Australian Government
Australian Centre for
International Agricultural Research

ENHANCING KEY ELEMENTS OF THE VALUE CHAIN FOR PLANTATION GROWN WOOD IN LAO PDR

Log grading

Part 2 A manual for the Lao PDR sawmilling sector

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VALTIP2

Contents

Glossary

ACIAR	Australian Centre for International Agricultural Research
Burma	Myanmar is the alternative name for Burma adopted by the military junta in 1989. This report follows ACIAR's use of the English name Burma, except where referring to Myanmar Government.
Butted	Removal, usually by chainsaw, of a disc off the end of the log to exclude or reduce defect/s
Butt log	The log removed from the lower section of the tree, above the stump.
Checks	The separation of wood fibres, often due to shrinkage.
Grading	Grading separates logs into quality groups, providing a way in which buyers and sellers can agree on value.
Grading system	A system that allows: • the sawmiller to consider the end product, enabling them to purchase only the required quality for intended purpose; • the seller to offer their material at a fair and competitive price.
Lao PDR	Lao Peoples Democratic Republic (preferred by ACIAR, instead of Laos or Lao).
Quality	The combination of characteristics of a tree and its parts that permits the best use of the wood for the intended purpose; the intrinsic wood quality is defined in terms of the suitability of the wood for various products or end uses.
Rot	Decay.
SEDUB	Small end diameter under bark.
Splits	A wider separation of fibres along the grain.
Sweep, bend	The curvature along the axis of the log.
Wane	The absence of wood due to the natural, external shape of the log.
Want	The absence of wood due to mechanical damage.

Part 2: A log grading system for Lao PDR

Introduction

The following log grading system has been developed as an activity within the ACIAR Project FST*I*2010/012 *Enhancing key elements of the value chains for plantation-grown wood in Lao PDR*. Within this project, Activity 2.2 is 'Improve or implement log grading/segregation activities at the mill prior to processing' with the required output being a user-friendly manual for log grading and segregation rules for SME sawmills in Lao PDR. This document is provided as that output.

The aims of this Manual are to provide a benchmarking system for log quality, to help growers achieve a fair value for their trees, and to enable sawmillers to specify and pay for logs of a known quality, ensuring that the wood and products will meet the requirements of their customers.

The guidelines are issued as a first edition and may be superseded or refined in the future if the needs of the stakeholders change, the nature of the resource changes (for example through improved silvicultural management resulting in higher quality logs), or if new products and markets are developed that require a different suite of grade descriptors than those provided here.

These guidelines were developed after a review of the literature and assessment of current practices and log qualities during factory visits in Lao PDR. The rules build on the current system, which is based on dimension only, by adding quality parameters relevant to the target end products (furniture, door and window joinery, flooring and decking).

Documentation

It is recommended that a Wood Purchase Agreement is drawn up between the supplier and processor, listing the desired volume, minimum grade quality and dimensions. This order should specify if chainsaw-hewn squares are acceptable or only sawn squares with a higher quality surface such as produced by a bandsaw or circular saw. The order should also note if nails, screws, barbed wire or other metal fittings and foreign objects are to be removed prior to delivery.

The supplier should supply all relevant and necessary documents in accordance with Lao PDR legislation, where applicable, such as:

- *Plantation License* details
- *Cutting Permission*
- *Wood Moving Agreement* as issued by the District Forest Office and village if required;
- *Wood Moving Certificate* issued by Province or Prefecture Forest Office noting the total volume allowable for transport;
- *Loading Certificate*;
- *Bonded Transport Certificate*;
- *FSC certification* details if applicable;

Ideally the seller's representative and the purchaser should check the volume and grade quality together and agree on all aspects of the transaction at this time.

Pricing

Fair prices are a matter of agreement between the grower and purchaser, although it is expected that rates might increase from chainsaw-hewn, to sawn squares, due to the higher surface quality and implied higher recovery in the latter.

A buyer's premium of 10% could apply to logs from certified plantations, for example forest Stewardship Council FSC Certification.

Transport costs will be negotiated between seller and the factory and should reflect the haulage distance from the supply region to the factory gate.

Square billets

Minimum length

Square billets and round logs will be cross-cut to maximise straight lengths in accordance with the buyer's written specification for length. In most cases this will be 2.0 to 2.2 m.

Shorter lengths may be supplied by agreement between both parties.

Section sizing

Logs should be sawn to maximise face width, removing most of the bark. Sapwood is permitted as described in the heartwood minimum thresholds for each grade unless specified in writing to be excluded. The narrowest face should be no less than 10 cm.

Billet mensuration

The length will be measured as the shortest length (if the end cut is sloping and not square to the long axis) or the end of a split where a severe end split is present.

Section sizes will be measured on the smallest face and rounded down to 10 cm (10 to 14.9 cm), 15 cm (15 to 19.9 cm), 20 (20 to 24.9 cm), etc.

Round logs

Minimum length

Square billets and round logs will be cross-cut to maximise the length in accordance with the buyer's written order specification.

Log mensuration

The length will be measured as the shortest length if the end cut is sloping.

Where a severe end split that would affect sawn recovery is present, a reduction in length may be recorded as agreed by the seller and purchaser representatives so that the volume paid for is reduced accordingly.

Log storage and handling

If logs are to be held in storage for prolonged periods before sawing, bark should be removed to prevent insect infestation and reduce the potential for damage to occur.

End-sealers should be used to retard development and severity of end checks.

Fungicides may be necessary to prevent against sapstain during the wet season where end products can’t tolerate sapstained sapwood components.

Log segregation

Logs and billets should be arranged on bearers to keep feedstock off the ground and avoid contamination with rocks and grit.

Logs and billets should be arranged in batches according to grade quality so they can be easily selected to match product orders.

Within graded batches, logs and billets should be arranged by diameter or section size, so that sawing patterns are the same for a batch.

Grade descriptions

Classes are designated by alpha characters in preference to of numeric descriptors. This was adopted due to the inconsistent use of numeric systems in hardwood grading classifications between different countries, e.g. 1 is best in USA and SEALPA countries but 1* is the lowest grade in Burma; whereas A grade always defines the best quality.

A grade

- best quality sawlog or square section billet
- suitable to produce feedstock for exposed components in high quality furniture, doors, windows, flooring and decking.

Heartwood visual estimate of heartwood proportion on log or billet end: ≥60%

Square section billets- minimum diameter heartwood for A grade

Section size (cm)	Minimum heartwood diameter (mm)
10 x 10	87
15 x 15	131
20 x 20	175
25 x 25	219

Round logs- minimum diameter heartwood for A grade

Log diameter (cm)	Minimum heartwood diameter (mm)
10	77
15	116
20	155
25	194
30	232

Decay not permitted, check billet/log ends and knots

Knots <5 cm Ø maximum of 3 knots per 2.0 m length
>5 cm Ø not permitted

Knot holes not permitted

Insect holes/galleries not permitted, includes beetle, moth and termites

Sweep maximum deviation 3% of length (e.g. 6 mm per 2.0 m length)
double bends are not permitted

Want/ wane	visual estimate of face area: ≤5%
Splits	severe splits: reduce measured length to allow for effect of split
Stain	not permitted, unless within the want and wane tolerance
Fluting	diameter of rounds logs with excessive fluting shall be measured excluding the irregularity (diagram)

B grade

- medium quality sawlog or square section billet
- suitable for feedstock for some exposed components and all hidden components in furniture, doors, windows, flooring and decking

Heartwood visual estimate of heartwood proportion on log or billet end: ≥40%

Square section billets- minimum diameter heartwood for B grade

Section size (cm)	Minimum heartwood diameter (mm)
10 x 10	71
15 x 15	107
20 x 20	143
25 x 25	178

Round logs- minimum diameter heartwood for B grade

Log diameter (cm)	Minimum heartwood diameter (mm)
10	63
15	95
20	127
25	158
30	190

Decay not permitted, check billet/log ends and knots

Knots no limits if sound

Knot holes permitted if <5 cm Ø maximum of 3 knot holes per 2.0 m length

holes >5 cm Ø not permitted

Insect holes/galleries permitted if within the surface area limits equivalent to knot hole limits

Sweep maximum deviation 5% of length (e.g. 10 mm/2.0 m)

double bends are not permitted

Want/ wane visual estimate of face area: ≤20%

Splits severe splits- reduce measured length to allow for effect of split

Stain permitted

Fluting diameter of rounds logs with excessive fluting shall be measured excluding the irregularity (diagram)

C grade

- lower quality
- utility sawlog

Heartwood	measure diameter of heartwood on log or billet end: ≥40 mm
Decay	permitted
Knots	no limit
Insect holes/galleries	no limit
Sweep	no limit; double bends are not permitted
Want/ wane	no limit
Splits	severe splits- reduce measured length to allow for effect of split, use reduced length for volume calculation
Stain	no limit
Fluting	diameter of rounds logs with excessive fluting shall be measured excluding the irregularity (diagram)