional environment has an influence on the actors who participate in the value chain, on equity in the distribution of benefits along the value chain, and on how the value chain is governed. The institutional framework in value chain analysis is important because economic performance is determined by the institutional environment (Aoudji et al., 2012). An unfavourable and inequitable institutional environment can lead to inefficiencies within the value chain and the development of parallel, unsustainable timber value chains, as can be seen from the ubiquitous nature of the informal timber markets in most tropical developing countries where unfavourable regulatory compliance requirements have pushed smallholders and other small-scale loggers into illegality (Cerutti et al., 2013; Weng & Putzel, 2017). Midgley, Stevens, & Arnold, (2017, p.10) note that severe impediments in the institutional environment can undermine the effectiveness and efficiency of forest products chains; thus, sympathetic, legal and regulatory frameworks are important for equitable value chains, especially where smallholders need to participate in the chain for their livelihoods and financial sustainability. The inability of smallholders to participate in the legal timber market due to regulatory and institutional constraints forces them to find ways to navigate these institutions, but this reduces their ability to capture greater benefits from the timber market (Mejía, Pacheco, Muzo, & Torres, 2015; Pacheco, 2012; Pacheco, Mejía, Cano, & de Jong, 2016). The institutional framework for timber value chains can be described through the lenses of forest policy, tax policy, and the regulations governing tree planting, logging, and trade in forest products (Aoudji et al., 2012). This will serve as a guide in assessing the institutional environment for the timber value chain in Myanmar.

Methodology and study area

Research approach and methods

This study is exploratory in nature and employs largely qualitative and quantitative research methods in data collection and analysis. It used the value chain approach, drawing an analytical framework from the existing literature and guidelines on value chain analysis. By adopting a classical approach to value chain analysis, the study interviewed the key value chain stakeholders and reviewed the literature and statistical data on timber trade to help provide a strong analytical background to value chain issues, constraints, and opportunities (Lusby & Panlibuton, 2007). Thus, the study began with the mapping of the material flow and the actors involved and their responsibilities within the value chain from timber production to its consumption. Timber production (from government-managed forest and other forests) was chosen as the entry point, looking at the sources of timber and who produces it, who extracts it and then following the material flow to the distribution, processing and consumption of timber and its products, whilst also looking into the various actors and their responsibilities at various stages of the value chain. The study then proceeded to assess the governance of the chain and the distribution of profits and benefits among the various actors within the value chain, and the institutional environment mediating forest production, use and trade of forest products. This then paved the way for the identification of the value chain and REDD+ compatibility issues (Figure 2).

Figure 2: Research approach

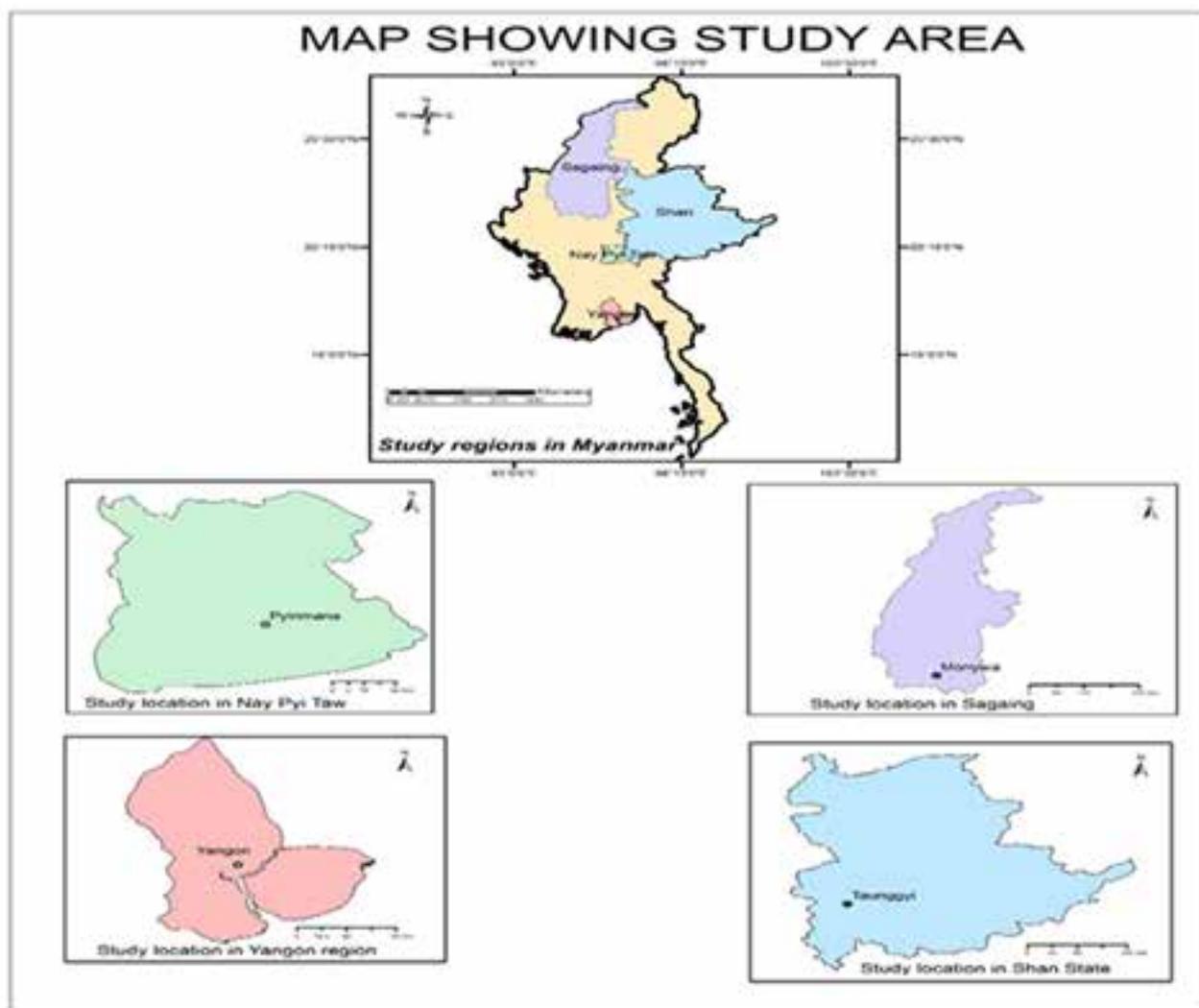


Data collection and analysis

This study was carried out in four different areas of Myanmar as shown in figure 3 below. The study used semi-structured interviews for primary data collection. The semi-structured questionnaires were developed to guide the interviews with the various stakeholders in the timber value chain. This had been preceded by a mapping of the stakeholders in collaboration with the research partners in Myanmar to ensure that the data collection was feasible, and the appropriate actors were interviewed. Different sets of interview guidelines were developed for each actor group due to the peculiarity of information required from each actor group. Some questions, however, appeared on more than one set of questionnaires for the purpose of triangulating the responses. The various actors were organized into focus groups for interviews, but the questions that demanded individual responses were asked directly to individuals within the focus groups. For instance, questions regarding the number of people employed and the profits made by the timber processors and furniture producers were answered by each individual member of the focus groups. In total, seven focus group discussions and nine individual interviews were held with the stakeholders to collect the primary data for this study. Focus group interviews were mainly used for the primary data collection due to the fact that data collection through several individual interviews and surveys would not be feasible considering the difficulties in getting the respondents, and time constraints as well as the sparse distribution of the areas selected for the study which required long-distance travel to various regions.

Focus group interviews were held with the FD and MTE officials of Sagaing Region in Monywa; the FD officials of Shan State in Taunggyi; the FD officials of Nay Pyi Taw in Pyinmana; the domestic timber traders (sawmill owners

Figure 3: Location of study areas



and small-scale furniture producers) in Pinyinana; the members of the Myanmar Timber Merchants Association (MTMA) and other large-scale timber traders in Yangon; and top officials of the MTE in Yangon. Individual official interviews were held with the chairman and a member of the Wood Based-Furniture Association (WBFA) in Yangon; two officials of the MTE in Taunggyi; two officials of the MTE in Nay Pyi Taw; two officials of the FD in Yangon; and also an interview with the representative of a private teak plantation owner in Pinyinana.

This primary data was then enhanced by secondary data from an extensive literature review and analysis of policy and statistical documents. Published and unpublished reports and other grey literature on timber trade and forest management, especially of Myanmar, served as valuable sources of information for contextualizing the research and also to help make sense of the primary data collected from the field. The data analysis was largely done qualitatively, but also with the aid of tables and figures as deemed appropriate. This analysis had been preceded by a transcription of the interviews and the organization of the data manually in the contexts of the various themes and objectives of the study.

Selection of timber species and study area

The teak (*Tectona grandis*) timber species was selected for this study. The famous Burmese teak is the most valuable hardwood species and highly traded timber in the formal timber value chain in Myanmar. The teak wood is a major focus of the Government of Myanmar for extraction, domestic trade, and export; thus, Myanmar is one of the global leaders in teak export, even though it also exports other valuable hardwood (Kollert & Walotek, 2015). Almost half of the estimated 29 million ha of the global area of natural teak forest is found in Myanmar, making the country a

heavyweight in the global teak trade and the primary producer of teak logs—supplying a quarter of the reported global teak logs (Kollert & Walotek, 2015). Natural teak forest covered about 16.5 million ha of the entire forest in Myanmar as of 1993, forming 70% of the global remaining natural teak forest then (Myint, 2012, p.5). Not only is Myanmar a heavyweight in naturally grown teak, the country also has the third largest area of planted teak (about 390,000 ha), only behind India and Indonesia globally (Kollert & Cherubini, 2012; Kollert & Walotek, 2015). Besides, the top three major importers of teak globally—India (74% of the total global teak trade volume), Thailand (15%), and China (10%) (Kollert & Walotek, 2015)—are all neighbours of Myanmar, which makes the export and trade of teak roundwood even more attractive. Thus, the teak timber species, which is the most traded and exported in the formal timber market in Myanmar, was selected to make data access and collection more feasible and relatively easy.

To enable the data collection and analysis of the timber value chain, Nay Pyi Taw, Yangon, Sagaing Region and Shan State were chosen as the areas for this study. Yangon is Myanmar’s commercial centre and the formal export point for Burmese teak and other hardwood timber species. Nay Pyi Taw, the country’s capital, is also a huge market for timber trade owing to its proximity to teak production ranges, and the boom in construction activities there over the years. Besides, a couple of timber extraction sites and depots were selected and visited for observation and interviews to ascertain the processes and factors pertinent to the sourcing of timber. One township each in Sagaing Region and Shan State (South), which are known as hotspots for timber extraction (Springate-Baginski et al. 2016), were selected and visited for observation and interviews with the actors in timber extraction and trade. In Sagaing Region, which is known as Myanmar’s “teak basket” (Springate-Baginski et al., 2016), Monywa—Sagaing’s capital city—where an MTE extraction agency and an FD are located, was selected, whilst in Shan State, its capital district, Taunggyi, which also has an MTE extraction agency and an FD, was selected for interviews.



Results and analysis

The timber value chain in Myanmar

To get a better picture of the teak timber value chain in Myanmar, it is important to highlight and distinguish the potential sources of all hardwood timber in the country. The overall timber value chain in Myanmar is broader and involves more actors than the teak timber value chain due to the fact that teak is the most valuable hardwood species in Myanmar, and the government has the exclusive right over teak timber extraction and trade. Generally, all hardwood timber in Myanmar come from two major sources—Classified Forests (Permanent Forest Estate) and Unclassified Forests¹ (Springate-Baginski et al., 2016). Unclassified forestlands are under the Ministry of Agriculture and Irrigation, while the trees themselves are under the FD. The forestlands could be given out as concessions for other land uses like agriculture, and the timber that comes from the land conversions (conversion timber) is extracted by the land grantees, but belongs to the MTE (Springate-Baginski et al., 2016). Teak timber and other valuable hardwood in Myanmar are sourced from the reserved and public protected forests of the Permanent Forest Estate. The Permanent Forest Estate² comprises Reserved Forests³, Public Protected Forests⁴, and Protected Areas, all of which are under the management of the FD (Castrén, 1999).



¹ Areas of forests not yet reserved by the Forest Department, and therefore by default under the Ministry of Agriculture and Irrigation, which classify them as Virgin Fallow and Vacant Land (VFLV) areas, suitable for conversion to other land use such as plantation (Springate-Baginski et al., 2016).

² These are areas of forested landscapes reserved by the Forest Department for plantation (Springate-Baginski et al., 2016)

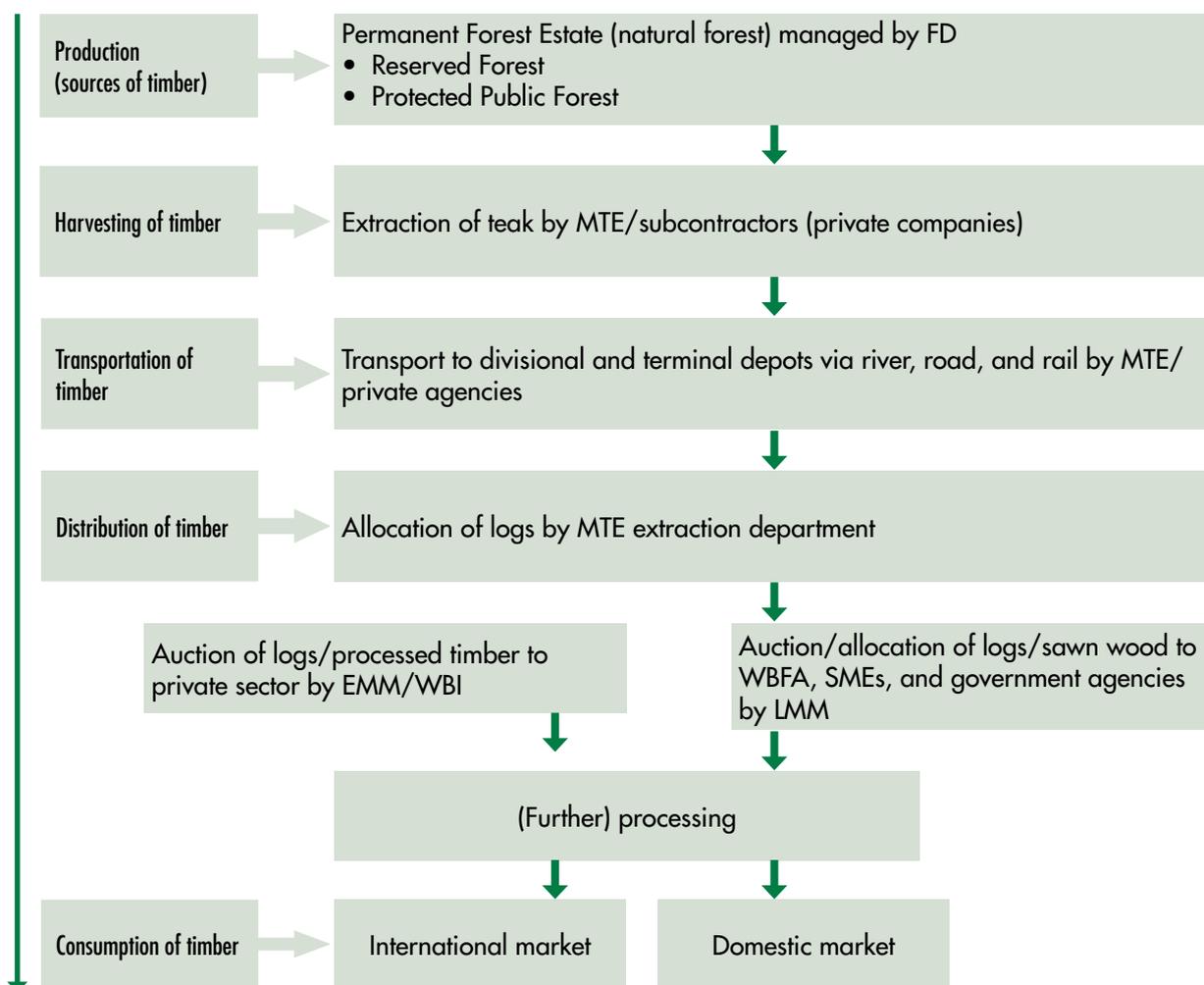
³ Areas of forest landscape reserved by the government as they contained higher value timber stands at that time, and were allocated for timber production by the state under a forest management plan (Springate-Baginski et al., 2016).

⁴ Areas of forested landscapes containing lower value timber stands or those which have not yet gone through the reservation process for other reasons. These are allocated for domestic supply, although the timber is also extracted by the state and its agents (Springate-Baginski et al., 2016).

Mapping the teak timber value chain

The teak timber value chain is mapped here by tracing the timber from its production, harvesting, transportation, and distribution to its consumption, and by describing the various actors and activities that pertain in these various levels of the chain (Figure 4).

Figure 4: Teak timber flow in the value chain



Teak timber production

This involves the growing and management of trees and forest from which the teak timber is sourced. All natural forests in Myanmar belong to the government and are managed by the FD which is entrusted with the responsibility of protection, conservation, and sustainable management of all forest resources in the country. All teak timber in Myanmar are currently sourced from the natural forest (reserved forest). There are also established government and private plantations as well as community forests, but all teak timber currently comes from the natural forest. Thus, the main actor in teak timber production in Myanmar is the FD which manages the natural teak forests according to the Myanmar Selection System (MSS). The FD is not only involved in teak timber production and management, it also performs various preharvest activities and other responsibilities along the various stages of the teak timber value chain. The annual allowable cut (AAC) for teak and other hardwood species is calculated by the FD using data from the inventory of trees and their growing stock; this is prepared by the district forest offices in the various forest management units (FMUs). This AAC helps to regulate the amount of timber harvested from the forests to ensure that there is sustainable timber supply and sustainable forest management. The FD is also responsible for

the preharvest mapping of trees, and the girdling and marking of selected teak trees for felling as prescribed in the management plan of the FMU. Information on the selection of trees marked for felling and a map showing the location of the marked trees are handed over to the MTE for logging. The MTE also plays a role in timber production by doing enrichment planting after harvesting and taking care of these trees for a year before handing them over to the FD.

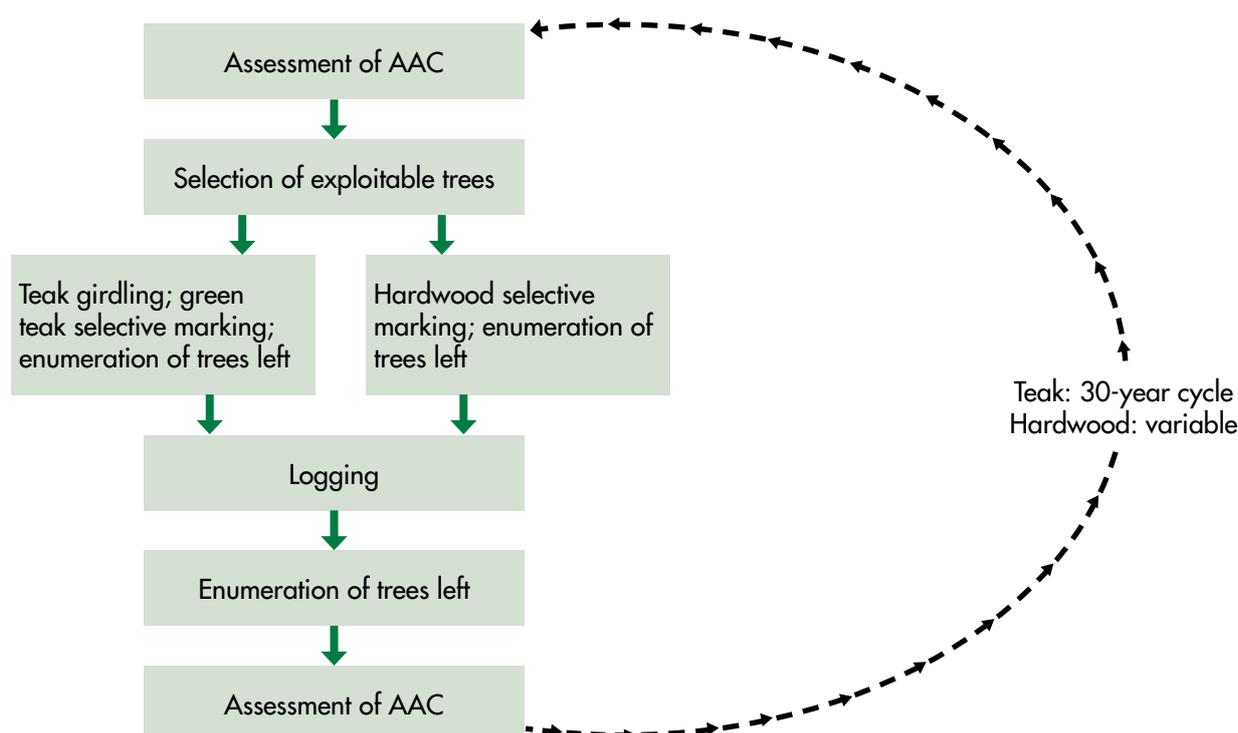
The Myanmar Selection System

Natural teak forests are scientifically managed using the Myanmar Selection System. This method of forest management is a scientific system based on selective logging of matured trees in a 30-year cycle as opposed to the clearing of the whole forest stand (Castrén, 1999; Springate-Baginski et al., 2016). Under the MSS, specific territories are reserved for timber production (“reserved forests”), and these are harvested according to the 10-year forest management plans, based on the tree inventory and the ACC calculations so that only the “increment” volume is extracted (Springate-Baginski et al., 2016). The MSS was adopted in the moist and dry mixed deciduous forests of Myanmar which consist of a division of 30 blocks of equal yield capacity, among which selective logging is carried out in each of the blocks every year. The minimum exploitable girth limit for moist deciduous forests is 229 cm (7.5 ft), while that for the dry mixed deciduous forests is set at 198 cm (6.5 ft) (Kollert & Kleine, 2017, p.43). Under the MSS system, seed bearers are maintained to ensure the natural regeneration of the teak forests (Kollert & Kleine, 2017, p.43). As depicted in figure 5 below, the same MSS is used for other hardwood species, but is modified to meet the specific requirements of various species; thus, the AAC is established both for teak and other hardwood based on the number of juvenile trees surveyed during the logging operations under the MSS (Castrén, 1999, p.6; Myint, 2012).

Timber harvesting

Timber harvesting here is used to refer to the various timber extraction activities, and generally entails the activities involved in the construction of skidding trails, trucking roads and the landings, the felling of the tree, delimiting, and the bucking of the felled trees into logs. The main actor in teak timber extraction is the MTE which is a state-

Figure 5: The Myanmar Selection System (MSS)



Source: Castrén (1999); Myint (2012)

owned enterprise vested with the exclusive legal right and responsibility to harvest teak and other hardwood species for commercial purposes, as well as the control over the milling, processing and marketing of timber products. The MTE, however, sometimes gives subcontracts to private companies to extract timber, especially in areas where it is unable to do the logging by itself due to security concerns, and topographical and logistical reasons. For instance, in the south-eastern part of Shan State, it has been revealed that teak extraction is currently being done by a private contractor due to topographical and security reasons. The method of logging used for teak and other hardwood by the MTE is the RIL. Thus, the actual felling of the trees is preceded by the construction of skidding trails, trucking roads, and landings using tractors and/or graders/bulldozers. There are also private companies contracted to carry out some of these preharvest construction activities due to logistical constraints. The extraction of the timber is done by the extraction agencies of the MTE at the FMUs.

Apart from the MTE and private companies, the FD also plays a role during timber extraction by monitoring the on-site logging activities of the MTE and/or its subcontractors, and also conducts a post-harvest assessment together with the MTE to ascertain the MTE's compliance with the logging regulations. This is especially important where the FD has not been able to monitor the logging effectively, even though the post-harvest inventory is still done even when the FD has monitored the logging process.

Transportation of timber

In the context of timber, transportation involves the process entailed in moving timber from the point where the tree is felled to the distribution and consumption locations of the timber and its products. These activities include skidding and/or trucking of the logs to the landings (measuring points), and hauling, rafting, barging, or rail transportation of the logs to the terminal points of distribution (depots). The first stage of teak timber transportation in Myanmar begins with elephants skidding (dragging) the logs to the measuring points (landings) directly and/or to wider skidding paths where it is further hauled by the skidders to the landings where the logs are measured by the FD together with the MTE for revenue (royalty) assessment (Kyaw, 2013; Zaw, 2003). At these measuring points, revenue hammer marks and serial numbers are placed on the logs (Kyaw, 2013). The log-skidding activities are mainly carried out by elephants (Figure 6 left) owned by the MTE, but in some cases, elephants owned by private parties are also used on a contractual basis (Castrén, 1999; Kyaw, 2013; NEPCon, 2013; Springate-Baginski et al., 2016; Woods, 2013; Zaw, 2003). For instance, in Sagaing Region, it was found that approximately 30% of the skidding is done by privately owned elephants because the extraction department of the MTE does not have enough elephants to do all the skidding by itself. The second stage of transportation is the skidding and/or trucking of logs from the measuring points to transit depots (river depots, rail sidings, and/or log yards). The loading of logs into the hauling trucks is done by wheel loaders (Zaw, 2003). These logs are then transported to terminal depots in Yangon by rafts, trains, and trucks (Figure 6 right) where the log distribution is done for processing and export. Some of these transit depots (at the divisional level) also distribute timber for the domestic market.

Figure 6: Elephant skidding teak log (left); trucking of timber from the transit depot in Sagaing (right)



In Sagaing Region, it was observed that all logs are transported by rafts, whereas in Shan State (South) and Nay Pyi Taw, all logs are transported to the divisional and terminal depots in Yangon by trucks because there are no connecting rivers between the depots and Yangon. Most of the transportation (trucking, rafting, and railing) is done by the MTE, but there are also private-sector actors who participate in the trucking when the MTE does not have enough capacity to do the same. In Nay Pyi Taw, it was seen that all transportation is done by the MTE, while in Shan State (South) and Sagaing Region, part of the transportation responsibilities are carried out by private-sector actors. Apart from the MTE and the private sector who perform most of the responsibilities in transportation, the FD also plays a role in the chain of custody of timber by monitoring the transportation, and issuing trucking slips to the logging trucks and removal passes to the private-sector trucks transporting timber across different states and regions. Critical control and checking points have been established at vantage points along the transportation route where the staff concerned of the FD check the quantity of timber brought to these stations against the hammer marks and the quantity written on the removal passes to ensure that illegal timber is secretly mixed with legal timber and illicitly transported. (Kyaw, 2013).

Distribution of timber

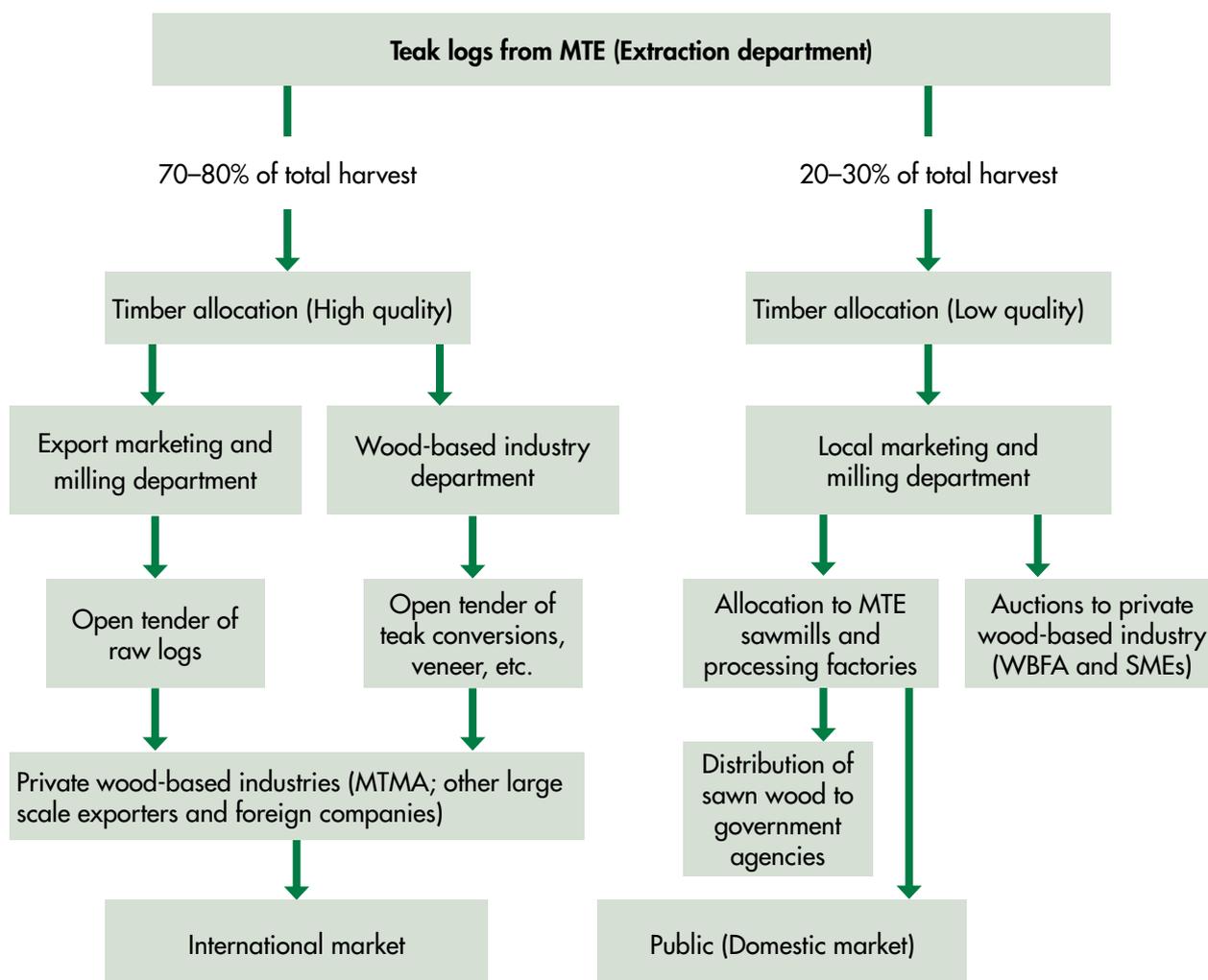
There are two forms and processes of distributing teak timber and other hardwood to traders in Myanmar—auction and allocation (Figures 7 and 8). Teak timber is distributed to the private sector through open tender (held monthly) where the various private-sector companies all have equal opportunity to participate, whilst the government-owned wood-based industries do not participate in the auction but get direct allocation from the MTE. Auctions for the distribution of teak timber take place at two levels—national and divisional depots. Auctions at the divisional levels are held for domestic traders who process and sell timber and furniture for domestic consumption. Auctions at the national level are mostly held in Yangon, but also in Mandalay, and these open tenders are mostly for private-sector actors who export timber. Low-quality timber such as those below sawing grade seven (SG-7—about 20–30% of the total teak harvested) is often allocated by the MTE for the domestic market, while high-quality timber such as SG-1 to SG-6 (70–80% of the total harvest) is allocated for the export market. The responsibility of teak allocation for the export market is shared between the Export Marketing and Milling (EMM) department and the Wood-Based Industry (WBI) department of the MTE in equal proportions. The EMM department sells the logs to the private-sector wood-based industries through open tenders, while the WBI department sells processed timber (teak conversions, veneer, mouldings, plywood, etc.) to the private-sector wood-based industries. The logs and the processed timber are then processed by the private wood-based industries into semi-finished and finished products, and exported to the international market. The timber allocated for the domestic market goes directly to the Local Marketing and Milling (LMM) department of the MTE who then auctions part of it to the domestic private-sector wood-based organizations such as the WBFA and to wood-based SMEs who process the timber into finished products for the domestic market. The remaining timber is processed in the LMM department's sawmills into sawn wood to be supplied to government agencies and sold to the general public (domestic market).

To participate in the open tenders (auction process), the participating companies have to deposit stipulated amounts as bank guarantee (earnest money) at the Myanmar Foreign Trade Bank of Yangon and the amount of the guarantee varies depending on whether it is for domestic or export purposes. For big domestic (Myanmar) companies and foreign companies who buy timber for export, the deposit amounts are set at USD 5,000 and USD 10,000 respectively, while domestic companies who buy timber for the domestic market have to deposit MMK (Burmese kyat) 250,000 (approx. USD 184.50) to participate in the auctions. One of the most important actors in the distribution of timber is the MTMA which helps to distribute the MTE logs and sawn wood to the public and private domestic wood-based industries; this body plays an important facilitating role between the MTE and the private sector (Woods, 2013). All big domestic (Myanmar) companies exporting timber are members of the MTMA, and they bid for logs separately, abiding by the ethics of the MTMA in timber trade. There are also foreign companies (global timber traders) based in Asian financial centres who bid for timber directly from the MTE through open tenders for export. Generally, most of the harvested teak timber in Myanmar is sold in the log form to the private-sector wood-based industries, with only 25% of the harvested teak being processed by the MTE into semi-finished and finished products, and sold to the private-sector industries. For processing timber into semi-finished and finished products, the MTE has wood-based units (8 teak sawmills, 4 plywood factories, 3 veneer factories, and 10 furniture factories).

Figure 7: Logs at the divisional depot in Monywa, Sagaing Region



Figure 8: The distribution process of teak timber



Processing/consumption of timber

The majority of teak timber from Myanmar is exported in the semi-finished form to India, China, and Thailand where the timber is processed into finished products. Only 20–30% of the timber is allocated for domestic consumption, while the rest (70–80%) of the timber is consumed in the international market. Before the log export ban (LEB) in 2014, 80% of the harvested teak was exported in the form of roundwood logs, with the major importers being the above three countries because the US and the EU had placed economic sanctions on Myanmar and so it could not export to these markets. However, after the LEB, the teak allocated for export is now processed into semi-finished and finished products, and exported to the US, Europe, Singapore, Thailand, China, India, and Malaysia. It is estimated that 95% of the sawn-wood products and furniture currently exported to these countries is of teak. The products exported include: sawn wood (lumber), teak decks (the most profitable to export, but forms only 20% of the timber sourced from the MTE), mouldings, furniture, veneer, and plywood. India continues to be the leading market for most of the teak timber from Myanmar, followed by China and Thailand. Apart from the fact that these countries are closer to Myanmar geographically, the teak timber markets in these countries are relatively unregulated compared to the EU and US markets which require strict proof of legality of timber through a recognized forest legality verification and certification scheme. The Government of Myanmar is yet to establish a globally recognized forest certification scheme and thus can only legally export teak timber to India, China, and Thailand, which provide proximate markets for the Burmese teak.

The timber allocated for domestic consumption is also processed into finished and semi-finished products and sold to domestic consumers. The SME sawmills buy the logs from the MTE and process them into sawn-wood products which are bought by the SME furniture producers to produce the finished products (furniture), which are sold to domestic consumers, while some of the sawn wood is also bought for domestic construction activities. Most of the sawn wood and other products from the LMM department of the MTE are consumed by government agencies, and only a few are sold to the general public.

Determination and distribution of consumer prices and benefits

The tender (reserved) prices for teak at auction are fixed by the MTE based on the cost of extraction and the prevailing timber price dynamics in the local and international markets. In the value chain, the timber producer (FD) does not sell the timber but only receives some payment in the form of royalties from the MTE. The MTE pays to the FD a royalty amount⁵ of MMK 30,000 (approx. USD 22.14) per hoppus ton (HT) of harvested teak. This money is not paid to the FD directly but rather to the central government; thus, the FD is only shown the receipts of the royalties paid by the MTE. In Sagaing Region, private elephant owners charge MMK 6,000 (approx. USD 4.41) per HT for skidding the teak logs to the landings, while private truck owners charge MMK 8,000–34,000 (approx. USD 5.91–USD 25.01) per HT for trucking the teak logs to the depots. In October 2017, the average tender prices for teaks logs from the export department in Myanmar stood at USD 4,545 per HT for the highest quality (SG-1), while the prices for low-quality teak (SG-7) were USD 1,665 per HT (International Tropical Timber Organization—ITTO—2017). Minus the cost of felling and road construction, the MTE incurs a cost of approximately USD 51.47 per HT on royalties and the transport of teak to the depots (as per the MTE figures for Sagaing Region), but could sell teak log for as high as USD 4,545 per HT at the depots. During the same period, the ex-yard prices for high-quality sawn teak (First European Quality, FEQ) imported from Myanmar to India ranged from INR 9,000–INR 16,000 (approx. USD 138.08–USD 245.44) per cubic feet (ft³), while low-quality (Grade B) sawn teak from Myanmar were sold at INR 5,000–INR 6,000 (approx. USD 76.70 –USD 92.03) per cubic feet (ft³). Translating that into hoppus ton, the exporters can sell high-quality sawn Burmese teak for USD 8,774.19–USD 15,599.68 per HT, and low-quality teak for USD 4,874.91–USD 5,849.24 per HT in India (more than twice the tender prices for the logs they buy in Myanmar).

⁵ The royalty amount is assessed by the FD together with the MTE at the measuring points in the teak extraction sites.

Table 1 : Summary of the value chain actors and their activities

Stage of value chain	Actors	Roles played by actors	Output
Timber production	Forest Department (FD)	<ul style="list-style-type: none"> • Determines the AAC • Preharvest marking of trees for felling 	<ul style="list-style-type: none"> • Stumpage timber
	Myanma Timber Enterprise (MTE)	<ul style="list-style-type: none"> • Undertakes enrichment planting 	<ul style="list-style-type: none"> • Juvenile trees
Timber harvesting (extraction)	FD	<ul style="list-style-type: none"> • Marking and girdling of trees • Monitoring of harvesting • Post-harvest assessment • Measuring of logs for royalty assessment 	<ul style="list-style-type: none"> • List of marked and girdled trees • Post-harvest assessment report on compliance with extraction regulations • Royalty amounts
	MTE	<ul style="list-style-type: none"> • Logging (felling and delimiting of trees) • Construction of trucking roads and skidding trails • Preliminary post-harvest assessment 	<ul style="list-style-type: none"> • Teak logs • Preliminary post-harvest report to the FD
	Private sector	<ul style="list-style-type: none"> • Construction of trucking roads and landings • Logging (as subcontractors) 	<ul style="list-style-type: none"> • Teak logs
Transportation	MTE	<ul style="list-style-type: none"> • Skidding, trucking, rafting and railing of logs to depots 	<ul style="list-style-type: none"> • Logs at landings, transit and terminal depots
	Private sector	<ul style="list-style-type: none"> • Skidding and trucking of logs 	<ul style="list-style-type: none"> • Logs at landings and transit depots
	FD	<ul style="list-style-type: none"> • Issuing trucking slips to logging trucks, and removal passes to private transporters • Monitoring at checkpoints on transportation routes 	<ul style="list-style-type: none"> • Legality assurance • Revenue to the government
Distribution and processing	MTE	<ul style="list-style-type: none"> • Conducting auctions at divisional and national levels for the private wood-based industry • Allocation of logs to the MTE processing factories and processing of wood into products • Distribution of timber to public and government bodies 	<ul style="list-style-type: none"> • Logs to private-sector traders • Sawn wood, veneer, plywood, mouldings, and furniture to private sector for export
	MTMA and other large export companies; Foreign companies	<ul style="list-style-type: none"> • Buying timber (logs) through auctions for exports 	<ul style="list-style-type: none"> • Sawn wood, veneer, plywood, decking, mouldings, and furniture
	WBFA and domestic SMEs	<ul style="list-style-type: none"> • Buying timber (logs) and sawn wood from the MTE and domestic wholesalers to process for domestic markets 	<ul style="list-style-type: none"> • Furniture, plywood
Consumption	Domestic consumers (general public; government agencies)	<ul style="list-style-type: none"> • Buying finished products from the WBFA and SMEs 	
	International consumers (US, Europe, China, India, Malaysia, Thailand)	<ul style="list-style-type: none"> • Buying sawn wood and furniture from the MTMA and other large-scale export companies 	

For domestic distribution (low quality—below SG-7), the auction prices for teak at divisional (local) depots average from MMK 100,000–MMK 150,000 (approx. USD 73.80–USD 110.70) per HT. However, interviews with domestic furniture producers such as the WBFA revealed that they buy teak logs, mostly of low quality (below SG-7) on an average for USD 800 per HT from the MTE in Yangon and sell the furniture at approximately USD 2,300, and are only able to make a profit of 20–30%—a profit below 20% will lead to the collapse of their business. The transporters also charge around MMK 45,000 (approx. USD 33.21) per HT for transporting the teak from the depots to the sawmills and production sites. In Nay Pyi Taw, the SME furniture producers who buy sawn timber from the SME sawmills are able to make profits of 10–15%. Thus, the biggest beneficiaries in the teak timber value chain are the MTE (government) and the private teak exporters who are able to buy directly from the MTE. The biggest losers are the domestic SME furniture producers and timber traders who find it difficult to source timber directly from the MTE, so have to buy, albeit informally, from the large companies (exporters) who procure quality timber from the MTE. The recovery rate for teak timber from high-quality logs (mostly auctioned for export) is 60%, while that for low-quality (below SG-7) ones is only 25%. Thus, the domestic wood-based SMEs do not only face the difficulty of procuring timber from the MTE, but they also get only 25% sawn timber from the logs they procure from the MTE.

Value chain governance

The teak timber value chain in Myanmar has a government-centric governance structure. Decisions on who gets the timber are mostly made by the MTE which is the government agency responsible for timber extraction and trade. The prevailing structure of the timber value chain governance in Myanmar is a prototypical centralized (top-down) system, where decisions are made by a government agency, as opposed to a market (participatory) governance system that would be expected of an efficient value chain. This can be attributed to the revenue-driven, export-oriented nature of the timber value chain, but also to the effect of the exploitative colonial administrative structures and postcolonial centralized governance structures from which the country is yet to fully move away from. The FD regulates and determines how much timber is extracted from the forests by the MTE by setting the AAC limit; thus, there is a constant and effective coordination (exchange of information) between these two government agencies regarding timber extraction, transportation, and trade. Without a travel pass from the FD, timber and timber products cannot be transported from one township to another in Myanmar. The MTE has monopoly over timber extraction and trade, and thus determines how much timber goes to the local market (for domestic consumption) and international market (export). This makes the MTE the most powerful and most important actor in the timber value chain in the sense that, it serves both as a regulatory agency and as a business entity (involved in the processing and sale of timber/lumber). Though the FD also wields great power in the chain through its regulation of extraction and transportation of timber, the MTE is ultimately the most influential actor in shaping the timber value chain in the country. In fact, the MTE, over the years, became much more powerful than the FD due to the revenue-driven exploitation of the forest resources which led to over-extraction of timber above the AAC limit since 1988 up till 2015 (Springate-Baginski et al., 2016; Woods, 2013).

Apart from the MTE and the FD, the MTMA also wields significant power because of the influence enjoyed by the member companies and the export-oriented nature of the teak timber value chain in Myanmar. There is a level of coordination among the member companies of the MTMA in timber trade, as they have their own standard business ethics which they have to adhere to. The MTMA member companies are mostly big exporters who buy timber from the MTE, and thus have a strong level of coordination with the MTE due to the export-oriented teak timber trade policy of the government. It is believed that the MTMA is a government-backed private business association which courts foreign timber buyers for Burmese teak (Woods, 2013), and as such, there is an excellent rapport between the MTMA and the MTE in the timber value chain. The MTMA serves as a direct link between the MTE and the international market. Similarly, the WBFA, a private national association of furniture producers, also has some coordination with both the MTMA and the MTE, and has in recent times, received direct allocation of timber from the MTE and the FD in the form of seized logs. Such coordinations are necessary for the various actors to obtain timber due the centralized and export-oriented nature of the timber value chain.

Taking into consideration the typology of the value chain governance espoused by Gereffi et al., (2005), the teak value chain in Myanmar can be described as hierarchical because both legislative governance (basic rules defining the conditions for participating in the chain) and judicial governance (coordination of the conformance

to the parameters) (Kaplinsky & Morris, 2001) are performed by the MTE, a government agency. Two forms of coordinative relationships in a value chain—horizontal (among actors at the same level of a value chain) and vertical (among actors at different levels of a value chain)—can be observed in the teak timber value chain (Mutua, Njuki, & Waithanji, 2014, p.3). It is also worth noting that the teak timber value chain exhibits a system of relational governance (producer-driven),⁶ as opposed to the much-efficient system of market governance (Mutua, Njuki, & Waithanji, 2014 p.3).⁷

Institutional environment

The institutional environment for the timber value chain has to do with the laws and regulations on timber production, extraction, and trade. The institutional framework for timber value chains can be described through the lenses of forest policy, tax policy, the forest regulations governing tree planting and logging, and the trade in forest products (Aoudji et al., 2012). The institutional environment in this study consists of the forest policy and regulations governing timber production, extraction, and trade, as well as the tax policy. The institutional environment for timber trade is robust, but there is a need for strict implementation and some reforms to ensure efficiency and equity as well as a sustainable supply of teak in the value chain.

The forest policy

Forest policy in Myanmar has been greatly influenced by the export timber trade since the colonial era (Springate-Baginski et al., 2014). All natural forest areas in Myanmar, be it reserved, protected public forests or unclassed forests, belong to the state, even though 4,100 ha of the approximately 32 million ha of forests have been designated as community forests to be managed by local communities under long-term lease agreements with the government (FAO, 2015; Htun, 2009; Sunderlin, Hatcher & Liddle, 2008). It is also important to note that all natural teak trees, even if located in individual farmlands, are state property and can only be extracted by the MTE (Castrén, 1999). The timber administrative system in Myanmar as it exists today was established under the British colonial era (Springate-Baginski, Treue, & Htun, 2016). Under the legal framework, the FD is responsible for timber production, while the MTE is vested with the legal right and responsibility for the extraction and marketing of timber, with the FD only regulating timber extraction using the AAC (Springate-Baginski, Treue, & Htun, 2016). Also, teak and other hardwood timber from private plantations can only be harvested by the owners with permission from the FD. The Myanmar Forest Policy 1995 recommends a market-oriented approach to log allocation, the removal of state ownership in processing, and increasing the allocation of logs to SME sawmills (Castrén, 1999, p.12), but this has not been implemented yet, as the state still owns the processing industries, and the SMEs face difficulties in getting timber.

The Myanmar Forest Policy, (1995) identifies six imperatives for ensuring the sustainable development of the forestry sector for environmental and economic purposes: protection of soil, water, wildlife, biodiversity, and environment; sustainability of a forest resource for the continuous supply of its tangible and intangible benefits; basic needs of the people such as fuelwood, shelter, and food; efficiency in harnessing the full economic potential of the forest through increased productivity, while controlling the socio-economically and environmentally unacceptable side effects; participation of the people in the conservation and utilization of the forests; and public awareness about the vital role of the forests in the well-being and socio-economic development of the country (Ministry of Forestry, 1995, pp.3–5). These six imperatives constitute the nucleus of the forest policy and establish a firm foundation for defining its objectives and strategies to achieve the desired results (Ministry of Forestry, 1995, p.5). What can be deduced from the forest policy, which was formulated in line with the Agenda 21 (1997) goals of Myanmar is that there is recognition of the need for state forest management to evolve to include local communities and the private sector as partners in forest management (Linn & Liang, 2015, p.21); it also recognizes the role of forests in fulfilling the socio-economic needs of the country, with a focus on efficient and sustainable extraction and utilization of forest resources such as timber. The forest policy of Myanmar has historically focused on timber production, but has gradually

⁶ Relational value chain governance is that in which the lead actors, such as producers in dairy cooperatives, buyers in contract farming for chicken, and intermediaries (exporters) in tea, determine the transactional framework within which the other actors will work, resulting in producer-driven, buyer-driven and intermediary-driven relational value chains respectively (Mutua et al., 2014, p. 3).

⁷ Market-driven value chain governance is that in which the price is the determinant as to which actors participate and how long the transactional relationships will last (Mutua et al., 2014, p.3).

evolved to recognize and emphasize environmental conservation issues and sustainable forest management methods after the Rio Earth Summit of 1992 (Linn & Liang, 2015). Recent short- and medium-term policy measures such as the one-year logging ban in the entire country from 2015–16 and the 10-year logging ban in the teak-rich Bago Region are all efforts to ensure forest regeneration and the sustainable supply of timber and other products of the forest. The government and the FD are now in the process of making reforms to the forest policy by permitting the establishment of private plantations in order to ensure sustainable utilization and supply of teak.

Laws and regulations on timber production, extraction, and trade

There are several legislations governing the production, management, harvesting and trade of timber in Myanmar. For the purpose of this teak value chain study, a few relevant legislations and regulations are considered. The Forest Law, (1992) which highlights forest protection and environmental and biodiversity conservation, also defines the rights to teak. According to this law, “A standing teak tree wherever situated in the state is owned by the state” (Status of Tropical Forest Management, 2011, cited in Linn & Liang, 2015, p.25), which includes natural teak on farmlands (Castrén, 1999). This law, however, provides opportunity for the promotion of private-sector involvement in reforestation and timber trade, as well as encourages decentralized (community) forest management, thereby demonstrating a shift from the focus on revenue generation to shared forest management with the local people (Linn & Liang, 2015). This has led to the legislation of the Community Forestry Instructions, (1995) in order to promote community forestry, but the progress has been slow in terms of the national target of 2.27 million acres by 2030—only a little over 42,000 ha of forest are under community management so far (FAO, 2015; Linn & Liang, 2015; Tint, Springate-Baginski, & Gyi, 2011).

The Forest Rules (1995)—dealing with the declaration of areas as permanent forest estate; the management of forest lands; the establishment of forest plantations; and the procedures for obtaining permission to extract forest produce—was also promulgated to implement the provisions of the Forest Law (1992) (Linn & Liang, 2015, p.20). The Forest Rules also has provisions on timber harvesting and trade, including procedures for: harvesting forest produce; establishing and operating timber depots; establishing wood-based industries; investigating violations; undertaking administrative actions to penalize violations, such as imposing fines and confiscating the timber; and defining offences and imposing penalties (Linn & Liang, 2015, p.20). In addition to these, the MTE carries out timber extraction according to the guidelines in the MTE Extraction Manual (1936) and the National Code of Forest Harvesting Practices (2000). This code of forest harvesting has the objectives of maximizing economic returns and sustainable forest management; thus, it is a comprehensive document that gives a step-by-step prescription of what needs to be done at each stage of timber extraction, ranging from preharvest planning to the harvesting process itself (Zaw, 2003). The code also contains a requirement for the involvement, at each stage, of all the stakeholders in the forest management system, including the FD, subcontractors, elephant owners, NGOs, local communities, and others dependent on forests (Zaw, 2003).

Tax policy on timber trade

Trade in teak and hardwood attracts different forms and rates of taxes depending on the market of the trade (domestic or export markets). Teak timber trade and export are levied taxes such as Commercial Tax (CT) and Special Goods Tax (SGT), which have been continually adjusted in the last few years. Before 2014, the CT on both the export of teak log and teak lumber, and the initial sale of teak and hardwood in the country was 50% of the turnover (Khine & Pawlita, 2013). The CT on import and sale of teak and hardwood logs and wood cutting within the country was reduced to 25% under the Union Revenue Law of 2014, while the CT on export of teak and hardwood logs remained at 50% of the turnover (DFDL, 2014). These taxes were put under the SGT in the Union Tax Law of 2016. Under this Union Tax Law, teak and hardwood logs as well as teak and hardwood cuttings of 10 square inches and above imported and/or produced in the country were subjected to 25% SGT, while the export of the same attracted 50% SGT. Under the new Union Tax Law (2017), this SGT on the import and trade of wood logs and wood cuttings in the country has now been reduced to 5%, while the SGT on the export of the same has been reduced to 10%. This is to encourage the import of other hardwood so as to reduce extraction from the natural

forests, but according to the MTE, the future plan is to allow the import of other hardwood at zero per cent tax. Also, the sale of teak and hardwood products in Myanmar are subject to the standard 5% CT, that is, the domestic furniture producers have to pay this 5% CT on the sale prices of the products they sell in the country. On another count, SME furniture producers in the country have to pay MMK 600,000 (approx. USD 442.80) annually as business licence renewal fee, while the private transporters have to pay a nominal fee to the FD for a removal pass to be able to transport timber and timber products from one township to another.

Gender in the teak timber value chain

A gender-sensitive value chain analysis is important for identifying and capturing the different roles men and women play across the various and the gender-specific barriers to entry and opportunities for growth (Mutua et al. 2014). It has been noted that men tend to dominate and control value chain functions which have relatively high barriers to entry and correspondingly greater returns, while women occupy the lower nodes⁸ (Mutua et al. 2014, p. 6). This is true in the case of the teak trade in Myanmar, as the teak timber value chain is mostly dominated by men due to the physical requirements of timber extraction; nevertheless, women do play various roles albeit in the lower nodes of the chain. The role of women in the timber value chain is almost only visible at the later stages of the value chain where they are involved in cleaning the sawdust in sawmills, gluing and packaging plywood, and loading and carrying lumber and furniture products from the factories to the storage and sales points. Almost all activities at the production, extraction and transportation stages of the value chain are carried out by men. There are, however, now some few women in the production stage who serve as range officers, but most of the work where women actively participate have to do with office (administrative) activities. In the domestic SME wood-based enterprises, women often form partnerships with their husbands to set up enterprises, but there are no easily identifiable enterprises solely owned by women. Even the timber export business also seems to be dominated by men, as there was no representation of women in the focus group discussions with the large-scale wood-based industries.⁹ All in all, the teak timber value chain in Myanmar is male dominated, and this could be attributed to the fact that timber value chain activities require a lot of physical strength which mostly favour men. Further studies on gender-based entry constraints and opportunities are needed for a gender-sensitive timber value chain development, as this was beyond the scope of this study.



⁸ This could be due to women's lack of adequate income (capital), limited skills, limited access to education and training, and limited access to markets and market information (World Bank, 2001; 2007, cited in Mutua et al., 2014, p.6)

⁹ These are mostly private large-scale businesses who buy timber from the MTE, and process and export them to the international market. These businesses have relatively easy access to the MTE timber and thus make much more profits than the SMEs.

Discussion of results

Value chain issues and REDD+ compatibility

REDD+ compatibility and value chain issues in the teak timber trade are discussed along the lines of strengths (positives), weaknesses (negatives), opportunities and threats that are at play in this chain which could be of concern for improving equity and efficiency in the value chain for REDD+ compatible teak timber trade in Myanmar.

Strengths (positives) of the value chain

The use of scientific forest management

Myanmar has followed scientific forest management techniques for the longest time in the whole Greater Mekong region in the area of teak and other hardwood species by continuing with the colonial forest management system known as the Myanmar Selection System, a modified name for the Brandis Selection System used by the British colonial authorities to manage forests in Burma (Castrén, 1999). This obviously is a positive feature, one that is important for sustainable forest management, sustainable timber supply and the achievement of carbon conservation objectives if the system is strictly applied. Even though strict adherence to the scientific forest management methods were disregarded under the former military government by resorting to revenue-driven overharvesting of teak timber above the ACC (Springate-Baginski et al., 2016) limit, the recent democratic transition of the country has enabled a return to strict implementation of the scientific forest management system. Thus, efforts and investments towards strict adherence to the MSS for teak and other hardwood is critically important for forest regeneration and conservation in Myanmar.

The use of reduced impact logging

The use of reduced impact logging method for timber harvesting in Myanmar is a good practice for sustainable forest management and to achieve the objective of REDD+. RIL can reduce the damages to residual sand and soil (Khai, Mizoue, Kajisa, Ota, & Yoshida, 2016), as well as to ecosystem functions and services (Edwards, Tobias, Sheil, Meijaard, & Laurance, 2014). This provides a strategy for managing tropical forests that minimizes the potential climatic risks associated with large changes in carbon and water exchange (Miller et al., 2011), considering that RIL is capable of reducing carbon emissions by 1.5–2.1 billion tCO₂ per year in tropical timber-producing countries under a 50-year project cycle (Sasaki et al., 2012). Khai et al. (2016) in their study on RIL in Myanmar found that directional felling and elephant skidding as RIL practices are very effective in reducing damage to residual trees and soil in the logging sites. Thus, the use of RIL as done in Myanmar is important and appropriate for sustainable forest management projects as part of the REDD+ scheme, especially if combined with a 40-year or longer cutting cycle (Sasaki et al., 2012).

The use of elephants for skidding

Animal skidding is the most cost-effective and environmentally friendly method of skidding (Khai et al., 2016; Myint, 2012) because it “precludes the construction of costly and easily eroded roads into the forest or up steep hilly terrains and also prevents possible destruction of valuable unfelled trees” (Zaw, 2003, p.2). A study by Khai et al., (2016) on 9 ha of logging sites in Bago Region concluded that there were no visible damages to residual trees and soil from elephant skidding three months after the logging operations. This is particularly important for forest and carbon conservation as tree mortality is reduced, and the soil disturbance and erosional activities that could result from road construction and the use of heavy skidding machines are also reduced. The use of elephants for skidding also creates jobs for local people—as elephant riders and private elephant owners. The main concern here should be on how to take good care of the elephants to keep them healthy.

The decentralization of the auction system

Formerly, the distribution of timber was centralized (mostly done in Yangon and Mandalay). However, it is now possible for auctions to be held at divisional depots, albeit for the domestic market, due to the reforms of the auction system in 2015. The change in the auction system to direct auctions at the divisional field depots appears to have improved transparency, enhanced the state revenue, and reduced wastage (Springate-Baginski et al., 2016); thus, further decentralization of the auction processes in documentation and payment of deposits will reduce travel distances for the actors and enhance the SMEs' participation in the MTE auctions.

The log export ban

The log export ban, which was instituted in April 2014, has enabled some in-country value addition as processing before export has become a requirement. It has also enabled the domestic timber traders to now have access to timber than before. Before the LEB, 80% of the teak harvested was exported in the form of raw logs; even though about the same amount of teak is still allocated for export, there is, and must be, some form of processing before export after the implementation of the LEB. The positive impacts of the LEB have been recognized by domestic wood-based entrepreneurs as well as by the officials of the MTE, as reflected in the interviews carried out with them. It is estimated that Myanmar lost about USD 1.2 billion from the export of raw logs of teak wood between FY 2011–12 and FY 2015–16 because the exporters applied for legal licence by understating the market price (Shein, 2015, cited in Ko, 2016). Since logs are no longer exported, these losses have been curbed and the contribution of teak to the domestic timber trade has marginally improved.

Weaknesses (negatives) of the value chain

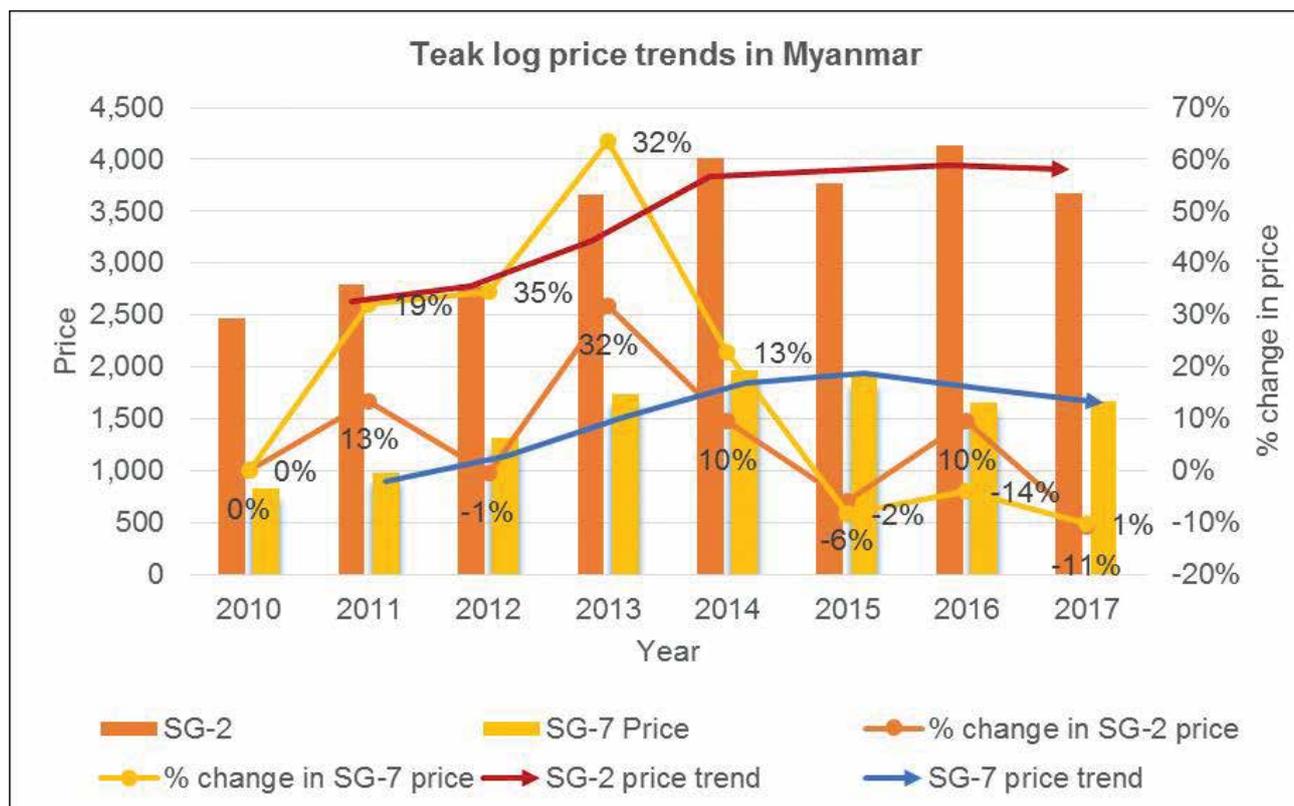
Trend of increasing teak prices and illegal logging

The trend of increasing teak prices has been an issue of concern for both domestic and export traders, a situation confirmed by the MTE itself (see Figure 9). Increasing timber prices has been identified as an underlying cause of illegal logging in tropical developing countries because some traders tend to buy timber from informal sources where prices are lower than in the formal channels (Paudel, Khatri, Khanal, & Karki, 2013; Pokorny, 2014; L. Tacconi, 2012). Interviews with wood-based SMEs in Nay Pyi Taw confirmed that some traders buy timber from informal sources because it is comparatively cheaper and easy to procure. In Yangon, the WBFA believes that if the reduction in timber prices has to wait till illegal logging is eliminated, then some traders will continue to buy from the informal sources. There is a high rate of illegal timber both in the local and cross-border markets (EIA, 2015; Springate-Baginski et al., 2016; Woods, 2013). Though the volume of illegal logging is difficult to quantify, its prevalence in the country has been confirmed by both the MTE and the private timber traders. Illegal logging distorts timber market prices as other traders are able to buy the wood at cheaper prices than in the formal market (Ko, 2016; Tint, Springate-Baginski, & Macqueen, 2014). The consequence of illegal timber in the market is that it creates inequitable distribution of resources and benefits (profits) within the value chain (Pokorny, 2014) since products from those in the formal sector have to compete with the illegal timber products which are produced at a relatively lower cost. The adverse consequences of illegal logging are also manifested in the high rates of forest degradation in the country (Springate-Baginski et al., 2016; Treue et al., 2016). If stringent measures are not put in place to tackle illegal logging, the goals of sustainable forest management and carbon conservation will be difficult to achieve.

Export orientation and difficulties faced by domestic traders in sourcing timber from the MTE

The timber value chain is export-oriented which makes it difficult for domestic wood-based industries, especially the SMEs, to get teak timber from the MTE. This is clearly exhibited in the plan for the distribution of teak timber for the harvest year of 2017–18: out of the plan harvest of 15,000 HT, 7,000 HT of logs are planned to be sold in open tender to the private sector for export; 5,000 HT as transfer to the State-Owned Enterprise (SOE) sawmills; and 3,000 HT as transfer to the WBI department. The SOEs will also process the timber mostly for export; thus, virtually all the teak will be exported, leaving the domestic private wood-based industries with access to only other hardwood

Figure 9: Teak log price trends in Myanmar (based on ITTO timber market trends data)



species. This will definitely affect the domestic wood-based industries which depend on teak; this might force them into sourcing timber from informal (illegal) sources. The SMEs in Nay Pyi Taw complained about the lengthy process in paying bank guarantees to participate in the auctions and the difficulty they face in getting back their deposits when they fail to win bids. This discourages them from participating in the auctions because they have to travel long distances to make these payments and incur hotel costs to enable them to participate in auctions which they are not sure of winning. The documentation and payment processes for participating in the auction system should be further decentralized to ensure the SMEs’ participation which will help reduce illegal timber sourcing. There is a need for special attention to be paid to the domestic wood-based SMEs as they provide a lot of jobs and contribute substantially to the economy (Macqueen, 2008, 2016).

Little in-country value addition

Up until the LEB in 2014, most of the value addition was taking place outside Myanmar, as 80% of the teak timber was exported in the form of raw logs mostly to India, China, and Thailand, where the processing was carried out and the profits made. Thus, the country was exporting both timber-processing jobs and profits, and lost about USD 1.2 billion between 2012 and 2016 in log export due to the understating of market prices by the exporters (Ko, 2016). Over the past decades, the wood-based industry had been relying only on primary processing (Kudo, 2001); while there has been no significant changes (NEPCon, 2013; Springate-Baginski et al., 2016) after the introduction of the LEB, at least a little in-country value addition has been set in motion because processing before export has become a requirement. But most of the value addition is still being done outside the country as the majority of the exports are still in the form of semi-finished products. The timber-processing industry is dominated by sawmills and a limited number of plywood facilities; but without a functioning and effective higher value wood-processing industry, value addition is limited and so the benefits of the LEB and higher profits from value addition cannot be reaped (NEPCon, 2013 p.28).

Lack of globally recognized certification scheme

There is currently no nationally or internally recognized certification scheme that can demonstrate compliance with the EU timber regulation or the US Lacey Act, so Myanmar cannot legally export timber to these regulated markets

which offer competitive prices for Burmese teak. The absence of an internationally recognized certification scheme for Myanmar's timber raises issues of legality and prevents the government and timber exporters from maximizing revenues and profits from these regulated markets. This has resulted in the export of Myanmar's teak timber mostly to India, China, and Thailand which have relatively less legality compliance requirements. This practice has grave adverse implications for sustainable forest management and REDD+, considering the fact that legality verification and certification schemes have the potential to promote sustainable forest management that generates positive net carbon benefits (Kishor & Lescuyer, 2012; Sasaki et al., 2012). The efforts and activities of the Myanmar timber certification committee and the VPA process need to be supported and fast-tracked to ensure the legality of timber in the market.

Deficiencies in the institutional environment and value chain governance

Some deficiencies and constraints in the governance of the value chain and in the institutional environment do not allow for efficient and equitable distribution of resources and benefits in the value chain. The hierarchical and relational governance of the value chain means that those at the lower node of the chain, such as the wood-based SMEs, find it difficult to procure timber and effectively participate in the chain. The value chain is export-oriented and thus the domestic SMEs and traders have to depend (informally) on the exporters to secure quality timber as the quantity of timber provided to the local market by the MTE is insufficient and of lower quality which leads to higher conversion losses (75%). Besides, laws and regulations do not permit local people's participation in the commercial timber trade, and the right to all teak species, including natural teak on private farmlands, is also solely vested in the state. This obviously disincentivizes smallholder and private investment in teak plantations (Castrén, 2005) and thus contributes significantly to the absence of plantation teak supply in the market. There is a need for reforms that will democratize the value chain (making it market-based rather than relational) and remove the regulatory barriers that prevent the local communities and the SMEs from participating in the chain.

Illiberal timber market (state's monopoly over timber trade)

The MTE's monopoly over timber extraction and trade does not ensure efficiency and equity in the timber value chain. With the MTE being a civil service entity, there is no incentive to ensure efficiency and maximize production or profits in the value chain. The monopoly over timber trade also provides rent-seeking opportunities for some officials of the MTE; at the same time, it contributes to the relational structure of the value chain which does not ensure equity. The monopoly does not allow the domestic traders to meet their timber demand since the MTE favours export trade. This illiberal nature of the timber market drives illegal logging in the country and hikes the domestic demand (Prescott et al., 2017, p.1260). There is a need to introduce competition in the value chain so that the market prices and the distribution of timber are determined by the forces of demand and supply, rather than by a predetermined and specific allocation process as being currently followed by the MTE.

Lack of diversity in timber supply sources and low investment in promoting private plantations

All teak timber in the value chain are sourced from the natural forests; there is currently no teak timber being supplied from government plantations, private plantations, smallholder plantations, or community forests. The over-reliance on natural forests for timber supply has resulted in forest degradation in the country (Springate-Baginski et al., 2016; Treue et al., 2016) and in the low supply of teak timber; this has led to a hike in the prices of teak timber over the years. There is low investment in the promotion of teak plantations by the private sector, smallholders, and community forest groups. As noted by Kevin Woods, "While the private sector is now encouraged to invest in the tree plantation sector, the state offers no incentives and the benefits of teak planting will be in question as long as teak is legally a state-owned species, and quality seeds and seedlings are difficult to source" (Woods, 2013). Policy and regulatory reforms that would give commercial timber rights to smallholders and community forest groups and streamlining the processes for private-sector investment in teak plantations will help ensure diversity and sustainability in timber supply, as well as pave way for sustainable forest management in the country.

Barriers to local people's ability to benefit from timber trade

The timber industry in the tropical developing countries produce USD 30–40 billion worth of timber and processed wood products annually, but the benefits accruing from this industry to the rural poor are rather minimal (Mutamba,

Campbell, Kowero et al., 2005). This is true of the teak timber value chain in Myanmar too as institutional barriers have excluded the local people from participating in the timber trade. Only the MTE has the right over timber extraction and trade in the country, so the people living in and/or close to these forests are unable to benefit from the trade. Since there is no allocation of timber revenue to the local people, the only direct benefit they can get from the trade is to serve as elephant riders and/or labourers during timber extraction—but these activities can only serve the well-being of a few people. Thus, the local communities do not see any incentives or special opportunities in engaging in sustainable forest management (Tint et al., 2014). Reforms and investments that grant rights to the local communities over timber and ensure that they are able to participate in the trade will go a long way in attaining the goals of sustainable forest management.

Lengthy processes for SMEs' participation and transportation of timber products

SME sawmill owners have expressed concerns over the lengthy process they have to follow to participate in the auctions of the MTE. The length of time taken to deposit bank guarantees and even for unsuccessful bidders to get back their deposits after the tenders, have been constraints on the SMEs to participate in the MTE auctions; and so they procure their timber from illegal sources. The SME furniture producers also noted the requirement of removal passes (permits) to be able to transport the timber products to other parts of the country as another constraint on the domestic trade, because the buyers usually order in small quantities. This generates a lot of cost for the SME furniture producers, thus discouraging domestic timber trade.

Opportunities for improving the value chain

The democratization of the country and reforms of the forest policy

The transition from military rule to democratic government provides an opportunity for the restoration of rule of law and transparency in governance which is important for sustainable forest management and sustainable timber harvesting (Springate-Baginski et al., 2016). This transition process has led to the removal of economic sanctions by the US and EU which provides an opportunity for Myanmar to capture better prices for timber from these two huge markets. It also opens up the country and boosts the confidence of foreign investors who could be encouraged to invest in the forest sector. Now there are also efforts to reform the forest policy and regulations which is important for equity and sustainable forest management. These efforts need to be supported and fast-tracked to ensure that the reforms are implemented in a timely manner.

The VPA negotiation process

Myanmar's engagement in the negotiation process for a Voluntary Partnership Agreement with the EU provides an opportunity for certification of timber under the EU Forest Law Enforcement, Governance and Trade (EU-FLEGT) standards. This would provide legality for Myanmar's timber and compliance with the EU's timber regulation (EUTR) practices. A FLEGT licence would serve as a trump card for accessing the huge market for Burmese teak products in the EU and would also help eliminate the obstacles that the export traders face due to the legality-based restrictions that are in place in the EU and other regulated markets. However, even though improvements in the export market through the VPA provides an opportunity for higher revenues and positive benefits for REDD+, it may also threaten the legitimate domestic demand for timber (Springate-Baginski et al., 2014); thus, measures need to be put in place to sustain the domestic timber market.

Increasing interest of private sector

The opening up of the country to the international community and global markets has sparked a new wave of interest among the private sector to invest in Myanmar's forestry sector (Springate-Baginski et al., 2014). The government can leverage this opportunity to increase the volume of plantation timber in the market to help reduce the pressure on the natural forests. In this context, the procedures and processes for the acquisition of land and licences for private investment in plantations need to be simplified to make it easier and quicker for the private actors to participate in timber production.

High potential for community forest enterprises across multiple products

In their study on the potential of community forest enterprises in Myanmar, Tint, Springate-Baginski, & Macqueen, (2014) concluded that there is a high potential for developing community forest enterprises in three major sectors: timber (including poles and posts); bamboo (including both processed and unprocessed products); and non-timber forest products (particularly, medicinal and ornamental plants). This would challenge the current monopoly of the government agencies over timber production. If effective measures are put in place to promote community forest enterprises, their potential provides a great opportunity that can be leveraged for diversifying timber supply sources in the country (Tint et al., 2014).

Threats

Conflicts and instability in forest-rich areas

Conflicts in some parts of the country such as the south-eastern part of Shan State have resulted in private contractors giving out subcontracts to harvest teak. Monitoring the activities of the subcontractors in these areas cannot be effective and the legality of the timber will be difficult to verify. When subcontractors carry out the extraction, it is difficult, in the chain of custody, to trace the specific forest from where the extraction took place; so, a complete documentation to demonstrate the chain of custody becomes difficult. Besides, forest degradation is high in conflict areas because of increased illegal logging which funds these conflict forces (Springate-Baginski et al., 2016; Woods, 2013). For example, in the conflict-ridden south-eastern part of Shan State, illegal logging has been reported to be among the highest in the country. Thus, persistent conflicts in forest-rich areas threaten sustainable timber supply, sustainable forest management, and the conservation of carbon stocks; more so, because the most commercially and ecologically viable remaining forest in the country are located in these conflict areas (Treue et al., 2016; Woods, 2013).

Illegal logging

Uncontrolled and illegal logging poses a threat to the survival of endangered primates, limits the accessibility of forest resources to the poor, encourages organized and cross-border crime, disrupts legitimate trade flows, and encourages the funding of conflict forces (Ko, 2016). Illegal logging, if not effectively controlled, could lead to the total depletion of an already highly degrading forest with its attendant consequences for forest and carbon conservation (Springate-Baginski et al., 2016). The threat of illegal logging to the formal timber trade is widely acknowledged in both government and private circles in the country. It threatens sustainable timber value chains (Tint et al., 2014) and forest conservation in the country, and has been identified as one of the major drivers of forest degradation in Myanmar (Treue et al., 2016). Thus, proper attention needs to be paid to addressing the menace of illegal logging in the country.

Trend of increasing timber prices

The trend of increasing teak timber prices threatens sustainability in the value chain because it reduces the profits of domestic traders, especially the SME furniture merchants who cannot increase their prices due to the availability of substitutes such as plastic chairs. This can push them into sourcing timber from informal (illegal) sources where they can buy for cheaper prices—this has grave implications for sustainable forest management as forest degradation will result from sustained illegal logging. It is believed that illegal logging mostly increases due to the high prices paid by the traders in the formal chain who then turn to rely on illegal sources for cheaper timber (Paudel et al., 2013; Tacconi, 2012). Some SME sawmill owners in Nay Pyi Taw confirmed that some of their colleagues buy from illegal sources due to the high prices and the difficulty they face in getting teak from the MTE. The trend of increasing prices can also lead to the collapse of wood-based SMEs which provide jobs to the local communities. Interviews with SME sawmill owners and furniture producers revealed that each SME sawmill enterprise of 5–10 HT capacity has 8 employees on an average in Nay Pyi Taw; they complained that business is poor and some sawmills have closed down due to the high teak prices. The prices for high-quality teak logs (such as SG-2), which are mostly exported, increased by a cumulative 47% between 2010 and 2017. Within the same period, the prices for low-quality logs (such as SG-7) almost doubled (i.e., recorded a cumulative increment of 84%). This has greatly affected

domestic teak trade and the SMEs because the MTE offers only low-quality timber (SG-7 and below) to the domestic traders, whilst high-quality timber is auctioned for export traders. The prices for teak logs surged to their highest between 2012 and 2014, probably due to the speculative response to the scheduled log export ban in April 2014, when traders rushed to export before the ban came into effect. However, there has been a marginal but inconsistent decline in tender prices for teak since 2015 (see Figure 9).

Natural forest loss, and low level of investment in community forests and smallholder teak plantations

Natural forest, which provides all the teak timber in the formal sector, has virtually been legally and illegally logged out (Springate-Baginski et al., 2016; Treue et al., 2016; Woods, 2013). This phenomenon threatens the sustainability of both the teak timber value chain and the forest management in the country, because there is currently a lack of enough teak timber supply from either government or private commercial plantations, smallholder forestry or community forests. Timber plantations can reduce the degradation of natural forests as they provide opportunities for reduced pressure on natural forest extraction. Pirard, Dal Secco, & Warman, (2016) aver that there is a high conservation benefit in promoting timber plantations. Similarly, the potential of smallholder plantations to contribute to conservation and livelihoods, as well as their significance in supplying to the commercial timber markets, has been elaborated (Midgley et al., 2015; Midgley et al., 2017). However, smallholder and private commercial investment in teak has been very low probably due to the fact that the commercial right to teak species is held by the state (Castrén, 1999; NEPCon, 2013) and the community forests do not yet have the right to engage in commercial timber trade (Castrén, 1999; NEPCon, 2013; Springate-Baginski et al., 2016; Tint et al., 2014; Woods, 2013).



Conclusion and recommendations

This study assessed the teak timber value chain and its implications for REDD+. The timber value chain is illiberal, export-oriented, and dominated by export traders (large-scale companies) who have the capacity and influence to secure timber directly from the MTE. The value chain exhibits hierarchical and relational characteristics where decisions are made by a centralized government agency (MTE) as opposed to a market-based determination of prices and allocation of resources that would be expected of an efficient value chain. The main strengths of the value chain in relation to its compatibility with REDD+ in Myanmar are found in the production and extraction stages of the value chain—forest management through the MSS and the use of reduced impact logging in timber extraction. In terms of policy on timber trade, the decentralization of the auction system and the log export ban are seen as positive measures. However, there are weaknesses and barriers in the institutional environment and in the governance of the value chain which make it difficult for the SMEs and local people to effectively participate in the value chain. There is also a lack of diversity in timber supply sources, while the presence of illegal timber cartels distorts market prices and equity in the value chain. The monopoly of the state over the timber trade does not allow for efficiency and equity in the value chain. To ensure efficiency, equity, sustainability, and REDD+ compatibility in the timber value chain, there is a need for policy reforms and measures in timber production and trade, including the following:

Promoting community forest enterprises, smallholder and private commercial teak plantations to ensure diversity in timber production; to guarantee sustainable forest management; and to bring benefits to the local people and the private sector. In this regard, there should be reforms in forest regulations to give the local communities and smallholders commercial forest rights, including on teak. Lack of commercial forest rights is the reason the local communities are not fully aware of the economic opportunities in community forestry (Tint et al., 2014). Improving access to bank loans, establishment of supplier–buyer partnerships, and further simplification of export requirements could help promote the private plantation forestry (Tint et al., 2014).

Tackling illegal timber logging and trade through both better law enforcement and market-driven pricing/trade perspectives. There is no gainsaying that illegal timber logging and trade have had a deleterious effect on conservation and equity in the value chain. Reducing timber prices and making timber easily accessible to the SMEs and other domestic traders can help discourage sourcing from informal channels. There is also a need to increase funding towards forest management law enforcement. It has been noted that insufficient funding for monitoring and law enforcement has enabled illegal logging to flourish in Myanmar (Prescott et al., 2017, p.1263).

Promoting forest-based SMEs' participation in the value chain by increasing the allocation of timber for domestic trade and simplifying the auction processes and requirements for SMEs' participation in tenders. The SMEs play a vital role in Myanmar's economy, as they form its largest sector in terms of their number, employment scale, output, and investment (Tint et al., 2014).

Deregulating timber trade by corporatizing the MTE. The monopoly over timber trade enjoyed by the MTE as a state agency (civil service entity) does not allow for efficient and equitable allocation of resources in the value chain. As noted by various authors (Castrén 1999; Springate-Baginski et al., 2016; Woods, 2013), giving the MTE autonomous status and corporatizing it to run it as a business enterprise will increase its efficiency and effectiveness in delivering the necessary results. Deregulation will also help in further liberalizing the timber trade and ensuring a market-based functioning of the timber value chain which may even lead towards privatization of the MTE in the long run.

Promoting in-country value addition by encouraging further processing to help create jobs and increase the contribution of the forest sector to the economy. Encouraging private investment in the wood-processing industry and/or the establishment of more processing facilities by a corporatized MTE will contribute to a boom in the domestic timber industry.

The need to improve and expedite the process and efforts towards timber certification in the country. Certification would not only ensure legality and sustainability in the value chain, it will also provide the government and the private sector the opportunity to access and maximize profits from regulated markets such as the EU and North America. As noted by Sasaki et al., (2012, p. 42) "... a certification scheme, and payment for ecosystem service will likely reduce illegal logging, thereby increasing government revenues from timber royalties and taxes, and creating more jobs in the legal logging industry".

Review forest policy and regulations to give commercial forest rights (including on teak) to private individuals, smallholders, and local communities. This will help increase investment in plantation forestry in the country and also ensure benefits to the local people from the commercial timber trade. Further, this will contribute to natural forest regeneration and sustainable forest management in the country.

The need to promote peace and stability in forest-rich areas. Conflicts in timber-rich areas, such as in Shan State, promote illegal logging and forest degradation. Resolving these conflicts through dialogue and other mediation processes is important for sustainable forest management and timber supply in the country. Conflicts trigger an increase in illegal logging, and provide revenue for the armed groups; thus, arriving at a peace agreement that ensures equitable distribution of forest management responsibilities and benefits will be important for forest conservation and lasting peace in the country (Prescott et al., 2017, p.1264)

These recommendations provide a way forward by identifying action-specific measures for tackling the deforestation and forest degradation caused by timber trade. The scope of this study and the data collected were insufficient to make prescriptive recommendations. Thus, there is a need for further research and in-depth analysis, consisting of case studies in areas of high deforestation and forest degradation, and those facing law enforcement issues, so as to prescribe action-specific recommendations that require REDD+ interventions.



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