

Developing a legality framework for community and smallholder timber production

Technical Report 111

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ABN: 47 065 634 525

Prepared by

AECOM Services Pty Ltd

Level 28, 91 King William Street, Adelaide SA 5000, Australia
T +61 8 7223 5400 F +61 8 7223 5499 www.aecom.com
ABN 46 000 691 690

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Prepared by Braden Jenkin, Sylva Systems Pty Ltd

Reviewed by Andrew Piper, Technical Adviser and Dale Hamilton, Deputy Team Leader

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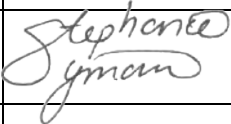
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Table of Contents

Acronyms	i
1.0 Executive Summary	ii
1.1 Summary.....	ii
1.1.1 <i>A snapshot of the PNG small-scale processing industry</i>	<i>ii</i>
1.2 Key findings.....	ii
1.3 Recommendations	iii
2.0 Introduction and methods	1
2.1 Introduction	1
2.2 The concept of legality and market access.....	1
2.3 Methods used.....	2
3.0 The current PNG industry	3
3.1 Products and markets	3
3.1.1 <i>Log exports</i>	3
3.1.2 <i>Domestic demand – the PNG housing markets</i>	4
3.2 Current industry.....	5
3.2.1 <i>Supply chains</i>	5
3.2.2 <i>Small-scale sawmilling</i>	6
4.0 The policy and legal frameworks	8
4.1 PNGs guiding framework towards the future	8
4.2 Existing regulatory framework of resource access	9
4.2.1 <i>Forest industry participant</i>	9
4.2.2 <i>Harvest authorities</i>	9
4.2.3 <i>Barriers to small-scale processor participation</i>	10
4.3 The export process	10
4.4 PNG legality and compliance.....	13
4.5 Small-scale processing operations and certification	13
5.0 Other considerations	15
5.1 Plantations	15
5.2 Species issues	15
6.0 A synthesis of small-scale processor participation issues	16
7.0 Recommendations and action plan	17
Appendix A Detailed recommendations	A-1

Acronyms

Abbreviation	Description
AFS	Australian Forestry Standard
CITES	Convention on International Trade in Endangered Species
CMU	Central marketing unit
CoC	Chain of Custody
CPU	Central processing unit
CW	Controlled wood
EU	European Union
EU FLEGT	EU Forest Law Enforcement, Governance and Trade
FIP	Forest Industry Participant
FM	Forest Management
fob	Free on board
FSC	Forest Stewardship Council
NFDG	National Forest Development Guidelines
NFI	National forest inventory
NFP	PNG National Forest Policy
NGO	Non-Government Organisation
PEFC	Programme for the Endorsement of Forest Certification
PFMC	Provincial Forest Management Committee
PHAMA	Pacific Horticultural and Agricultural Market Access Program
PNG	Papua New Guinea
PNG NAQIA	Papua New Guinea National Agriculture and Quarantine Inspection Authority
PNGFA	PNG Forest Authority
RAL	Reserved Activities List
SGS	Société Générale de Surveillance
SME	Small to medium enterprise
TA	Timber Authority
TLTV	Timber and Legality and Traceability Verification
USA	United States of America

1.0 Executive Summary

1.1 Summary

1.1.1 A snapshot of the PNG small-scale processing industry

A comprehensive report has been prepared and this document is a summary of that report. This report has documented where possible, the Papua New Guinea (PNG) small-scale processing sector. In some cases the data was collected from parties consulted and in other cases, the collected data was collated with published information to create models to provide an estimate of the sector. The following is an estimated high-level snapshot of the PNG small-scale processing sector:

- **Capacity:** Number of small-scale portable sawmills operating in PNG is estimated to be approximately 2,000;
- **Labour:** People involved in small-scale timber production in PNG is estimated to be approximately 24,000;
- **Value of the industry:** The retail equivalent value of the PNG domestic market is estimated to be approximately K56 to K168 million for the fully commercial portable sawmill operations.

1.2 Key findings

The following is a summary of the key findings of the analysis:

1. **Current trade:** The PNG forest sector is currently dominated by log exports (3.9 million m³ in 2015) with a relatively smaller and un-documented domestic processing sector. There are exports of processed forest products and the documented free on board (fob) price is comparable with domestic prices observed. The domestic housing market represents the main opportunity for smallholder supply chains though strong export markets exist for specific species and products. The following provides a snapshot of the current trade:
 - a. **Domestic market:** Based on house construction (new additional house construction of 36,213 units per year) and an assumed 10% use of non-traditional methods that the current domestic market for sawn timber is 72,426 m³/y (annual full retail purchase value of K110 to 180 million). At 100% permanent house construction, the PNG domestic demand would be 724,250 m³/y, and if purchased on a retail basis, the domestic market would be worth K1.1 to 1.8 billion/y;
 - b. **Capacity:** It is estimated that approximately 4,000 portable sawmills have been supplied to PNG, with an estimated 2,000 units still operational and of those, 100 to 300 working on a full time commercial basis. At 10% and 100% permanent housing, 259 to 2,587 respectively portable sawmills operating on a fully commercial basis would be required to meet the domestic demand for sawn timbers;
 - c. **Output:** It is estimated that the current output of the commercial small-scale sawmill sector is 28,000 to 84,000 m³/y by processing 80,000 to 240,000 m³/y of logs. At 10% to 100% permanent house construction, to satisfy demand, the small-scale sawmills would be required to process 206,929 to 2,069,293 m³/y of logs.
 - d. **Labour:** The total current labour demand to operate the estimated 100 to 300 fully commercial portable sawmills would be 1,200 to 3,600 people per year. A total current labour demand for the 2,000 operational portable sawmills would be 24,000 people per year involved but not all on a fulltime basis. At 10% to 100% permanent house construction, 6,208 to 62,079 people respectively would be required to operate the portable sawmills.
2. **Regulatory framework:** The current regulatory and forest management framework presents a number of barriers to smallholder participation through resource access mechanisms, complexities of the export process and other requirements;
3. **Legality:** A series of structural issues with the regulatory framework create specific and effectively insurmountable barriers to participation by individual small-scale (and potentially

even groups of small-scale processors) processors in export markets where legality requirements in destination countries demand compliance with the laws in the country of origin. PNG has developed a National legality standard in an attempt to assist with legality compliance by defining the pertinent legality framework, but this requires revision and the development of supporting tools;

4. **Commercial feasibility:** The small-scale processing sector has been predominantly driven by portable sawmills, in many cases supported by external organisations. There is a need to identify commercially viable business models that can operate within the practical and financial constraints of small-scale production. Where small-scale processor output is supplied into local markets, few barriers exist. Where small-scale supply requires access to other domestic markets, some form of central aggregation and processing is usually necessary. This is more so the case in order to facilitate smallholder supply into export markets;
5. **Certification:** Export market requirements for certification can be a market access gatekeeper (effectively setting a minimum standard for entry). Uptake of certification in PNG has been minimal and there is a need to align certification requirements with smallholder production models and legality requirements if export markets are to be pursued.

1.3 Recommendations

Drawing on these findings, a number of recommendations have been made to strengthen the role of smallholders in the PNG forest sector which have been grouped under the following broad initiatives:

- Supporting information on the smallholder forestry sector;
- Planning for industry development;
- Market information and producer support;
- Enabling regulatory frameworks; and
- Legality and certification.

As part of the 'planning for industry development' initiative, an initial step that PHAMA can undertake is to explore the formation of a stakeholder consultative group on 'smallholder forestry' as a focal point for detailed consideration of priority areas for industry improvement. Such a group would incorporate stakeholders engaged in smallholder timber production in native forests, smallholder plantations and outgrower programs, and aggregators and processors of smallholder timber. Priority areas for consideration could include:

- Policy and planning for increasing SME involvement in the PNG forest sector;
- Market awareness and technical support for small producers;
- Legality frameworks to enable smallholder participation in timber supply chains; and
- Measures to improve access to certification.

2.0 Introduction and methods

2.1 Introduction

The Pacific Horticultural and Agricultural Market Access Program (PHAMA) provides practical and targeted assistance to help Pacific Island countries manage regulatory aspects associated with exporting primary and value added products. This project has a specific focus on the forest industry sector of PNG and seeks to explore the legality framework for community and smallholder timber production. The project evolved from fieldwork conducted in April 2016:

“This activity will undertake a targeted policy review to examine issues that limit export development for community produced processed wood products and inform measures that can strengthen ability to comply with market expectations.”

2.2 The concept of legality and market access

The aim of this project is to explore issues associated with market access by small-scale processors and producers of forest products in PNG. An analysis of the opportunities for small-scale processors participation and access to markets must commence with an understanding of the national and international controlling frameworks. The markets of interest cover domestic and export options, hence the concept of legality is fundamental to the issues considered. Legality is a mandatory requirement for access to Australian, European Union (EU) and United States of America (USA) markets. There are three states of legality as presented in Figure 1 and an increasing requirement is to ensure that forest resources and the resulting forest products are supplied into export markets on a legally compliant basis (legal production). The second state of legality is that while the forest products traded have all the required documentation and approvals, the processes by which such approvals were granted are not legal, hence the products are referred to as legalized and legalized forest products are illegal. The last state is where the forest products are blatantly illegal which can include theft of the resources from the rightful owners.

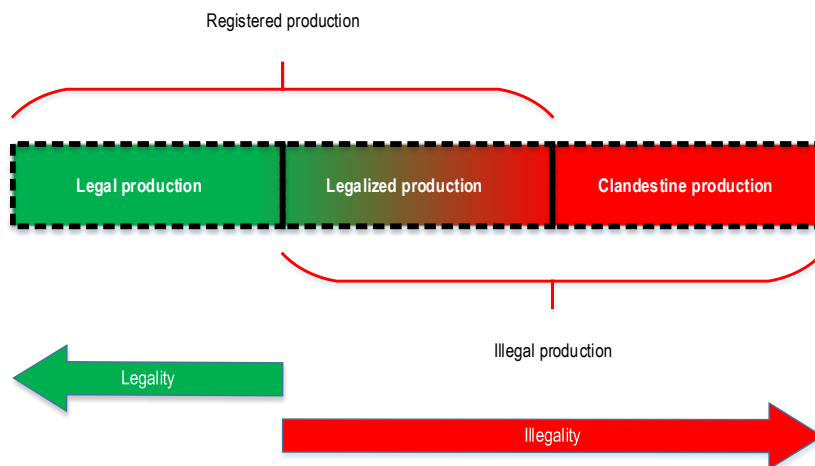


Figure 1: An overview of the concept of legality.¹

¹ Based on Wells, A., del Gatto, F., Richards, M., Pommier, D. and Contreras-Hermosilla, A. (2007: p.142) *Rural livelihoods, forest law and the illegal timber trade in Honduras and Nicaragua*. In: Ed. Tacconi, L. (2007) *Illegal logging: Law enforcement, livelihoods and timber trade*. Earthscan London.

2.3 Methods used

The project was undertaken employing the following methods and approach:

1. **Project initiation:** The project commenced with a review of the project tasks and discussions with PHAMA staff to develop a project plan;
2. **Back-ground research:** A range of documents and web based information was reviewed and key researchers contacted to develop a list of target parties for consultation;
3. **Candidate parties:** The listed parties were contacted by email or telephone to establish an initial link, and the project-tasking note was provided as background information. The parties' willingness to engage with the project was determined and a short-list of parties was collated;
4. **Fieldwork:** Fieldwork and interviews were conducted in PNG over the period of 03/08/2016 to the 12/08/2016. In some situations, additional parties were contacted following leads provided while in PNG and further information was collected. During the fieldwork a range of documents were collected or arranged to be provided by email;
5. **Follow-up:** All interview notes were typed-up and provided back to the interviewee for comments and confirmation of the details. As well, a process of triangulation was undertaken of the information collected to verify comments made where possible and to seek source documents noted. In some cases, the information as provided was treated as perceptions, which in itself, provided useful insights as to a range of issues;
6. **Data:** A range of data sets were sourced and analysed for inclusion in the document and these are referenced within the document;
7. **Report drafts:** The interview notes were collated into a structured document and published information was included as appropriate. The report was revised and restructured to seek a logical flow of the information and this was reviewed by PHAMA team;
8. **Workshop:** A workshop was held in Port Moresby on the 14th of November 2016 at the Ela Beach Hotel;
9. **Final draft:** The draft documents were amended to take account of feedback provided.

3.0 The current PNG industry

3.1 Products and markets

3.1.1 Log exports

By value and volume, un-processed logs are the current dominant forest product exported by PNG. In 2000, 1,373,000 m³ of logs were exported and by 2015, this had increased to 3,869,271 m³: a 283% increase over 15 years (see Figure 2). The forest management leading to the level of exports are unknown (e.g. whether selective harvest and/or land-use conversion) but the harvest and export is allowed under the PNG regulatory environment and has a ready market in China (the main destination).

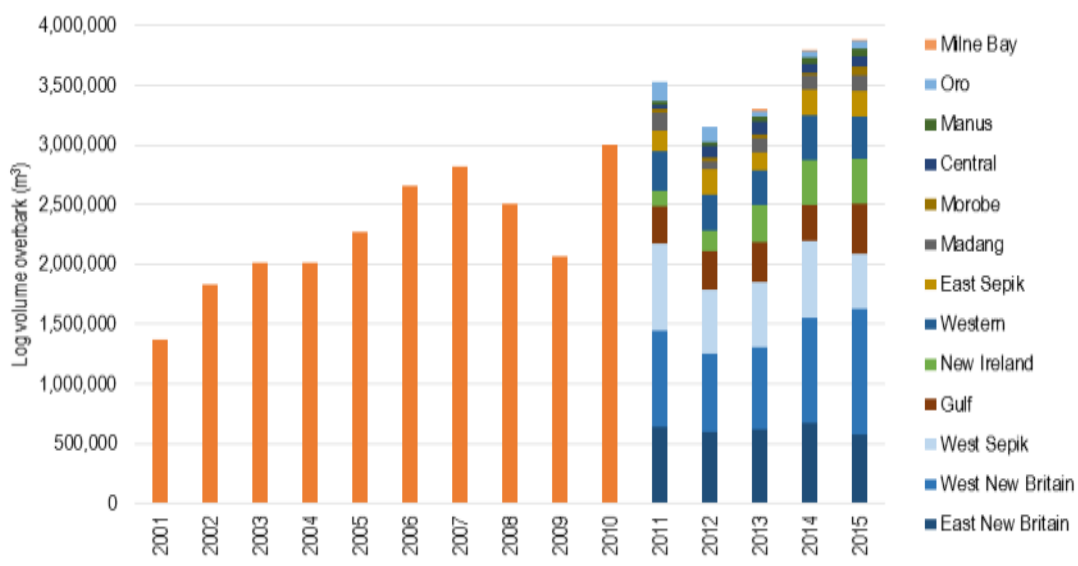


Figure 2. A summary of PNG log exports from 2001 to 2015: data for 2011 to 2015 includes province of origin.

The free on board (fob) price for logs varied from K103 to K747 /m³, which equates to a log cost² contribution to sawn-timber costs of K294 to K2, 134 /m³ (see Figure 3). As well, a range of processed forest products is produced in PNG: structural timbers, moulded products, furniture, plywood, veneers and pallets. Effectively there is very limited data available on the scale of sawn timber production in PNG.

² At an assumed sawn timber recovery rate of 35%.

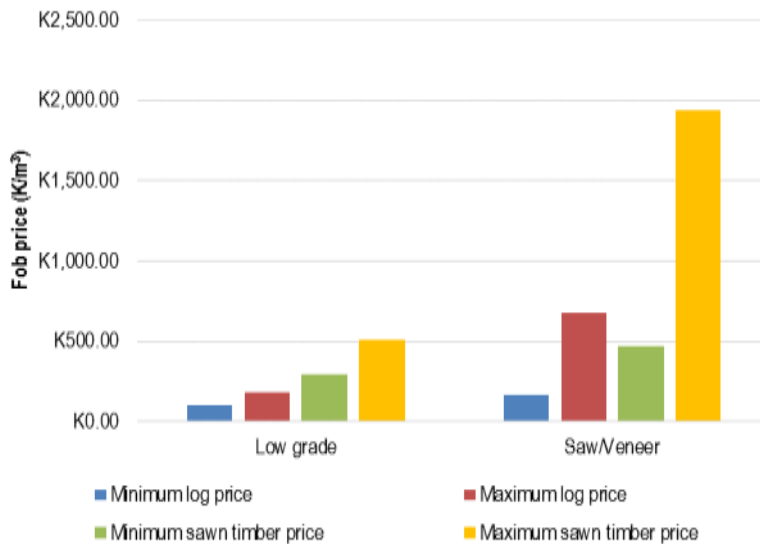


Figure 3. A calculated log cost contribution to sawn timber price for natural forest origin logs.

3.1.2 Domestic demand – the PNG housing markets

House construction is a significant consumer of sawn timber and a model was constructed to predict the number of new houses needed based on change in population and assumed housing occupancy. The aim was to generate some estimate of the scale of the PNG sawn timber market. In 2011 there were 1,374,644 houses providing shelter to 7,275,324 PNG citizens (73.2% traditional materials and 19.1% permanent dwellings) and based on population growth, it is estimated that 36,213 additional houses are required each year. Based on house construction inputs of processed forest products, demand for sawn timber was estimated (see Figure 4). If 10% of new houses include maximum use of sawn timbers, the total demand would be 72,425 m³/y, and if 100% of houses are built with maximum use of sawn timbers, the total demand would be 724,250 m³/y. Given a shift in expectations and aspirations of people in PNG to more permanent housing, the demand for sawn timber should increase, unless other materials such as steel dominate.

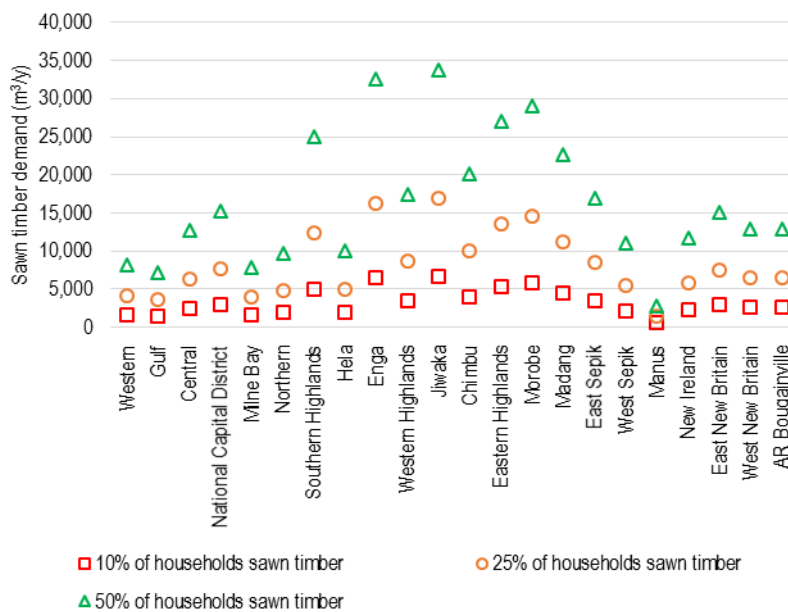


Figure 4. Modelled PNG sawn timber demand by Province and the level of use of sawn timbers.

The domestic market remains the dominant market and within that market structural sawn timber is the main product driven by demand for housing. The price paid for rough sawn timber varies from K500 to

K3 000 /m³ for wholesales sales up to K2 977 /m³ for treated structural timbers on a retail basis (see Figure 5). Data on sawn timber exports is limited and the PNG Forest Authority (PNGFA) export fob price barometer indicates the following export fob prices for sawn timber³: Rosewood - mean fob price of K2 335 /m³, Kwila - mean fob price of K1 163 /m³ and mix species - mean fob price of K1 091 /m³ (see Figure 6). Given the price ranges indicated, care is required to target the most profitable market for the sawn timber produced: sales revenue less the cost of production and sales (e.g. for an export market to Brisbane or Sydney, an extra cost of K320 or K460 /m³ respectively). It is possible that premium products could be exported and the balance of sawmill output supplied into local markets. If all new housing in PNG were constructed using retail purchased sawn timber, the value of the sector would be K1.1 billion to K1.8 billion/y. A key limiting factor will be the capacity to pay of the families seeking a permanent house.



Figure 5. An analysis of the data collected for structural sawn timber prices.

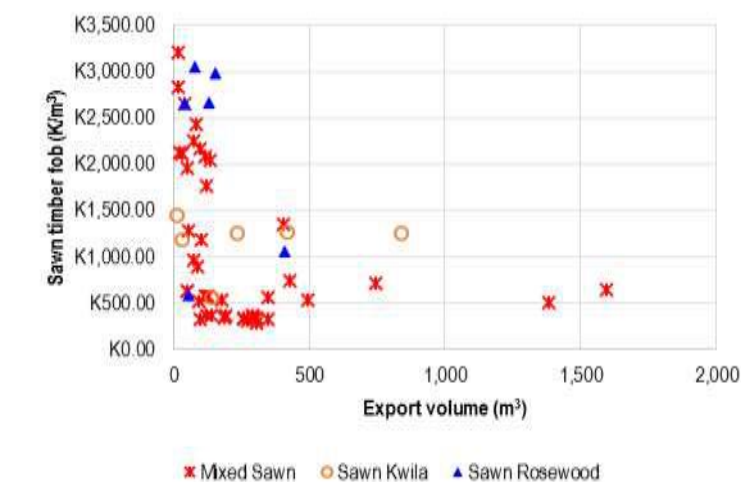


Figure 6. An analysis of the PNGFA sawn timber export price barometer data.

3.2 Current industry

3.2.1 Supply chains

There are five broad supply chain models in use in PNG:

- **Direct supply into a local domestic market:** A simple supply chain involving two parties: the resource owner and the sawn timber purchaser (consumer);

³ The PNGFA dataset describes the exported products as sawn timber without specific details of the type of sawn timber e.g. whether dressed all round or not.

- **Nucleus processor and wholesale aggregator:** The most common business model encountered during consultation was a nucleus-processor supplementing their output by purchasing complementary outputs from small-scale processors;
- **Central marketing unit:** A central marketing unit (CMU) is a business which aggregates products for sale as a pool;
- **Central processing unit:** A central processing unit (CPU) is a processing site to which resources (logs) are supplied from a range of sources (including ownership). The term CMU was observed used interchangeably with the term CPU;
- **Manufactured products into the export markets:** The most sophisticated supply chain involves the entire process from harvesting through to manufacture and export of products, and in one case all by the one party.

3.2.2 Small-scale sawmilling

Details of the PNG forest products processing sector are limited and a range of large-scale projects were identified during consultation. The operations processed natural forest and one case plantation grown, logs into sawn timbers or peeled products for plywood manufacture. The scale of the operations was stated to be from 60,000 to 330,000 m³/y of log inputs (the upper limit requires verification).

The initial driver for investment in portable sawmills in PNG was to support Government outposts by enabling self-sufficiency in sawn timber and in more recent times this has shifted to where portable sawmills are supplied as part of non-government organisation (NGO) and aid projects. One aim of the recent supply of portable sawmills has been to encourage an alternative to large-scale log exports, while providing an income source for communities. In many cases once the NGO or aid agency support ceased, so did the sawmill operations. In a number of cases commercial operations had gained FSC certification, which was subsequently withdrawn as the operations were operating without a PNGFA authority to harvest and/or *Forest Industry Participant (FIP)* registration⁴.

Data on historic totals and annual sales of portable sawmills by two suppliers was collected. Approximately 3,400 units have been supplied with a current annual rate of supply of approximately 500 units per year. This combined with other potential supply (e.g. imported second-hand units and units manufactured in PNG) would suggest a fleet of approximately 4,000 units across PNG, of which it is suggested that 2,000 remain operational. Of the 2,000 operational units, industry suggests that 100 to 300 are operated on a full-time and commercial basis.

Portable sawmills can be operated at the stump, at the roadside, on a log landing or at a permanent set-up site (more akin to a static sawmill). A hybrid strategy is to increase the available road network within the forest to allow truck access to haul out the sawn timber output. Quoted sawn timber recovery rates varied from 35% to 55% (which is in line with common conversion rates elsewhere), and daily log processing production rates varied from 1.8 to 8.7 m³/day (360 to 1,740 m³/y), depending on the operation of the sawmill. A successful business model for small-scale processors is to form an arrangement with a larger processor as the market for the sawn timber outputs. This can include the supply of logs to a landing where the portable sawmills are located in a semi-static position. There is a range of cultural issues impacting on portable sawmill operations and these require management (e.g. operating in response to cash needs). Other issues to address include the initial financing arrangement of sawmills, the nature of the forest (e.g. resource knowledge and management skills), logistics, economies of scale, financial sustainability, quality control, labour requirements, supporting mechanical workshops, and training (including business and financial literacy skills). Some processors have been able to address many of these issues and in other cases the level of poor quality output products caused such supply to cease.

The initial capital cost of a portable sawmills is significant (e.g. current examples are from K31 000 to K70 400) and cost K510 /month to maintain. Part of the current supply of portable sawmills into PNG communities is via local politicians donating sawmills to constituent communities. A typical operating crew would be 8 to 12 people. Based on a set of assumptions (including a wholesale sawn timber

⁴ See discussion on the requirements of an *FIP* in later sections.

price of K500 /m³), a breakeven throughput of 2.2 m³/day of logs was required and at a throughput of 4.0 m³/day of logs, a net margin of K318.54 /m³ of sawn timber output was achieved (see Figure 7).

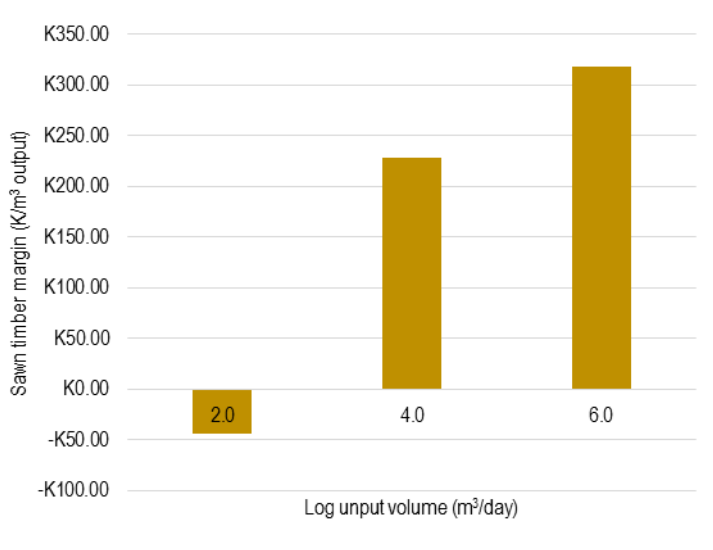


Figure 7. The net margin per cubic metre of sawn timber output for a portable sawmill based on the assumptions listed.

4.0 The policy and legal frameworks

4.1 PNGs guiding framework towards the future

The PNG Vision 2050 (the Vision), the PNG Small to Medium Enterprise (SME) Policy (and Master Plan), the PNG National Forest Policy (NFP) and the National Forestry Development Guidelines (NFDG) were reviewed and all documents had a specific focus on benefiting the people of PNG (see Figure 8). The Vision specifically aimed to benefit the citizens of PNG by ensuring that as a nation, that there was a balance of the elements which contribute to a robust society: “*we will be a Smart, Wise, Fair, Healthy and Happy Society by 2050.*” Importantly the finite nature of a mineral dominated economy is recognised by the Vision and the SME Policy and they seek to diversify into more sustainable sectors such as forestry. The PNG Government’s SME Master Plan has a clear focus on enterprises owned by Papua New Guineans. The SME policy includes a foundation concept of an expanded Reserved Activities List (RAL) for local PNG enterprises (e.g. logging, sawmilling, timber yard and timber retailing) which can only be owned by 100% domestic investors and excludes foreign investors. The following are the predominant policy directions that relate to forest management.

- **Forest management:** The overarching goal of the NFP is the sustainable use of the nation’s forest resources supported by research, education and administrative and legal mechanisms. A specific objective is the perpetuation of the country’s high value indigenous species including use of selective logging;
- **Log exports:** The status quo for the PNG forestry sector is a significant focus on exporting of logs harvested from natural forests. All policy documents reviewed included specific reference to a ban on export of all un-processed logs, but they do not provide a specific mechanism to achieve such stated objectives. Domestic processing is regarded as a key tool to achieving benefits for all PNG citizens and to maximise this potential, the processing must be financially viable and therefore sustainable. While previous policy targets set to cease to log exports in the past, it was not achieved due to a lack of domestic processing capacity, infrastructure and energy. A revised time table is to phase out of log exports by 2020 as reported by the PNGFA but a specific plan to achieve this intent has not be set;
- **SME:** The Vision recognises the role of the development of commercial businesses in the successful outcomes of the Vision, with a specific focus on SMEs and a shift from informal to formal sectors. This is supported by the NFP by encouraging the development of small-scale processing. Small-scale processing operations contribute to the solution and are well aligned with the Vision and objectives (e.g. rurally located and offer potential for broad-scale participation, generation of cash income and payment of wages);
- **Markets:** The NFP recognised the differences in demand between domestic and export markets and seeks to increase the domestic processing of the more readily exported sawn timber species. In support of product exports, the NFDG requires an expanded market for the outputs;
- **Plantations:** The NFP and the NFDG are strong advocates of the development of plantations and woodlots based on sound commercial analysis.

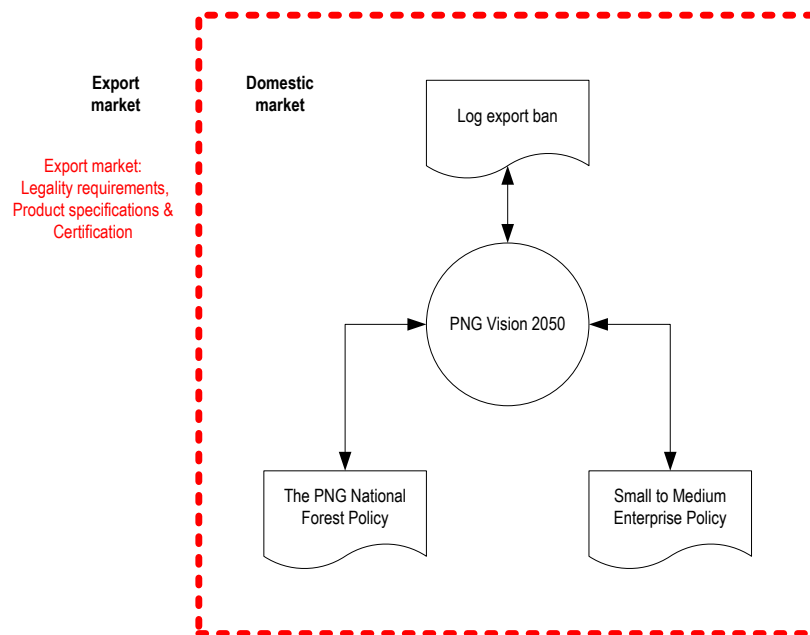


Figure 8. The driving framework towards the future of the PNG forestry sector.

4.2 Existing regulatory framework of resource access

4.2.1 Forest industry participant

The legal framework for the harvest of forest resources in PNG is set by the Forest Act 1991. Under the Act, the forest products captured are broad and could include all agricultural tree crops. To be involved in a commercial harvest and/or processing, a party must be a registered *Forest Industry Participant (FIP)* and only a *FIP* can seek to gain an authority to harvest from the PNGFA. Registration as a *FIP* is limited to parties (a natural person or registered entities) processing greater than 500 m³/y of logs (see Figure 9 and Figure 10). Once issued, an authority to harvest is linked to the *FIP* and the harvest cannot be sub-contracted.

4.2.2 Harvest authorities

There are four broad harvest authority mechanisms: a *Timber Permit*, a *Timber Licence*, a *Forest Clearing Authority* and a *Timber Authority (TA)*. *Timber Permits* and *Timber Licences* are used by larger-scale selective logging operations and a *Forest Clearing Authority* is for land-use change (to agriculture or for road development both up to a maximum of 2,000 ha). A *TA* has a 12 month life and is applied to operations harvesting 5 000 m³ or less of logs per *TA* making them the most relevant approval mechanism that applies to smallholder producers. There are 5 types of *TAs*: Domestic processing, Roadlines, Agriculture conversions, Other forest products and Plantations. *TAs* are issued by the PNGFA after approval by a Provincial Forest Management Committee (PFMC). An application fee of K275 is charged along with a K20 000 performance bond. The smallholder resource owners supplying resources under a *TA* gain a financial benefit from the harvest of their resources. A point of caution is that the *TA* requirements prohibit smallholders processing logs derived from a *TA* issued to another party (unless purchased from the *TA* holder and included in the *TA*), which creates a barrier to resource owners participating as small-scale processors conducting local processing and sale of timber sourced from a *TA*. Another point of caution is that depending on interpretations, export of sawn timber generated by a domestic *TA* cannot be exported.



Figure 9: A natural forest sawlog with a diameter of 36 cm, a length of 4.2 m and with a volume of 0.428 m³. 500 m³/y would equate to 1,168 such logs processed per year.



Figure 10: A log truck with a payload capacity of 25 to 30 m³ of logs. 500 m³/y would equate to 17 to 20 such truckloads of logs processed per year.

4.2.3 Barriers to small-scale processor participation

There are a number of barriers to small-scale processors participation: the *TA* (a requirement to be a *FIP*, the application process, the time taken and the bond cost), infrastructure and trust between the parties. The PNGFA recognises the impediments posed by a *TA* and has sought to amend the Forest Act 1991 to accommodate small-scale processors. There is a need to address the Forest Act 1991 to provide an as of right legal basis for the initial sale of logs at harvest (by the resource owners) from either a plantation or natural forest, there is a need to change the requirements to be a *FIP* to allow small-scale processors to be involved (e.g. *FIP* status is required for all commercial activities) and that an appropriate small-scale processor authority to harvest mechanism is required.

4.3 The export process

The legal ability to export specific forest products from PNG is limited to parties who hold an authority to harvest issued by the PNGFA (either a *TA*, a *Timber Permit*, a *Timber Licence* or a *Forest Clearing Authority*) and to be a *FIP*. A PNGFA *Export Permit* is required for each shipment of timber products with a shipment defined as the products relating to a single purchase order and invoice. The Minister for Forests must sign each *Export Permit*. The steps and process required to export timber products from PNG involves 21 separate documents and 8 parties including the issuance of a *Phytosanitary Certificate* by the PNG National Agriculture and Quarantine Inspection Authority (NAQIA) (requiring 9 steps) (see Figure 11).

The cost of exporting is driven by the need to generally make use of 20' shipping containers due to wood density determining that weight prior to volume limits are reached in container capacity. The

costs can be K320 to K460 / m³ of product which may make the domestic market a more attractive option for some products. As is the case in most primary industries in PNG the ability to comply with the requirements to export forest products are likely to be a barrier to small-scale processors, and it is more likely that an intermediary becomes involved and aggregates resources to achieve economies of scale and to facilitate the export process.



Figure 11: A summary of the documentation required in support of an export of timber products from PNG by an incorporated entity.

4.4 PNG legality and compliance

In addition to national legislation are other international legal frameworks (both voluntary and legislative), which affect market access and dictate market access requirements. There are forest products legality frameworks in place for the key consumer markets of Australia (the Illegal Logging Prohibition Act, 2012), European Union (EU Forest Law Enforcement, Governance and Trade) and the United States of America (USA) (the Lacey Act) which place legal obligations on the importer (with associated penalties) for failure to comply and trading in illegal forest products. In support of industry, Australia and PNG have developed a PNG Country Specific Guideline, which is a schedule to the Australian Illegal Logging Prohibition Act, 2012. The Australian PNG country guide has a narrow focus on the Forestry Act 1991, which provides the legislative basis for how PNG's forest resources are developed and managed. The Australian Country Guide provides a specific focus on the administrative process leading to an export of forest product. The Australian framework recognises the EU Forest Law Enforcement, Governance and Trade (EU FLEGT) licencing scheme, Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) certification as part of the due diligence process. However, the current PNG Société Générale de Surveillance (SGS) Timber and Legality and Traceability Verification (TLTV) is not one of the pre-tested standards recognised under the Australian guide. The PNG Country Guide provides a list of species banned from exporting in log format, which is at odds with the PNG Customs Act, and associated Tariff details in Schedule 2 (where the list of species banned from export in log form includes Teak).

A fundamental principle of legality is to set the basis of testing for legality compliance with the laws of the country of origin and it is possible a country will develop an internal country specific legality standard. PNG has developed a legality standard in response to a need for compliance with the international frameworks. The guide seeks to define the scope of the local laws required to be tested for legality compliance. The scope of the PNG legality standard is too broad and fails to provide a tool to assist compliance by detailing the specific sections of the listed acts for which proof of compliance is required. Further there is a need to develop specific tests of compliance with the targeted sections of the Acts listed in the standard.

The scope of the species to be considered under the PNG legality standard is narrow and specific to the species listed in The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). There is a need for a mechanism to maintain currency with the CITES listing and to be able to effectively disseminate any updated species requirements. There is a need to provide a link under the legality standard to the Customs Act, which via tariff regulations limits the export of a range of species in log form. Other issues to address in the PNG legality standard are consideration of the needs of external parties, a definition of the parties with overall responsibility for the systems and integration with other systems which may provide a basis of cross-referencing compliance (e.g. the national forest inventory - NFI) and lastly the standard is silent on the issue of resource acquisition. Specific issues which require addressing in regards to small-scale processors include the nucleus processor / aggregator model, labour laws and sawmill employees, and application of the PNG Logging Code of Practice.

4.5 Small-scale processing operations and certification

Forest certification offers voluntary frameworks for verification of forest management and processing practices. In many cases, market demand for certification can effectively become a minimum standard for entry. There are two forest certification schemes: the FSC and the PEFC. FSC has a specific PNG presence and PNG companies can access PEFC via Australia and the Australian Forestry Standard (AFS). There are three components of certification: Forest Management (FM) which addresses the methods and impact of the initial generation of the forest products traded, Chain of Custody (CoC) which collates and passes along the chain of ownership of a forest product, specific details of the forest products traded from the forest to the final consumer, and the logo representing the embodied claims in regards to the product. A point of difference between FSC and PEFC is that FSC's CoC must commence with a certified forest, were as PEFC's CoC can commence at any point in the supply chain but still seeks to exclude any controversial wood sources from the supply chain.

The uptake of certification in PNG has been characterised by initial seeking and securing certification and then the certification lapsing or being revoked. The initial drive for certification was facilitated by NGO activities working with communities (e.g. the Foundation for People and Community Development project in the Madang area), in response to the customer demands (e.g. Open Bay Timber Limited) or as a demonstration (Cloudy Bay Sustainable Forestry Limited). Three PNG parties currently hold FSC certification, one party holds a suspended certificate and terminated certificates include a group certificate (8 parties) and 6 parties that held 8 individual certificates. One PEFC / AFS CoC certification is in place. FM certification is only possible under a *Timber Permit* or a *Timber Licence*. Based on the limited life (12 months) and nil ongoing land management obligations, it is not possible to achieve PNG FSC certification for operations under a *TA*.

Certification can be a significant driver of the cost of business and supply of forest products and the cost of certification is recognised as a barrier to small-scale processor participation. The cost of certification is determined on a case-by-case basis depending on the nature of the party and the works required to complete internal documentation. The main associated costs being: staff time, resources to implement necessary systems and processes, external technical support, and ongoing costs of auditing. Further, where certification is set up via a NGO with donor funds, the ongoing sustainability (funding) of certification must be addressed (many of the current pool of lapsed or revoked certificates fall into this category). The drivers of the cessation of certification by the parties noted were:

- **Costs:** The parties could not afford to maintain certification status;
- **Legality:** On closer scrutiny some parties were found to be operating without the required PNGFA authority to harvest and/or *FIP* status and certification was revoked;
- **Cessation:** Some companies ceased to operate.

Certification may be required by some markets as a gatekeeper to the ability to supply (e.g. product specifications include a requirement to hold environmental certification). An example of the influence of certification on local production has been with the balsa supply chain where initially the market did not require certification but then the certification became a mandatory requirement of the company's customers. A market-pull for certified timber products has led to some current PNG exporters excluding other resources to maintain FSC 100% and in another case, the exporter switched from FSC 100% to FSC MIX to allow inclusion of small-scale processors Controlled Wood (CW) resources (as the market would accept such a switch). Part of the business planning process should be to identify the target markets and whether the market actually requires certification. It is likely that where a domestic market is targeted, certification becomes an un-necessary overhead.

Two related issues are that exclusion of illegally harvested forest products is fundamental to the two certification schemes and that the need to identify and document forest product species is a paramount condition of both for compliance with CITES (with species identified using both scientific and common names).

5.0 Other considerations

5.1 Plantations

There is an objective to increase the area of plantations across PNG (driven by the Vision) to 800,000 ha by 2050. The intent is to generate resource supply by the plantation development as a supplement to and replacement of the natural forest resource. The project is referred to as *Painim graun na planim diwai*. The plantations are to be developed on grasslands: across PNG there are 3 to 5 million hectares of grasslands. There are three types of plantations proposed (industrial plantations, environmental planting and woodlots) at three scales (watershed scale or landscape basis, a compartment basis and small-scale woodlots). The following are required to support of the development of the estate: funding sources, land-base assessment, costings, and nursery capacity and addressing environmental issues. Care is required in species selection and the project can be informed by past experience to develop a very narrow range of plantation species to supply the market, supported by best practice manuals (to ensure consistent outputs) and marketing plans.

5.2 Species issues

Species identification and tracking is a significant compliance and market access issue. The need to identify and track species is required by the Forests Act 1991, the export process, international conventions (e.g. CITES), legality frameworks and that species attributes (wood basic density and moisture content as they affect weight) will drive export costs based on the size of shipping container which can be used (most likely a 20' container). As noted in the log export data from 2011 to 2015, over 141 species are exported, making the task of species management a complex process. The issue of species is important to the market based on inherent wood properties (e.g. reputation, colour and texture or mechanical strength). There is strong species preference by the sawn timber export markets where Kwila and Rosewood dominate, and for domestic markets where the focus is more on structural timbers, a broader range of light to heavy weight species can be utilised on a mixed basis.

6.0 A synthesis of small-scale processor participation issues

Structural and practical issues have been identified that affect smallholder participation and market access. A shift to domestic processing of all logs as opposed to exports (as directed by the PNG Government's Vision and SME Policy) creates an opportunity for a significant expansion of processing capacity to process an over-bark volume of 3.9 million m³ (as exported in 2015). As a reality check, if 50% of the currently exported log volume were to be sawn domestically, around 1.9 million m³/y of logs would be available. The output of sawn timber at 35% recovery green-off-saw would be 665,000 m³/y, which would fill 33,250 X 20' shipping containers each year. The development of any strategy to achieve a shift from export to domestic log processing must be underpinned by a specific analysis of the resources available and expected supply on a development node basis. A key point is the proportion of log exports sourced from land-use conversion compared to sustainable yield selections logging. Over the period 2011 to 2015, PNG log exports included over 141 species with a wide range of appearance, mechanical and durability properties, hence a wide range of species are likely to be produced during domestic processing and markets would be required for each. While the analysis of small-scale processors focussed on portable sawmill technology, there is a need to explore the potential for small-scale peeling operations.

Combining species / product mix and the scale of output, demands the development of significant export markets for all products: if such markets cannot be found, then the scale of harvest would require reassessment to a commercially viable level. Alternatively, the sleeping giant is the PNG domestic market driven by the aspirations of the people for better quality permanent housing and population growth requiring 36,200 additional houses per year with potential to consume 742,250 m³/y of sawn timber recovered from 2,069,300 m³/y of logs and if processed by portable sawmills, 2,587 units would be required (operating on a full-time basis). Based on potential scale, the domestic PNG market is highly attractive, and allows a concentration of branded and preferred species for supply into export markets should the net margin be greater than that of the domestic market. A point of caution is that, accessing export markets is significantly more complex and expensive than domestic market supply. Any newly developed processing capacity will need to address the following:

- **Access to capital:** One barrier to the participation in the forestry sector is access to finance as most banks will not provide loans for forestry enterprises and one role of the SME Policy is to provide financial support to commence projects;
- **Infrastructure:** The development of increased capacity will required a range of enabling infrastructure from electricity supply through to road networks;
- **Labour:** A crude analysis indicates the scale of skilled and semi-skilled labour required to support increased domestic processing: 100% larger scale capacity would require 14,500 to 18,500 staff and 100% small-scale processing would require at least 30,000 staff to produce of green-off-saw boards plus 3,800 dry mill staff;
- **Political framework:** The SME Policy could lead to a perception of sovereign risk by external parties assessing PNG resources and the opportunities on offer / available. The intent of the SME Policy model is to ensure that smallholders and small-scale processors receive the main benefit by the preclusion of the larger foreign developers in a range of industries.

In order to explore and demonstrate the issues associated with small-scale processing capacity development, a series of scenarios of the different business models are presented.

7.0 Recommendations and action plan

The structure of the main report includes specific recommendations at the point in the document where an issue is identified. Those recommendations are listed in full in Appendix 1 structured as a potential action plan for further detailed consultation by PHAMA with partners.

These recommendations have also been aggregated into a summary of potential next step activity tasking's for PHAMA and partners, with some indicative costing's in Table 1. A nominal priority ranking has been assigned to the proposed activities for consideration and endorsement by PHAMA and stakeholders

Table 1: Developing a legality framework for community and smallholder timber production – key recommendations and actions.

INITIATIVE	KEY ACTIVITIES	COMPONENT TASKS	INDICATIVE TECHNICAL INPUTS	ESTIMATED COST (AUD)	PRIORITY ^{3*}
Supporting information on the smallholder forestry sector	Profile the PNG smallholder wood processing sector	<ul style="list-style-type: none"> Building on this PNG11.2 report, collect and collate data on the smallholder forestry and wood processing sector Confirm information needs and develop brief profile document/s on the smallholder sector with reference to key supply chains, markets and pricing. Distribute among PNGFA, donors and other stakeholders to improve awareness of the sector and understanding of challenges and opportunities for development. 	~ 20 days for technical input	\$20,000	Lower priority
Planning for industry development	Establish a smallholder forestry working group	<ul style="list-style-type: none"> Confirm stakeholder interest and support for a working group on smallholder forestry in PNG, with indicative focus areas of: <ul style="list-style-type: none"> Policy and planning for increasing SME involvement in the sector. Awareness and technical support for producers. Legality frameworks to enable smallholder participation. Measures to improve access to certification. 	Facilitated by PHAMA, PNGFA and others	--	1
	Strategy for industry shift to local processing	<ul style="list-style-type: none"> Undertake analysis of the market impacts of the proposed 2020 log export ban and implications for SME's, with reference to other studies and relevant policy documents. Identify strategies and action plan to maximise involvement of SME's and smallholders as the forest industry transitions to greater local processing. 	~ 20 days for technical input	\$20,000	Lower priority
	Policy development	<ul style="list-style-type: none"> Work with PNGFA to formulate a code of practice (or similar) to define the legal framework required to harvest, sell and process timber for the smallholder forestry sector, including: <ul style="list-style-type: none"> Small-scale sawmilling, Woodlots, plantations and agroforestry systems; and Plantation out-grower programs 	~ 20 days for technical input	\$20,000	3
Market information and producer support	Producer awareness programs	<ul style="list-style-type: none"> Work with PNGFA and others to design awareness and training programs for producers on: <ul style="list-style-type: none"> Forest management; Timber processing and quality; 	Depends on nature and scale of training program and travel and other costs associated with implementation	\$100,000+ Main cost associated with domestic travel	Lower priority

INITIATIVE	KEY ACTIVITIES	COMPONENT TASKS	INDICATIVE TECHNICAL INPUTS	ESTIMATED COST (AUD)	PRIORITY ^{3*}
		<ul style="list-style-type: none"> – Market requirements and awareness; – Business management; and – Other areas as appropriate <ul style="list-style-type: none"> • Conduct training in alignment with <i>Painim Groun na Planim Diwai</i> and other existing initiatives. 			
Enabling regulatory frameworks	Legal mechanism to enable smallholder involvement	<ul style="list-style-type: none"> • Ideally in conjunction with a stakeholder consultative forum (Priority 1), identify and describe options for legal mechanism/s to enable legally compliant production and sales of timber by smallholders (nominally those producing < 500m³/yr), with specific focus on possible amendments to TA processes and requirements for registration as a FIP • Identify preferred approach in consultation with PNGFA and stakeholders • Engage legal specialist to draft necessary legal documents for input into PNG Government processes 	<ul style="list-style-type: none"> ~ 20 days for technical input and consultation ~ 10 days for legal input 	\$30,000	2
Legality and certification	Finalise the PNG legality standard	<ul style="list-style-type: none"> • Work with stakeholders to develop supporting tools for application of the PNG Legality Standard • Facilitate stakeholder consultation and finalise the standard as a mechanism for demonstration legal compliance for PNG forest products • Communicate outcomes to local and relevant international markets. 	~ 20 days for technical input and consultation	\$20,000	Lower priority

*Nominal priority ranking for consideration and endorsement by PHAMA and stakeholders.



Appendix A

Detailed
recommendations

Appendix A Detailed recommendations

Table 2: A summary of the recommendations generated by the analysis and an associated action plan to address the points raised.

Finding	Issue	Recommendation	Responsible organisation
Supporting information	The development of markets and market access should be underpinned by robust and complete data.	Recommendation 1: There is a need to develop a comprehensive profile of the PNG wood-processing sector to assist in the development of forest and industry policy.	
		Recommendation 2: There is a need to develop a mechanism to capture sawn timber production data across PNG to assist with the development of Government policy and business to make investment decisions.	
		Recommendation 3: There is a need to develop a mechanism to capture data on the nature of the new houses built in PNG to assist with the development of market intelligence, Government policy and business to make investment decisions.	
		Recommendation 4: There is a need to develop a mechanism to capture PNG sawn timber price data to assist in the development of forest and industry policy.	
		Recommendation 5: There is a need to develop an integrated model of the PNG housing sector combining house construction rates by house type and the sawn timber inputs and costs to assist in the development of forest and industry policy.	
		Recommendation 6: There is a need to develop a mechanism to collate data on other uses of sawn timber in PNG markets.	
		Recommendation 7: There is a need to develop a mechanism to capture all PNG export sawn timber data to assist in the development of forest and industry policy and opportunities for expanded sawn timber output.	
		Recommendation 8: The pursuit of export markets must be informed by consideration of the current domestic markets and the price paid. A strategic approach is required to ensure supply of sawn timber into the markets with the best margin.	
		Recommendation 35: A mechanism to track the use of portable sawmills is required – this could commence with the registration of each sawmill as it arrives in PNG or at the point of sale.	
Development of future industry plans	While clear and specific policy objectives have been formulated, there is a need to develop strategies and action plans to implement such visions.	Recommendation 10: The PNG Vision 2050 includes cessation of log exports and a development plan is required to facilitate such a change. The plan should include consideration and details of the role of small-scale processors.	
		Recommendation 11: Given the Reserved Activity List inclusion of key forestry based activities (e.g. logging, sawmilling, timber yards and timber retailing), development of a facilitation plan from log exports to domestic processing must include this requirement.	
		Recommendation 15: There is a need to develop a forestry sector plan detailing the match between the forest resources available and the markets for the range of possible products. The required processing capacity and enabling infrastructure can then be determined.	
		Recommendation 49: There is a need to explore the potential to develop integrated natural forest processing capacity, plantations and a route to market for the resulting products.	
		Recommendation 41: There is a need to develop operational and marketing plans for the planted trees and wood flows resulting from the target of 800,000 ha planted tree estate across PNG.	
		Recommendation 40: There is a need to develop operational and marketing plans for the intercropped cash crops associated with the development and management of the target 800,000 ha planted tree estate across PNG. This should include consideration of the agricultural products potentially produced by the trees e.g. nuts or latex.	
Extension services and support	As small-scale processors are a primary beneficiary of any developments in regards to development of markets, there is a need for mechanisms to convey information from the	Recommendation 12: There is a need for a mechanism for the small-scale producers to make use of forest inventory information and resources pertinent to their own forests.	
		Recommendation 13: A key point in the development of small-scale processing will be extension support in technical and business management skills required to run an SME.	
		Recommendation 18: In order to maximise the benefit from resource utilisation, the smallholder resource owners should receive business skills and develop individual financial literacy skills.	

Finding	Issue	Recommendation	Responsible organisation
	source to this audience.	<p>Recommendation 24: A mechanism is required to provide forestry technical skills to small-scale processors and this could be as suggested by the PNGFA, by the development of Ward (or another level of Government) technical field staff.</p> <p>Recommendation 37: It is possible to develop a specific forest owner-training package, which can address the target topics (e.g. forest management, tree volume, log recovery and log scaling) at an appropriate level of detail and practicality.</p> <p>Recommendation 33: There is need to develop extension materials to help inform small-scale processors of the value of their sawn timber outputs with the ability to maintain currency of the information.</p> <p>Recommendation 27: A mechanism is required to ensure currency of any list of species requiring specific treatment and that there is a mechanism to disseminate such information to small-scale processors.</p> <p>Recommendation 42: There is a need to identify the PNG parties responsible for monitoring CITES related issues and to develop mechanisms to ensure compliance with the requirements of this convention.</p>	
R&D	There is a need for specific research and development activities in support of the development of markets for forest products.	<p>Recommendation 14: In implementing the NFP research policy it would be important to ensure that each target area of research is segmented into generic elements, those more applicable for large-scale production and those more suited to small-scale operations.</p> <p>Recommendation 26: There is a need to develop a process by which the species of timber can be tracked through the supply chain, where a product is to be exported.</p> <p>Recommendation 47: There is a need to document the stowage factors for sawn timbers of different species as they relate to shipping container capacity for exports.</p> <p>Recommendation 46: There is a need to document the natural durability of species and develop effective and safe treatment strategies for sawn timbers produced in village situations.</p> <p>Recommendation 45: There is a need to document the wood properties of a broad range of natural forest species, which may be suited to exports based on potential species substitution and market requirements.</p> <p>Recommendation 39: There is a need to develop a case study of the potential to include a CPU to generate cash to fund plantation development.</p> <p>Recommendation 9: There is potential to further develop industry opportunities based on harvest and processing residues and this should be explored. A first step is to quantify the scale of such materials.</p> <p>Recommendation 38: A more detailed analysis of the cost of operating portable sawmills is required to assist informing and training of small-scale processors.</p> <p>Recommendation 36: There is a need to more completely document sawn timber recovery rates from portable sawmills by review of published information and/or by undertaking sawmilling studies.</p> <p>Recommendation 48: The development of any strategy to achieve a shift from export to domestic log processing must be underpinned by a specific analysis of the resources available and expected supply on a development node basis (e.g. within a target project area).</p> <p>Recommendation 50: There is a need more fully explore the financial viability of the export markets including specific discussions with potential importers, to better develop case studies based on more complete and robust data.</p>	
Legal frameworks	There is a need to review and seek to amend the legal framework in support of the management, harvest, sales and processing of forest products.	<p>Recommendation 17: There is a need to develop a legal mechanism to allow the TA holder to supply logs for processing by the resource owners and to supply sawn timber into the TA holders supply chain.</p> <p>Recommendation 19: A review is required of the TA structure proposed in Table 4: one suggestion is that the requirements for a TA must be linked to consideration of the requirements to be a FIP. Further, the log volume classes could be reviewed to ensure simplicity. A first catch point should be that a TA is required for any commercial supply of forest products.</p>	

Finding	Issue	Recommendation	Responsible organisation
		Recommendation 20: There is a need to amend the regulatory system to develop a small-scale processor compatible framework as outlined in Section 5.9.	
		Recommendation 22: It would be of benefit to develop a template tool for each required plan to assist small-scale processing operations to be compliant with the Papua New Guinea Logging Code of Practice.	
		Recommendation 23: It would be of benefit to develop a planted trees and smallholder / small-scale processor version of the Papua New Guinea Logging Code of Practice as a subset of the current document rather than as a standalone document.	
		Recommendation 43: There is a need to develop mechanisms and tools to allow compliance with the Papua New Guinea Logging Code of Practice, in particular the requirements to harvest on a selective cut basis.	
		Recommendation 44: There is a need to explore the options to adjust the PNG HTS listings to be species specific as a tool to assist in the export of timber products and aid compliance with CITES and legality requirements.	
		Recommendation 25: There is a need for a mechanism or documented pathway to allow the aggregation of sawn timber and other forest products for export by a party acting as an aggregator.	
		Recommendation 30: There is a need to engineer mechanisms where small-scale processors operating on customary land can be compliant with the legal framework and achieve certification. Under such conditions the PNGFA required bond should be reviewed for relevance.	
		Recommendation 17: There is a need to develop a legal mechanism to allow the TA holder to supply logs for processing by the resource owners and to supply sawn timber into the TA holders supply chain.	
		Recommendation 29: There is a need to explore the threshold of production above which <i>FIP</i> registration is required. This could include the approach to make any commercial production captured by the need to become a <i>FIP</i> .	
Policy frameworks	There is a need to develop specific policy frameworks in support of the sector: either by standalone documents or by amendments to current policy documents.	Recommendation 34: Given the scale of portable sawmilling in PNG, development of specific policy framework is required to assist and guide this subset of the forest industry sector.	
PNG legality standard	Their current PNG legality standard required amendment and the development of supporting tools.	Recommendation 28: There is a need to revisit and revise the PNG legality standard, as per the list of issues noted in Section 7.6.	
Certification	While a voluntary tool, there is a need to consider mechanisms to allow cost effective access to certification by small-scale processors.	Recommendation 31: There is potential to expand the certification base for PNG by the development of a PEFC standard, either for PNG or on a pan-Pacific basis (see Section 8.10.2).	
		Recommendation 32: The approach to certification taken by other Pacific nations could be documented and where appropriate, used to guide development of PNG specific systems.	