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Advancing enhanced wood manufacturing industries in Laos and Australia

Value Chain Assessment: Interim Summary Report - Teak plantations in Northern Laos

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EXECUTIVE SUMMARY

The plantation sector in Lao PDR in undergoing transformation; it is being pushed and pulled by market forces, new policies, emerging governance models and development interventions. Together with the support of development partners and some industry participants, the Government is currently formulating a new strategy for forests and plantations. The Government has also recognised a need to improve the climate for doing business and for mobilizing and attracting quality investment; promoting and building the competitive capacity of domestic enterprises; of reducing administrative barriers; and of improving the efficiency of and trust in the administration.

At present, however, policies for plantation value chains remain both unclear and inconsistent, and the role of Government in the sector is both multi-faceted and ill-defined. A complex regulatory environment is constraining investment and inhibiting some value chain elements; non-state measures to facilitate market access have had only limited success. New approaches are needed to facilitate adoption of new operating parameters, such as ensuring timber legality or facilitating market access; these require a repositioning of the Government more as a facilitator, and the reformulation of policies and regulations as enablers of legal and sustainable timber value chains. This also requires the building of trust and transparency along value chains.

This report explores these issues through an assessment of teak value chain in Northern Laos.

Smallholder growers are the supply mainstay of the teak wood sector. Value chains based around smallholder teak plantations have emerged over decades and, until recently, have been dominated by the export of unprocessed and semi-processed wood and the domestic production of low-grade furniture. This smallholder-led system originally developed largely in response to securing land tenure rather than to growing wood, and while it makes a significant contribution to the local economy, this contribution could be much greater if value chains were enhanced.

The large wood importing markets on all three sides of Northern Laos (China, Thailand, Vietnam) have a strong and continuing demand for teak wood, but there are stresses in the system: other shorter term 'boom crops' offer profitable alternatives for farmers; regulation is opaque and governance of plantations is a low priority relative to the bigger issues associated with the natural forest sector; knowledge, training and business skills are generally weak, and the sector could soon be dominated by external firms that could limit value capture within Laos; replenishment of the teak plantation base

is being hampered by inappropriate regulation, and local officials are little incentivized to bring forward new ideas for more responsive regulation; plantation investment promotion to smallholders has been ineffective, and large-scale investment has focused on other crops.

Recent policies such as PMO15, which are primarily aimed at addressing illegal logging in natural forests, improving processing standards and developing exports, have impacted significantly across teak value chains. Some outcomes are positive, some negative, and some are unexpected. What is certain is that the teak plantation value chains are changing. The ban on the export of unfinished wood products has resulted in a translocation of foreign processors, particularly from China, into Laos. New product export rules have resulted in a contraction of established 'short' export value chains for round and square logs, which were particularly attractive and beneficial to growers and small traders; innovation in processing , particularly by micro- and small enterprises is also constrained and this inhibits investment and upgrading.

There has been an increase in processing within Laos for export products associated with PMO15 in 2016. While most end-product manufacturing is undertaken by large foreign joint-ventures, intermediate production is dominated by micro and small Lao enterprises; while service providers such as brokers play an important role in linking value chain firms. However, there is an evident policy tension between promoting and supporting small-scale Lao entrepreneurs and promoting a rationalization and modernization of the industry as a whole.

Associated with the increase in manufacturing there are new employment opportunities and Lao people are benefitting; participation by women appears to be significant. However, highly skilled jobs such as wood carving continue to be undertaken by foreign workers, and there seems to be little in-firm investment in training local workers. Business-skills as well as technical 'upgrading' are needed to increase efficiency.

Despite recent reform efforts, the regulations for smallholder plantation value chains remain complex, time consuming and costly. They do not create an enabling business environment and are often in excess to practical need. Over-regulation is 'gumming up' the value chain. Government policies aimed at improving efficiency and promoting timber legality are impacting the sector, such as through the enforcement of enterprise regulations and processing standards, however, compliance remains an ongoing challenge, particularly for smallholders and micro-and small enterprises. If left unaddressed, this may exclude them from export markets and have negative impacts on local and domestic wood product supply.

The nature of the plantations is also changing. Past policies, coupled with the various livelihood strategies of the many thousands of farmers who own the plantations, have created a diverse and scattered resource, making wood supply unpredictable and logistically challenging. The accessible larger planted trees have been harvested and stands of smaller and mixed age trees are now dominant. There are some new areas being planted; however, plantations are also being lost from the landscape as the changing rural economy provides new options for teak growing households – including off-farm employment, new agricultural crops, land use conversion due to increased land prices and land sales for peri-urban expansion and land acquisition for infrastructure projects.

This report presents a detailed analysis of the value chains for smallholder teak plantation in northern Laos. It is based on a thorough assessment of these value chains, building on the preliminary research undertaken by VALTIP2. It is the first assessment of this type in Laos. The report presents 25

preliminary findings, and makes recommendations about some immediate action that could be undertaken to address these. Key issues include:

1. Providing a clear and strong vision for the plantation wood sector for export and domestic markets and recognising the important role of micro and small enterprises.
2. Ensuring all plantation wood enterprises can meet the requisite standards and are able to participate in existing and emerging markets, particularly once timber legality assurance is required.
    - Designing and testing procedures for input-output (chain-of-custody) management specifically for micro and small plantation wood enterprises and demonstrating these at the National University of Laos Wood pressing Facility
    - Developing scale-appropriate standards for the wood sector.
    - Encouraging and promoting innovation and value adding by revising the list of export products to only include plantation wood products that cannot be exported.
    - Promoting and supporting compliance with enterprise regulations through fee reductions and other incentives.
3. Improving the flow of legal wood to industry and encouraging smallholders to invest in planting trees.
    - Drawing on the experiences of other countries, identify and test new mechanisms, as alternative to the current dependence on plantation registration, to enable and make it easier and cost-attractive for smallholders to legally sell their wood.
    - Simplify plantation registration processes including through field trials of group registration, using point GPS locations instead of area maps.
4. Exploring appropriate opportunities for expanding the area of teak plantations within the Production Forest Estate, including through new plantation partnership models, based on a trial in Luang Prabang Province.

The report is part of a larger body of ACIAR project work directed at supporting the development of value chains based on planted trees in Lao PDR. Companion reports and policy briefs address other topics relevant to Lao tree plantation and smallholder tree growing.

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INTRODUCTION

This report presents the findings, issues and questions for further research arising from assessments of two teak plantation value chains in Lao PDR. These value chain assessments (VCAs) were undertaken in December 2017 and March 2018 as part of the ACIAR Project FST/2016/151, 'Advancing Enhanced Wood Manufacturing Industries in Laos and Australia' (also known as VALTIP3) which will run from 2018 until 2021. The project aims to support the development of innovative wood processing industries to enhance markets for planted timber resources within Lao PDR and Australia.

This research contributes to one of the three sub-objectives within the Project - namely Objective one, which aims to identify the key elements of the policy, governance and administrative environment that constrain the development of plantation forests and value chains in Lao PDR, identify other constraints to improving plantation value chains, and to develop strategies for engaging with this environment and improving plantation value chains.

The value chains have been analysed to address the following research questions:

- What are the principal value chains for Lao plantation resources, in this case for teak plantations?
- What are the key elements of the policy, governance and administrative environment that constrain the development of plantation forests and value-adding to their products in Lao PDR, and what are the most important and promising pathways for policy change to address constraints?
- What are the barriers that prevent small and medium plantation-based enterprises in Laos from investing and developing new technologies and how can they be rectified?
- What are the major impediments to resource availability for domestic processing, and how might they be addressed?

The research and the results will also contribute to the question:

- How can the gender balance of the Lao plantation and wood industry be improved to increase the role of women?

This study builds on research undertaken during previous phases of the VALTIP project - specifically VALTIP2, which investigated key elements of the value chain including transaction costs (Said 2016), regulatory systems for teak plantations Laos (Smith 2014; Smith 2016; Smith et al. 2017a), the role of grower groups and enterprises (Ling 2014, Ling 2016, Ling et al. 2018) options for verification and certification (Flanagan and Laity 2016), the nature of the 'the teak resource' through mapping and size classification (Boer and Seneanachack 2016) and teak markets (Midgely et al. 2015). It also draws from and builds on research undertaken in an ACIAR project on plantation policy in Laos and Vietnam ('LVPPP'), which included analysis of the plantation policy setting (Smith et al. 2017b), environmental protection measures for plantations (Smith et al. 2017c), an assessment of one teak value chain in Sayaboury province (Maraseni et al. 2018) and on research into the role of teak plantations in the livelihoods of farmers and through the ACIAR Lao Australia Agroforestry project ('LATARP'; Newby et al. 2012, Newby et al. 2013, Newby et al. 2014).

SUMMARY OF KEY FINDINGS

The research to-date has revealed a number of results and issues that add substantially to our knowledge and understanding of the organization and operation of smallholder led teak value chains in Northern Laos, and that are relevant to forest and industry policy development in Lao PDR. These are summarised below and elaborated in subsequent sections:

What are the principal value chains for Lao teak plantation resources?

1. There are numerous destinations for smallholder grown teak. Each of the international (dominantly ASEAN Region - China, Thailand, Korea, Viet Nam and India), domestic (within Laos) and local (within village/district) markets are important. Global and domestic value chains offer different opportunities and are constrained by different factors; some markets demand high product quality, specific wood properties and have highly selective consumers who may be influenced by standards for legality or sustainability, while others are seeking an opportunistic or sustained supply of wood regardless of these other factors. Some local markets require low-cost and low-quality products, but the demands of domestic retail consumers are evolving.
2. Teak value chains can be complex, involving many actors; or may be quite simple. Complexity appears to diminish value to smallholders, while vertical integration enhances value to growers. However, the number of integrated value chains is relatively limited; they tend to be selective and geographically constrained and provide opportunities to only a small proportion of growers.
3. Geographical context matters. Despite some interconnections, the chains for teak from Luang Prabang province, Northern and Southern Sayaboury province are materially different. This is due to:
    - The nature of the market - size and number of participants, destination markets and the price that firms are willing to pay for wood.
    - The geographic distribution of the teak plantations and distance to supply chain nodes and destination markets, particularly in China and Thailand.
    - Governance – particularly the application of regulations, which is influenced strongly by the presence of natural teak within Sayaboury province and a perceived risk of illegal logging.

What are the key elements of the policy, governance and administrative environment?

4. Past governance has been reactive. State agencies have assumed the role of 'gatekeeper' with a strong reliance on top-down directives. A shift to 'governance by facilitation' that is more proactive and forward-looking, supported by regulations that enforce appropriate legality standards while promoting "Ease of Doing Business", is necessary. Good inter-agency coordination (e.g. MAF & MoIC) in policy implementation, based on evidence and practical reality, is also necessary. Local officials need to be more incentivised to foster policy innovations. This intent is supported by PMO02 2018 and the "Open Door, Open Mind, Open Barriers" policy.

5. Recent polices, such as PMO15[1], which are primarily aimed at addressing illegal logging in natural forests, improving processing standards and developing exports, have impacted significantly across teak value chains. Some outcomes are positive, some negative and some are unexpected.

    - The ban on the export of unfinished wood products has resulted in a translocation of foreign processors, particularly from China, into Laos.
    - New product export rules for permitted products have resulted in a contraction of 'short' export value chains for round and square logs, which were particularly attractive and beneficial to growers and small processors who were able to easily export these products.
    - The increase in processing within Laos required to finish products prior to export has also increased processing requirements along the value chains, including for the micro and small processors that previously produced square logs for export. The resultant increase in processing costs, such as for labour, means that processors are paying less to growers in order maintain their own profit margins.
    - State-driven 'upgrading' through the introduction and enforcement of the regulations for processing standards has resulted in closures (temporarily or permanently) of some low-grade micro and small processors, including of plantation teak. This is continuing, and it is as yet unclear what the impact on value chains will be. For example, it may reduce sales options for smallholder growers, reduce competition, promote localised buyer monopolies and increase the importance of brokers or traders. The elimination of some buyers from the market may also result in a reduction in farmgate prices.
    - Processing standards are being applied equally to all firms regardless of the source of input material (natural forest or plantation), firm size or product destination. These include the typically micro- and small- processors of locally- and domestically- consumed products from teak, both finished and unfinished. The elimination of some of these micro- and small- processors may impact the supply of lower quality, typically cheaper products, that are locally consumed, or increase their price.
    - The increase in processing within Laos has also increased domestic employment opportunities, and there appear to have been some positive outcomes for women. However, highly skilled work continues to be undertaken by foreign labour. The extent of investment in training and skills development by individual firms remains unknown, although GiZ and the Lao Wood Industries Association ate developing a training facility in Vientiane, and another training facility is also being developed at NUOL through this ACIAR project. Both are in Vientiane, distant from the majority of teak processors. Access to these facilities for micro and small enterprises is likely to remain elusive unless supported by government, association or donors.
    - Upgrading of the processing sector may improve production standards and resource recovery, but development may become constrained if future wood supply is not

[1] Order No. 15/PM on Strengthening Strictness of Timber Harvest Management and Inspection, Timber Transport and Business, dated 13th May 2016.

addressed through appropriate plantation investment promotion mechanisms or new product options.

- Opportunities for novel engineered wood products based on veneer, laminated wood and other composite materials including from small diameter logs have yet to manifest in the teak sector, although these are being considered under Objective 2 of this project. In undertaking this work, careful consideration of the selection of 'lead firms' for technological upgrading is needed, to ensure that they have the capacity and commitment to a shared value chain approach.

6. The legal value chain associated with teak includes formal and informal mechanisms as well as voluntary and private components.

    - Domestic regulation is highly consequential for value chain organization and upgrading, and timber legality assurance has the potential to significantly affect and exclude smallholders, by making domestic regulation less "locally flexible" and more determined by external concerns:
        - Despite recent reform efforts, the regulations for smallholder plantation value chains remain complex, time consuming and costly. They do not create an enabling business environment and are often in excess to practical need. Over-regulation is 'gumming up' the value chain.
        - It is unclear why so many regulatory steps (such as plantation certificates, pre- and post-harvest inventory, moving permissions and release documents) are needed in the first instance – and perhaps explains why so many steps are circumvented.
        - There are locally specific regulations and variations in the interpretation and application of national regulations. This could represent a rational and flexible response by local authorities to inappropriate or ineffective central regulation. Both government and non-government actors apply regulatory 'work arounds' for expediency and efficiency.
    - The payment of fees and donations beyond those officially required has been normalised for a long time and adds to the cost of wood.
    - Enforcement of plantation regulations is not a priority relative to other forest enforcement issues (such as illegal logging, corruption or wildlife trafficking).
    - Enforcement of processing regulations has increased since PMO15, and the impacts are apparent in recent mill closures. Whether and how many micro- and small mills will recover is as yet unclear.

What are the barriers that prevent small and medium plantation-based enterprises in Laos from investing and developing new technologies and how can they be rectified?

7. The firms in the value chains are dominantly micro and small enterprises and these play a key role:

    - Some have an opportunistic, short term focus, or lack core business skills.
    - Others have moved into high value-added production, with good inventory management, product design, strong connections back to retailers, and high employment for small volumes of timber.

- Heavy-handed or highly complex policy systems can disrupt fragile value chains and increase business risk. There is a need to aim for a supportive business environment, that facilitates Lao entrepreneurship, value chain "upgrading", and more value capture within Laos.

8. However, the governance regime of policies, regulations and practices are inconsistent in the treatment of these enterprises: the role and value of micro and small enterprises is not well recognised nor supported. . There is a policy tension between promoting and supporting small Lao entrepreneurs and promoting a rationalization and modernization of the industry as a whole.

9. There are weak connections between possible 'lead firms' and the majority of plantation growers. The previous VALTIP project interventions did not adequately consider the complexity of smallholders' livelihood strategies in approaches to improve these connections. Key value chain elements, including of firms, were researched largely in isolation from the network as a whole and, as a result, some interventions failed to deliver the anticipated benefits - for example efforts for forest certification and the formation of grower groups.

10. There are some 'lead firms' but these appear to be those that are the most 'closed' (vertically integrated) with relatively short supply chains. Firms that are upgrading in response to market pull (as opposed to State push) are typically based on foreign investment and/or have strong export market connections. Non-state-led up-grading of small firms seems to be associated with business diversity or development assistance rather than response to consumer demand.

11. While all firms face a range of technical issues related to equipment, skills and resource quality, the lack of core business skills, particularly in stock inventory management, may be more limiting, particularly when chain-of-custody legality requirements are required. Business upgrading should be undertaken together with technical upgrading; this could be supported through demonstration activities at the National University of Laos' new wood processing training facility.

12. There are a few large enterprises, which are dominantly foreign owned or funded through foreign investment, and they are export-oriented.

13. The dominant medium and large enterprises (although not all) are clustered into three industry associations. Participation of micro and small enterprises in the industry associations is low and there is little perceived benefit to them of joining. Smallholder growers are not represented and as a result their perspective may be under-represented or poorly understood during policy development.

14. The three associations have different sources of external and ODA support, and maintain different spheres of influence and power relations. Whether and how these are impacting teak plantation sector governance is unclear - they are potentially not working in harmony, creating friction and hindering the government's decision making around policy and regulatory reform.

15. The formation of smallholder grower groups and enterprises has not been effective nor sustainable. Many factors have influenced this, including farmer livelihood strategies, the needs -based nature of smallholder teak harvesting, the resultant low contribution of household revenue from teak, relationships or the breakdown of relationships, dynamic markets, the application of regulations, and high dependence of farmers on external actors to sell their teak.

16. Brokers (often known as ‘middlemen’) and other service providers are important actors in the value chain, although they are frequently overlooked or dismissed particularly by some areas of government, which view them as ‘value grabbing’ rather than ‘value adding’.

17. Relationships are important in establishing and maintaining value chain connections. These may be based on industry, family, locality, ethnicity or other social and contextual factors.

18. While upgrading processing standards is important to an increased and more expansive focus on consumer requirements and trends, product design, quality assurance and marketing are needed to better access export markets and meet the needs of an urbanised domestic and regional consumers.

19. There is limited evidence of marketing of Lao teak as a speciality high-value product, although there is some activity by individuals through online platforms, either independently or through government led forums. This represents a foregone market opportunity.

What are the major impediments to resource availability for domestic processing, and how might they be addressed?

20. The status of current teak wood supply and future wood availability is unclear, and perceptions vary. There is some consensus that, other than in remote areas where the access cost is very high, most of the existing large ‘high value’ teak has already been cut out. This is being explored further in Project Objective 1.3.

21. Current supply, including large volumes of small diameter wood, appears to be influenced by volume cleared from infrastructure activities such as hydro projects, roads and the Lao-China railway. Project Objective 1.3 is mapping the impact of these developments on teak plantations.

22. New teak is being planted including, anecdotally, through foreign leases or concessions as evidenced through larger volume seedling purchases at teak nurseries, in more ‘upland’ areas around Luang Prabang, and by famers close to Paklay in Sayaboury, which is due to locally high prices.

23. The ownership and management intent of teak is changing. There is some transition to aggregated holdings through accumulation by better-off urban residents.

24. Some farmers are switching to annual- or shorter rotation- agricultural production systems and some are exiting agriculture entirely. Broader socio-economic trends, including migration of younger people out of rural regions, are impacting the management and ownership of teak and the willingness of people to work in the sector. A shortage of availability of workers is being felt, particularly with respect to harvesting and carrying logs to roadside. This is likely to become more significant as more alternatives arise, and as local aspirations change.

25. There is weak connection between the governance of the plantation resource and that of the processing sector; the decision -making associated with approvals for new processing facilities is opaque, and there is little evidence in this of the consideration of the impact on, or sustainability of, long term wood supply. While new investment in processing may spur some plantation establishment there are concerns that some recent investments may be opportunistically targeting short term increases in wood supply associated with forest clearing for development, and may have future detrimental impacts associated with increases in illegal logging in natural forests.

26. ‘Upgrading’ of supply by improved plantation management through certification has not been successful nor beneficial to smallholder growers. ODA-supported certification activities, which are overly technical, may be having a very unintended effect of inhibiting grower participation. As with state regulatory compliance, voluntary certification standards are complex, time consuming and costly.

SUMMARY OF RECOMMENDATIONS

Current policies are not enabling sustainable teak value chains. However, in the current dynamic policy environment, there are opportunities for immediate actions that could enhance the sector.

1. Providing a clear and strong vision for the plantation wood sector for export and domestic markets and recognising the important role of micro and small enterprises.
2. Ensuring all plantation wood enterprises can meet the requisite standards and are able to participate in existing and emerging markets, particularly once timber legality assurance is required.
    a. Designing and testing procedures for input-output (chain-of-custody) management specifically for micro and small plantation wood enterprises and demonstrating these at the National University of Laos Wood pressing Facility
    b. Developing scale-appropriate standards for the wood sector.
    c. Encouraging and promoting innovation and value adding by revising the list of export products to only include plantation wood products that cannot be exported.
    d. Promoting and supporting compliance with enterprise regulations through fee reductions and other incentives.
3. Improving the flow of legal wood to industry and encouraging smallholders to invest in teak.
    a. Drawing on the experiences of other countries, identify and test new mechanisms, as alternative to the current dependence on plantation registration, to enable and make it easier and cost-attractive for smallholders to legally sell their wood.
    b. Simplify plantation registration processes including through field trials of group registration, using point GPS locations instead of area maps.
4. Exploring appropriate opportunities for expanding the area of teak plantations within the Production Forest Estate, including through new plantation partnership models, based on a trial in Luang Prabang Province.

WHAT ARE 'VALUE CHAINS'?

The concept of 'value chains' has been widely and variously adopted as research framework, an analytical tool and approach to development, including as a mechanism for enabling interactive, collaborative systems that create and deliver products valued by consumers (Collins et al. 2015).

Many of ACIAR's programs have a focus on inclusive value chains; a principle that is based on the premise that "sustainable economic development, led by the private sector, is the most effective, proven way to reduce poverty." [2] Smallholder famers are recognised as essential in most agri-food systems but are often excluded from the most valuable chains, to their detriment. Taking a value chains approach offers insights into how smallholders can be connected to opportunities that can help lift them out of poverty while creating broader benefits through socio-economic development.

The term "inclusive value-chain development" typically denotes a very broad set of expectations around value-chain interventions. It involves actors with different and often divergent interests, entrepreneurs and businesses of different sizes, farmers with a variety of assets and productive capacities, and an array of input and service providers, all operating in a dynamic business environment with severe limitations in terms of infrastructure and services (Donovan and Stoian 2016).

There are many approaches to value chains, and making value chains work for the poor is challenging. While market development and research are often focused on a single product chain, for farmers (and some other value chain actors) multi-faceted livelihood systems are more often involved. Interventions, whether they be aimed building smallholders' capacity to respond to growing demand for high-value products in export markets or developing options for enhancing the policy and governance environment through removing legal barriers or institutional bottlenecks need to be cognisant of this complexity.

Specific terminology is often used in association with value chains.

Supply chains – business chains that supply goods and services to customers and eventually to a final consumer (Collins et al. 2015). Supply chains are often thought of in the context of stock inventory (input-output) management.

Commodity chains - can be viewed as a network of labour and production processes whose end result is a finished commodity (Hopkins and Wallerstein 1986). Commodity chains consist of the steps involved in the transformation of raw materials into final goods and webs connecting the sets of productive activities and sets of inter-firm networks which connect manufacturers, suppliers and subcontractors in industries to each other, and ultimately to markets (Bair 2008).

Value Chains - describe the full range of activities required to bring a product or service from its 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 in some cases final disposal after use. In this type of analysis, production *per se* is only one of a number of value-added links (Tallec and Bockl 2005). Governance of value chains is often emphasised.

[2] https://www.aciar.gov.au/Our-Goals/Inclusive-Value-Chains

In the context of value chains, *value* can refer simply to the financial worth of a product or service, but it can also refer to other aspects of people's cognition that underpin decisions and behaviour (c.f. Jones et al. 2016). This is particularly important when a value chain includes actors, such as smallholder farmers, who are making decisions about their livelihoods that are associated with a particular commodity (in this case teak). This requires greater scrutiny of the social, economic and cultural values that shape livelihood-based decision making (Neilson and Shonk 2014).

Chains are often viewed as, and criticised for being, linear and unidirectional (Lowitt et al. 2015). The concept of networks and systems adds a multi-dimensional perspective.

Networks –are viewed the fundamental structural and relational nature of how production, distribution and consumption of goods and services are organized (Coe et al. 2018). They are viewed as more dynamic than chains and better reflect spatial and temporal variability. Networks, as opposed to chains, reflect that interactions are not necessarily sequential or uni-directional and they may be iterative. Network mapping and analysis should be undertaken to identify actors and examine vertical and horizontal connections and relationships between them.

Adding the '*global'* element to supply-, commodity- and value- chains and networks places them in a broader context, principally one of an international trading system and the associated political economies. It introduces concepts associated with global governance and law, country-level relationships including those associated with the inequities of 'developed' and 'developing' countries and the power relations between them. The role of development programs and interventions become more relevant.

The term *firm* is used to denote a commercial entity (business, enterprise or individual) that operates on a for-profit basis and participates in selling goods or services. *Lead firms* have the capability and power to determine how the other actors in a value chains behave by, for example, defining chain-wide product and processing standards, setting quantities and conditions of delivery or using brand ownership or proprietary technology.

The term *actor* tends to denote any type of participant in a value chain, either directly (as a firm) or indirectly, for example as a consumer.

Upgrading refers to improving a firm's position within the value chain, and this is generally associated with increased competitiveness that allows for the capture of greater value-added through the production process (Bair 2008).

METHOD

The method for this study is described in detail in the supporting field reports. In summary, the method broadly follows that of Collins et al. 2015. Approaches used included:

- Identifying, mapping (from inputs to market) and analysing the major value chains for the Lao smallholder plantation resource, complementing and further developing work undertaken by ADP/2014/047 for eucalyptus and teak.
- Analysis of the costs, benefits, risks and constraints along the value chains.
- Characterise ownership categories of plantations and smallholder management intent and strategies with respect to their plantations and wood sales.
- Network mapping and analysis of timber traders and brokers, and their role in the value chains, including regulatory processes and transaction costs.

BRAINSTORMING

An initial brain storming session was undertaken with the project team and representatives from LPTP to develop a general picture of the Luang Prabang Value Chain. Numerous types of actor were identified. They were divided into two broad categories: value chain actors and institutional actors.

Several key stakeholders were identified and targeted for interview by the VC team, including three processors, in order to get an idea of who they were buying from and selling to – these actors became potential targets for subsequent interviews. Ywo value adding units within grower groups were also deliberately selected at the outset, to determine if there was a particular sub-chain as a result of their support from LPTP. Relevant institutional actors in Luang Prabang and Vientiane (POIC, PAFO, the Luang Prabang Wood Association, Lao Furniture Association and RAFT) were also targeted for interview.

A summary of the stakeholder types interviewed, and their gender, is given in **Error! Reference source not found.**.

Figure 1: Team work

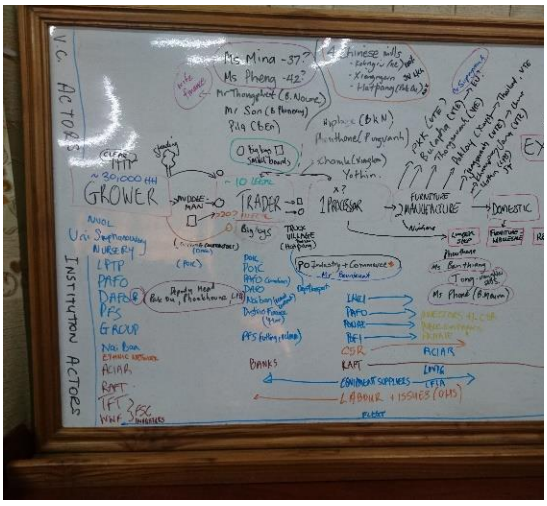


Figure 2: Value Chain and Stakeholder mapping

WORKING DEFINITIONS

Many actors perform more than one value chain role. The following 'working definitions' were used.

- 'Finder' – locates and may purchase trees on behalf of another – but never owns the trees (also a broker)
- 'Trader' – buys and sells wood. In this case round logs or square logs. The buying and selling may occur at various physical locations - the roadside, roadside log yards, sawmill sites etc.
- 'Processor' – buys round logs and processes (mills them) into square logs or sawn board.
- 'Manufacturer' – factory, makes a finished product
- 'Retailer' - sell to end user
- 'Transporter' - ships wood or finsihe products under contract;
- 'Harvester' - harvests trees under contract, including cutting trees and carrying logs to roadside
- 'Small' – less than 100m^3/month input
- 'Medium' - 100-1000m^3 /month
- 'Large' - >1000m^3/month input

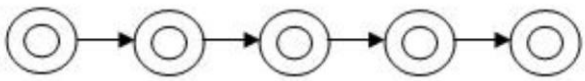
VALUE CHAIN ACTOR INTERVIEWS

The study used a combination of structured mapping, semi-structured interviews and field observations including photographs and short videos to gather the data for analysis.

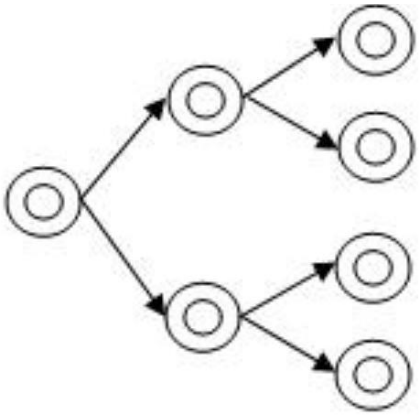
A non-discriminative snowball sampling approach was used to identify interviewees: each respondent was asked from whom the bought wood and to whom they sold wood. Intermediate service providers were also identified during interviews.

Snowball sampling is a non-probability sampling technique that is used by researchers to identify potential subjects in studies where subjects are hard to locate. This type of sampling technique works like chain referral. After observing the initial subject, the researcher asks for assistance from the subject to help identify people with a similar trait of interest. There are several types of snowball sampling

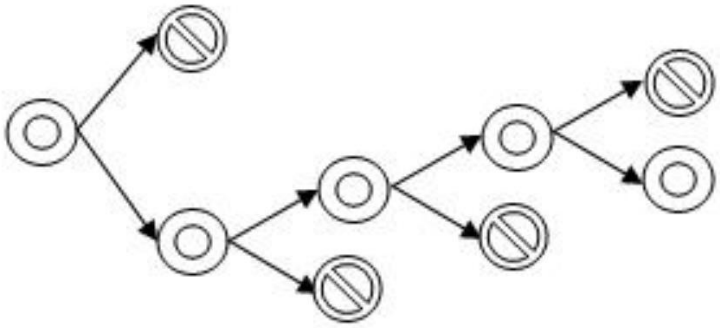
- Linear snowball sampling



- Exponential non-discriminative snowball sampling



- Exponential discriminative snowball sampling, the type used in this study.



There were two main elements of the interviews for VC actors, being:

a) to understand the current state of the teak value chain, and
b) to analyse the costs, benefits, risks and constraints along the chain.

UNDERSTANDING THE CURRENT STATE OF THE TEAK VALUE CHAIN

Value chain actors were asked:

- details of their own role in the value chain (harvesting, processing, trading etc.):
- scale of their operation (number of employees, estimates of volume)
- purchase conditions (minimum diameter, grades, origin)
- where they source their input products from and who they sell to, prices, amounts and contact details
- institutional actors affecting operations (government, development actors such as LPTP, trade associations)

These elements were mapped onto a large piece of white paper, in either Lao or English[3].

In Figure 3, a small enterprise is placed in the middle, with the role of producing furniture. The inputs are on the right, and show that he buys only small round logs between 8 and 16cm in diameter (300-600,000 LAK/m^3), or small squared logs (5*5 to 10*12cm diameter (500-1,350,000 LAK/m^3). His markets (on the left hand side), are either in Luang Prabang (Cher Kong Hong store) or to passing customers from Xieng Khouang or Vientiane.

[3] English was used in the team in which translation was needed to assit in the interview process.

In Figure 4 a wood processor and transport company is placed in the middle, with the role of processing wood and transport. The inputs are on the left and outputs on the right, with connections to other actors indicated by arrows. Symbology is used to denote types of inputs and products.

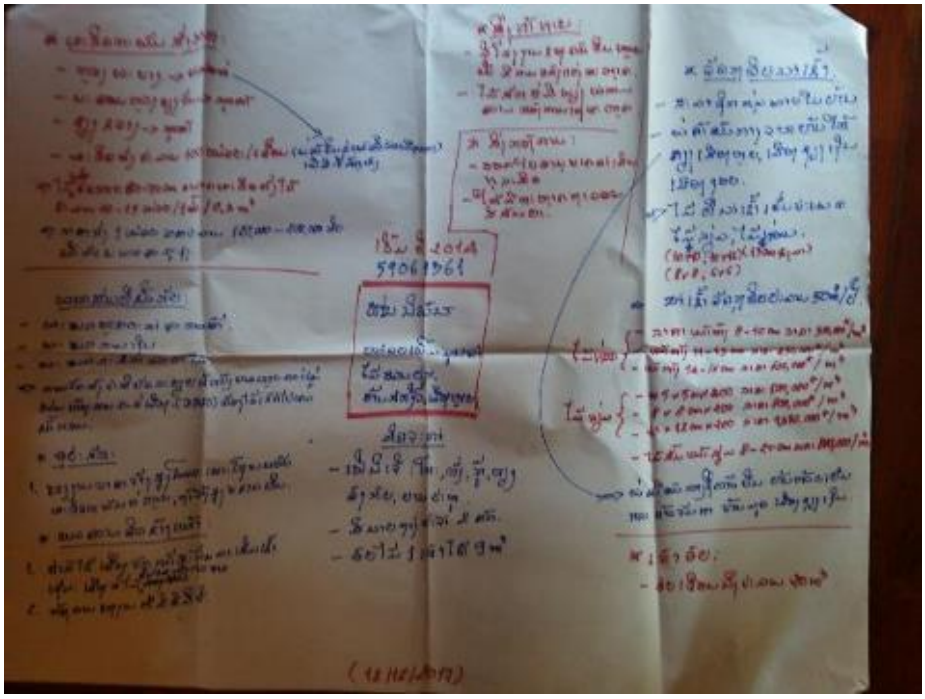


Figure 3: Example of Value Chain Assessment of a small value-adding Unit

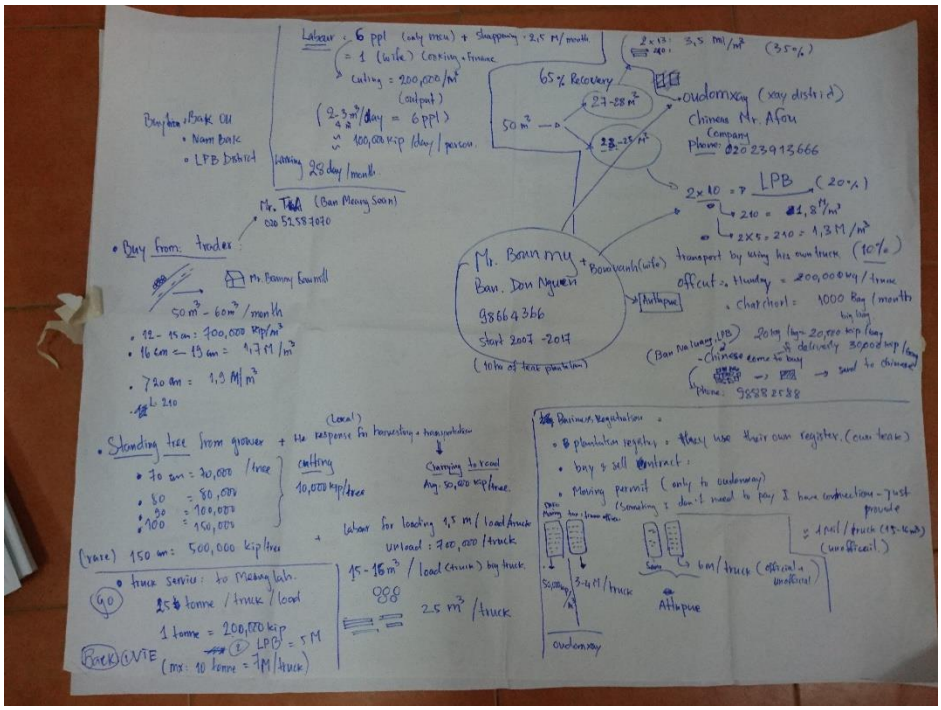


Figure 4: Example of Value Chain Assessment of a wood processor and transporter

A mix of open-ended and closed questions, were asked, including:

- What are the constraints to your business and how may these be overcome?

- What are the opportunities for your business and how these may be realised?
- What are the priority actions/decisions required to immediately improve the value chain (for immediate consideration by policy-makers)?
- Being optimistic, what would you see as a desirable future for your business in five years' time.
- How do you establish prices for your inputs? Are you able to negotiate prices for your products – if so how?
- Are you a member of a group, association or other social organisation?
- How will resource availability change over the next five years?

Some specific questions related to gender were included:

- What are the roles of women in your organisation. How do they differ from the role of men?
- What are the salary packages for men and women?
- To women: What are particular constraints or opportunities you have as a woman in the value chain compared to a man in the same position?

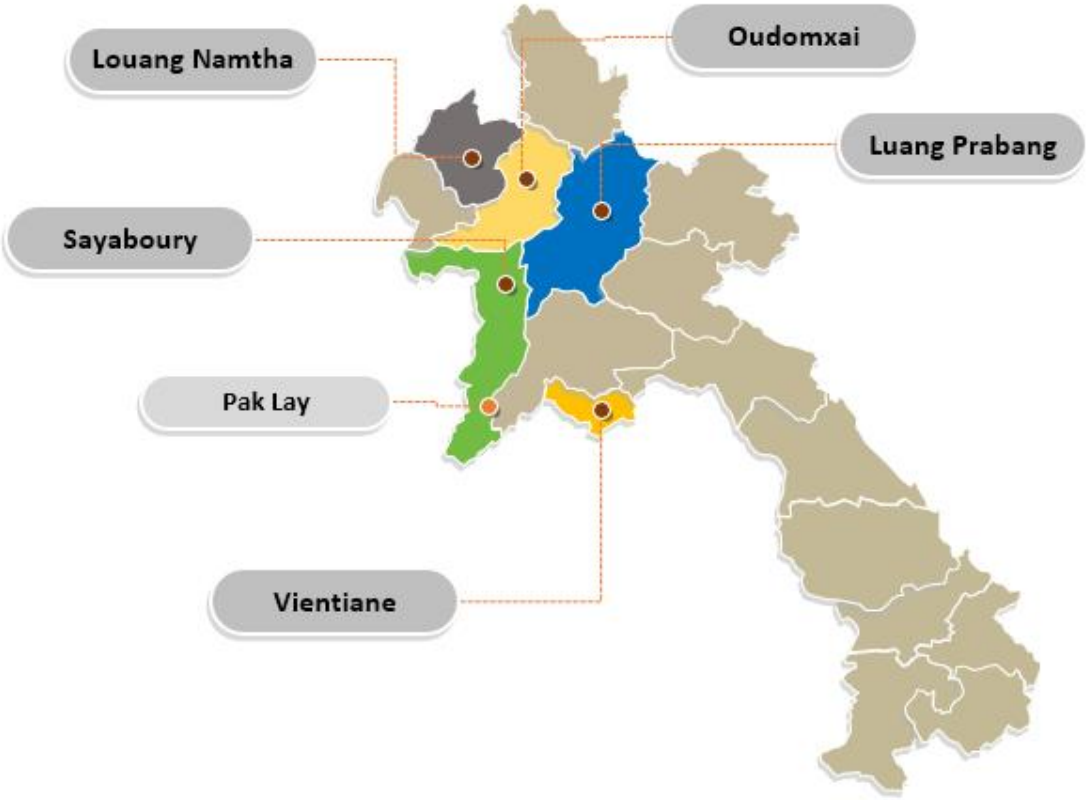
Each actor or firm type was investigated with a different mix of questions, which were designed to cross check information that had been given by other chain actors. Probing questions, to give depth to a topic or point of interest, were also used to tease out the story.

These methods helped us to understand:

- who is involved, how the chains are organized and who most influential/powerful players in the chain are;
- how, through what institutional mechanisms, are the chains regulated and governed
- how regulation and governance affects the generation, capture, and distribution of gains in value across chain participants; and
- what determines the position of chain actors from low to high value-added activities, and their movements (e.g. through value chain upgrading).

Adopting the snowball sampling approach, research commenced in Luang Prabang City (Luang Prabang province) as the teak plantation wood supply zone in December 2017, and connections were followed to Luang Namtha, Oudomxai, Sayaboury and Vientiane (Figure 5). Interviews were conducted with a range of firms of different sizes and types and non-firm actors including district, provincial and national government representatives. Based on the results of the Luang Prabang value chain assessment, it was decided that, despite their interconnection, the Sayaboury teak value chain would be separately assessed as results indicated significant differences between the two provinces. Research in Sayaboury was undertaken in March/April 2018 in and around Sayaboury city and Paklay.

Figure 5: Location of research



Fieldwork teams comprised a mixture of non-Lao researchers, counterparts from the Luang Prabang teak Projects and Lao students. In most cases teams included at least one female researcher.

A total of 80 interviews (99 people[4]) were conducted with of actors or firms associated with the Luang Prabang and Sayaboury teak value chains (Table 1). Thirty-one percent of interviewees were female and 69% were male. Firms were dominantly micro (49%) or small (42%), with independent traders and growers classified as micro-enterprises. The size of firms is based on the classification set out in *the Decree No. 25/MOIC on the Classification of Small and Medium Enterprises, 2017*, using number of employees as the metric: 'micro' = 1-5 employees; .small' = 6-50 employees; 'medium' = 51-99 employees; 'large' = >100 employees.

[4] More than one person was present at some interviews.

Table 1: Number of value chain Interviews of each actor/firm type and firm size

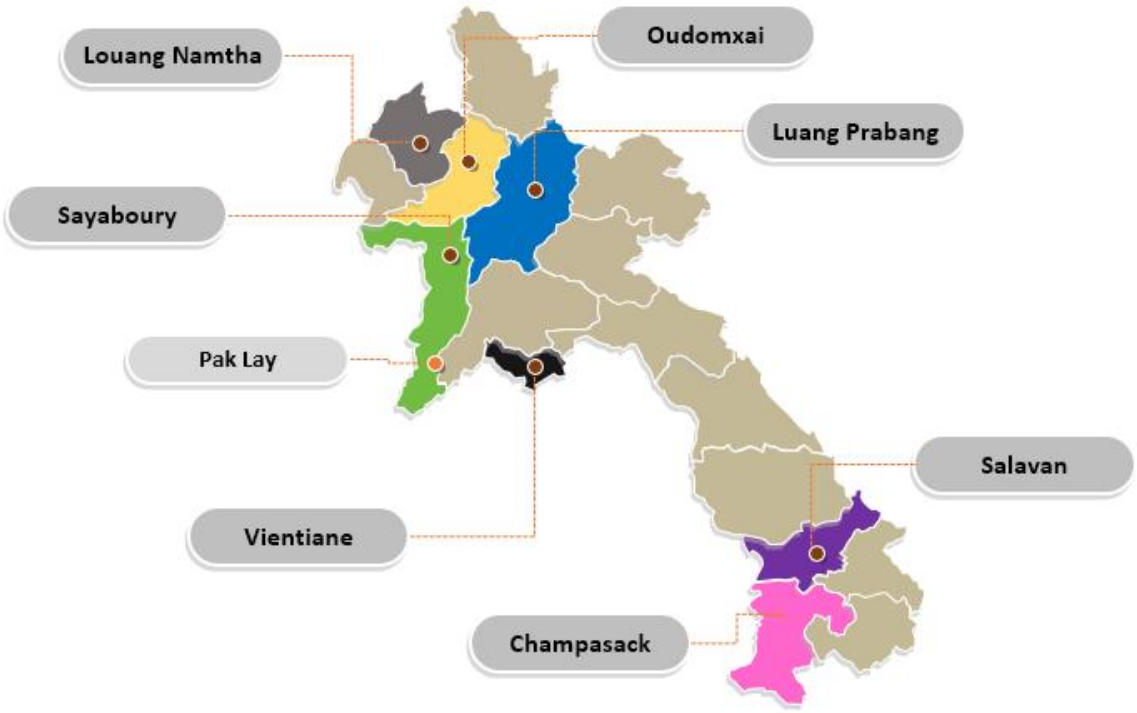
Actor/Firm	Large	Medium	Small	Micro	Unknown	NA	Total
Consumer						1	1
Contract harvester				1			1
Finder/ trader /Level I processor			1				1
Finder/broker			1	4			5
Government						17	17
Grower				5			5
Grower Group			1	3			4
Industry Organisation						2	2
Level II processor		2	3	2	2		9
NGO						1	1
Level I processor		1	5	3			9
Level I/II processor & transporter			1				1
Level I/II processor (manufacturer)	2		10		1		13
Retailer				1	2		3
Trader & processor				1			1
Trader				4			4
Transporter							1
Wood retailer				2			2
Total	**2**	**3**	**22**	**26**	**6**	**20**	**80**

ISSUES AND AREAS FOR FURTHER RESEARCH

TEAK VALUE CHAINS ARE INTERNATIONAL AND DOMESTIC.

Teak is grown and processed, and teak products are manufactured at several locations in Lao PDR (Figure 6).

Figure 6: Lao Teak Value Chain Nodes

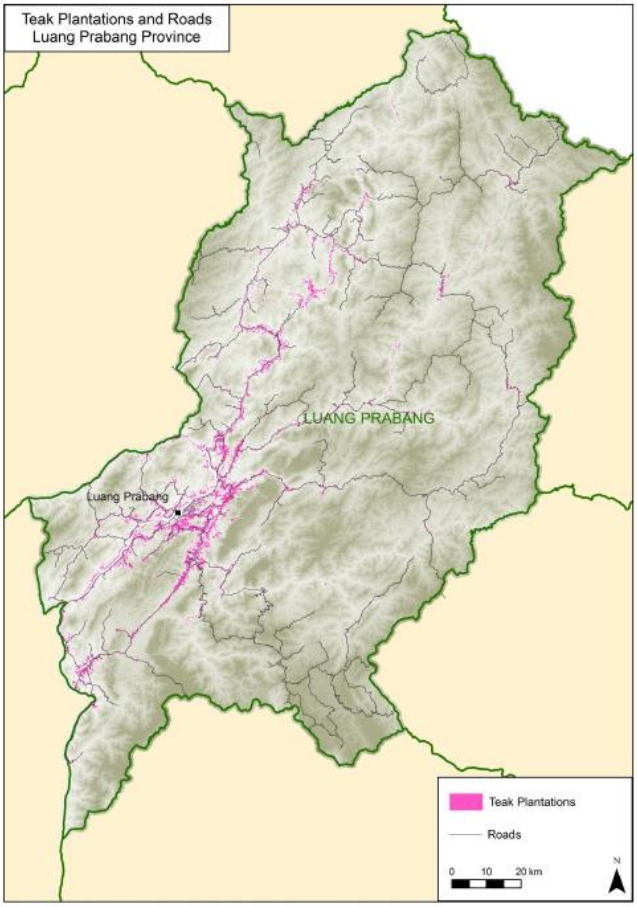


The largest areas of teak plantation in Lao PDR are in Luang Prabang Province (around 18,000 ha, Figure 7 2016) and in Sayaboury province (estimated to be in the order of 8,000-11,000 ha, but as yet unmapped). According to DAFO in Paklay district of Sayaboury province there are also about 2,700 ha of natural teak remaining in the district. Smaller areas of teak have been planted in Vientiane, Salavan (2,120 ha in 2011[5]) and Champasack (5,323 ha in 2011[6]) provinces. More recent data is being sought.

[5] Results of the Consultation Workshops and Exchange of Lessons on Plantation And reviewing local forestry inventories In Lao PDR 2011: Page 11 – 13

[6] Results of the Consultation Workshops and Exchange of Lessons on Plantation And reviewing local forestry inventories In Lao PDR 2011: Page 11 – 13

Figure 7: Planted teak in Luang Prabang



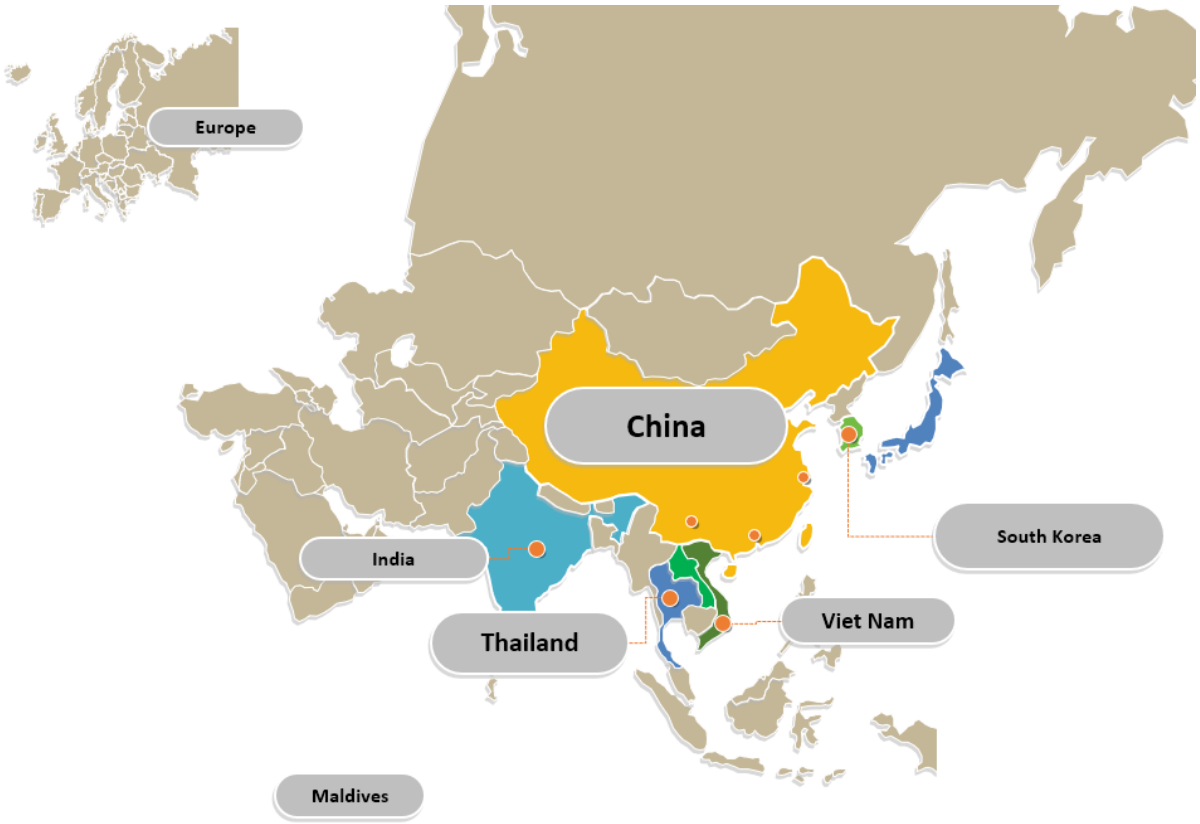
Most of the primary processing of teak also occurs in Northern Laos, a factor related to geographical proximity to the resource and the cost and logistical challenges for transport. This is related to both the condition of the road network, distance to market and costs imposed through regulation. Historically the nodes of manufacturing to finished products have been in Vientiane or abroad, although this is changing in line with PMO15. Processing for local use, that is within villages and districts for use in households and schools for example, and which tends to be a lower quality, continues to occur.

Domestically (for consumption with Laos), the dominant teak markets are Luang Prabang, Vientiane and Vang Vieng. There are numerous international destinations for teak (dominantly in the ASEAN Region) (Figure 8), but domestic and local markets are also important. Teak exports were found to be destined for China, Thailand, Viet Nam, Korea, Europe, the Maldives, and India.

Global and domestic value chains offer different opportunities and are constrained by different factors. Government policies are largely export oriented, and while they promote domestic processing and employment there is limited policy focus on enabling domestic and local markets. Export controls only make any sense if they are effective in stimulating domestic processing and employment. If export opportunities are cut-off and are not replaced by equal or greater domestic processing, they may risk killing off the sector. Applying restrictions to exports must be more than compensated by stimulus to domestic processing and there is currently no evidence of this occurring. It has just been assumed local industry was ready and able to scale up to new opportunities, which it was not.

Further research is planned to understand the final destination market drivers of teak value chains.

Figure 8: Laos teak international destinations



MARKET ACCESS AND LOGISTICS ARE IMPORTANT BUT DIFFICULT

The logistics of teak value chains are inefficient and costly. In the plantations, higher quality wood is less accessible from roadsides and rivers and access to more remote stands is challenging. The extraction of teak is typically by way of manual harvest and carrying or, for greater distances, a small tractor 'lot sing' is used. The availability of workers willing to undertake these tasks is reducing and the cost is rising as other employment options increase.

While most highways and major roads are sealed, much of the rural road network, particularly near plantation areas, is unsealed and in poor condition. This particularly an issue in the wet season. While distances between production, processing and markets are not particularly long, efficiency is hampered by poor infrastructure. In Luang Prabang province teak is clustered around the city of Luang Prabang and 83% is less than 1 km from a road (Boer and Seneanachack 2016, and see Figure 7).[7] Poor road conditions, however, contribute to higher transport costs by reducing average travel speeds, increasing maintenance costs of heavy vehicles; wood and products may deteriorate in transit. River access is disappearing as the number of dams increases.

Inter-district and inter-provincial regulations for the movement of timber incur costs – both official and informal and respondents reported these to be significant in terms of their choice of market

[7] Analysis undertaken by Boer and Seneanachack (2016) used available data for sealed roads and long-life unsealed roads suitable for use by trucks. It did not included minor roads and tracks suitable for use by smaller vehicles although these may also be used for the transport of logs. The existing road mapping was incomplete so review and remapping of the roads layer in the GIS was required.

destinations. Transporting wood across provincial borders legally requires additional and expensive paperwork that reduces its profitability. Moving wood a few kilometres (from Sayaboury to Nan district in Luang Prabang for example) is more expensive than bringing it hundreds of kilometres from Nambak district, because it remains within the province of Luang Prabang. Such restrictions on trade potentially encourage, rather than diminish, smuggling between provinces. Lower prices due to the introduction of PMO15 have meant that the profitable supply zone for small logs has shrunk: it is no longer viable to send small logs from Sayaboury to Luang Prabang.

Little research has been done on the logistics of teak value chains. It would be useful to undertake a more detailed assessment of the steps, costs and benefits to understand the current circumstances and develop policies to optimise transport routes between enterprises and their markets. The outputs could inform operational, investment and regulatory decisions and value chain strategies at a national scale (c.f. Higgins et al. 2017). Synergies with the ACIAR project "Evaluating options for reducing agricultural transport costs and improving market access for smallholders in South East Asia" (AGB/2016/033) should be explored.

WHO ARE THE ACTORS, WHAT ARE THEIR ROLES AND HOW ARE THEY CONNECTED?

While a core objective of this project is to identify the *key elements* of the policy, governance and administrative environment that constrain the development of plantation forests and value chains, in order to do this, we need to know what all the elements of the value chains are. Stakeholder analysis and network mapping was undertaken identify the full suite of actors and firms and their roles and connections in the value chains. This helps to identify dominant firms, actors and nodes, and how they influence the chains and policy/regulatory reform processes.

For VALTIP2, the focus was also on 'key elements of the value chain' and the research and analysis were, in hindsight, overly simplistic and narrow. This may have contributed to the limited success of 'interventions' proposed by that project.

Our current research has revealed several connecting actors and firms including:

i. Nurseries – breed and grow tree seeds and seedlings for sale to plantation growers and buy seeds from growers.
ii. Growers/owners – plant, manage, grow and sell trees and plantations; may also sell seeds to nurseries.
iii. Finders/brokers - locate and may purchase trees or logs on behalf of another – but never own the trees or logs.
iv. Traders - buy and sell logs and wood. In this case round logs or square logs. The buying and selling may occur at various physical locations -the farm, the roadside, roadside log yards, sawmill sites etc.
v. Harvesting contractors - harvest trees under contract, including cutting trees and carrying logs to roadside
vi. Transporters - ship wood or finished products under contract;
vii. Processor– buy round log and processes (mills them) into square logs or sawn boards. Processors may different types as defined in *Decision No. 0719/MOIC on the Timber Processing Manufacturing Standards 2009*:
    - *Household and micro-processor* - small timber processor or small furniture manufacturer producing semi-finished products or finished products such as

tables, chairs, shelves, beds, decorative woods, wooden sculpts, wooden jewellery, picture flames, household and handicraft products to supply for bigger sawmills or for export and domestic purposes.

These types of firms are perceived of as 'artisans', although in reality few could be considered as such.

- *Level I processor* - sawmill, or semi-finished products manufacturer that produces sawn wood, cut wood, semi-processed wood, construction wood, interior decoration wood and pulp which can be supplied to Level II manufacturers to be processed into finished products or for added value.

viii. Manufacturer – termed *Level II factory* in Decision No. 0719/MOIC are manufacturers of finished timber product and furniture for export and domestic purposes.

ix. 'Retailer' - sells finished products to end users/consumer

x. 'Government' – administers, regulates, promotes, controls various value chain elements;

xi. 'Industry Associations' – represents members.

xii. 'Grower Groups' – facilitate the sale of trees/logs; represents members

xiii. 'Development Partner' – funds and supports research, extension, investment in various value chain elements

xiv. Consumers including *local consumers* – in the village/district; domestic consumers (for example, *domestic consumers* in the country where the final product is produced; and *export consumers* in the final export destination (where this is not known).

Teak networks can be complex involving many actors and firms or may be quite simple. Network complexity appears to diminish value to smallholders because each service or processing step adds cost, while vertical integration enhances value to growers. However, the number of integrated value chains are relatively limited, they tend to be exclusive and geographically constrained and provide opportunities to only a small proportion of growers.

Examples of simple value chains include: farmers selling trees or round logs to directly to micro- or Level I processors who on sell them or process them into square logs for direct export Figure 9); farmers selling round logs directly to micro- or Level I processors who manufacture and sell finished products to consumers, with a limited number of independent actors (Figure 10) - the end products can be simple and low grade such as school furniture or higher grade artisanal products; local value chains in which micro enterprises buy trees or round logs from grower groups to which they are connected and produce finished good for local or domestic consumption (Figure 11); an integrated export value chain where all actors interact through connections to the final retailer (in this case in Thailand; Figure 12) - smallholders sell to buyers who are contracted directly to the Level I processor, who sets volumes based on orders placed by the parent retail company.

Figure 9: Round and Square Log export value chain

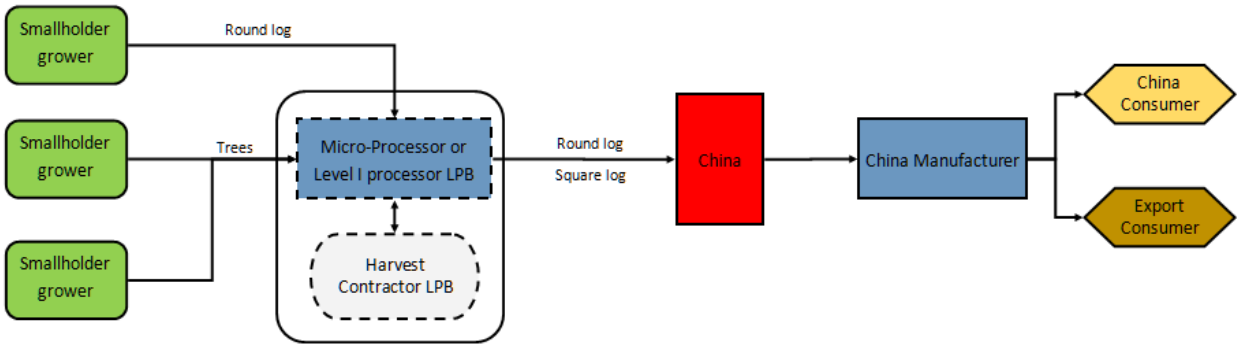


Figure 10: Simple local value chains - a limited number of independent actors

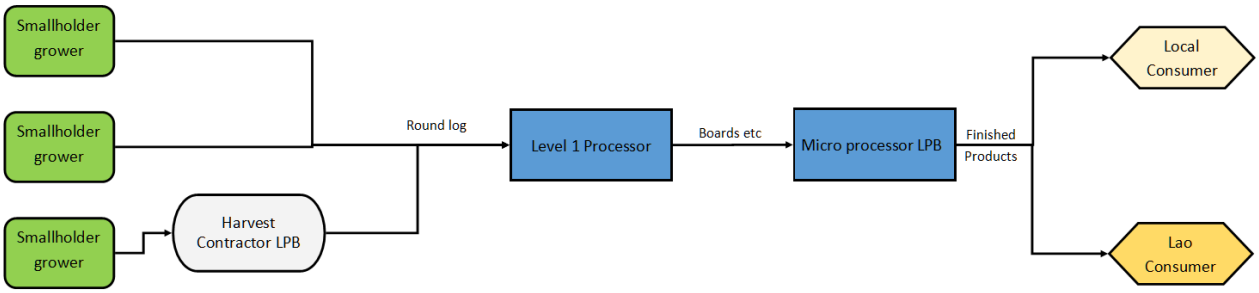


Figure 11: Simple local value chain with grower group and enterprise

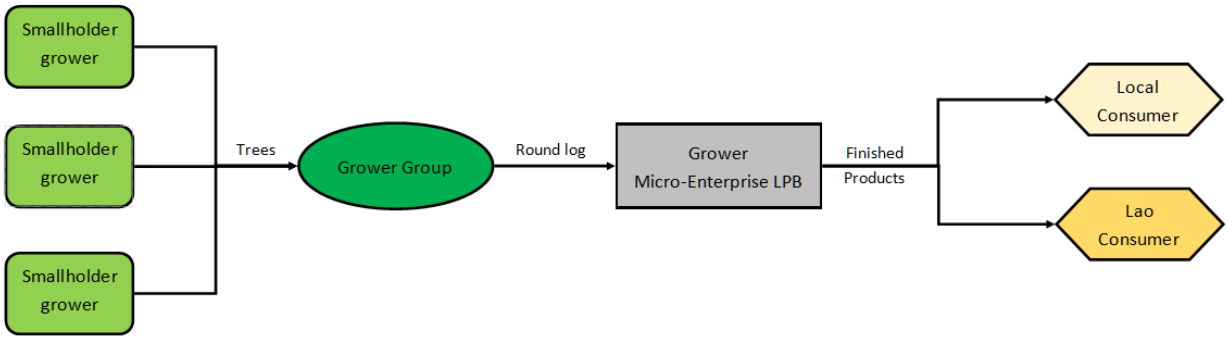
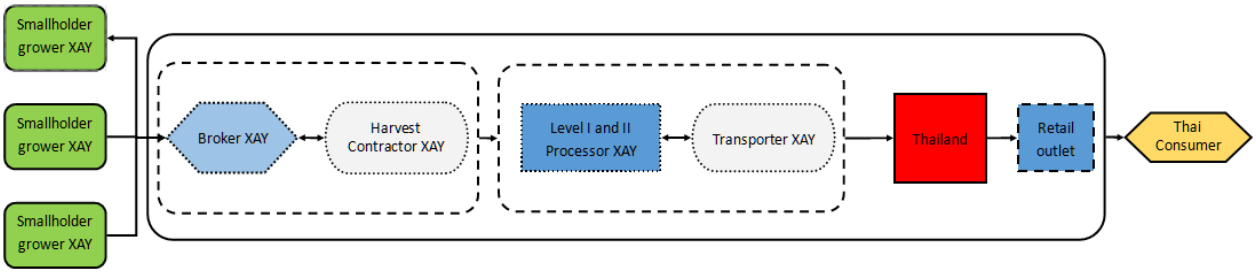


Figure 12: Simple integrated export value chain



More complex value chains are also present. Service providers, such as traders, harvesting contractors and transporters, establish relationships and work in teams to facilitate the movement of wood along the value chain (Figure 13). These teams may service more than one client processor (Figure 14).

Figure 13: Service providers working in teams.

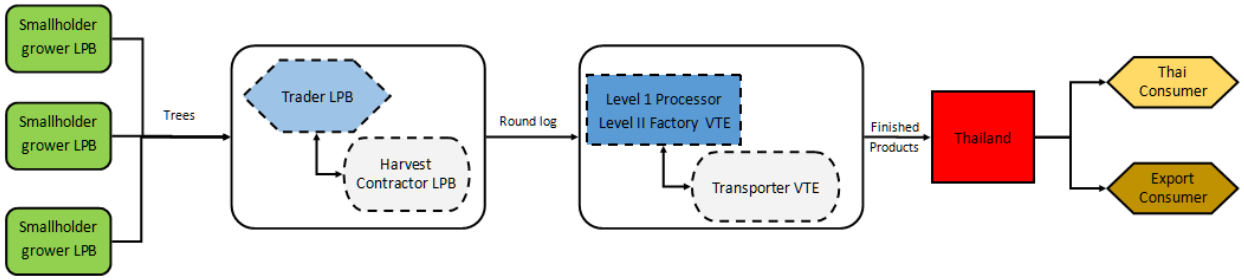
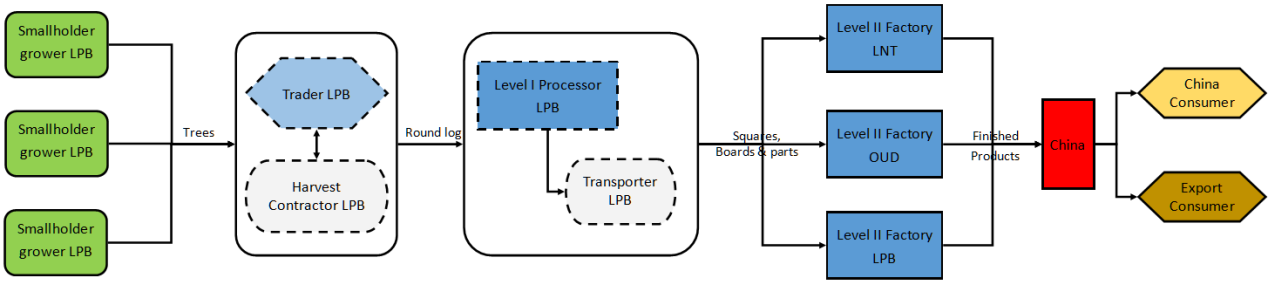


Figure 14: Service provider working in teams with many client processors.



Grower group micro-enterprises may interact with farmers via grower groups or buy directly from non-member farmers. They may supply several markets such as semi-processed or simple finished products for the local and domestic markets via mill gate sales and semi-processed products to Level II processors for manufacturing into finished products that are then sold domestically via orders (at mill gate), to domestic retailers or are exported. Export may be directly to consumer, based on orders or to retailers.

More complex chains may be based around larger Level I processors that are directly connected to Level II manufacturers and export through, for example foreign investment. They may buy wood from many sources, including at the mill gate directly from farmers or via traders. and through several channels.

Figure 15: Grower Groups and Enterprises

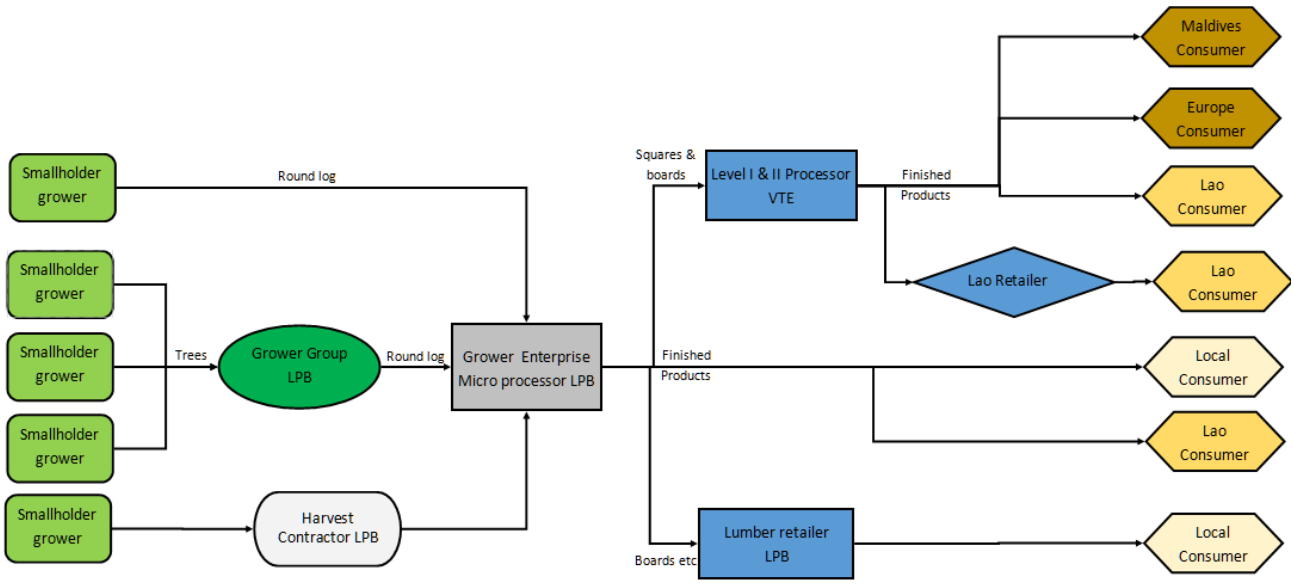
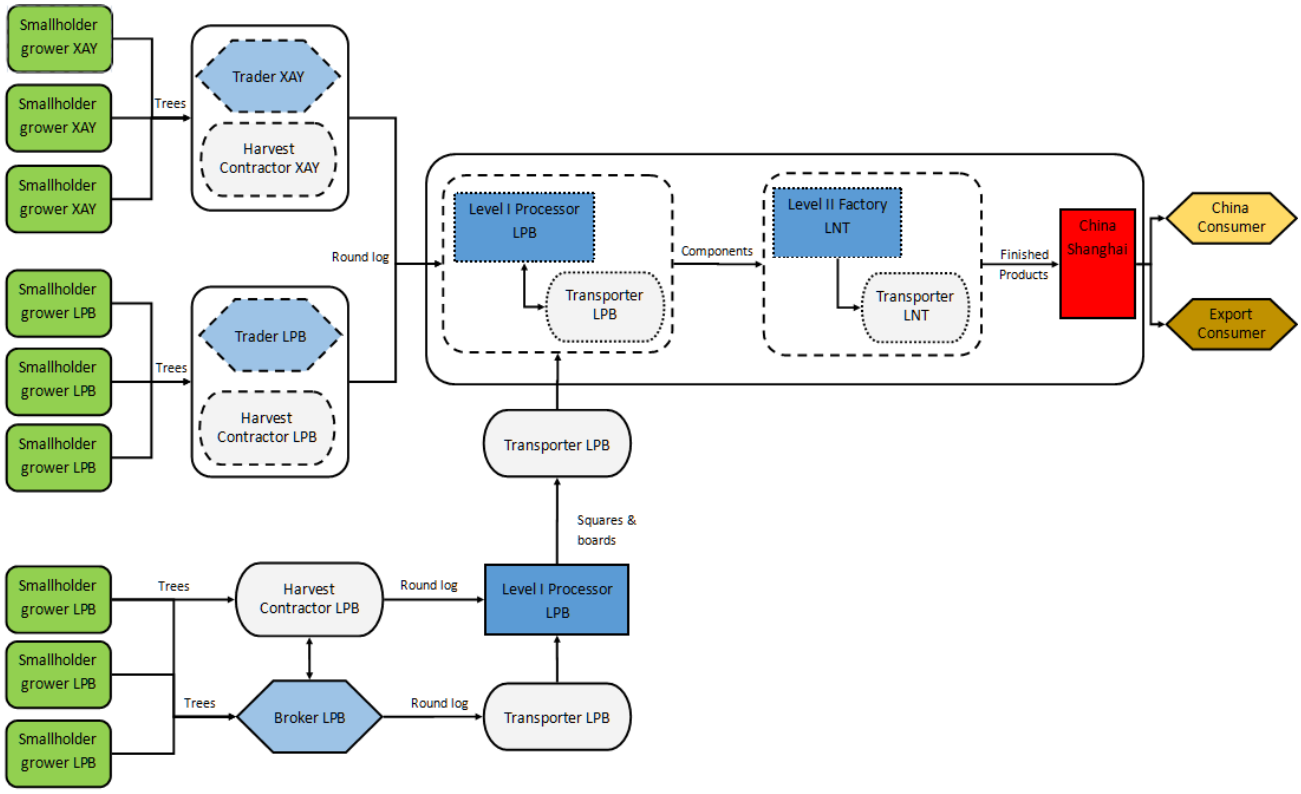


Figure 16: Complex vakue chain with teak sourced thorugh multiple channels



Network mapping and analysis has revealed the complexity of the chain but there is a need to look more closely at the vertical and horizontal connections and relationships taking into account the historical, institutional and social contexts or the geographic place in which the chains are situated. This could be explored through a more detailed comparison of the Sayaboury, Luang Prabang, Vientiane and Salavan teak chains (the latter two still to be documented).

One of the challenges in doing the network mapping and value chain analysis is in exposing actors and firms and networks and connections that may otherwise, and intentionally, be kept hidden (Bainton 2009). Thereby rendering them taxable or regulatable. This may result in upregulation, further 'gumming up' (Clapham 1985) and 'grid lock' (Katz 2010).

ARE TYPOLOGIES OF ACTORS USEFUL IN POLICY MAKING?

Several broad types of firm were identified in our research. These can be generalised. Developing typologies can be useful for the purpose of policy making (See for example Castella et al. (2009) who describe a typology of ownership and investment arrangements for rubber).

- 'Precarious Processors' – micro and small processing firms that are operating on the edge of the market and on the edge of legality, supplying mostly primary products (e.g. square logs, sawn boards) to manufacturers and to village consumers. They have low capital investment and poor recovery. They are the target of PMO15 mills closures.
- 'Cautious Conservatives' - those who made money in the past without much need for value adding, using their knowledge of the system and their personal contacts; they are now at risk of becoming unprofitable. Their equipment is basic or outdated and the wood recovery is low. Logs are stockpiled in the yard without protection and losses due to splitting are high. While they may understand the technical processes of milling, they lack the business skills needed to effectively compete. They are unwilling to borrow money to invest in their business due to doubts about future income streams. They are unlikely to invest further in the teak sector and may move to other, more profitable activities or leave the industry altogether.
- 'Vientiane Establishment' - long-standing processors and manufacturers who have operated for some time and who are influential in the sector including through policy influence and strong political connections.
- 'Integrated Foreigners' – integrated businesses with foreign financial support and direct/established access to export markets with multiple supply chain nodes internalised including plantations, processing , manufacture and export. These companies are invested for the long term.
- 'Aspirational Venturers' - those who have realised the need to invest in value adding in order to survive. In most cases, this means cooperating with foreign investors to bring in additional capital and provide reliable markets. Wood recovery is much higher due to better log management, which means that government-imposed costs (which are generally levied on a m^3 basis) are less onerous.
- 'Diversifying/Adaptive SMEs' – micro and small firms adapting to changing markets and using new and traditional methods to manufacture products and utilising new marketing chains such as social media to access customers. They may establish or accumulate their own plantation area and are utilise strong connections to resource supply.
- 'Opportunistic exporters' - firms that have established in Laos since PMO15 or in response to increased supply from infrastructure development. It is unclear whether they are invested in the long term or will decommission once supply diminishes.

Similarly, typologies of teak farmers have been identified (c.f. Sikor 2011; Newby et al. 2014; Smith 2016), for example:

- 'Survival-focussed households' who concentrate on meeting their immediate needs, primarily food and basic consumer items, and possibly saving a small surplus as a buffer against unexpected expenses.

- ‘Surplus oriented households’ who are more likely to integrate plantations into the household economy, each year, seeking to maximise surplus from all their activities combined.
- ‘Investment-oriented households’ who make decisions about plantations independently of other livelihood decisions.

These are being explored further as part of research into farmer decision making.

It is also very important to understand what happens at an aggregate scale if many households that used to be subsistence-oriented transition to become surplus oriented. What happens to volume and quality of supply, pricing behaviour and timing of sales?

LOCAL CONTEXT MATTERS

Despite policies and regulations that have been issued centrally, there are locally specific interpretations that shape and impact the value chains. These have been influenced by historical, geopolitical and geo-economic context.

At the provincial level Sayaboury and Luang Prabang have very different approaches to regulating teak plantations and value chains (Table 2). This is in part due to the presence of natural teak in Sayaboury’s Paklay and Thongmixay districts,[8] and fear of it being illegally harvested and smuggled in consignments of plantation teak; and perhaps due to the past FLEGT pilot project on plantation registration in the province. As a result, Sayaboury province is stricter about the proper legal procedures, which add additional costs and paperwork to those processors buying wood from Sayaboury. While the financial costs of regulation can be substantial the non-financial costs (involving time and effort) may more significant. There is lack of inter-agency collaboration or state-industry collaboration (governance-institution nexus).

Within Luang Prabang, districts apply different approaches. For example, in one district logs were observed to enter and leave the processors without being seen by DAFO/PAFO and release documents were only issued on loads of over $20m^3$. In another district they pre-harvest and roadside inspections were only undertaken when traders reported to DAFO that they have 100 trees to be measured.

There is limited coordination and information sharing between the different departments at provincial levels which are responsible for regulating the teak supply chain, despite the past PMOs instructing them to work together. The boundaries of responsibility remain unclear. For example, the larger Chinese owned operations in Luang Prabang report directly to the POIC, information between POIC and PAFO is not shared, and it is not possible for PAFO to assess whether the wood can be considered ‘legal’ according to the law (PAFO must provide the evidence of source of origin). This may be an example of a non-market advantage gained by well-capitalised external investors.

It appears that once wood products are approved for export by POIC, it automatically becomes ‘legal’. It is unclear why so many regulatory steps (such as plantation certificates, pre, post-harvest inventory,

[8] When pressed however, Sayaboury PAFO could not provide any evidence of natural and plantation teak being mixed in the past. PAFO or DAFO staff were unable to provide any recent evidence that natural teak was entering the supply chain (nor were there any seizures). Anecdotally, some farmers have encroached into the area while doing their upland fields and cut teak for personal use (but not for commercial use), while several (or possibly many) years ago some villagers cut teak with handsaws so that they wouldn’t attract attention.

moving permission) are needed in the first instance – and perhaps explaining why so many steps are ignored, particularly in Luang Prabang.

There is seemingly little recognition by state actors that over-regulation and bureaucratic complexity is 'gumming-up' the teak production chain with red-tape (Gupta 2012), and that the tendency is to pass responsibility up to higher levels results in 'grid-lock' (Katz 2010).

Table 2: Examples of policy and regulatory differences between Luang Prabang and Sayaboury

Luang Prabang	Sayaboury
The ***plantation certificate*** is only used when the area is less than one rai or trees are scattered; signed by the village head and sent to DAFO for their information	The ***plantation certificate*** (area less than one rai) may only be certified by DAFO; meaning that DAFO signs off on all plantations under 5ha.
The ***plantation harvesting proposal*** to DAFO does not need to be certified by the village head	In some instances, the ***plantation harvesting proposal*** needs to be certified by the village head to prove ownership
A ***pre-harvest inventory*** is no longer required in accordance with Instruction NO. 365/DOF 2017.	A ***pre-harvest inventory*** is still required in accordance with a provincial notice[9]
The ***post-harvest inventory*** is designated to DAFO and the tree owner before being sent to the Provincial PFS for signature	The ***post-harvest inventory*** is undertaken by PFS, DAFO and the tree owner before being sent to the PFS for signature
The ***movement*** of plantation wood to other provinces is approved by PAFO, after being inspected (and stamped) by PFS (only PFS has hammer). The load can be transported prior to PAFO signing the approval (although cannot cross the border without it)[10]	The ***movement*** of plantation wood to other provinces is approved by the PAFO after being inspected, stamped and signed by the DOIC, DAFO and PFS. It cannot be transported before PAFO has signed the approval.
Wood exports are ***inspected*** and sealed by wire (nip kip) by POIC, PFS, Finance Dept (sapsin) before being loaded onto the truck. The load may leave for the border before the head of POIC certifies the inspection forms.	Wood exports are <u>not</u> sealed by wire (nip kip) – but still ***inspected*** by representatives of POIC, PFS, Finance Dept. The inspection forms then need to be certified by the head of POIC before the load can be moved to the border.
DAFO have the authority to issue registration for chainsaws	Only PAFO have the authority to issue registration for chainsaws

[9] Notice of the Provincial Governor No. 195, 16th July, 2014.

[10] In Luang Prabang, the truck will leave without the inspection document being signed by POIC. Then the wood owner will get the document signed, and travel to the border in a pickup to supervise the border procedures with the document in hand.

GOVERNMENT POLICIES HAVE A STRONG INFLUENCE - SOME GOOD, SOME BAD, SOME UNEXPECTED

Government policy and regulatory instability impacts the functioning of the value chain. Some policies are effective but have unintended consequences. However, ongoing and drawn-out regulatory reform processes create instability, uncertainty and are resulting in 'work-arounds'.

- The Forestry Law No 06/NA 2007 has been under review since 2012 in an on-again, off-again process. This has hindered the reform of supporting regulations such as Decree No. 96/PM on Plantation Investment and Promotion, 2003.
- Concern about the quality of past investments, including in plantations resulted in a moratorium (Order No. 13/PM 2012) on some new plantation projects, consequently constraining investment in both the plantation growing and plantation wood processing sectors. However ,this was recently revised un Order No. 09/PM 2018.
- The introduction of PMO15 has had a large impact on growers and processors, since the once profitable activity of picking up round logs and sending them to the border with a minimum of regulation and processing them into square logs for export has been effectively prohibited. Almost everyone interviewed knew about PMO15 or the log export ban.
- The limited number of permitted export wood product categories[11] is being interpreted in different ways – with some observing that even complete furniture[12] does not meet the requirements.
- Some Chinese processors have moved their operations to the Lao side of the border but were reported to be paying more taxes to both the Lao Government (due to better collection procedures or less leakage associated with fewer processors) and to the Chinese government (which collected higher taxes on processed timber), which has in turn resulted in lower prices for Lao processors and growers.

  It appears that in Luang Prabang prices paid to growers are somewhere between 10% and 40% lower in 2017 compared to 2016, which economists might predict as an outcome of export restrictions (c.f. Neilson 2014) because governments are not aware or do not understand that the costs of many pro-industry interventions are ultimately borne by growers, in the form of significantly lower log prices. This potentially impacts the ability of farmers to invest in productivity enhancing measures. Other causal factors need to be explored.

[11] Instruction No. (Amended version) No.186/DIH.PSD, on the List of Wooden Products for Export (Amended version) dated 27 February 2018; Notification on the List of Eligible and Prohibited Wooden Products for Export No. 1356/PMO.S, dated 09 September 2016 and Decision No. 1883/DIH.SD on an adoption of eligible and prohibited list of Wooden Products for Export, dated 03 October 2016.

[12] The dynamic nature of the policy environment is reflected on the Revision of the agreement No. 1833/MOIC, issued on 3 October 2016 on the list of wood products for exports (No.0002/MOIC, issued on 3rd January 2018, which permits depths of 5cm to be exported and which was amended on 27 February 2018

Table 3: Price comparison between Luang Prabang, Sayaboury and Paklay for a 2.2 m round log

Size class (circumference)	Luang Prabang province	Sayaboury district (Sayaboury)	Paklay district (Sayaboury)
70	70,000	70,000	Not bought
80	80,000	80,000	325,000
90	100,000	100,000	325,000
100	150,000	120-150,000	425,000
120		150-250,000	425,000
130+	300,000	250,000	

- Inefficient and small processors of all types of wood are declining, in line with government policies to reduce their number. The Lao press reports that, in Sayaboury, 83 substandard mills were closed in 2017 (https://vientianemai.net/khao/16724.html) and these remaining mills must process teak. At the time of our fieldwork POIC in Luang Prabang said that while the y had closed 40 processors, they had not closed down any teak small processors, and were encouraging unregistered processors that met standards to register with them. However, by June 2018 temporary closures of micro and small teak sawmills were being reported. Some mills are required to relocate from within the village to roadsides in order to be more visible to enforcement agencies.

- Some Lao processing firms, that are able to meet the new processing standards, are supportive of PMO15 viewing it as much fairer for Lao companies. One processor stated that "when the Chinese exported round logs, they only had to pay tax in Laos once on the round logs, and they always bought only big trees. But as a processor, I had to pay twice, once for the round logs before processing, and then again on the processed product". However, this fails to acknowledge the tax burden for Chinese processors in their own country.

- There appears to be some significant overinvestment among some large processors that is dis-proportional with the amount of wood being received. While these processors may have a range of diverse business interests giving them a better capacity to absorb short term losses associated with teak wood processing, this overcapacity is an inefficient allocation of current resources that has the potential to depress prices (assuming production is commenced) and hurt other investors. This over-investment may be associated currently high volumes associated with infrastructure, pre-emptive of a recommencement of timber harvesting in nature forests or related illegal activities.

- While growers may be temporarily worse off, there has also been additional incentives for domestic manufacturing, and new employment, including skills development and training, generated in the processing industry, with possibly women being a major beneficiary. This could in turn help to support farmgate prices, but these may not be sustained in the long term if the processors are only viable because log prices are artificially depressed.

- There is potential to further explore what the impacts of PMO15 have been on farmgate prices, whether and to what extent new domestic manufacturing has been incentivised, whether there has been additional employment generated and who the beneficiaries are.

External influencing factors, such as exchange rates and constraints on consumer markets also need to be considered; for example, if China puts high import tariffs on processed wood from Laos, even from Chinese owned mills, there will not be much domestic processing for export. A classic lose-lose outcome.

HAVE WE REACHED 'PEAK TEAK'?

There are very different perceptions about the area of teak, whether it is increasing, stable or declining and the long-term wood supply from the resource. In Luang Prabang province POIC is confident there is enough teak for the industry in the future but PAFO is not. Objective 1.3 is currently updating the 2016 teak mapping and undertaking inventory and mapping will commence in Sayaboury in 2019.

Anecdotally the area of teak appears to be declining, particularly in northern Sayaboury province. When the teak boom began in the 1990's, teak was usually the only option for securing 'spare land' with limited road access. Now however, the returns from alternative cash crops and the better road network mean that there are higher value uses for that land. In southern Sayaboury, particularly around Paklay higher prices seem to be encouraging farmers to plant trees.

In Luang Prabang province, in some places teak is being harvested and not replanted to make way for infrastructure projects, for conversion to agriculture and for land speculation. Mapping by this project indicates that there have been some significant areas of new plantings in the last 5 years in larger patches further away from roads and villages and, anecdotally, this may be associated with medium-scale investment in teak concession or leases by Chinese firms as evidenced by large volume sales by private teak nurseries who typically source seed from farmers. There are also some areas being harvested and left to coppice.

What seems clear is that the average tree size is getting smaller because growers/traders have typically harvested only the easiest to access best quality trees (based on current market requirements) and more recently have taken advantage of high demand from the Chinese mills and cut down their larger trees. This approach is sub-optimal for over-all stand quality, and is likely to diminish future quality and hence price. Remaining stands with larger trees (older plantations) are being harvested at different intensities leaving a much more varied overall plantation 'estate' and stands of smaller trees are largely unmanaged.

Lower prices in Luang Prabang, seemingly due to the introduction of PMO15, have meant that the zone for profitably transporting small logs has shrunk: it is no longer profitable to send small logs from Sayaboury to Luang Prabang, for instance). Small logs/squared logs are not accepted by some mills, since milling costs are higher per m^3. Taxes levied on a m^3 basis further discriminate against small size classes, a situation that remains unchanged despite many efforts to encourage thinning and processing of small logs by LATARP, VALTIP and LPTP over the past ten years. Low prices for small logs, which may be logical in terms of lower size, lessor quality and less product recovery, mean that growers will not thin their trees, overall returns per hectare will be lower, and teak will likely be replaced by other crops, unless it is retained for land security or speculation.

Many informants suggest a shift is underway from teak to higher value agriculture, the short-term financial incentives of which may be impossible to resist. Research being undertaken for this project is exploring changing farmer attitudes towards teak and other crops. This raises some fundamental questions:

- Should teak still be promoted to farmers?
- Are other tree species more appropriate; for example, species better suited to agroforestry, species that grow in shorter rotations than teak or natural species?
- If teak is still appropriate, what is the best way to plant and grow teak?
- Are other land more suited to teak as a longer rotation species, such as land that legally must remain as part of the forest estate, i.e. State Production Forest, with consequently lower risk of conversion to other uses.
- What other models of ownership and management should also be considered? For example: collective village forest zones, involving grower collectives or enterprises. The new land law and regulations may allow for this and it might also be compatible with the DOF strategy for reforesting degraded lands.

Does the decline in teak matter and can the industry adapt? The Sayaboury value chain highlights how little timber is needed to run a highly efficient teak mill - one Paklay mill employs 230 people on 80m^3/month. However, a mill in Luang Prabang that may seem modern and efficient to the outside observer, requires around 350m^3/month and employs 50 people. In any case, resource availability is relative, and clearly depends on the efficiency of the processing industries. Objective to is researching recovery from trees of different sizes

It is unclear whether in [Luang Prabang] teak a 'sunset' industry, and what the implications of that are for all value chain actors. It may be that it is a sunset industry for smallholders, who have been the dominant supplier, but who will increasingly leave the land, switch to crops providing earlier returns, consolidate their farms and specialise or it may continue with bigger players who are able to upgrade supply by consolidating small holdings, planting larger areas and by using improved genetic material (tissue culture) and management practices. However, if farmers are leaving the land for urban jobs, then tree planting may remain a good way to both utilise the land with minimal labour inputs and maintain possession rights, but this may only serve to sustain then sub-optimal resource that currently exists.

Should the government provide direct incentives and improve support (involving expenditure of resources) for tree growers or renew the offering of land titles for degraded land for teak planting?

Are there other models for involving farmers in plantation ownership and other industry actors in plantation management?

Is the greatest and most effective stimulus for smallholders to grow teak (or anything else) a strong market demand and good profits to growers, now and in future? If these conditions are in place what is the roles, if any, for Government?

'JUST IN CASE OR 'JUST IN TIME? - WOOD FLOW AND BUSINESS PRACTICES?

Wood inventory management is highly variable between processors - many millers keep large stockpiles in their log yards despite cash flow problems and the risk of degradation of logs. This could be related to unpredictable supplies, 'pulses' of supply, such as large volumes of timber from conversion activities and as a risk management strategy ('just in case'). A few manage their supplies more efficiently ('just in time'). This may be as a quality control measure, for example to ensure wood is sawed green and minimise losses due to splitting or due to strong connections with parent

companies which maintain a stock inventory at every branch, and so they know what needs to be produced based upon monthly sales.

WHO OWNS PLANTATIONS AND WHY?

For plantation owners - there is evidence of increasing sales of whole plantations (trees only or land plus trees) in a trend that diverges from earlier observations of farmers selectively selling a few trees in time of need (Newby et al. 2014; Smith 2016). These land sales may be a strategic part of farmers' livelihood strategies – there is some evidence (Newby et al. 2014) that farmers previously established plantation specifically for the purpose of later selling them. Increased land prices may be making this an increasingly attractive option, particularly in Luang Prabang where both urban expansion and infrastructure development pressures exist. It might also be related to new consumption patterns, and increased social expectations for access to consumer goods and people exiting from teak to agriculture, or from farming altogether.

For processors - buying up complete plantations to secure supply may be a successful strategy that reduces overhead costs and allows harvesting according to product requirements. The establishment and ownership of plantations by processors has been a past policy and has recently been reintroduced to plantation promotion policies (draft of revision to Decree No. 96/PM 2003 and the draft forestry law [draft revision to the Forestry Law No. 06/NA 2007). There are few examples of vertical integration occurring found during interviews, which would require large capital outlays. However, misguided attempts at vertical integration could also add complexity, costs, and could divert a wood processor's attention off of their core business activities.

For processors, the accumulation of trees by absentee owners, for whom silviculture aimed at growing higher quality wood may not be a priority may impact the availability, predictability, quality and quantity of wood supplies.

There is anecdotal evidence of medium- scale investment in teak concession or leases by Chinese firms and teak mapping indicates larger areas (e.g in the order of 20 ha blocks) are being established (Objective 1.3) in remoter areas around Luang Prabang. This requires further investigation.

From an industry perspective there is potential for the consolidation of the processing sector into fewer hands with the shift to smaller dimension logs (associated with changes in the size of logs available) and associated requirements for higher processing technology. This may be already under way, with recent Chinese investment into processing, which may be occurring due to the larger amounts of capital available to them.

Contracts between processors and growers are limited. Few companies have entered into agreements with a limited number of teak growers and are supporting them in the attainment of group certification.

PRICES VARY BUT GROWERS STILL HAVE LIMITED POWER TO NEGOTIATE

Prices for wood vary between provinces and are dependent on size, quality, regulatory costs and a number of logistical factors. Policies, such as PMO15 have altered industry dynamics and affected prices in some areas. Growers mostly remain 'price takers' and have little capacity to negotiate. However, companies with strong supply chains may be willing to pay more. A few farmers with larger trees, but who have other sources of cash or income, are able to retain their trees despite demand.

Efforts to reduce regulatory burdens, reduce transaction costs and improving mill recovery rates (amongst others) are important but the introduction of modern, well-managed processing plants with guaranteed markets (vertical integration) may be more important. It is unclear whether there is still market competition amongst buyers, or whether monopoly rents are being organised through collusion amongst a small number of large processors.

- Prices for squared logs were reported as 20-30% higher/m3 in the Vientiane market (5-700,000 LAK/m^3) when compared to the markets further north, but this difference is fully accounted for by the additional costs of transport (300,000 LAK/m^3, documentation (150,000 LAK/m^3), and 'unofficial' payments at checkpoints, rather than representing a willingness of Vientiane processors to pay higher prices for wood.
- Transporting wood across provincial borders requires additional and expensive paperwork that reduces viability. Moving wood a few kilometres (for example, from Sayaboury to Nan district in Luang Prabang) is more expensive than bringing it hundreds of kilometres from Nambak district to Luang Prabang. Such restrictions on trade may encourage smuggling between provinces.

These provincial trade barriers are a significant issue that should be prioritised for reforms. The policy basis and regulatory impact of these needs to be further explored.

- The higher-end Bangkok and Vientiane markets require processed wood products (such as mouldings, furniture) to have no knots whatsoever: this is unlike Western markets in which they are considered to be a feature. One mill in Phieng, for example, pays a large premium to receive such no-knot logs, and grades its furniture for sale accordingly. In Nan district Chinese owned mills are also reported to be grading logs. However, higher prices are not passed onto growers, who continue to be paid according to the standing tree. While pruning does not seem to increase price lack of pruning (knotty trees) can downgrade price and hence negotiating power may be enhanced by pruning trees.
- In Luang Prabang province and Sayaboury district of Sayaboury province, the standing tree price varies according to numerous factors, depending on the distance to the road, the quality of the tree (short knotty trees are worth less) and the soil type (sandy soils have a greater proportion of sapwood). This variability reduces the bargaining power of growers. By contrast the prices established by the buyer for one mill in Paklay are fixed and transparent according to tree size, although he will not buy uneconomic trees (such as those established with stumps). Table 3 shows the different prices in Luang Prabang and two districts of Sayaboury province.
- Another mill in Sayaboury (which is a State Enterprise) pays slightly lower prices to farmers, because 'they have to on-sell in the open market in Thailand'. The mill also measures tree circumference at between 1.8 and 2m (as high as the buyers can reach) compared to a standard height of 1.5m.

In Luang Prabang is is unclear why the Chinese mills are paying so little for their wood. Mill-gate prices in Luang Prabang have declined over the last few months, due to a combination of reportedly lower prices in Shanghai, the introduction of PMO15 which forced additional processing, handling and tax charges which were then passed back growers in the form of lower prices and and possibly other

factors such as exchange rates. Is it simply a case of market forces (and the transport costs of getting wood to market), or is there less competition amongst buyers leading to lower prices for sellers?

While Laos teak is reported to be destined for several markets in China –namely Shanghai, Guangzhou and Kunming the value chain steps from the Lao border to these depots and the final consumer have not yet been investigated.

WHAT IS THE ROLE OF THE GOVERNMENT IN TEAK VALUE CHAINS, AND WHAT SHOULD IT BE?

Any state may have a strong influence on value chains as a 'facilitator', 'regulator', 'competitor', 'collaborator', 'producer' and/or 'consumer (Horner 2017). There are challenges in distributing these roles within government administration or allocating some to other value chain actors. In Laos this is manifest in a tension between the Government's historical role as a 'controller' and an apparent desire to transition to a more neoliberal state providing greater opportunities for market control. At present the state remains dominantly a 'regulator' and while trends towards becoming a 'coordinator' of 'facilitator' are emerging these are still immature.

The state shapes and is shaped by value chains, including through their interaction with actors, firms, associations and ODAs. The state plays a role in upgrading (currently mostly through regulation) and may enable or dis-enable value chains. Opaque and inconsistently applied taxes, fees and charges may simultaneously create a disenabling business environment and enable the informal sector, and limit value to farmers and some firms or intermediary.

The value and legal basis for many fees, charges and taxes remains unclear. Many unofficial charges are levied on most value chain actors. This impacts the cost of doing business. VALTIP2 documented the transaction and regulatory costs associated with teak supply chains (Said 2016; Smith 2016). In this new study, processors again noted a lack of transparency when it comes to official costs. While some unofficial costs are associated with real or claimed administrative steps, donations to Government that are a normalised form of social obligations were reported by most interviewees. Lao owned mills, for example, feel a social obligation to give donations to local temples and festivals and to government workshop, whereas Chinese mills may not feel this same obligation.

Taxes remain a significant and often unclear and inconsistently applied financial constraint. Some taxes act as a disincentive to good plantation management which has flow on affects along the chain in term of supply and quality.

Some administrative requirements are excessively complex and therefore costly both in time and money. Brokers and traders play an important role in undertaking many administrative requirements for wood transactions and alleviating this burden for farmers, although at some cost. Any new policies to up the regulation these actors, which are likely to come with new fees and charges should take into account consequential impacts on other supply chain actors, particularly growers.

MICRO AND SMALL FIRMS ARE NECESSARY BUT NOT EVERYONE VALUES THEM

The teak value chains are dominated in number by micro and small and medium enterprises and service providers. Our research found, based on the number of employees, which is one of the criteria for defining enterprises in the Law No. 11/NA on the Promotion of Small and Medium Sized Enterprises 2011 and Decree No. 25/MOIC.ERM on SMEs 2017, that 89% of teak enterprises were micro or small enterprises (Table 4). Most large and medium and enterprises are foreign owned or are joint ventures.

According to data compiled by Department of Industry and Handicraft the total number of registered wood processing factories for the whole country in 2016 (prior to PMO15), was 1,595 comprising 40 sawmills, 482 finished product wood processing factories and 1,073 furniture manufacturers. In addition, there were approximately 1,154 household (micro) wood processing enterprises of which 198 were legally registered and 956 were operating without license.

Table 4: Size of firms interviewed in this study.

Enterprise size (based on # employees[13])	Number	Percent
Micro	26	49.1%
Small	22	41.5%
Medium	3	5.7%
Large	2	3.8%

After the issuance of PMO15, which specifically targeted small and unregistered enterprises, the number wood processing factories has been reported at 1,354 and the number of registered SMEs had reduced to 467. The remaining households and micro- enterprises that did not have a license to operate have been scheduled be shut down by the end of February 2018. This is still an ongoing exercise.

The Government appears to have no data on employment in the teak sector and so is unable to understand the economic contribution of teak firms from this perspective. Perhaps as a result the roles and value of micro and small enterprises do not appear to be recognised.

Table 5: Average number of employees by enterprise size category in firm interviewed in this study.

Firm size	Average number of employees
Large	188.00
Medium	62.30
Small	20.10
Micro	1.20

In addition to PMO15, there are mixed policy messages about micro and small enterprises; it is unclear what the Government's (through key agencies) actual position is on recognizing and supporting these enterprises. In a period when leading Lao economists are saying that a few megaprojects could take care of national growth targets, does the case for micro and small enterprises, especially forest sector SMEs, need to be made clearer? This requires a better articulation of whether they have any competitive advantages or efficiencies that could influence or stymie a process of market integration and consolidation.

One informant said: "In five years' time there won't be any Lao processors, because they don't have the cash flow -they can only afford to buy, say 100m^3, while the Chinese can buy 1,000m^3. Lao investors cannot borrow form the bank, because interest rates are too high".

[13] Number the number of employees as stated by informants, not including the owners. Employees may be permanent, casual or on contract.

There is a need to comprehensively review the policy and regulatory environment for HH and SMEs, clearly articulate their roles and understand and what has happened since PMO15.

THERE ARE MARKETS, BUT NOT MUCH MARKETING.

Globally teak is a species in demand and there are strong markets (c.f. Midgley et al. 2015). While there is clearly a strong market pull (China seems to a bottomless market for Lao teak products) it is unclear what the market outlook for Laos' teak is. Midgely et al (2015) note that "whilst the markets for mature teak from both native forests and older plantations are well established, markets for small-sized, fast-grown teak logs are still emerging". This resonates with the situation in Laos if, as described, the size of available teak is transitioning downwards.

Is plantation teak in Laos a sunset industry, or can it adapt to change?

Objective 2 of this ACIAR project is exploring new options as alternatives to the traditional solid wood teak products. Engineered wood products are being considered – such as veneer, laminated wood and other composite materials including from small diameter logs. However, there are technical, capacity, market socio-cultural and regulatory constraints to realising these opportunities. If 'upgrading' or 'regrading' to these products is to occur there is a need to explore the consequential impacts on all value chain actors and whether teak remain the most appropriate and logical species to promote.

Whether the teak plantation resource base will a sustain long term supply for 'larger markets' or new markets is unclear.

- There are grading challenges and lack of incentives to farmers for upgrading or management interventions that add value. For example, with a few exceptions, not only is teak not graded, but sales of teak sawnwood by primary processors to secondary processors are also often not based on grades. Seemingly an intractable problem. Grading will occur spontaneously if and only if, doing so actually adds value – i.e. the graded product is worth more than it cost. The introduction of grading just because it happens elsewhere is likely to fail. One of the problems identified in VALTIP2, which attempted to introduce grading, was that the grower group took a 5% fee to grade logs according to the company's criteria – this led to lots of arguments, and no additional price was gained, A simple measure of size, which is the common approach, is at least transparent but does not adequately reward more investment in silviculture.
- There are still barriers to efficient and effective management of plantations which impact growth, yield and quality.
- It is unclear whether the area of plantation teak is increasing, decreasing or is static.
- It is unclear whether farmers will be willing to harvest their trees in a way that supplies the market.

While there is some consensus that Luang Prabang is 'famous for teak' there is little evidence of marketing of teak and almost no evidence of design. There are no high-quality local or domestic furniture producers and product design is focussed on traditionally ornate and large products. New markets and new opportunities are emerging. The Lao-China railway will create better transport connections and access to regional and global markets with demand for a broader range of products. Accessing these will require new designs and higher quality processing.

Domestically, socio-economic change, including increased disposable incomes, urbanisation and 'small space' apartment living may see changes in preference towards simpler and smaller furniture styles.

There may also be an opportunity for the development of an 'artisanal market' including opportunities for branding through less formal, and onerous, certification and standards. This has been attempted for products elsewhere - such as 'relationships coffee' in Indonesia, although not without its challenges and failures. For example, Vicol et al. (2018) found that while the relationship coffee model does present upgrading opportunities, facilitating the transfer of ideas, knowledge and capital to individuals in producer communities because of the way that these interventions 'couple' with prevailing institutions and local social/political relations in rural Indonesia, upgrading has primarily manifested as rent-seeking for local elites. Furthermore, the lack of attention paid to local institutional and livelihood contexts frequently leads to the breakdown of the relationship and there are critical weaknesses in the upgrading narrative as applied to development interventions in (at least some) rural communities. The lack of attention paid to social and political relations at various scales in upgrading interventions also means that such interventions inevitably reproduce pre-existing patterns of inequality. The attribute this to the result of a weak conceptualization of politics in prevailing development applications of Global Value Chain theory.

If there is a desire to promote 'artisanal' teak chains through 'relationship teak' there is a need to explore who the actors are, and what policy or other barriers need to be addressed to enable this.

There would also be benefit in exploring some key scenarios for teak into the coming decades, using data from Objective 1.3 and what the possible policy response options are. For example, does the project advocate for simple deregulation (which may include some minor foregone state revenues), and/or more 'active state or donor support, involving directed funding, support and resources?

THERE IS LIMITED CONFIDENCE AND TRUST BETWEEN SUPPLY CHAIN ACTORS

One of the key issues hindering 'relationship' models for teak is that, with few exceptions the teak plantation supply chains do not act as theoretically constructed 'ideal' value chains. While there may be some connections between actors and nodes, overall, they serve to maximise their own benefit.

- Lack of trust appears to be a motivating factor for the tight regulations that the government retains for plantations and plantation grown wood although these are poorly enforced, and compliance is low.
- There were no examples found of long term contracts between suppliers and buyers, which has dampened the confidence/ability of processors to borrow money for investing in new equipment.
- The 'long-rotation' nature of teak plantations, unpredictability of supply and lack of regulatory and policy certainty may be impacting the confidence of processors to enter into contracts.
- Late payments by mills (e.g. in Vientiane) and the corresponding lack of cash flow and confidence has limited the expansion prospects of smaller operators.

The reasons for 'late payments' are unknown and require further investigation. It may be that shipments are not up to quality standards or are delayed due to re-tape, or due to business cash flow issues, potentially even amongst 'lead firms'.

- For growers, long term contracts may not be attractive because, as past evidence suggests, timber sales are generally ad hoc (emergency needs) or plantation ownership is strategic (land security/investment). These are not very compatible with contracts requiring regular and ongoing supply.
- Despite the large number of buyers and sellers, market information remains limited, and previous good relations (trust) generally determine to whom a product will be sold, rather than the best price. Growers also determine price based on word of mouth, for example with their neighbours. There are no benchmark prices, which could be used by growers and processors to support contract negotiations, and benchmark prices would be challenging to establish for round logs due to differing measurement standards.
- Some traders and sawmillers are responding to market signals by buying logs based on size, grading them and sending them on to other millers for a higher price. However, individual teak farmers may not have the time or interest to disaggregate their harvest in this way and millers buying up different grades of teak do not have the volumes to be able to group them into a large enough bundle to sell onwards.
- There were several examples of the importance of personal relationships to enhance one's position in the market chain, either with other firms or to actors within government.
- There was some evidence of ethnicity being an important element in value chain connections. The role of factors that determine the nature and extent of networks such as based on ethnicity or geography requires further exploration. It is unclear whether there is uneven participation in various segments of the sector due to ethnicity and how labour markets and ethnicity are connecting to the teak sector.
- Partnerships may be important in value chain efficiency. This could be between firms in the value chain, through contracts or between firms and the government. There has been little research about how, for example, contract have been develop or used between firms and whether the regulatory framework (e.g. Law on Contract and Tort) and institutional support (e.g. mediation mechanisms) are enabling for such arrangements. The government is exploring options for Public Private Partnerships, though a a Decree, however this does not currently focus on the plantation sector.
- Some donors, are focusing their efforts on a small number of connected 'lead firms', such as through the formation or support of associations, through upgrading opportunities or by helping them to build strong connections with government. The 'choice' of 'lead firms' must be undertaken with care, could result in all sorts of distortions and anti-competitive outcomes in the domestic market.

'MIDDLEMEN AND WOMEN' ARE NECESSARY NOT NEFARIOUS

Brokers (often known as 'middlemen', although many are women) and other service providers are important actors in the value chain, but they are frequently overlooked or demonised particularly by some areas of government, which view them as 'value grabbing' rather than 'value adding'.

Our research revealed several connecting service providers in the value chain including:

- Finders/brokers - locates and may purchase trees on behalf of another – but never owns the trees.
- Traders - buys and sells wood. In this case round logs or square logs. The buying and selling may occur at various physical locations - the roadside, roadside log yards, sawmill sites etc.
- Harvesting contractors - harvests trees under contract, including cutting trees and carrying logs to roadside.
- Transporters - ships wood or finished products under contract.

These appear largely unregulated but provide important services, particularly connecting the owners of the geographically dispersed resource to markets. Geography, family, ethnicity or other factors bind value chain actors together. all depends on. One Khmu broker stated that he mainly bought from Khmu and only from within his district.

Lack of regulation may make these connections more efficient and cheaper, and actors may wish to stay out of view (keeping the network hidden c.f. Bainton 2010). In the light of the FLEGT VPA work, however, there is a high probability that the Government will want to regulate these actors to make sure they are 'legal'. Exposing them and rendering them taxable may have unexpected consequences for the value chain – such as reducing price to growers. And this is something to be mindful of in value chain research and network mapping because it is unclear what the risk and benefits of keeping these networks hidden or exposing and regulating them are?

Further research would benefit from specific surveys of these service providers. For example, in a log yard to do a survey of timber middlemen (brokers) or direct sellers, in order to better understand purchasing arrangements ,trader margins, volumes and prices as well as relationship, connections and information sharing both between traders and firms and traders and growers - how to traders know where to buy teak/who from, and what information, if any, do firms provide traders and brokers in terms of wood size and quality.

VALTIP2 included some of these actors in the regulatory mapping but specific policies and regulations were not considered in detail. We need to understand what the project work means for these actors in terms of exposing them - 'rendering them regulatable'.

VOLUNTARY CERTIFICATION - DOES IT UPGRADE FARMER PRODUCTION OR DECREASE VALUE?

Certification, the formation of grower groups and enterprises benefit a few, not many.

Grower Groups and Enterprises

VALTIP2 research (Ling 2014, Ling 2016, Ling et al. 2018), found several reasons why grower groups on their own were not effective in enhancing the position of plantation owners in the value chain. Grower enterprises were somewhat more effective but benefitted a few – not many.

Grower groups were established as a governance mechanism but were not sustainable on their own. Both the Kok Ngiu and Xienglom grower groups have to seek their own markets in order to survive, with both no longer sending to the LPTP facilitated markets in Vientiane. In seeking markets, they are still advantaged over others due to the support of LPTP which has increased their bargaining power

within the chain and provided access to donor funded benefits. However, the ways in which these firms are selected for project assistance also needs to be addressed to minimise inequity (c.f. Vicol et al. 2018).

While they retain the grower group name for social and media purposes, in effect both are now family businesses, representing a form of elite capture having been the recipient of support for enterprise establishment and new technology (c.f. Vicol et al. 2018; Neilson and Shonk 2014). Nevertheless, as small family businesses they are now exposed to policies of MOIC that have been introduced in response to PMO15 which is aimed at upgrading but is resulting in permanent or temporary closure. While this policy/governance intervention is a form of state driven upgrading, undertaken in isolation it is improving value chains (c.f. Ivarsson and Alvstam 2010). The flow-on impacts to growers of next stage firms is unknown.

The formation of grower groups together with standards development for certification (see below) did not result in grower upgrading. The numerous ways trees/logs are measured confuses growers and makes it hard to bargain on price. Grower group membership did not particularly enhance this.

Keeping in mind that some form of registration is important for traceability purposes, there is need to reconsider and reframe the recommendations made by VALTIP2 of farmer groups providing assistance with registration under a streamlined regulatory environment. Less technology dependent, faster and lower cost methods are needed. Cash flow also remains an important issue for timber buyers which in turn impacts sales opportunities for growers.

Certification

Past efforts to support certification of smallholder grown wood have not been successful. Through VALTIP2 and research undertaken by Carmichael (2017) it was found that certification added costs to management and production, but did not result in increased price to growers.

'Upgrading' of plantation management activities through certification was supported by the development of standards and guidelines with training, based on FSC requirements. However, in the absence of an increased market price, these activities were not sustained because they do not add value. The role of and contribution of teak to farmers' livelihoods was also a determining factor – where farmer livelihoods are diverse, and the relative contribution of teak is low the relative teak price increase is much greater if actions are to be considered worth doing. The compounding impact of increased time-effort to undertake the management actions, more transactions and costs and legal procedures demotivated farmers to participate. Pressure to supply to market needs, as opposed to their own needs and challenges with grower groups, were also factors (Ling et al. 2018).

Development interventions

Donor agencies aim to directly influence value chains through 'value chain development programs' including for 'upgrading'. This can have unexpected outcomes.

Interventions under VALTIP2 which supported initiatives to help smallholders gain FSC certification had an unintended consequence of exacerbating regulatory complexity and cost rather than ameliorating it. The attempt to achieve FSC certification for teak growers in Luang Prabang promoted legality (a requirement of certification) by proving support to plantation registration, the regulatory mechanism to demonstrate plantation ownership. The procedure for issuing plantation registration certificates described in plantation regulations requires only a map hand-drawn by a village Forest

officer, however the FSC program introduced boundary identification using GPS and maps produced using GIS, undertaken by professional officers. This has since become the default and has been incorporated into recently produced plantation registration guidelines issued by the Department of Forestry. When questioned on whether it was really necessary to use a GPS map, PAFO officials stated that "village forest officers can't draw good maps and the production of digital information assists PAFO and DOF in achieving their reporting obligations".

Increased dependency on digital technology to create maps for plantation registration I(amongst other uses) has been defended as necessary in the context of assuring ownership and hence legality. Increasingly digital mapping is viewed as as more legitimate by the state and other interested parties (such as certification or verification bodies) and hand drawn maps are viewed as less accurate, more susceptible to error or bias, less replicable and at a greater risk of getting lost. In the absence of supported programs, however, the cost of such technical approaches is likely beyond the means of most farmers and at present the government does not have the resources, skills or information technology systems to support this approach. Digital mapping meets governments objectives but not smallholders, yet all the cost burden falls on the smallholders. As a consequence, plantation registration by smallholders is not widespread, and given the number of individual holdings, which are likely in the tens of thousands (c.f. Smith 2016) this will take years to complete, leaving the smallholder teak value chain excluded on the basis of illegality.

As an interested counterpoint - despite the regulatory requirement, in Sayaboury it appears that that plantation registration certificates, for which support has been provided through a FLEGT pilot project, are not actually accepted as evidence of plantation ownership, since buyers must also have tree ownership certified by the village head.

THERE ARE LABOUR WINNERS AND LOSERS, INCLUDING IN GENDERED TERMS

Labour supply is being impacted by emerging employment opportunities, but PMO15 has had some positive outcomes.

- There is a shortage of skilled Lao furniture makers, which means that Chinese and Vietnamese labour has to be imported to achieve export quality products. Vietnamese employees were typically found to be doing the more advanced/specialised furniture design/production tasks, perhaps due to previous exposure to Vietnamese wood processing standards. Even when someone local who is good is found, they rarely stay long and prefer to leave the company to set-up their own business.
- It was reported that it was hard to find felling crews, due to the ready availability of 'easy' work in the tourism sector and other industries.
- However, employment opportunities are increasing through the relocation of foreign mills and factories into Laos following PMO15.
- Compared to Australia, there is a higher proportion of women who were managing processing facilities. There was also a high proportion of women employed in secondary processing – in one mill in Phieng district 35 of the 60 employees were women, and there were significant numbers in other mills.

- Labour differentiation can be gender-based with men undertaking the more manual tasks and women being employed for more detailed tasks. Some manufactures stated a preference to women undertaking these roles due to better attention to detail.
- Wages vary according to task; with wages for dangerous and heavy work, typically undertaken by men, higher than those for light/detailed work. However, the highest wages were paid for specialist activities such as saw sharpening.
- Women were chosen over men for undertaking the detailed work in secondary processing, such as gluing, sanding (compared to the more physical work of milling logs). However, they were usually:
    - on lower salaries/daily wages as their work was regarded as less physical and less dangerous than that of men
    - more likely to be employed on a temporary and/or daily basis than men: it is unclear whether women prefer this more flexible arrangement, as ordinary female factory workers were not interviewed during this study. This will be further explored by Objective 3.
- Women in managerial roles/owned their own businesses reported no discrimination compared to a man in a similar position – in fact they suggested that they were advantaged in their business because of their better communication skills with both their employees and government officials. For example, "men will get angry and lose their temper when dealing with officials, whereas we know how to be diplomatic"
- Women, and particularly younger women with children, have more family commitments and cannot stay at work late like men can.
- In smaller/family companies, women are owners, co-owners, financial managers, did retail sales and also marketing (e.g. social media sales etc)
- The Government has policies on foreign labour, however, whether these are being complied with in the forest sector has not been widely researched.
- Labour, welfare and Occupational Health and Safety issues are being considered through the FLEGT process.
- It would appear that female employment in processing is directly proportional to the level of value adding, with women being preferred for the detailed work required for secondary processing. A simple answer to the project's research question 'How can the gender balance of the Lao plantation and wood industry be improved to increase the role of women?' may be to promote value adding, but at which nodes of the value chain?

Further research could focus on whether there are new employment terms and conditions, opportunities and vulnerabilities, presented by a shift to manufacturing labour for women. How the 'household' becomes extended into different geographical areas when people move for new employment opportunities and whether there are new freedoms but also responsibilities back to the natal household?

ARE THERE OPPORTUNITIES FOR INDUSTRY-LED NON-STATE GOVERNANCE?

The dominant medium and large enterprises (although not all) are clustered into three industry groups being the Lao Furniture Association, the Lao Wood Processing Industry Association and the Lao Planted Forest Products Group, which is not yet a formal association. The three groups have different ODA support (GiZ, RAFT, and IFC respectively), spheres of influence and power relations and whether and how these are impacting plantation governance is unclear - they are potentially working against each other creating friction and hindering government's decision making around policy and regulatory reform ('gridlock'). While these associations represent different elements of the plantation and wood sectors and in some cases completely different value chains there are nevertheless connections and interdependencies. They are a form of governance and have varying degrees of power and influence over value chains.

While the Lao Furniture Association reports over 100 members many of which are Lao, the Lao Planted Forest Products Group is small, and its members are mostly foreign enterprise. The membership of Lao Wood Processing Industry Association is unknown, but where provincial branches of this existed in the past there are no longer functioning. Participation of micro and small enterprises in associations is low and there is little perceived benefit to them of joining.

Compared to the Thai Furniture Association which is well established and can count most of the country's processors as members, the Lao Associations may be undermined by the high proportion of foreign investors (especially Chinese in the case of teak), who are not member and do not require the services of an Association to seek markets or raise capital.

It was perceived by several sources that some foreign processors (especially Chinese and Vietnamese) also do not feel obliged to follow the regulations and social obligations that the Lao processors must follow, giving them a competitive advantage. They could also have the advantage of working directly within Chinese business networks and may have access to subsidised capital through the Chinese government or state-linked financial institutions, as has been the case with other sectors, such as the rubber industry (Shi 2008). Establishing a viable singe Lao Association to service the teak value chain (seek markets, provide capital, support training, collect taxes on behalf of government) will be challenging. The Lao Furniture Association is seeking a land concession from the Lao government to establish a permanent display zone for Lao furniture products, which it is hoped will raise the profile of the industry and make it easier for consumers to seek out Lao products.

ARE THERE LEAD FIRMS AND IS ANYONE FOLLOWING THEM?

There are some 'lead firms' but these appear to be those that are the most 'closed' (vertically integrated) with relatively short supply chains. Some are domestic and either 'Vientiane establishment' with their 'lead' based on a power and connection while others are foreign owned leading through innovative approaches to wood supply, technology upgrading and strong approaches to corporate social responsibility. Firms that are upgrading in response to markets (as opposed to State driven upgrading) are typically foreign owned and/or have strong export markets. Non-state led up-grading of small firms seems to be associated with business diversity or development assistance rather than markets.

Generally, there are weak connections between possible 'lead firms' and the majority of plantation growers and the VALTIP project interventions have not adequately considered the complexity of smallholders' livelihood strategies in approaches to improve these connections. Key value chain

elements have been considered, largely in isolation from the chain as a whole. New approaches, such as out-grower schemes, are being trialled, and these may be effectives for short rotation species however, the socio-economic aspects of smallholder teak growing still need to be addressed.

POOR POLICY AND DIVERSE PRACTICES HAVE RESULTED IN POOR SILVICULTURE AND POOR WOOD QUALITY

Silviculture and plantation management has been identified as an issue for teak value chains in this and several other studies. Past policies did not effectively promote the growing and managing of teak for timber, especially small logs, and as a result silviculture has been largely absent and the quality of trees and wood is poor. For most plantations it is too late to remedy this and in order to take advantage of the current teak resources industry will need to adapt.

There are differences in market demand for quality between Luang Prabang and Sayaboury. In contrast to Luang Prabang, where log quality is not highly regarded and prices for growers are low, millers in Paklay, Sayaboury are prepared to pay premium prices to growers for quality logs. Silvicultural management becomes much more important – the following aspects need to be considered (and are being discussed with the LATARP project):

- With respect to *heartwood proportion* mills in Paklay and Phieng in Sayaboury only measure actual heartwood diameter for payment at the mill gate. However, there is local variation. Respondents reported that trees planted along the sandy Mekong soils grow faster, but are worth less to growers, because they have a much higher proportion of sapwood compared to trees on rocky soils (see also Maraseni et al. 2018). Similarly, they suggest that thinning trees heavily, or regenerating trees from coppice, would result in a higher sapwood proportion and downgrade prices.
- However, the area of *coppiced* trees appears to be increasing in Sayaboury as growers harvest their stands and allow stumps to grow back rather than replanting. As well as having a higher proportion of sapwood, coppice stems are reportedly not as strong and snap easily during storms. There is also evidence of coppicing in plantations harvested for powerline construction in Luang Prabang.
- While convenient for transporting, *trees planted with stumps*, rather than seedlings, face two issues. Firstly, they have a much higher risk of windfall due to shallow rooting systems. Secondly, but more importantly, they are much more susceptible to borer damage (‘duang’), leading traders either to not purchase stump grown trees outright, or to downgrade their price even before they are harvested. The Paklay mills measured out damage due to borers, so that their buyers had to be particularly careful when buying standing trees to avoid losing money. Despite this, using stumps to plant teak is still occurring and many growers throughout prefer the technique.
- *Pruning trees* increases bargaining power (price) within the value chain, with the following exchange from being instructive on this point.

  Question: “Why bother to prune, when price doesn’t reflect your efforts?”

  Answer: “The company won’t upgrade the price, but they can downgrade price for ugly trees. With pruning the trees are tall and good looking.”

It is noteworthy that the pruning saws were still being used even though the grower groups were inactive in all other respects. Providing good quality pruning saws would appear to be a cheap means to improve farmer bargaining power – this is especially so for poorer farmers, who are prepared to engage in these activities since they lack alternative activities that provide a higher return to labour.

NEXT STEPS

This research has shown that the value chains for plantation teak in Northern Laos are numerous, complex and include a significant number of diverse actors. A number of issues were identified during the research, and questions were raised. These will be addressed as the project continues.

Objective 1 will also further explore other teak value chains in Laos including in Vientiane, Salavan and Champasack provinces and will also undertake some comparative analysis with teak value chains in other countries. Other plantation wood value chains in Laos PDR including rubberwood, Eucalyptus and Acacia will also be assessed.

If you would like more information about the ACIAR project "Advancing enhanced wood manufacturing industries in Laos and Australia please visit our website http://laoplantation.org/

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