Annual report

Project

Enhancing key elements of the value chains for plantation-grown wood in Lao PDR

<table>
<thead>
<tr>
<th>Project number</th>
<th>FST/2010/012</th>
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</thead>
<tbody>
<tr>
<td>Period of report</td>
<td>1 May 2013 – 30 April 2014</td>
</tr>
<tr>
<td>Date due</td>
<td>30 May 2014</td>
</tr>
<tr>
<td>Date submitted</td>
<td>13 June 2014 (extension provided by Program Manager)</td>
</tr>
<tr>
<td>Prepared by</td>
<td>Assoc. Prof. Barbara Ozarska</td>
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<tr>
<td>Co-authors/</td>
<td>Alf Said (ANU), Ken Boer, Dr Hilary Smith, Stuart Ling, Richard Laity, Stephen Midgley, Adam Redman, Gary Hopewell (DAFF), Dr Benoit Belleville (UoM), Assoc. Prof. Latsamy Boupha (NUoL)</td>
</tr>
<tr>
<td>Collaborators</td>
<td>Assoc. Prof. Latsamy Boupha (NUoL)</td>
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1 Progress summary

The project is progressing well despite its complexity. Significant progress has been made during Year 2 across each of the four objectives with active participation of all project partners.

The 1st Annual Workshop was held on 29 October, 2013, in Vientiane. The workshop allowed members and stakeholders to receive an update on the progress of the project, and have answers to their questions; more importantly intense discussions on a range of project related matters were held.

The Project Advisory Committee Meeting involving stakeholders and Government representatives was held on 20 January 2014, to review the project progress to date and discuss major problems, challenges and opportunities.

Major activities and achievements in the reporting period are as follows:

Objective 1

A report on the legal and administrative arrangements for smallholder plantations and the wood processing sectors in Lao PDR has been produced. The report includes the results of interviews with almost 70 smallholder plantation owners and an analysis of legal impediments to plantation registration in Lao PDR and policy recommendations for consideration by GoL.

A draft consultation paper was developed which illustrates the scale and points of incidence of plantation-related transaction costs together with policy context. The paper also includes initial discussion on opportunities for amelioration of the impact of these costs for growers, industry and government which will be further developed through consultation with growers industry and government later in 2014.

A report was issued on factors affecting the formation of grower groups, examining successes and failures in Lao PDR and lessons learned. The report sets out comprehensive recommendations to foster the development of grower groups in Lao PDR.

A structure has been developed for the analysis of options for approaches to certification appropriate to the circumstances of smallholder growers in Lao PDR.

Objective 2

A review of the literature on log grading rules and systems was undertaken which, combined with in-mill trials, will provide improvements in efficient utilisation of Lao PDR plantation resources through optimum matching of logs to products.

The review of portable sawmilling equipment was completed which provides recommendations for optimal processing of plantation teak logs through improved technologies currently not widely used in Lao PDR.

Log grading and sawing recovery studies were conducted at selected Industry Cluster companies in Luang Prabang and Vientiane.

Objective 3

Regular visits to the Industry Cluster companies have been undertaken with the aim to implement the recommended improvements and changes in manufacturing methods and product quality. Each company has been considered on an individual basis according to its needs, current production capability, financial restraints and future strategic plans.

Gluing testing is in progress at NUoL Wood Technology Laboratory. A comprehensive testing program was developed for adhesives used for high value appearance wood
products and training was provided to NUoL researchers. The tests are being conducted on two plantation species, teak and river red gum (Eucalyptus camaldulensis).

A detailed methodology for a wood recovery study in wood products manufacturing was developed, training provided to Lao researchers and the studies in selected companies are underway. The studies will provide valuable information which will enable the development of recommendations for improvements in wood recovery rates in the furniture manufacturing processes.

Objective 4

A comprehensive market research report was completed which provides market information on selected appearance wood and market trends including consumption, production and trade. The main aim of the report was to provide the MoIC with data and information for the development of market strategy for the timber industry. The findings of the report were presented at a workshop involving stakeholders and government representatives.

NUoL team collected and summarized data and information on training programs for timber industry and smallholder groups. The gaps in the current training programs and training needs for major players within wood value-chain have been identified and the priorities for future training programs have been determined.

The current forestry and forest products education programs at NUoL and Souphanouvong University have been analysed and gaps related to plantation wood value-chain identified. A process of reviewing and updating current bachelor and postgraduate programs of Forest Economic and Wood Technology at the Faculty of Forestry, NUoL, has been initiated.

The collaboration between the project participants has further developed over the year with increasing networking and joint problem solving. It is particularly noted during research activities, training and technology transfer.

Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANU</td>
<td>Australian National University</td>
</tr>
<tr>
<td>DAFF</td>
<td>Department of Agriculture, Fisheries and Forestry</td>
</tr>
<tr>
<td>DOF</td>
<td>Department of Forestry</td>
</tr>
<tr>
<td>FLEGT</td>
<td>Forest Law Enforcement, Governance and Trade</td>
</tr>
<tr>
<td>FOF</td>
<td>Faculty of Forestry</td>
</tr>
<tr>
<td>FSC</td>
<td>Forest Stewardship Council</td>
</tr>
<tr>
<td>GoL</td>
<td>Government of Laos</td>
</tr>
<tr>
<td>LFA</td>
<td>Lao Furniture Association</td>
</tr>
<tr>
<td>LFTP</td>
<td>Lao Forest and Trade Platform</td>
</tr>
<tr>
<td>LPTP</td>
<td>Luang Prabang Teak Program</td>
</tr>
<tr>
<td>MAF</td>
<td>Ministry of Agriculture and Forestry</td>
</tr>
<tr>
<td>MoIC</td>
<td>Ministry of Industry and Commerce</td>
</tr>
<tr>
<td>MoNRE</td>
<td>Ministry of Natural Resources and Environment</td>
</tr>
<tr>
<td>NUoL</td>
<td>National University of Laos</td>
</tr>
<tr>
<td>UoM</td>
<td>The University of Melbourne</td>
</tr>
<tr>
<td>VALTIP2</td>
<td>Researchers involved in the current ACIAR project</td>
</tr>
</tbody>
</table>
## 2 Achievements against project activities and outputs/milestones

**Objective 1: To address inefficiencies in the value chain (harvest to sawmill stages) that limit returns to smallholder growers**

<table>
<thead>
<tr>
<th>No</th>
<th>Activity</th>
<th>Outputs/ milestones</th>
<th>Completion date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Characterise smallholder planted tree resource in Luang Prabang region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Establish partnership arrangements and negotiate access to remotely-sensed imagery</td>
<td></td>
<td>31-12-12</td>
<td>Completed. Suitable current imagery has been identified through NGD and a request has been made through NUoL for free access as GoL in-kind contribution. A reduced price was negotiated.</td>
</tr>
<tr>
<td>2.</td>
<td>Develop methodologies and ground-truth for sample of imagery</td>
<td></td>
<td>31-12-13</td>
<td>In Progress. A Lao GIS assistant has been recruited and training has commenced May 14, allowing finalisation of project methodologies, including ground-truthing.</td>
</tr>
<tr>
<td>3.</td>
<td>Delineate, map and communicate extent of Luang Prabang teak resource</td>
<td></td>
<td>30-09-14</td>
<td>In Progress but delayed. Anticipated that significant progress can be made on Milestone 3 by the due date. Extension required to 30/03/15</td>
</tr>
<tr>
<td>4.</td>
<td>Map and communicate age class distribution of resource</td>
<td></td>
<td>30-03-15</td>
<td>In Progress as part of mapping. Requires clarification as to specific outputs. Extension required to 30/09/15.</td>
</tr>
<tr>
<td>5.</td>
<td>Establish and communicate protocols for ongoing monitoring and reporting</td>
<td></td>
<td>30-03-16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Identify and test how barriers to legal registration of smallholder planted trees can be addressed</td>
<td>A. Establish partnership arrangements with responsible agencies and related projects at national and provincial levels</td>
<td>31-12-12</td>
<td>Completed: Early research into the legal framework identified numerous responsible agencies and identification of appropriate counterparts is continuing.</td>
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<tr>
<td></td>
<td>B. Identify and test how transaction costs in the sale and delivery of smallholder planted trees can be diminished?</td>
<td>2. Publish and communicate a Report outlining current and potential improved processes for legal registration of planted trees</td>
<td>30-09-13</td>
<td>Completed A comprehensive overview of the legal framework for plantations and timber processing was issued in February and a summary presented at a meeting of the Project Contact Group. A policy brief summarising key findings is also in preparation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Identify acceptable improved processes and trial implementation with growers groups; adapt approach as necessary</td>
<td>30-09-14</td>
<td>On schedule. Proposed that targeted discussion with relevant groups will take place in September 2014.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Publish and communicate a Report outlining experience of improved approach(es), and expand scope of implementation through relevant agencies</td>
<td>30-09-15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Map supply chain from forest to processor, and survey transaction and component costs at each stage.</td>
<td>30-06-13</td>
<td>Completed. An initial mapping was issued for discussion in May 2013 and a revised draft issued in late 2013, presenting transaction costs and points of incidence along the value chain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Publish and communicate a Report contextualising the issues and summarising results of this study, for discussion with government agencies and businesses comprising the supply chain</td>
<td>31-12-13</td>
<td>A draft report was issued on limited circulation in late 2013 for comment. Feedback and the results of further inquiries have been incorporated in a general consultation draft revised report issued in May 2014.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Publish and communicate Report outlining proposals for reducing transaction costs.</td>
<td>31-12-14</td>
<td>On target. Initial proposals for reduction in transaction costs are incorporated in the report May 2014 draft report.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Trial implementation of proposal(s) in conjunction with grower group(s) and other supply chain participants.</td>
<td>30-09-15</td>
<td></td>
</tr>
</tbody>
</table>
### 1.3 Identify and test what forms of (A) grower organisation and (B) group certification are feasible and sustainable, and will improve returns to smallholders; and explore how can they be fostered

<table>
<thead>
<tr>
<th>A.</th>
<th>1. Establish partnership arrangements with responsible agencies at national, provincial and district levels, and with related projects and CBOs</th>
<th>31-12-12</th>
<th>Completed: Partners undertaking the Action Research are National University of Laos (Vientiane), Souphanouvong University (Luang Prabang), and LPTP. Visits made to potential partner companies (eg Burapha, Oji Paper).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Publish and communicate a Report outlining rationale for, and feasible approaches to, development of growers groups; and recommending pathways for development of these groups.</td>
<td>31-12-13</td>
<td>Completed. Reports were completed in both English and Lao language. The findings were presented at the “Consultancy Workshop for the future planning of LPTP” on 20&lt;sup&gt;th&lt;/sup&gt; December, 2014 in Vientiane.</td>
</tr>
<tr>
<td></td>
<td>3. Implement recommended approaches adaptively in trial locations.</td>
<td>30-09-14</td>
<td>In progress. A meeting to discuss the findings directly with LPTP is being held on May 17. Afterwards the teak farmer groups will be visited to discuss the setting up of enterprises.</td>
</tr>
<tr>
<td></td>
<td>4. Publish and communicate a Report summarising experiences, and progressively implement successful approaches with more grower communities.</td>
<td>30-09-15</td>
<td></td>
</tr>
<tr>
<td>B.</td>
<td>5. Establish partnership arrangements with responsible agencies at national, provincial and district levels, with LFTP and LPTP and any related initiatives/parts, and with NUoL.</td>
<td>31-12-12</td>
<td>Completed: Partners actively undertaking the Action Research are NUoL, LFTP, Burapha, Luang Prabang Sawmill Cluster and LPTP. 2 ACIAR funded research assistants were appointed to LPTP.</td>
</tr>
<tr>
<td></td>
<td>7. Trial implementation of preferred option(s) with one or more growers groups, in conjunction with LFTP, LPTP, certifiers and any other relevant parties.</td>
<td>30-09-14</td>
<td>Early preparation is underway for trial implementation of preferred option(s).</td>
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</tbody>
</table>
### Objective 2: To increase returns to smallholders and processors through improved efficiencies of the wood processing sector (primary processing)

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Outputs/ milestones</th>
<th>Completion date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Identify and characterise current production practices and processing efficiency in Lao companies</td>
<td>1. Formation of sawmilling and drying operation clusters. 2. Detailed analysis of current production practices in Lao companies. 3. Detailed analysis of current processing efficiencies in Lao companies. 4. Workshop to present activity outputs.</td>
<td>30-07-12</td>
<td>Completed. Ten companies were selected for the Industry Cluster according to the Selection Criteria developed within this project. Milestones 2 &amp; 3: Completed. All companies were visited and their production practices &amp; processing efficiencies were assessed and English report written. Lao PDR report in preparation. Combined workshops for Obj. 2 &amp; Obj. 3 were held in conjunction with the Annual Meeting in October 2013</td>
</tr>
<tr>
<td>2.2</td>
<td>Improve or implement log grading / segregation activities at the mill prior to processing</td>
<td>1. “User-friendly” Manual on log grading and segregation rules used in sawmilling applicable to SMEs in Laos. 2. Recommendation on strategies for improving log grading and segregation to meet optimal performance. 3. Implementation of grading rules by members of Industry Clusters and possibly other companies.</td>
<td>30-06-14</td>
<td>Literature review and in-mill log grading data gathering completed May 2014, English report due June 2014; Lao translation due Dec 2014. To be included in the User Manual, June 2014. NUoL staff will conduct in-mill training and on-going support.</td>
</tr>
<tr>
<td>Activity</td>
<td>Description</td>
<td>Initial</td>
<td>Forecast</td>
<td>Details</td>
</tr>
<tr>
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</tbody>
</table>
| **2.3** Conduct studies to optimise and improve sawing operations and recovery | 1. “User-friendly” Manual on best practice sawing operations used in sawmilling applicable to SMEs in Laos.  
2. Documented realisation of sawing operations and recovery improvements and proposed potential hardware modifications.  
3. Implementation of sawing operations by members of Industry Clusters and possibly other companies. | Initial 30-06-14  
Forecast 30-02-15 | 30-06-14  
30-11-14 | User Manual delivery date needs to be revised until sawing studies completed, recommendations implemented and follow up studies completed (similar to activity 2.4). Report detailing preliminary results and recommendations for improvements to techniques and existing equipment. |
| **2.4** Develop and/or improve drying operations to reduce degrade and costs | 1. Documented advice to cluster companies on how to improve drying best practices.  
2. Documented improvements to drying operations and drying schedules for plantation species to improve dried quality and reduce costs.  
3. Documented advice on cost effective upgrades to current drying equipment.  
Forecast 30-12-14 | Initial 30-11-14  
Forecast 30-05-15 | Detailed assessment and recommendations for improved drying practice in selected organisations.  
Extension required.  
Assessment of improvements Milestone date needs to be changed to align with relocation of drying expert, Adam Redman in Laos from 7-09-14 to 06-16-15.  
Extension required. |
| **2.5** Develop and/or improve product grading rules systems and implement the rules in the Industry Clusters companies. | 1. “User-friendly” Manual on product grading rules applicable to SMEs in Laos.  
2. Documented recommended standardised grading, product and product waste segregation systems.  
3. Implementation of grading rules by members of Industry Clusters and possibly other companies. | 30-06-15  
30-11-15  
30-03-16 | Current grading rules will be observed and reported during Adam Redman relocation in Laos from 7-09-14 to 06-16-15. |
### 2.6 Provide impartial and independent advice and demonstration of appropriate primary processing equipment suited to Lao industry

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Initial</th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Report on findings for optimal processing equipment and potential product streams gathered from LIGNA exhibition, Germany 2013.</td>
<td>30-10-13</td>
<td>30-10-14</td>
</tr>
<tr>
<td>2.</td>
<td>Report on findings for optimal processing equipment and potential product streams gathered from woodworking machinery and furniture manufacturing exhibition, China 2014.</td>
<td>30-10-14</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Documented review of successful small log sawmilling and veneering operations in developed countries and their applicability to the Laos industry.</td>
<td>30-06-15</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Demonstration of optimally identified process and product solutions to Laos delegates in Vietnam.</td>
<td>30-10-15</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Laos workshop detailing range of recommended processing equipment and layout options.</td>
<td>30-10-16</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Final Manual on wood processing methods recommended for Lao timber industry.</td>
<td>30-12-16</td>
<td></td>
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</tbody>
</table>

#### Quotations for veneer peeling equipment have been collected. Team leader attended LIGNA exhibition to assess primary processing equipment suitability and capital costs. A report, of portable sawmilling literature review 2.6.3, will be provided by 30-09-14.

#### Attendance to this exhibition was cancelled under a revised strategy to purchase, install and run peeling trials at NUoL – see new activity 2.7

#### A report focusing on portable sawmilling equipment options will be presented at the mid-term review in Vientiane in September 2014.

### 2.7 Introduction of veneer peeling technology to Laos

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Date 1</th>
<th>Date 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Procurement of lathe to undertake research at NUoL</td>
<td>30-10-14</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Install and commission lathe.</td>
<td>30-02-15</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Perform initial trials and train staff</td>
<td>30-05-15</td>
<td></td>
</tr>
</tbody>
</table>

#### Potential companies selected and visits to negotiate purchasing of lathe and ancillary equipment underway

#### Remark: part of the allocated time devoted to procure, install and perform relevant peeling trials is taken from other activities in objective 2
**Objective 3: To improve the value and quality of wood products for domestic and export markets (secondary processing).**

<table>
<thead>
<tr>
<th>3.1</th>
<th>Determine typical current recovery and productivity levels in Laos manufacturing facilities and identify and recommend improved efficiencies in-company and through co-operative cluster scenarios.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Formation of two Manufacturing Clusters.</td>
</tr>
<tr>
<td></td>
<td>30-07-12</td>
</tr>
<tr>
<td></td>
<td><strong>Completed.</strong> Two Manufacturing Clusters were formed: Cluster 1 - four companies involved in the previous project, Cluster 2 – eight “new” companies.</td>
</tr>
<tr>
<td>2.</td>
<td>Detailed analysis of the current wood recovery rate in production of high value wood products.</td>
</tr>
<tr>
<td></td>
<td>a) Cluster No 1</td>
</tr>
<tr>
<td></td>
<td>b) Cluster No 2</td>
</tr>
<tr>
<td></td>
<td>30-01-13 30-06-13</td>
</tr>
<tr>
<td></td>
<td><strong>Milestones 2 &amp; 3: Completed.</strong> All companies were visited and their current recovery and productivity levels were assessed. Final report on the Cluster 1 was completed. Report on Cluster 2 is in draft form and is being amended.</td>
</tr>
<tr>
<td>3.</td>
<td>Detailed analysis of the current productivity levels in Lao manufacturing facilities.</td>
</tr>
<tr>
<td></td>
<td>a) Cluster No 1</td>
</tr>
<tr>
<td></td>
<td>b) Cluster No 2</td>
</tr>
<tr>
<td></td>
<td>30-01-13 30-06-13</td>
</tr>
<tr>
<td></td>
<td><strong>Completed.</strong> The results of the companies’ assessment formed the basis for the development of recommendations on the improvements of the industry capabilities. The report was completed jointly by the Lao and Australian team members.</td>
</tr>
<tr>
<td>4.</td>
<td>Recommendations for improving efficiencies in-company and through co-operative cluster scenarios.</td>
</tr>
<tr>
<td></td>
<td>30-07-13</td>
</tr>
<tr>
<td></td>
<td><strong>Completed.</strong> The results were presented at the Annual Workshop in October 2013 and Advisory Committee Meeting jointly with the Objective 2 results.</td>
</tr>
<tr>
<td>5.</td>
<td>Workshop to present the activity outputs.</td>
</tr>
<tr>
<td></td>
<td>30-07-13</td>
</tr>
<tr>
<td></td>
<td><strong>Completed.</strong> The first implementation and assessment visits to all manufacturing Industry Cluster companies were completed and reports on each company written.</td>
</tr>
<tr>
<td>6.</td>
<td>Yearly review of progress made by the companies on improving production efficiency and recovery rate.</td>
</tr>
</tbody>
</table>
### 3.2 Determine the most appropriate practices and equipment for furniture and joinery machining, bonding and finishing:

1. **Laminating and finger jointing technologies.**
2. **Improving quality of wood products through introducing optimal machining, joining and coating methods.**
3. **Investigating various uses of wood waste and off-cuts.**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
<th>Milestone Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Laboratory testing of glue-bond strength for plantation species (report).</td>
<td>30-10-13</td>
</tr>
<tr>
<td>2.</td>
<td>Laboratory testing to assess the performance of various types of glues and joints in various conditions (report).</td>
<td>30-07-14</td>
</tr>
<tr>
<td>3.</td>
<td>Guidance on optimal gluing methods and types of adhesives for various products and service conditions for Lao plantation timbers.</td>
<td>Extension required till 30-04-15</td>
</tr>
<tr>
<td>4.</td>
<td>Specification on optimal machining parameters, tools and machining methods.</td>
<td>30-12-14</td>
</tr>
<tr>
<td>5.</td>
<td>Specification on joining methods for various types of components and products to maximise wood recovery and strength of products.</td>
<td>Extension till 30-12-15</td>
</tr>
<tr>
<td>6.</td>
<td>Specification on most appropriate finishing methods and finishes for various products and service conditions.</td>
<td>30-12-13</td>
</tr>
<tr>
<td>7.</td>
<td>Detailed plan for wood waste reduction and waste utilisation.</td>
<td>30-03-14</td>
</tr>
<tr>
<td>8.</td>
<td>Recommendations for GoL, industry associations and stakeholders on major improvements and investment required to implement value-added manufacturing processes.</td>
<td>Extension till 30-12-14</td>
</tr>
<tr>
<td>9.</td>
<td>Presentation of the activity outputs to project partners and stakeholders at the workshop.</td>
<td>30-03-15</td>
</tr>
<tr>
<td>10.</td>
<td>Training of Lao researchers and training instructors on the sub-activities 1-7</td>
<td>30-06-15</td>
</tr>
</tbody>
</table>

*Glue testing for Milestones 1 & 2 have been combined and the tests are in progress. As the testing includes several glues and involves long-term conditioning of samples, it is anticipated that the tests will be completed by 30-04-15.*

*Extension required. The guidance can’t be developed before the glue testing program is completed. Proposed completion date: 30-12-2015.*

*Completed. Report written.*

*In progress. UoM student completed the literature review. More information will be added to the final report.*

*Completed. Report written.*

*In progress. Wood recovery studies in manufacturing processes are carried out which will provide data on wood recovery rates, the amount of waste and recommendations for waste reduction and utilisation. Extension is required till 30-12-14.*

*Training on gluing, machining and finishing was provided to Laos researchers and some industry members. More training courses will be conducted till the project completion date.*
### 3.3 Improving quality of wood products and product design

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Completion Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>“User-friendly” Manual on quality control methods used in wood processing and manufacturing applicable to SMEs in Laos.</td>
<td>As above</td>
</tr>
<tr>
<td>2.</td>
<td>Guidance on quality requirements for various types of wood products for various markets.</td>
<td>As above</td>
</tr>
<tr>
<td>3.</td>
<td>Proposal for national testing facilities for assessment of products quality and performance, incorporating testing methods and testing equipment.</td>
<td>30-01-15</td>
</tr>
<tr>
<td>4.</td>
<td>Recommendation on strategies for improving product design to meet market requirements in the medium and long term.</td>
<td>30-12-15</td>
</tr>
<tr>
<td>5.</td>
<td>Implementation of designs by members of Industry Clusters.</td>
<td>30-12-15</td>
</tr>
<tr>
<td>6.</td>
<td>Development of the Manual on wood manufacturing methods recommended for Lao wood manufacturing industry.</td>
<td>30-12-15</td>
</tr>
<tr>
<td>7.</td>
<td>Publishing the final Manual which will combine wood processing and wood manufacturing methods recommended for Lao industry.</td>
<td>30-12-15</td>
</tr>
</tbody>
</table>

Sub-activities 1-3:
- 30-06-14
- Extension till 30-10-14

In progress. A simple “check list” is being developed which will combine Obj 2 & 3 quality control methods. Extension required till 30-10-14.
**Objective 4: To enhance the competitiveness and capacity of wood processing industries.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity</th>
<th>Outputs/ milestones</th>
<th>Completion date</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 4.1 | Developing an industry-led value-added timber market strategy. | 1. Report on market analysis which will comprise market information on selected wood products.  
2. Report on market trends including consumption, production and trade of the selected products.  
3. Workshop involving stakeholders and Government representatives to brainstorm the findings and gather views on strategic directions.  
4. Formation of industry led small groups to develop market strategy.  
5. Analysis of Lao market situation and product research.  
6. Identification of target markets for Lao timber industry based on the results of “3Cs” analysis.  
7. Activity report or book “market strategy for Lao value-added timber industry”. Presentation to the project stakeholders at the workshop. | 30-11-13  
30-11-13  
30-01-14  
30-01-14 Ext. till 30-09-14  
30-06-14 Ext. till 30-06-15  
30-10-15  
| 4.2 | Developing short-term and long-term training programs | 1. Assessment of current training programs for smallholder groups and timber industry, and identifying gaps according to the industry strategic directions.  
2. Workshop to discuss the findings and possible solutions.  
3. Development of training modules and training materials.  
4. Workshop with key stakeholders and government to discuss the implementation plan.  
5. Implementation of training programs. | 31-12-12  
30-01-14  
30-04-15  
30-06-15  
Summary Progress to date:

Objective 1: To address inefficiencies in the value chain (harvest to sawmill stages) that limit returns to smallholder growers

The Objective 1 projects have made good progress overall in the year to the end of May 2014.

Activity 1.1: A Characterisation of the Smallholder Teak Plantation Resource in Luang Prabang Region

A GIS Forest Mapper, Mr Hongkham Seneanachack, has been engaged in respect of the Forest Inventory project and training commenced in May/June 2014. Very current high resolution FINNMAP aerial imagery has also been identified and acquired for 70% of Luang Prabang province (Figure 1). The northern 30% is programmed to be captured late 2014/early 2015. Methods for mapping the extent of the Teak resource have been developed and mapping has commenced. Approaches for stratifying the Teak resource of the basis of age or size class are currently being developed and employed as an integral part of the mapping. Existing field data from plantation registration is being used to assist stratification. Further field studies will be undertaken in September to progress this aspect. Although progress with early milestones has been delayed, it is expected that good progress will now be made.

Clarification is required as to specific outputs from this objective, particularly non spatial outputs such as quantification of the Teak resource.

Figure 1: A sample of the FINNMAP data showing individual registered Teak plantation parcels mapped by LPTP (Yellow) and large areas of planted Teak (orange)
**Activity 1.2A: Barriers to Legal Registration of Smallholder Planted Trees**

A very comprehensive report on the legal and administrative arrangements for smallholder plantations and the wood processing sectors in Lao PDR has been produced and a summary presented and well received at a meeting of the Project Contact Group in February 2014. The report includes the results of interviews with almost 70 smallholder plantation owners and an analysis of legal impediments to plantation registration in Lao PDR and policy recommendations for consideration by GoL. A policy brief, to be issued in English and Lao, is also in preparation.

The Legality Research Team makes the following recommendations to address issues with respect to regulatory barriers through the smallholder plantation value chain:

1. Convene a joint meeting of MAF, MoIC, MoNRE and MAF to discuss and clarify a range of issues including:
   a. Streamlining the process for granting temporary and permanent land use rights for plantations and clarifying agency responsibilities;
   b. Reviewing the purpose of, and requirements for, plantation registration, including in the context of the movement of timber along the supply chain (demonstrating ‘origin’);
   c. Identifying scale and risk appropriate measures to regulate smallholder plantations (establishment, silviculture and harvesting);
   d. Review, clarify and provide guidance on roles and responsibilities of agencies at plantation registration, harvesting, transport and processing.

2. With MAF, examine basic principles to differentiate smallholder plantations from industrial plantations and native forests. In particular review the concept of treating smallholder plantations as an agricultural crop.

3. Undertake further research into the use and traceability of plantation registration, timber harvesting/log tracking documents that may be used to demonstrate legality.

4. Develop simple guidance (e.g. posters/diagrams in Lao) on the main ‘regulatory’ steps for farmers.

5. Encourage the use of the Lao Gazette by Government agencies at all levels to keep legal instruments accessible and up-to-date.

6. Encourage legality verification programs to differentiate plantation smallholders and their wood from natural and industrial plantation sources.

Approaches have been made to the World Bank and the International Finance Corporation to assist convene the proposed meeting. This suggestion is under consideration.

**Activity 1.2 B: Transaction Costs in the Sale and Delivery of Smallholder Planted Trees**

An outline paper and summary table of transaction costs was issued for targeted consultation in late 2013. Feedback has been incorporated into a draft consultation paper released in May 2014, which illustrates the scale and points of incidence of plantation-related transaction costs together with policy context. The paper also includes initial discussion on opportunities for amelioration of the impact of these costs for growers, industry and government which will be further developed through consultation with growers, industry and government later in 2014.

Summary points from the Transaction Costs (TC) project:
1. While transaction costs can be beneficial in facilitating trade in timber and non-timber forest products, a poorly designed or implemented system of transaction cost can have a number of negative consequences, including a disincentive to participation in plantation growing, investment and legality and can create opportunities for maladministration;

2. Complexity of the legal arrangements is reflected in the complexity of the TC regime;

3. Transaction costs arise widely in connection with the plantation value chain in Lao PDR, including in association with land registration, plantation registration and with the process of harvesting, selling and transportation of plantation timber;

4. These costs arise mostly in connection with government regulatory activity. The complexity of the regime appears to lead to misinterpretation and inconsistencies in application. There has in the past been overlapping and competing interests in the administration and application of these costs. Unofficial costs are widespread and are a matter of considerable concern to participants along the value chain.

5. Cost reduction and remissions are available under the law.

6. The paper discussed initial thoughts on cost remissions opportunities for growers, the processing industries and for government. These will be further developed in the next stage of the Project.

**Activity 1.3: Grower Organisations**

A report was issued on factors affecting the formation of grower groups, examining successes and failures in Lao PDR and lessons learned. The report has been issued in both English and Lao and will form and input to future rounds of action research with grower communities and other stakeholders with a view to trialling locations for further grower group formation. This action research process identified numerous constraints to the development of feasible and sustainable grower groups in Lao PDR, particularly in the teak sector. These include the complex and conflicting laws and regulations, unfavourable tax policies for small logs and the lack of a domestic teak processing industry. The viability of the teak farmers’ groups also depends on being able to supply the market regularly, and buyers being able to meet customer orders for wood: however, under the current structure, which relies on the sale of FSC wood, there have been no sales for over a year, and member interest is declining. By contrast, the rubber groups studied appear to have a better chance of sustainability, since they provide a monthly income to members after the seven year establishment period. The report sets out comprehensive recommendations to foster the development of grower groups in Lao PDR.

Summary points from Grower Groups project include:

1. Expand the teak groups to cover four districts, that are capable of supplying the FSC market with a minimum of 3000 m³/year.
2. Encourage grower groups to form farmer group enterprises (FGE) or cooperatives in accordance with government policy, and provide co-funding for investments.
3. Encourage government to implement its existing policies on groups and enterprises.
4. Grower groups and/or Enterprises should cover both FSC and non-FSC teak.
5. Facilitate the establishment of a grower revolving fund for teak which is able to buy up wood from the people when they need to sell.
6. Ensure that the grower group committee takes responsibility for its own affairs.
7. Establish a Provincial Teak Platform for the management of teak in Luang Prabang.
8. Develop a log measuring tool using a mobile telephone application.
9. PAFO should designate forestry staff to be group liaison officers.

10. Undertake research into the impact of rapid agrarian change on the development of sustainable grower groups.

Activity 1.3B: Group Certification

A structure has been developed for the analysis of options for approaches to certification appropriate to the circumstances of smallholder growers in Lao PDR. Key support was also provided to the Luang Prabang Teak Program, which supports the extension of certification and plantation registration to Luang Prabang Province.

Objective 2: To increase returns to smallholders and processors through improved efficiencies of the wood processing sector (primary processing)

The English language report describing and analysing the Industry Cluster companies’ capacities was finalised and the Lao PDR language version is in preparation. A workshop with industry representatives was held in conjunction with the Annual Meeting in Vientiane on 29 October 2013 to present the results if the companies’ assessment.

A review of the literature on log grading rules and systems has been undertaken and the information will be combined with research undertaken within Industry Cluster companies during May 2014 and English language report provided during June 2014 with a Lao PDR translation due by December 2014. The report will be in the format of a User Manual in both languages and provide standardised log grading rules to match log quality and size to end products.

Processors in Vientiane and Luang Prabang were assessed during October 2013 to determine the most suitable companies in which to undertake trials and training of NUoL researchers. Preliminary sawing studies were conducted in Luang Prabang during January 2014 and log grading and further sawing study activities were implemented at two companies during May 2014 (Figure 3). The report will be prepared by the end of June 2014.
A range of processing equipment options suitable for Lao PDR industry was reviewed by combination of a visit to LIGNA, Hannover, Germany, during May 2013 and a literature review of manufacturers. The report including recommendations will be provided in August 2014 and results presented at the mid-term review in Vientiane in September 2014.

The purchase, installation and performance of preliminary trials of a veneer peeling lathe and ancillary equipment is a new activity added to Objective 2. As a consequence some of the time allocated to other activities in objective 2.6 will be used for this purpose. For instance, a visit to a wood machinery exhibition in China was postponed and will be used for visiting lathe manufacturer BSY in China with the intent to purchase a lathe and ancillary equipment to be installed at NUoL.

**Objective 3: To improve the value and quality of wood products for domestic and export markets (secondary processing)**

The assessment of the current manufacturing processes and the quality of wood products within 14 Industry Cluster companies (Cluster 1 and 2) has been finalised. Reports originally written in English for each company were translated into the Lao language by NUoL researchers and submitted to the companies. A detailed plan was developed for each individual company according to the observations made. Team members will be working closely with the companies on a continuing basis, until the completion of the project. Suggestions may include improved factory layouts, machinery set ups, OH&S issues, production methods, quality control procedures etc. The first implementation visits to all companies have been completed. Initially both Australian and Lao team members visited the companies, but after training only Lao researchers visited the remaining companies. The aim of the joint visits was to teach young Lao researchers about the implementation process, and then they were able to conduct further visits independently and provide reports. Discussions with the managers/owners of the companies were held to decide which changes and improvements were feasible taking into account financial or other constraints (Figure 4).

A report on each company visited has been written by the Lao researchers. It was agreed that the implementation visits will be conducted at least every 3 months until the project is completed.
Gluing testing is in progress at NUoL Wood Technology Laboratory. A comprehensive testing program was developed for adhesives used for high value appearance wood products. Training was provided to NUoL researchers on the preparation of samples, testing procedures and assessment of test results. Burapha company kindly agreed to provide glue and prepare samples for the first stage of testing during which time the researchers could gain experience and confidence in performing the tests. The tests were conducted on two plantation species, teak and river red gum (*Eucalyptus camaldulensis*) (Figure 5). The experiments were completed and the results will be analysed and provided to Burapha company with recommendations for possible improvement in glue bond strength.

The next stage of glue testing is underway on five different types of adhesives provided by Henkel International.

A report titled “Specification on optimal machining parameters, tools and machining methods” with focus on appearance wood products used in indoor conditions was completed.

A report titled “Specification on finishes and finishing methods for various products and service conditions” was completed. The report provides information on the most appropriate finishing methods and finishes for various high value wood products. The focus has been placed on appearance wood products used in indoor conditions but some products such as outdoor furniture have also been included.

A detailed methodology for a wood recovery study in wood products manufacturing was developed. A whole day training program was provided to the Lao team on 21 May, 2014.
at FOF. The recovery study in manufacturing process is very complex as it involves many machines and a wide variety of wood products manufactured. Therefore, initially only two companies were used for the recovery study on 21-22 May, 2014: Lao Furniture Factory (KM21) and Kongsa Furniture Factory (Figure 6). The recovery studies in the remaining Industry Cluster companies will be undertaken by Lao team in May-June 2014. At the end of the activity, data will be analysed and individual company recovery rates will be determined. The studies will provide valuable information which will enable the development of recommendations for improvements in wood recovery rates in the furniture manufacturing processes.

The wood recovery study has been combined with wood waste reduction & utilization activity.

![Figure 6: Wood recovery study at Lao Furniture Factory (KM21)](image)

**Objective 4: To enhance the competitiveness and capacity of wood processing industries**

4.1 *Developing an industry-led value added timber industry*

A comprehensive market research report was completed which provides market information on selected wood products such as furniture, joinery, flooring, and architectural wood products; and market trends including consumption, production and trade. The main aim of the report was to provide the MoIC with data and information for the development of market strategy for the timber industry.

A workshop involving stakeholders and government representatives was held in Vientiane on 20 May, 2014, with the aim of presenting and discussing the findings of the report (Figure 7). The workshop enabled the establishment of collaborative relationship with MoIC on the development of market strategy for the Lao wood processing industry. It was agreed that the project team will assist MoIC in the process by providing information and data when required.
Representatives of VALTIP2 team, Assoc. Prof. Latsamy Boupha and Dr Kaisone Phengshopha will meet with several ministries at the end of May 2014 to discuss the EU certification process for Lao PDR. The meeting will be associated with an EU funded project on timber legality and certification which commenced in 2014 (4 years project). The project aims to develop a process to support companies to export products to EU market. Dr Phengshopha is involved in this project. So far, a roadmap has been developed to assist the industry in the production of legal wood products and in obtaining FLEGT licence.

Ministries expected to attend this meeting include: the Ministry of Agriculture and Forestry, the Ministry of Industry and Commerce, and the Ministry of Natural Resources and Environment. The meeting will also provide an opportunity to present VALTIP2 project and its activities to the Director General of MoIC and discuss topics such as:

- MoIC organization structure related to trade;
- Current trade status of timber products/trade data;
- MoIC view on how important the market strategy is and what gaps are;
- Explain how we can help the MoIC to develop the market strategy;
- Lao market situation and market requirements;
- Current industry capacity and needs for technical assistance;
- Formation of an industry led group to develop market strategy.

4.2: Developing short-term and long-term training programs

NUoL team collected and summarized data and information on training programs for timber industry and smallholder groups. A detailed report was written in Lao language while an executive summary was prepared in English for the Australian partners. The report summarised information on the current training providers, training courses (both short-term and long-term), training curricula and training materials available to plantation growers and timber industry. The gaps in the current training programs and training needs for major players within wood value-chain have been identified and the priorities for future training programs have been determined. The report highlighted the results of discussions with training facilitators and industry cluster members and allowed to identify the following
training priorities for 2014: timber drying, woodworking machinery and machining, furniture design and finishing.

Training on furniture design, basics of wood machining and wood finishing have been completed. Training on finishing was conducted at LFA by a company which produces and distributes wood finishes to timber industries. More than 20 Lao companies attended the training.

More training courses will be conducted in the future which will involve Pakpasak and LFA trainers/instructors. The courses will be widely advertised within the Industry Cluster companies and other companies will be also encouraged to attend.

Contact with Henkel International Group, a producer of wood adhesives, has been established to conduct training on wood gluing in Laos. The training will be conducted by the end of the year.

A meeting was held in September 2013 with Tino Kirchoff and his team from LFA Training Centre to discuss their training programs and possible collaboration with our project. It was agreed that we could develop training courses on collaborative basis utilising our skills on various wood processing and manufacturing topics.

4.3: Enhancing educational and research capabilities

The task “Assessment of current teaching programs with gaps and needs for changes and improvements identified” has been completed by NUoL team. The current forestry and forest products education programs at NUoL and Souphanouvong University have been analysed and gaps related to plantation wood value-chain identified. Research facilities (i.e. research equipment available) at the Faculty of Forestry, NUoL, have also been reviewed and needs for new equipment identified.

A process of reviewing and updating current bachelor and postgraduate programs of Forest Economic and Wood Technology at FOF, NUoL, has been initiated. The curricula development process consists of: subject description, subject content and teaching materials. The proposed concept for new subjects will be discussed with stakeholders at a workshop organised by the Committee for Assessment of Curricula at the end of December 2014. The subjects must be approved by FOF, NUoL, and Ministry of Education. The process of the development of new curricula is expected to take 1-2 years.
3 Impacts

3.1 Scientific impacts

An enhanced teaching, research and training capacity of the National University of Laos and Souphanouvong University will have direct benefits to the country by educating and training future experts in the plantation wood value chain. A wide range of research studies undertaken within the four objectives of the project will significantly strengthen skills and expertise of the Lao team members.

Research studies conducted at NUoL enable researchers and students to learn and undertake experiments on wood drying, gluing, machining, wood properties and processing characteristics of wood.

Although many scientific studies are in progress, at this early stage of the project term, their impacts cannot be fully assessed. However, several examples of scientific achievements can already be recorded:

- As a result of the log grading literature review combined with in-mill trials, the VALTIP2 team has developed a good understanding of the log grading requirements for the Lao PDR plantation teak industry. This output will provide improvements in efficient utilisation of Lao PDR plantation resources through optimum matching of logs to products.

- The review of portable saw milling equipment provides recommendations for optimal processing of plantation teak logs through improved technologies currently not widely used in Lao PDR.

- Gluing tests currently conducted at NUoL will provide valuable data on gluing characteristics of plantation teak and eucalyptus grown in Laos. The results will allow the development of specifications on optimal gluing methods and procedures for various products and service conditions. The results will be published in international journals.

- Wood recovery studies in sawmilling, undertaken within Objective 2, and in furniture manufacturing, within Objective 3, will have both scientific and economic values. The literature review revealed that only a limited number of studies on wood recovery in the manufacturing process have been undertaken. The methodology developed within this project, when published, will undoubtedly create a significant interest within the international research community.

3.2 Capacity impacts

The project structure is complex as it involves fourteen partner organisations from Lao PDR and Australia. Therefore, a strong emphasis of the project management has been placed on building collaboration between the project partners.

The project has already made significant impacts in capacity building, mainly through the development of strong network linkages between the project team members, all partner organisations, smallholder tree growers, wood processing and manufacturing companies and government organisations related to the project activities.

To date, significant achievements have been made through the formation of project teams for each objective. The team members are working together learning from each other, developing research linkages and friendship. This facilitates the development of collaborative research groups in Laos with expertise in various stages of plantation wood value-chain. This field of research has been previously very limited in Laos.
An important goal of the Objective 1 has been the establishment of collaborative linkages with smallholder teak growers through the formation of growers groups, collaboration with provincial and national Government agencies related to the forestry sector, as well as local and international organisations working with rural communities. The acquisition of the FINNMAP digital aerial photography and training in the use of GIS and GPS referenced photographs will enhance the capacity of LPTP and the Provincial Forestry for rapid mapping and assessment of plantations and forests. It will assist not only in developing a better understanding the nature and extent of the Teak resource base, but also in building efficiencies in the plantation registration process, including through a comparison of the GPS mapped plantation parcel boundaries and the actual plantation extent. The Grower Groups project will also improve individual grower skills in working collaboratively and potentially improve access to new markets.

Within Objectives 2 and 3 a strong emphasis has been placed on developing links with wood processing and manufacturing companies. This is being achieved through visits to the Industry Clusters' companies. Each company involved in the Industry Clusters has been visited several times to provide technical support in implementing changes and improvements in its production processes. It is essential the companies respond with trust and confidence to the project members and clearly understand the project’s goals and related activities. Researchers at NUoL are being trained on how to undertake research studies in wood processing and manufacturing, how to conduct industry assessments and to assist the industry in implementation of the recommended changes. The training includes both theoretical sessions and in-mill/in factory practical training (e.g., in-mill training on how to conduct log mensuration and sawmilling recovery studies, training in furniture factories on proper gluing procedures and how to reduce wood waste through measuring current recovery rate at various machining operations).

NUoL researchers were provided with kiln assessment tools including an anemometer, humidity sensors, thermocouples and data loggers. Training in the use of these items was also provided.

One postgraduate student from NUoL was awarded a prestigious John Allwright Scholarship and is currently undertaking PhD study on solar kiln drying of wood at the University of Melbourne.

Within Objective 4, collaboration has been established with the MoIC, the Department of Export and Import, MoNRE and industry associations to work together on developing a market strategy for Lao timber industry by providing market data and information when required.

The development of collaboration and friendship between the project partners has been achieved not only through enhancing research and training capacity of its members. Various “casual” events have been organised which provide a good opportunity to cement bonds between all the project members and discover more about Lao culture. For example, following the Annual Workshop, a party was organised by FOF team, with dancing show and music, which was attended by all participants of the workshop (Figure 8).
Figure 8: Annual Workshop party with traditional Lao food and dancing

The VALTIP 2 project has established its own soccer club. The team played its first two games in September 2013 and attracted a large crowd of supporters (Figure 9).

![VALTIP2 soccer team](image)

Figure 9: VALTIP2 soccer team

3.3 Community impacts

3.3.1 Economic impacts

The project report by Midgley and Phengsopha Global markets for plantation teak: Implications for growers in Lao PDR has provided a background to the dynamic markets for Lao teak. As a result of dam building and infrastructure development in northern Laos, expanded harvesting of teak plantations alongside watercourses and roads has been noted. Most of this material has been sent to China as round and squared logs. Some growers have been provided with an attractive opportunity to “cash-in” their teak plantations and the knowledge from the project report has provided a better decision-making foundation.

Generally, it is too early to determine economic impacts of the project.

3.3.2 Social impacts

Although it is much too early to estimate the social impact of the project it is envisaged that there will be significant social and community benefits arising from the project activities. In particular, studies of transaction costs and legality across the supply chain
will offer increased transparency and market information to growers. In due course, this will influence harvesting and sales intentions and negotiations about price.

Clarification and streamlining of the process for land use rights and plantation registration may enhance security of tenure for smallholder farmers and encourage more farmers to establish plantations. A more efficient and transparent regime for transaction costs may distribute the impact of these costs amongst value chain participants in line with their capacity to pay.

The development of growers’ groups will improve collaboration of farmers growing teak and will enhanced community cohesion.

During the assessments of sawmills and furniture companies the research teams noted a lack of workplace health and safety culture. Recommendations for increasing awareness of risk in the workplace are being incorporated within all reports and training modules to foster a safety culture.

A film crew sponsored by The Australia Network visited Luang Prabang 21 – 26 February to film a pilot program for the series “Food Bowl” The filming was undertaken over 6 days and involved Lao and Australian Project partners. The show was broadcast on Australia Network on 16 April. There was a considerable amount of good-willed support and cooperation from the community growers and Lao partners. The program can be viewed on YouTube: [http://youtu.be/INy5oYCh1n0](http://youtu.be/INy5oYCh1n0)

A feature of the utilisation of small sized teak has been the wide utility use in the communities. In the absence of other more expensive native forest hardwoods, household furniture, school desks and office furniture are being made from plantation teak.

### 3.3.3 Environmental impacts

This project has the potential to provide significant environmental impacts as its activities are focused on plantation-grown wood.

The demand for wood certification and wood product labelling is increasing noticeably internationally. Therefore, if the Lao smallholder teak plantations and industry follow international environmental policies there will be a great opportunity for this industry to promote its products as eco-friendly products. The introduction of environmentally friendly production methods and eco-friendly designed products will potentially create an on-going culture of production of ecologically sustainable wood products which may align with certification body requirements.

The project is encouraging the reduction of waste in sawmilling and furniture production by introducing more efficient wood processing and manufacturing methods, decreasing wood drying degrade, utilisation of small dimension timbers and wood off-cuts for various components and products. These value-added methods will result in more efficient use of timber which will provide both environmental and economic benefits.

Clearing for infrastructure and construction of dams in northern Lao PDR has caused unscheduled felling of many teak smallholdings. The project activities have potential to encourage smallholders to plant trees on their farms.
3.4 Communication and dissemination activities

Project related publications during the reporting period

Reports:


- Ling, S. (2013). Fieldwork Notes. Action Research Round 1. Report with an input from the Action Research Team: Dr Lamphoune (NUoL), Mr Chaly Lor (Souphanouvong University) and Mr Sichan (Upland Research Centre).

- Ling, S. (2013). Fieldwork Notes. Action Research Round 2. Report with an input from the Action Research Team: Dr Lamphoune (NUoL), Mr Chaly Lor (Souphanouvong University) and Mr Sichan (Upland Research Centre). 31p.


- Ozarska, B., Boupha, L., Siakor, L., Bpuaphavong, D., Xaypha, S., Si Xiong, and Hopewell, G. (2014). Assessment Visits to the Manufacturing Industry Cluster...


Conference papers and posters:


- Smith, H (2014) ‘Legal issues and legality barriers for smallholder plantation owners in Lao, PDR’. The Chatham House (Royal Institute of International Affairs) 24th Illegal Logging Update and Stakeholder Consultation meeting, to be held in London on 16-17 June, 2014.

Power point presentations:

- Objectives 1–4 progress reports presented at the 1st Annual Workshop held in Vientiane, 29 October 2013.


- Objectives 1-4 progress reports presented at Project Advisory Committee Meeting, 20 January 2014 by team leaders.


- Bouaphavong, D. Summary of the Objective 2 progress by Lao team. Project Team Meeting, Vientiane, 19 May 2014.

**Communication and dissemination:**

**Whole of project team meetings**

− Project Annual Workshop was held on October 29th, 2013, at the Lao-Japan Human Resources Development Institute (NUoL) in Vientiane (Figure 10). The workshop allowed members and stakeholders to get an update on project progress, to answer some questions and more importantly further discuss matters related to the project.

− Objectives 1-4 co-ordination meetings were held in conjunction with the Annual Workshop from 26 October to 1 November 2013 in Vientiane and Luang Prabang. These meetings allowed discussing the project and cross-objective issues.

![Figure 10: Annual Workshop held on 29 October, 2013, at NUoL, Vientiane.](image)

− The Project Advisory Committee Meeting involving stakeholders and Government representatives was held on 20 January 2014, to review the project progress to date and discuss future activities (Figure 11).
Coordination meetings

**Objective 1:**

- Alf Said: 8-13/9/2013. Discussions regarding recruitment of GIS project officer, imagery for GIS project, research in association with transaction costs project and general project administration matters.

- Alf Said: 1–6/10/2013. Attendance at meeting of senior Lao government and industry officials (3 October) to discuss plantation regulation and taxes and charges. (Also attended by Stuart Ling). Also other meetings pertaining to transaction costs and general project administration.

- Stuart Ling: 3/10/2013. Teak management and certification meeting, Luang Prabang.

- Stuart Ling: 8-9/10/2013. Visit by the German Cooperative organisation DGRV to Luang Prabang.

- Stuart Ling: November, 2013. Study Tour to Bokeo on sustainable Farmer Group Enterprises (FGE’s), by selected teak growers from the four LPTP villages, LPTP staff and government counterparts.

- Stuart Ling: 20/12/2013. Consultancy Workshop for the future planning of LPTP, at Dept. of Forestry in Vientiane.

- Stuart Ling: Village meetings in connection with Grower Groups action research program.

- Stuart Ling: Farmer group training program, 15 to 22 June 2014

- Aidan Flanagan: 14-15/11/2013. PEFC's Stakeholder Dialogue (Kuala Lumpur, Malaysia). Meetings with regional timber traders to discuss legality and market access issues, including certification and legality.

- Aidan Flanagan: 3-12/11/ 2013. Vietnam - Vietnamese Academy of Forest Science. Discussions relating to Lao-Vietnam trade, the impacts of Vietnam's potential VPA with the EU, increased verification requirements, and the cost of certification. Compliance costs with VPA and certification is an issue of concern. Noted a move away from markets where verification costs are high (EU), in favour of those where costs were lower (US, Australia and emerging Asian economies).

- Aidan Flanagan: 18-21/03/2014. IUFRO Acacia 2014 Conference, Hue, Vietnam. emphasis on small holders. Consequently, relevance to Lao smallholders. These key messages include the importance of supporting policies combined with low regulatory burdens, market and the importance that ‘middle men’ play in maintaining supply
tensions that keep returns high for growers.

- Aidan Flanagan: One in-country, out of session visit was made to Vientiane to meet with Richard Laity to progress the development of a framework and focused work plan.
- Hilary Smith: The Chatham House (Royal Institute of International Affairs) 24th Illegal Logging Update and Stakeholder Consultation meeting, to be held in London on 16-17 June, 2014.
- Ken Boer: 25/5/2014-11/06/2015 Vientiane and Luang Prabang GIS set-up, training and field visits for Teak Mapping and inventory work.

**Objectives 2, 3 and 4 meetings**

- DAFF Objective 2 activity planning meetings, discussion on activities: 17/7/2013, 6/08/13, 31/10/13, 7/05/14, 9/05/14.
- 27/08/2013: UoM and DAFF management meeting by teleconference.
- 28/10/2013: Objective 2 co-ordination meeting, NUoL, Vientiane.
- 19/11/2013: Valtip 2 Lao team meeting before visit to Industry Cluster factories.
- 18/12/2013: UoM and DAFF management meeting by teleconference.
- 21/01/2014: Objectives 2, 3, 4 Progress Review Team Meetings, NUoL, Vientiane.
- 3/03/2014: UoM and DAFF activity meeting by teleconference.
- 21/03/2014: Valtip2 team meeting to review every objective’s progress and project administration.
- April, 2014: Valtip2 Lao team meeting to discuss about wood recovery study.
- April 10, 2014: Valtip2 Lao team meeting to review progress.
- April, 2014: Meeting with Faculty of Architecture to discuss training on design.
- 1/05/2014: DAFF and UoM activity and management meeting, DAFF Queensland.
- 19/05/2014: Objectives 2, 3, 4 Progress Review VALTIP2 Team Meeting, NUoL, Vientiane.
- Objective 3 fortnightly review of Action Plan (communication between the Project Leader and NUoL team by emails).

**Ongoing communication**

- Frequent communication by email, telephone, skype and meetings is being carried out:
  - Between the Project Leader and the Country Coordinator, objective team leaders and team members on the project progress, planning and reporting.
  - Between team leaders and team members of each objective and sub-objective, regarding the work program for activities and sub-activities for each team (action plan, timetable, research progress, budget, publications etc).
  - Between researchers within partner organisations.
  - Between Lao researchers and the Industry Clusters’ companies.
• With the project stakeholders as required.
  - Project Newsletter No 2 has been published and distributed to the project partners and stakeholders.
  - Project Dropbox “VALTIP_2” is being used by the project members to download research reports and publications related to the project.
  - Project website http://www.laoplantation.org/ has been viewed by 13,730 visitors. The website will be updated in near future.

Field days

Regular visits to plantation sites, tree growers, timber companies and other relevant companies and organisations have been undertaken by the research teams according to the project needs.

Visits to the Industry Cluster companies were undertaken by team members of Objectives 2 and 3 to implement recommended improvements in their wood processing and manufacturing processes.

Examples of field trips and visits to factories:
  - October 30, 2013: Valtip2 team visit to Burapha about kiln dry air flow measurement.
  - 22/01/2014: Implementation visit to Pheng moungkhoun company and Changswang factory.
  - 23/01/2014: Implementation visit to Kongsa Furniture company and Khamphai factory.
  - April, 2014: Visit to Lao furniture industry factory for gluing testing sample preparation.
  - April, 2014: Visit to Burapha for gluing sample preparation.
  - April, 2014: Visit to Khamphai sana for glue testing sample preparation.
  - April, 2014: Visit to Pakpasak for wood machinery application.
4 Training activities

Objective 1 training
The Lao GIS Forest Mapper was trained in methods for mapping Teak smallholder plantations using the FINNMAP high resolution digital aerial photography. Field visits were made to assess the accuracy of the mapping and to investigate methods for differentiating the age class of plantations. Methods for using geo-located (GPS referenced) photographs to assist in ground-truthing the mapping were trialled and a method developed. Additional training was provided to LPTP to assist in GIS processing of GPS data collection during plantation registration.

Objective 2 training
NUoL researchers involved in Objective 2 were trained in methods for conducting sawmilling studies including experimental design, data collection, importance of accurate measurements and presentation of results in a report (Figure 12). This will allow local staff to continue with recovery studies for the full suite of cluster companies before and after implemented improvements.

Figure 12: NUoL researcher Phongxiong Wanneng receiving training in log mensuration from Rob McGavin of DAFF

NUoL Objective 2 staff were provided with and trained in the use of kiln assessment tools including an anemometer, humidity sensors, thermocouples and data loggers. This equipment will be used for data gathering for the activities in 2.4.

Objective 3 training
Lao researchers attended several training courses which enabled them to improve their skill in furniture manufacturing topics:

− Furniture coating training at Lao Furniture Association at Km 5, held on May 6, 2014. Attended by Louxiong Siakor, NUoL.
− Wood machinery application and maintenance training at Pakpasak Technical College, 23 April – 1 May, 2014. Trainees from NUoL team were: Phongxiong Wanneng, Louxiong Siakor, Si Xiong, Khonethong Souphaxay (Figure 13).

− Furniture design training, 6 - 8 May, 2014 at the Faculty of Architecture, NUoL. The training was attended by 20 trainees: 6 NUoL researchers, 6 industry members, 10 FOF students and 4 lecturers from the Faculty of Architecture (Figure 14). Trainees from NUoL team were: Latsamy Boupha, Phongxiong Wanneng, Louxiong Siakor, Si Xiong, Khonethong Souphaxay and Saykhan Xaypha. The training focused on the development of the concept of design. Two members of the Industry Cluster who attended the training, from PKK and Phonebouly Factory, were impressed with the design outputs of the training and said that they would make prototypes according to the designs developed. The next training on design will focus on product design.

− Training on wood recovery study in furniture manufacturing was provided by Dr Benoit Belleville to VALTIP2 researchers on 21 May, 2014. The training was done before the recovery studies were undertaken in selected furniture companies during the subsequent days to ensure that the researchers understand the procedure of collecting input and output data for wood machined during various stages of the production process. Templates for the recovery studies were developed.

− Training on gluing testing methodology was provided by Dr Benoit Belleville to VALTIP2 researchers during his visit to NUoL in April 2013, September 2013, January 2014 and May 2014.

Figure 13: VALTIP2 researchers being trained on wood machinery application and maintenance
Other training

Training was provided for 3 final year undergraduate students from FOF on wood recovery studies in sawmilling and furniture manufacturing. The students are being considered as candidates for employment at FOF on VALTIP2 project.
5 Intellectual property

To date no novel technologies or products have yet been developed.
6 Variations to future activities

Objective 1

Activity 1.1 was delayed by the inability to recruit a suitably skilled GIS Forest Mapper and due to the timing associated with the production of appropriate imagery.

In February a suitable candidate was identified and recruited and has since joined the team, and in May the FINNMAP data became available for 70% of Luang Prabang Province. The first round of training of the GIS Forest Mapper in the use of the data has taken place and it is anticipated that much of the lost time will be made up without significant impacts on project milestones.

Activity 1.3B (Certification) is running behind its milestone schedule but it is expected this will be made up going forward.

Objective 2

Research Scientist Adam Redman, DAFF, will move his base to Vientiane for a nine-month period to work full-time on Objective 2 activities. This will enable regular visits to Luang Prabang for trials and implementation of recommendations and will accelerate capacity building in NUoL as well as with the industry partners. Approval for Mr Redman’s relocation has been finalised. He will commence his work at NUoL in September 2014.

Approval to identify an appropriate suite of peeling equipment for installation at NUoL was granted during the period. This will allow training and trials in veneer and composites development. An existing shed on the NUoL campus has been identified as the most suitable location for installation of the lathe.

The purchase, installation and performance of preliminary trials of a veneer peeling lathe and ancillary equipment is a new activity added to Objective 2. As a consequence some of the time allocated to other activities in objective 2.6 will be used for this purpose. For instance, a visit to a wood machinery exhibition in China was postponed and will be used for visiting lathe manufacturer BSY in China with the intent to purchase a lathe and ancillary equipment to be installed at NUoL.

Objective 3

The Activity 3.2, tasks 1-3, on the assessment of gluability of plantation timbers has been carried out by VALTIP2 researchers at Wood Technology Laboratory, NUoL. The completion dates of the milestones need to be extended as the testing takes much longer time than was originally anticipated. Task 1, laboratory testing of glue-bond strength for plantation species, and task 2, laboratory testing to assess the performance of various types of glues and joints under various conditions, have been combined as both tests can be carried out concurrently. As the testing program involves testing six types of adhesives on two plantation timbers (teak and river red gum \(Eucalyptus camaldulensis\)) and requires long-term conditioning of samples, it is anticipated that the tests will be completed by 30 April 2015.

Task 3, the guidance on optimal gluing methods and types of adhesives for various products and service conditions for Laos, cannot be developed until the glue testing program is completed. Therefore, the proposed completion date for this task is 31 December 2015.
Objective 4

The directions of the Activity 4.1: Developing an industry-led value-added timber market strategy, have been modified. During the Advisory Committee Meeting held on 20 January 2014, it was agreed that the development of market strategy for the timber industry should be the key role of the MoIC. The project can support the Ministry by providing information and data collected during the market research study (tasks 1 and 2) but the development and approval of the strategy needs to be done by MoIC. A discussion between the project team members, the country coordinator, Assoc. Prof. Latsamy Boupha and Dr Kaisone Phengsopha, NUoL, have been initiated with the MoIC and the Department of Export and Import, about the project assistance in the development of market strategy for Lao wood processing industry by providing information and data, when required.

Due to the above changes in the market research activities, an extension to two tasks within the Activity 4.1 is required:

- Task 4: Formation of industry led small groups to develop market strategy – proposed extension till 30 September 2014.
- Task 5: Analysis of Lao market situation and product research – proposed extension till 30 June 2015.
7 Variations to personnel

Faculty of Forestry, National University of Laos

- Phongxioung Wanneng will replace Douangta Bouaphavong as in-country leader of Objective 2 due to Mr Bouaphavong’s successful application to a Thai University for admission to post-graduate studies.
- Khamtam Phonetip has relocated to Melbourne, Australia, to undertake PhD study at the University of Melbourne.
- Khonethong Souphaxay was appointed to FOF to work on Objectives 2 and 3.
- Sangkhan Xaypha, VALTIP2 researcher involved in Objectives 2 and 3, has resigned from FOF in April 2014, to take a position at the Ministry of Sport. A suitable replacement has not yet been made.
- Three final year FOF students have been identified as potential candidates for ACIAR project appointment. If accepted, they would start their work in September 2014.

Other new personnel

- Hongkham Seneanachack joined Objective 1 as the GIS Research Officer.
- Mr Aidan Flanagan was engaged as a general adviser to the Objective 1 projects. Mr Flanagan has extensive experience and industry contacts in the region.
8 Problems and opportunities

Problems

Major problems identified are:

1. Capacity building in wood technology

There appears to be a good knowledge base in forestry subjects within the NUoL. However there is a lack of experience and knowledge in forest products and related engineering matters.

The project team identified that there are not enough young researchers at FOF with wood technology skills who can be actively involved in the Objectives 2, 3 and 4. Currently there are six researchers involved in the project team but Khamtan Phonetip has already started PhD studies in Australia and Douangta Bouaphavong has been recently approved for his Masters studies in Thailand. With the absence of these two most experienced researchers there will be serious problems in continuing the project activities.

Increasing the number of researchers to be trained in primary and secondary wood processing becomes an urgent matter. It is also important to improve the English skill of the current VALTIP2 researchers to allow them to communicate with the Australian team and translate the project reports & training materials into the Lao language for industry use. Lack of English language skills limits the researchers’ opportunities to study abroad and communicate by emails with The Australian team. The project leader and the in-country coordinator agreed to support FOF researchers involved in the project in their English studies. They are all now studying English at evening courses at Vientiane College and at The 21st Century School of English.

2. Legal issues in other aspects of the value chain

Objective 1.2A has mapped the legal framework for the whole smallholder plantation value chain and barriers and inconsistencies have been found across all areas and recommendations have been made to address these. However, as the focus of the objective is to address barriers faced in the registration of plantations the remaining effort for the project will be to progress this issue. As such there is a risk that despite efforts to address the issue of plantation registration market access for, and the legality of, smallholder grown plantation wood may still be compromised by issues further along the value chain. An area of particular concern is the harvesting and sales of timber through traders and agents.

Opportunities

Research Scientist Adam Redman will be relocated to Lao PDR for a nine month period to manage, supervise and train staff in key roles that will enable the project goals to be achieved on time.

The proposed installation of a veneer peeling lathe and commencement of veneer production at NUoL provides an excellent opportunity for capacity building in this important research field.

With the improvements made in the plantation-grown wood value chain opportunities for rural development are enhanced which will bring an increased income to the local villages and SMEs. This will then provide improved health, well-being and standard of living to the inhabitants.
The acquisition of the FINNMAP photography, and training of Lao personnel in the use of this data, will enhance the long term capacity of the forestry sector across a range of areas.

The Forestry Law and the Land Law are both under review by the Lao Government. Together, these two Laws directly impact all aspects of the plantation value chain. The review of the legal framework undertaken by this project provides an opportunity to influence how these laws will impact and enable the plantation wood sector in the future.
9 Budget

No significant variations from the approved budget occurred during the reporting period. The summary of the expenditure for the reporting period is presented below.

Final Financial Statement of Income and Expenditure
till 30 April 2014

Project Title: Enhancing key elements of the value chains for plantation-grown wood in Lao PDR
Grantor: AUST CENTRE FOR INTL AGRICULTURAL RESEARCH
Chief Investigator: A/PROF BARBARA OZARSKA
UOM Reference: 094464

Receipts: Grants received from ACIAR TOTAL $1,263,312.00

Less Expenditures:

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Grants – Collaborating Institutions

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Totals

770,944.00     26,412.18     322,051.00     1,119,408.00

Carryover

$143,904.00

Carryover committed

100,000.00     Veneering equipment for NUOL
10,000.00      Travel (UoM)
20,000.00      Salaries (UoM - till 30 June 2014)
8,000.00       Lao PhD student expenses (equipment, material, training)

Final project balance

$5,904.00