

Salwood Asia Pacific Pty Ltd

- Services in Forestry

ABN : 15 108 926 656

**35 Steinwedel St
Farrer, ACT 2607
Australia**

Ph 61 2 61615906

Fax: 61 2 61615905

E-mail: stephen.midgley@salwood.com

Position Paper on Tree Plantation Sector Development in Lao PDR

Stephen Midgley

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List of Acronyms

ADB	Asian Development Bank
CPI	Committee for Planning and Investment
DDFI	Department of Domestic and Foreign Investment
DoF	Department of Forestry (Ministry of Agriculture and Forestry)
GDP	Gross Domestic Product
GoL	Government of Lao PDR
GTZ	German Technical Cooperation
IUCN	The World Conservation Union
JICA	Japanese International Cooperation Agency
LDSC	State Company for Land Development and Services
LPA	Lao Plantation Authority
MAF	Ministry of Agriculture and Forestry
NLMA	National Land Management Agency (as of July 2006, Department of National Land Use Planning and Development (DoNLUPaD, Prime Minister's Office) and Department of Land (DoL, Ministry of Finance) were merged.
NBCA	National Biodiversity Conservation Area
PEFC	Programme for the Endorsement of Forest Certification Schemes
PAFO	Provincial Agriculture and Forestry Office
PMO	Prime Minister's Office
Sida	Swedish Aid
TFT	Tropical Forest Trust
WWF	Worldwide Fund for Nature

Exchange Rate.

An exchange rate of US\$ 1 = 10,000 LAK has been used in this study. In September, 2006, the market rate was US\$ 1 = 10,100 LAK

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Consultant: Stephen Midgley
Salwood Asia Pacific Pty Ltd
Canberra
Australia
salwood@netspeed.com.au

Summary

Global demands for wood and wood fibre are increasing substantially, particularly in regions that combine high economic growth and population growth. Demands for paper products correlate closely with economic growth and the strongly growing economies of India, China and South East Asia are having a strong influence on global patterns of investment and resource development. Demand for high-value certified hardwoods for flooring and furniture remains strong as the sophisticated markets of North America and Europe become environmentally aware. In addition, world demand for products made from natural rubber is increasing and will continue to do so as strong oil prices limit the competitiveness of oil-based synthetics. Long term price trends for hardwood pulps and natural rubber are positive and market indicators suggest long-term stability. This confidence is reflected in the expansion in processing capacity to produce hardwood pulps in tropical and sub-tropical Asia.

In response to these global and regional influences, productive plantations worldwide have expanded by 2.5M ha per year over the past 5 years and currently 50% of the global industrial wood is supplied from a productive plantation area equivalent to 2.8% of the world's forest area. Most of the increase in the plantation areas has occurred in Asia where the main species planted have been fast-growing, short-rotation species such as *Eucalyptus* and *Acacia* and longer-term species, *Hevea brasiliensis*, Teak (*Tectona grandis*) and *Pinus* spp.. Globally there are now over 16M ha of commercial eucalypt plantations, 1.8M ha of tropical acacias and over 10M ha of rubber. Eucalypts now provide the raw material base for 40% of global supply of hardwood pulps. All of these species grow well in Laos and areas have expanded in recent years.

Responsibilities to shareholders, clients and the communities they serve have committed most responsible modern commercial plantation companies to sustainable business practices which move business development towards ecological, social and economic sustainability and a commitment to good corporate governance. The 4 core principles emerging to encompass the concept of sustainable plantation management are:

1. Sustainable productivity (and profitability)
2. Social Sustainability
3. Environmental Sustainability
4. Corporate Governance

These principles are consistent with several codes and guidelines offered by CIFOR, ITTO, FAO, IFC/World Bank, WWF and international schemes for certification and will form the cornerstones for national standards being developed for Lao PDR.

It is within the environment of emerging international principles for sustainable plantation forestry, corporate principles for sustainability and increased regional needs for raw materials that Lao PDR has embarked upon its expanded plantation program.

The Government of Lao PDR has firm policies which are clearly directed towards economic growth and poverty alleviation and has recognised the plantation sector as one of the highest priorities leading towards economic growth and increased revenues. There is a strong and attractive logic for Lao PDR to expand its plantation sector – the wood fibre, rubber and solid wood markets are strong and regional; population densities are low; there are significant areas of degraded and underutilised forest land (900 000 ha in the 5 provinces of central Laos alone) and the bio-climatic conditions suit the suite of plantation species of main commercial interest to an expanded plantations sector; eucalypts, acacias, rubber and teak. These all grow well on appropriate sites providing adequate silvicultural and management inputs are made.

Whilst policies, laws and a Forestry Strategy are in place to support plantations expansion, the complex series of laws, decrees and regulations relating to land use and allocation are unclear with considerable ambiguity surrounding authority, responsibilities and enforcement. This and the capacity to adequately manage these tasks to suit both major investors and smallholders remain the largest challenges facing the implementation of policies to expand the plantations sector. Allocation of State land is a very sensitive issue and will be an important task for the National Land Management Agency and the proposed Lao Plantation Authority.

Despite supportive policies, laws, regulations and a comprehensive Forest Strategy, the Lao PDR lacks a single coherent vision for their plantation expansion. Such a vision would offer a clear operational focus for the GoL, domestic stakeholders and foreign investors and would reflect GoL aspirations for international standards; it offers a clear context for sector strategies and support services.

The Lao Plantation Authority is soon to be established and will offer an opportunity for the GoL to provide a focussed service to the plantation sector. It is vital that this new authority enjoys the support and confidence of all government, public and investor stakeholders. Without this support, there is a risk that it will simply add to the lack of clarity in process for investment and operation of the plantations sector

Recognising the inherent attraction of plantation investment in Lao PDR, a number of global corporations have commenced plantation operations in Laos (Oji Paper, Aditya Birla Group) or are actively considering options (Stora Enso, UPM, APP). Most of these companies bring significant skills and experience in management of extensive commercial plantations and most have experience in dealing with smallholder partners. Most of the larger companies have clearly enunciated and unambiguous policies relating to sustainable plantation management, environmental care and respect for the societies and cultures within which they operate. Demonstrated capacity for a successful sustainable plantation business and a clear commitment to Corporate Social Responsibility are two vital criteria for consideration of large investors in Lao PDR.

Given that the drafting of such standards may take some time and discourage potential investors, the GoL may wish to consider adopting a system of self-defined standards for carefully selected international investors. In return for the stability and economic opportunity offered by Lao PDR, investors would commit to the proposed Lao Vision and the principles of sustainable plantation management and respond in detail in their applications to CPI. The details offered in the application will include verifiable indicators of compliance and form the basis for a formal contract. These details will also be the basis upon which the investment project is monitored and audited annually. Immediately a concession has been allocated, the company will

arrange for baseline colour satellite imagery (suggested 2.5 metre resolution) to be provided to the CPI as a tool in project monitoring and auditing. This approach has the benefit of corporations committing to their own high public standards which are consistent with national standards in the countries within which they operate. The use of satellite imagery and GPS in reporting and monitoring provides unambiguous focus and reduces the need for extensive field monitoring of project progress.

The national policies directed towards poverty alleviation make it imperative that accrual of real benefits for rural families and communities through an expanded plantations sector comes through the creation of wealth and assets via a number of means including:

- Smallholder ownership of plantations (assets)
- Sale of produce – wood, latex etc. (wealth)
- Improved infrastructure (improved access to markets, schools, hospitals)
- Development of skills and alternative employment opportunities
- + employment

Employment opportunities are important but only a part of the package of benefits offered by plantation forestry. Examples of successful and profitable smallholder involvement in commercial rubber and eucalypt plantations in NE Thailand and southern China, offer confidence that Lao smallholders can effectively engage with investors to contribute to wood flows of commercial wood and supplies of natural rubber latex and for the smallholder growers to benefit considerably from this activity through sales of produce. Similar benefits are beginning to accrue to smallholder teak plantings in northern Laos.

Whilst benefiting from a plantations strategy and contributing to wood flows and harvests of natural rubber, smallholdings face risks at both technical and market levels. Rubber smallholders are involved currently in a substantial and uncontrolled expansion of planting but have few sources of support as exist in Thailand and Malaysia, no standard contracts and no market information. Some of the reasons identified for the limited success of earlier ADB-funded plantation eucalypt initiatives in Lao PDR included lack of high quality technical back-up,

financial advice and market information. These are clear areas of attention for future development and will be partly addressed through the adoption of the proposed 2 + 3 Model (or equity model) where the farmer provides land and labour(2) and the investor offers technology, finance and market access (3). As smallholder systems emerge there is a role for involvement in growers' associations such as the Lao Tree Plantation and Cash Crop Business Association (LTPCCBA) and the Sustainable Tree Plantation & Livestock Promotion Association (STPL).

The study recommends that:

- Lao PDR adopts the set of 4 guiding principles for its plantations sector consistent with the concept of sustainable managed plantations. These principles are entirely consistent with national policies and laws and the Forestry Strategy.
- A Lao Vision be adopted for the expansion of the plantations sector in Lao PDR. This will bring together the context and the spirit of the existing policies, laws and national aspirations, and have resonance in both Lao language and culture and in foreign languages. The term *A World Class Sustainably Managed Plantation Sector* might be considered.

The study recognises that the development of national standards is an important task for which GoL might require some assistance. These

standards will be guided by guidelines and codes developed by CIFOR, ITTO, FAO, IFC/World Bank, WWF and international schemes for certification.

In creating an enabling environment for the range of small, medium and large investors in the Lao plantations sector, a number of institutional clarifications are urgently required and it is recommended that action be taken to compile and clarify laws, clarify processes and authorities, timelines and responsibilities within these processes. This clarification would be the basis for a clear road map for investment in the plantation sector of Lao PDR.

If Lao PDR is to secure the interest of world plantation leaders it is recommended that it send a clear, consistent and positive message to these investors.

- Lao PDR has land and supportive policies
- Lao PDR would like to encourage investment from companies/ groups willing to share the Lao Vision for World Class Sustainably Managed Plantations.
- Consistent with national policies, Lao PDR expects a strong commitment to smallholder wood production as part of sustainable plantation management.
- GoL will engage in positive dialogue with selected major companies at a senior level.

1

Global Trends and Regional Influences

1.1 Global Trends.

Population, economic growth and changes in demographics have a great influence on world demand for primary wood products. The largest global wood demand is for fuelwood, mostly in developing countries, but increasing wealth results in a steady shift towards industrial wood products (sawntimber, panels and paper). While there is an obvious increase in total consumption of wood products with population growth, per capita consumption has remained relatively static (de Fegely, 2005). Technological changes such as new processing technologies, recycling and recycling, and environmental issues have strongly influenced wood demand and consumption. Consumption is influenced by demographic changes as people in developing economies shift from rural to urban regions and styles of consumption change.

In Asia much of the growth in demand has been supplied from natural forests – often feeding exports to developed countries that have significant areas of forests locked away in

conservation reserves. The Philippines and Thailand are good examples of physically exporting themselves out of forest products. The Philippines was a major exporter of plywood in the 1960s and early 1970s and Thailand was in the 1980s until both countries virtually exhausted their natural forest supply which has subsequently meant that both countries are now net importers of forest products (de Fegely, 2005).

The strongest demand for forest products occurs in the regions that have a combined increase in population and economic growth such as China, India and the countries of Asia with strongly developing economies. Consumption of paper and board offers a good example of changing demand with increasing GDP; as people become wealthier, their consumption increases (Fig. 1.1). Although the trend breaks down as wealth increases and cultural preferences have greater influence, as a rule of thumb the maxim holds for countries with relatively low per capita GDP.

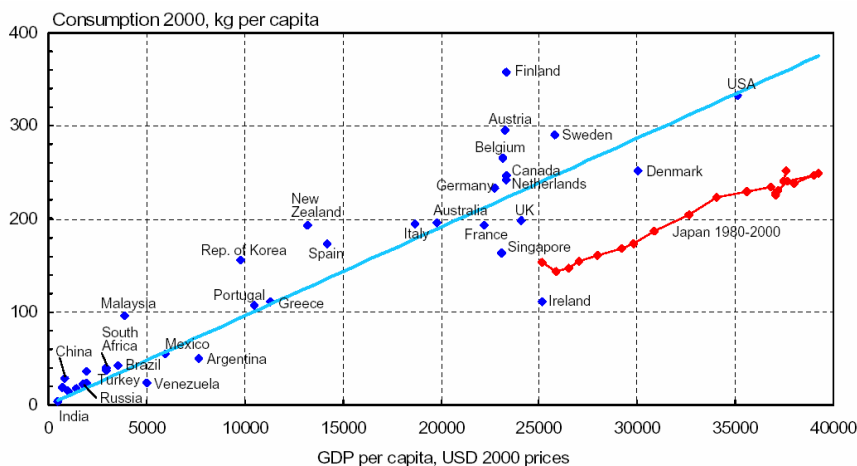


Figure 1.1. Paper and Board Consumption (kg/capita) and per capita GDP for selected countries. Source: Jaakko Poyry International

Global demand for papermaking fibre is anticipated to grow by around 2.0% per annum from around 320 million metric tonnes (mt) in

2003 to 490 million mt by 2020 (de Fegely, 2005) (Fig.1.2)

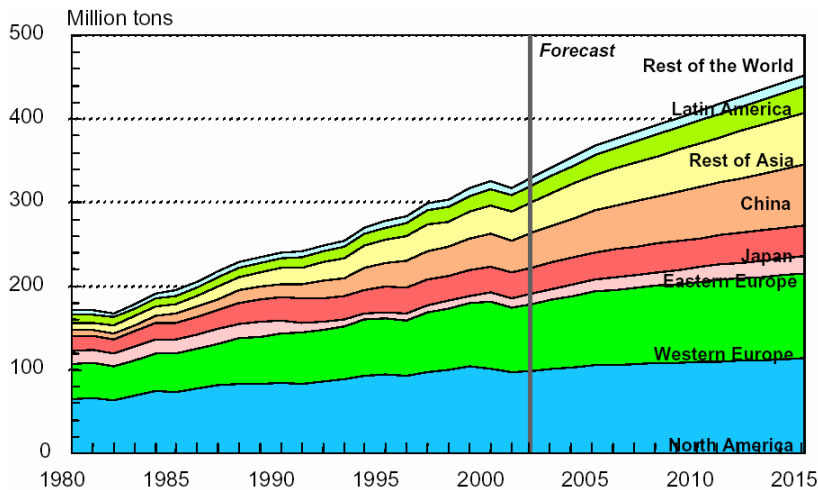


Figure 1.2. World Demand for Paper and Paperboard (Courtesy Jaakko Poyry Consulting).

Studies indicate that demand for other wood products will increase. Demand for sawn timber and panels are expected to increase by

around 1 to 1.6% per annum rising from around 590 million m³ in 2003 to around 770 million m³ in 2020 as shown below in Figure 1.3

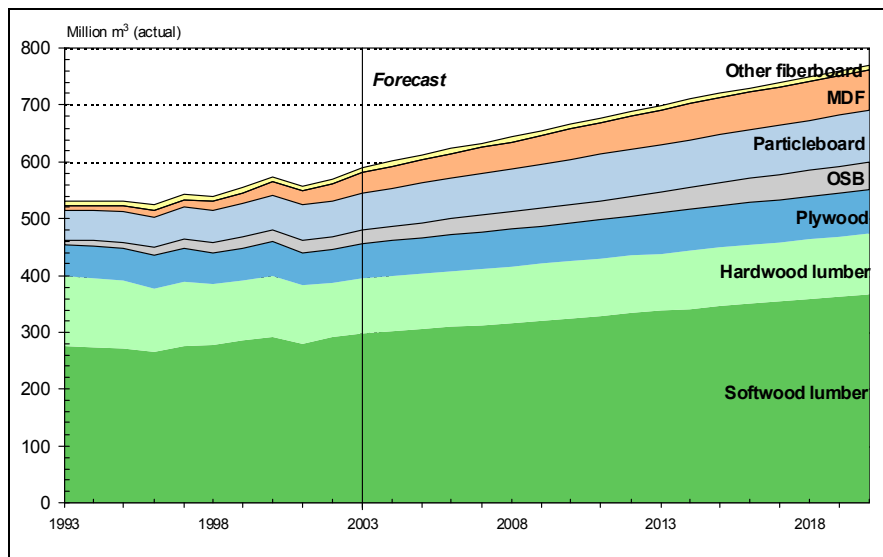


Figure 1.3: Global Wood Products Demand 1993 to 2020 (de Fegely, (2005), Jaakko Poyry Consulting).

The potential for forest plantations to meet this demand for wood and fibre for industrial uses is increasing. Although accounting for only 2.8 % of global forest cover (109M ha), in 2005 productive forest plantations supplied about 50 % of global industrial roundwood (FAO, 2005). In some countries such as Australia, New Zealand, Chile and Brazil, forest plantation production contributes the majority of industrial wood supply.

In addition, the global rubber markets are growing. The world's consumption of rubber is

about 20M tonnes made up of 11.9M tonnes of synthetic rubber made from oil and 8.8M tonnes of natural rubber derived from an estimated 10M hectares of tropical plantations of the tree, *Hevea brasiliensis*. Total rubber consumption is expected to increase to 30M tonnes in 2020. The major exporters of natural rubber are Thailand, Indonesia and Malaysia which accounted for 84% of 2005 world exports. The major importers are China, USA and Japan which accounted for 53% of 2005 world imports

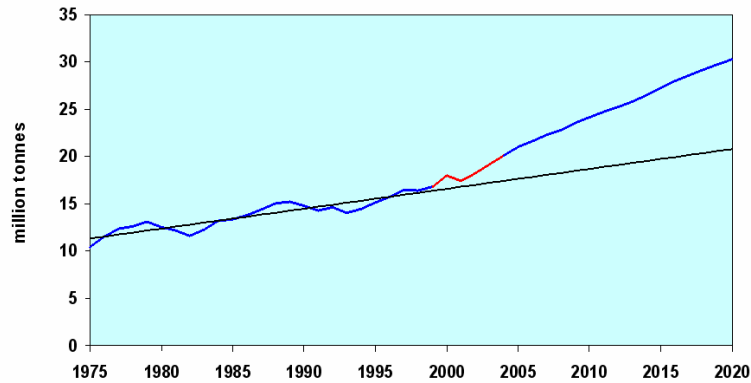


Figure 1.4. Predicted global increases in rubber demand to 2020 (synthetic + natural). (Yium Tavarolit, IRCO. 2006)

Natural rubber is an important raw material used for the manufacture of more than 40,000 products, including over 400 medical devices. It currently comprises 42% of the world’s total rubber consumption (synthetic plus natural) increasing from 39% in 1999 and demand has grown at 4.7% annually since 1999. Due to its high performance properties, natural rubber is an essential raw material used in a variety of products.

Globally, productive forest plantations have increased by 2.5 M ha per year over the past 5 years, and the largest part of this increase has been in Asia (Fig. 1.5). Part of this increase has been in high value hardwoods (such as teak) which will meet a niche offered through the reduced availability for wood from native forests.

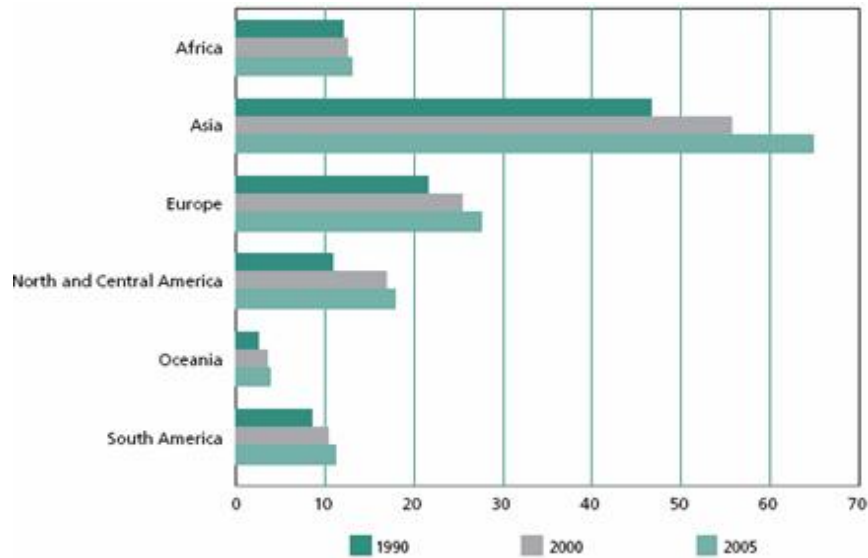


Figure 1.5. Changes in forest plantation area 1990 – 2005 (million ha) (FAO, 2005).

1.2. Regional Influences.

Regional demands for wood products, rubber products and plantation-grown wood have increased dramatically in recent years and this has been reflected in regional plantation programs. The main species planted in Asia are

fast-growing, short-rotation species from the genera *Eucalyptus* and *Acacia*, longer-term species *Hevea brasiliensis*, Teak (*Tectona grandis*) and *Pinus* spp. (Fig. 1.6).

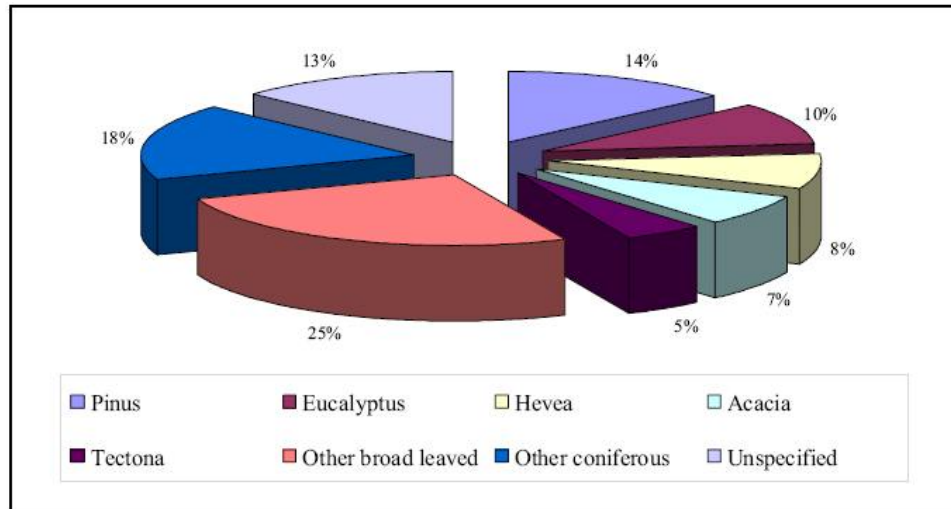


Figure 1.6. Species planted in Asia and the Pacific (McKenzie, *et al*, 2004)

At the regional level, changing and increasing demands for wood fibre are changing trade patterns and offering new opportunities for suppliers of wood raw materials. China's

booming economy and increasing demand for wood and wood fibre products has created a large and influential regional market (Fig. 1.7).

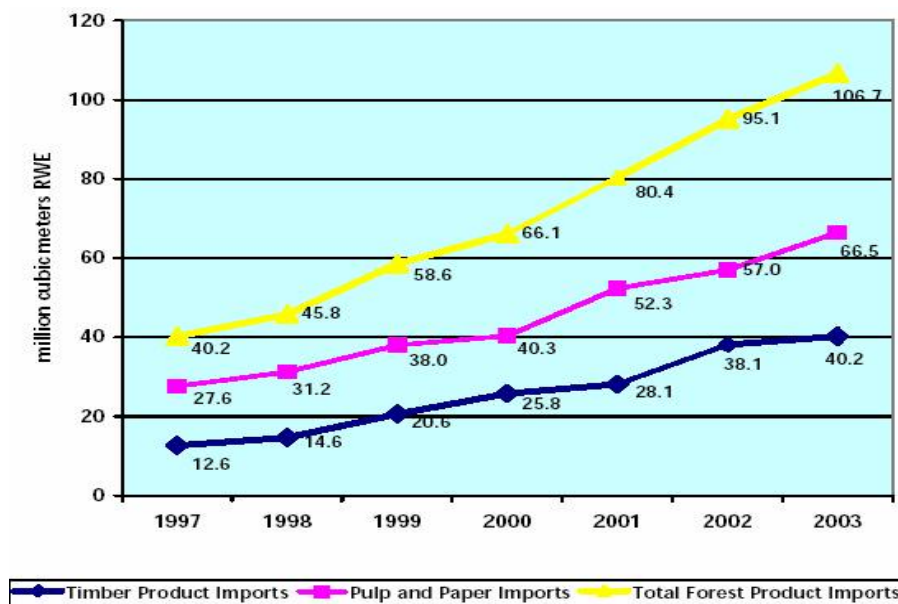


Figure 1.7. Increase in China's wood imports 1997 – 2004 (Source: Sun *et al*, 2004)

One part of this is China's wood chip imports. For the first time, China became a net importer of wood chips in 2005. From a high of 1.6 million BDMT (bone dry metric tonnes) of hardwood chip exports in 1995, China has substantially reduced exports and predictions are that imports will reach 1.6 million BDMT in

2007 (Flynn, 2005) (Fig. 1.8). China's need to import pulp is based upon the substantial increased demand from newly installed pulp mills. Despite a significant expansion in areas planted to fast-growing, high-yielding plantations, it is expected that China will remain an importer of wood chips.



Figure 1.8. China’s Hardwood Chip Trade (Source: Bob Flynn, Wood Resources International).

Other regional influences include Vietnam’s burgeoning wood furniture export industry. Over the past 10 years, Vietnam’s exports of wood furniture have increased dramatically to the stage

where Vietnam now has a modern, high quality industry and is ranked 4th in the world’s wood furniture exporters (Fig. 1. 9).

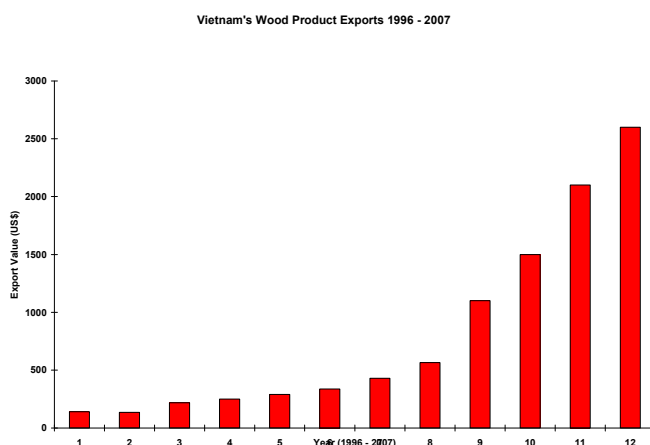


Figure 1.9. Vietnam’s growth in wood exports (Midgley (2006))

This industry has been largely fuelled by increased wood imports which have risen to 80% of the exports. In addition, the industry is responding to the shortages of rubber wood. As prices for natural rubber latex have become more attractive, less rubber wood is available with the result that manufacturers are looking for suitable substitutes. Plantation hardwoods, particularly acacias and eucalypts, are now filling this specialist niche.

The Vietnamese industry and the needs of the Chinese export furniture industry (the world’s #1) are stimulating demand for high value hardwoods such as teak. The physical and aesthetic qualities of teak have given it a worldwide reputation as a premium timber. It is highly sought after for shipbuilding and the manufacture of both interior and exterior

furniture. The current total global production of teak, around 3 million m³ annually, is small in relation to the total volume of world timber production, but teak is recognized as a high-value hardwood in global timber markets. It enjoys special status and has sustained strength in the marketplace.

India remains the world’s largest market for teak wood (Somaiya 2005; Padmanabha 2006). In the early 1980s the overall size of the teak market in India was 7.5 million m³ annually. All teak logs consumed in India are now imported — 2.5 million m³ of logs in 2005 (Padmanabha 2006). About 60% of the teak imports to India are from plantations in countries in West Africa, and Central and South America. There are fears within the teak industry that supplies of teak logs

from Africa will be constrained within five years and that shortages will become critical.

In recent years, steady and increasing demand for wood fibre products and attractive prices for products from regional plantations have offered encouragement to regional plantation development. There has been a great expansion

in capacity to produce high quality wood pulp from raw material provided from plantations. In addition to expanded capacity in Thailand, there are new mills in southern China which require substantial quantities of wood chips (Fig. 1.10).

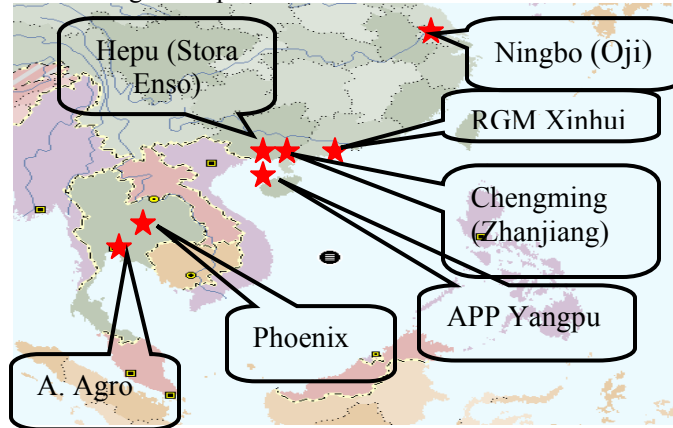


Fig. 1.10. Locations of expanding wood fibre processing facilities – established and proposed.

The demand for pulp and paper is set for long-term increase in the region and this is reflected in recent prices. The prices for bleached Kraft pulps from both eucalypts (from South America)

and acacias (from Indonesia) have steadily increased over the past 4 years (Fig. 1.11).

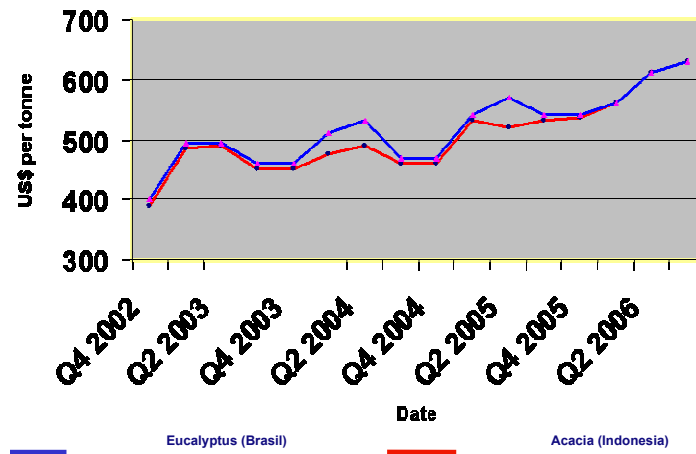


Figure 1.11. Spot prices (China) for Eucalypt and Acacia Bleached Kraft Pulps.

The plantation areas to service the needs of a modern bleached Kraft pulp mill are substantial. Figure 1.12 (modified from Barr and Cossalter, 2004) offers an indication of areas of productive plantations required for mills of various sizes. Pulp mills are highly capital intensive

investments and their success depends upon reliable supplies of wood chips at acceptable mill door prices. An indicative cost of a green field mill of about 800 000 tonnes per year output capacity is US\$ 1.1 billion.

Mill (Adt/yr)	Capacity	Wood demand (M m ³ /yr)	Net plantation area needed (ha)				
			15 m ³ /ha/yr	18 m ³ /ha/yr	20 m ³ /ha/yr	25 m ³ /ha/yr	30 m ³ /ha/yr
500000	2.1	154,000	128,000	115,000	92,000	77,000	
800000*	3.3	246,000	205,000	184,000	148,000	123,000	
1000000	4.1	307,000	256,000	231,000	184,000	154,000	
1200000	5.0	369,000	307,000	277,000	221,000	184,000	

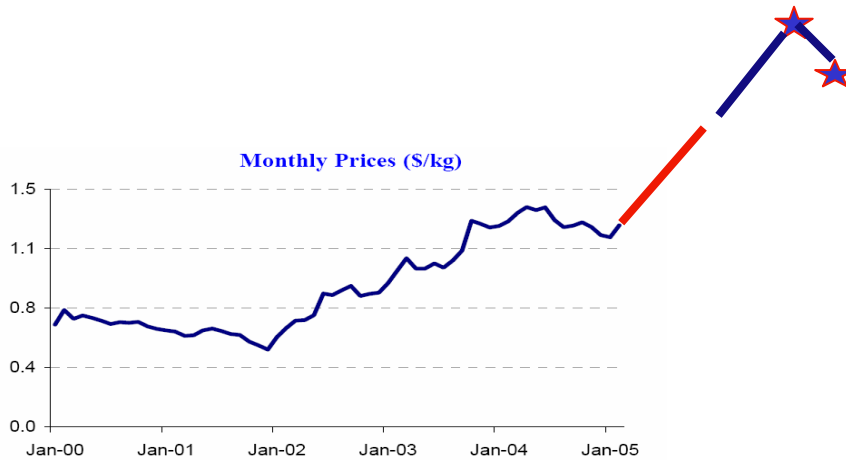
Figure 1.12. Wood Demand/ Plantation areas to serve BHPK mills¹.

¹ Assumptions: 4.15 m³ roundwood (solid wood under bark) produces 1 Adt BHPK; Plantations managed on 6 year rotations and 10% volume is non-commercial

With current low growth rates being achieved in Lao PDR for eucalypt plantations (~15 m³/ha/yr) an effective plantation area of about 250 000 ha would be required. This demand could be reduced to 150 000 ha should sustainable plantation productivity be increased to 25 m³/ha/yr.

Similarly, the prices for natural rubber have increased over the past 6 year, from a low of

US\$650 per tonne in 2000 to a record high (in some regional markets) of US\$2600 per tonne before falling to US\$1800 in September 2006 (Fig.1.13). China's total rubber sales have risen to US\$12 bill and production is highly dependent upon imports from regional countries, particularly Vietnam.



Source: World Bank

Figure 1.13. Prices for natural rubber latex 2000 – 2006 (World Bank data and derived sources)

The global trends and regional influences offer a strong logic for consideration of the development of a vibrant and modern plantation sector in Lao PDR. Lao PDR is strategically located for many of the major wood fibre investments in the region; it has climate and soils suitable for growing wood fibre and rubber plantations and presents few technical risks. The demands for raw materials are substantial and are strongly correlated with regional economic growth and offer Laos opportunities to attract long-term and

sustainable investments. In comparison with other countries in the region, population densities in Lao PDR are low. This leads to a simplified perception that Laos has considerable areas of vacant land which is available for commercial plantations. This perception must be tempered with the social realities that whilst lands might be underutilised, they are rarely unused. Plantation development in Lao PDR must balance the needs of society and a large and unique biodiversity with the imperatives of production and profit.

2

The Main Species and Products

The main species of interest to a commercial plantation sector in Lao PDR will be those for wood fibre, rubber and high value hardwoods. Given global trends and regional influences, it is likely the species used will be eucalypts and acacias (for wood fibre and solid wood), rubber and teak.

2.1. Eucalypts:

The genus *Eucalyptus* comprises some 700 species, all but two of which occur naturally in Australia. Despite the large number of species, the global commercial use of eucalypts is based on a relatively few species. According to Eldridge *et al.* (1993), the ten most important eucalypts, in terms of current annual increment of wood, would include: *E. grandis*, *E. camaldulensis*, *E. tereticornis*, *E. globulus*, *E. urophylla*, *E. viminalis*, *E. saligna*, *E. deglupta*, *E. exserta*, and then either *E. citriodora* (*syn Corymbia citriodora*), *E. paniculata* and *E. robusta*.

Eucalypts have grown vigorously as exotics in other countries, demonstrating a tolerance of a wide range of environmental conditions. They have been planted as exotics for over 150 years and can now be found in over 100 countries in the tropical, sub-tropical and warm temperate regions of the world. From an estimated global plantation base of 700 000 hectares in 1955, the area of planted eucalypts has increased to over 16 million hectares in 2005 (Table 1). Davidson (1995) observed that these data indicate that eucalypt plantations worldwide have doubled each decade since 1960.

Several million hectares of additional equivalent area is estimated to have been planted to eucalypts on farms and in other rural areas (such as China's 4-round plantings along roadsides, canal banks, railway embankments and on common lands) as single trees and in lines and small groups.

Country	Area (ha)
Argentina	250 000
Spain	350 000
Vietnam	350 000
Chile	360 000
Uruguay	400 000
Thailand	480 000

Country	Area (ha)
Portugal	500 000
South Africa	538 000
Australia	600 000
PR China	1 500 000
Brazil	3 617 000
India	4 800 000

Table 2.1. Countries with major eucalypt plantations. (ha)

These areas are expanding rapidly. For example, in China, eucalypts will form the foundation of a 2.7 million hectares raw material base of fast-growing high-yielding plantations in the South Coastal and Middle/Lower Yangtze regions production. Major expansions are underway in Uruguay, Australia, Vietnam and southern Brasil.

Why have eucalypts been successful exotics?

Rates of growth of eucalypt trees are often much faster in the exotic locations than are experienced at home, and usually very much faster than local indigenous species. The conventional wisdom for this was that insect pests which attacked the trees

heavily and continuously in Australia were absent from the exotic location. Though this idea may play a part, it is now considered that, given the way the genus *Eucalyptus* evolved in response to declining soil fertility and, after a long interval, to a drying climate as well on the Australian continent, they are almost invariably planted in an exotic environment which affords them access to more nutrients and moisture than they would experience at home. Though they grow fast, their evolutionary background still means they usually consume less nutrients and water than indigenous species for production of the same amount of biomass (Davidson, 1995).

In addition to this robust adaption to a wide range of site conditions, eucalypts have proven to be popular exotics for several other attractive features including:

- **Their ease of propagation.** Eucalypts are easy to propagate. The seeds of the popular species are small (typically 600 000 per kilogram) and are orthodox in behaviour and able to stored easily for long periods. These features have made them easy to distribute between growers and countries. Many of the widely planted species and hybrids can be readily and efficiently propagated vegetatively allowing quick capture of genetic gains.
- **Their capacity to grow fast.** Typically, eucalypt plantations produce over 20 m³/h/yr and can be managed in short (<12 year) rotations). On highly productive sites in Brasil, growth rates of over 50 m³/h/yr have been recorded. This capacity to grow fast offers attractive economic rates of return to commercial investors.
- **Their capacity to grow straight.** Eucalypts demonstrate an apical dominance which results in straight growth and straight stems that are easy to harvest and process and useful for a wide range of products.
- **Their capacity to offer a wide range of wood and non-wood products.** Eucalypts can produce a wide range of useful wood and non-wood products. In addition to environmental and non-wood products such as site and habitat protection, carbon sequestration, tannins and leaf oils, industrial chemical additives, adhesives and fodder additives, eucalypts provide many wood products – construction timbers, furniture, farming tools, transmission poles, railroad sleepers, fuelwood, charcoal, honey, pulp and paper, rayon, fibreboard and plywood.

Over the past 50 years, the international forestry research community has undertaken a great many species assessment trials in the warm temperate and tropical regions of the world. Many hundreds of species from many genera have been assessed for their suitability for growing on farms and as plantations. In this broad and

thorough search for species suitable for wood production, eucalypts have emerged consistently as a popular option. The choice of eucalypts as a preferred plantation species in the tropical and subtropical regions of Asia is no accident and has been based upon many years of scientific assessment.

Eucalypts are a preferred raw material for high quality pulps – primarily Bleached Eucalypt Kraft Pulp (BEKP) and smaller amount of Chemi-Thermo Mechanical Pulp (CTMP) and dissolving pulps for manufacture of viscose and other fibres.

Global production of eucalypt pulps exceeds 9M tonnes/year and they currently comprise 40% of global supply of hardwood pulps. There are many substantial new projects underway which will use eucalypt pulps and global production is expected to exceed 14M tpa by 2009. Demand for eucalypt raw material will remain high.

Demands for larger eucalypt logs for sawnwood and smaller material for wood fibre have steadily increased in the region and recent prices quoted for eucalypts grown by smallholders include:

Laos (Vientiane province), September 2006.

- *E. camaldulensis*. Debarked, farm gate US\$27 /green tonne (Thai baht 1000)

Vietnam (Vinh Phu Province), March, 2005.

- Mixed eucalypts. Standing trees on farmers land (close to roads) US\$24/m³.
- Mixed eucalypts, debarked, 4 metre logs to 6 cm sed at the mill gate. US\$30/tonne.
- Eucalypt bark: per 10 kg bundle at roadside = 1,000 Dong per bundle (~US\$6/tonne)
- Small branches and top pieces of trees (< 6 cm diameter) are chipped manually and sold for VND300 000 per green tonne (US\$18/green tonne) at the mill gate.
- Logs >25 cm sed (sold for sawlogs and construction VND 750 000 per green tonne at mill gate. (US\$45/m³ mill gate)

Vietnam (Hue), April 2003.

- Debarked and stacked at farm gate US\$26/ m³
- Standing trees US\$19/ m³

China (Guangxi Province, Beihai area) January 2006.

- Debarked, farm gate for logs > 7 cm sed: US\$ 57 – 63/m³ (Rmb 450/500/m³)
- Debarked, farm gate for logs > 14 cm sed (for solid wood): US\$65/m³ (520/m³)

China (Guangxi Province, Beihai area) June 2005.

- Debarked, farm gate for logs > 14 cm sed: US\$53/m³ (Rmb 430/m³)

Thailand May 2003

- *E. camaldulensis* logs for wood chip. Green tones at mill gate. 5 cm sed: US\$27/m³ (Thai baht 1000/m³).

2.2. Tropical Acacias

About 1000 species of *Acacia* are native to Australia and neighbouring countries. Substantial commercial plantations and smallholder woodlots have been established over the past 20 years with three tropical acacia species, *Acacia auriculiformis*, *A. crassicarpa* and *A. mangium* and a hybrid, *A. auriculiformis* × *A. mangium* (referred to as *Acacia* hybrid) and these are the focus of the current planting programmes. Within the SE Asia region, plantations of tropical acacias have been established in China, Malaysia, Indonesia, Papua New Guinea, the Philippines, Thailand, Vietnam, and in Melville Island in Australia and the total area planted exceeds 1.8 Mha (Table 2.2) with *A. mangium* being the dominant species with about 1.5 Mha.

Most of these estates are used as feedstock for mills to make Bleached Hardwood Kraft Pulp (BHKP) and now significant quantities of wood are finding their way into markets based on high-value solid timber.

Country	Area (,000 ha)
Australia	10
Brazil	40
China	40
India	30
Indonesia	1200
Malaysia	200
Papua New Guinea	10
Vietnam	300–400

Table 2.2. The tropical *Acacia* plantation estate in round figures (Midgley, 2006)

As a plantation species, *A. mangium* has proven to be very versatile, adapted to a wide range of acidic soils (pH 4.0) in the moist tropical lowlands. Its success is due to its extremely vigorous growth on favorable sites (annual wood volume increment of up to 30 m³/ha); tolerance of acidic soils with low nutrient status; ability to quickly shade out weed competition, such as *Imperata* grass; relative freedom from diseases; wood properties which potentially make it acceptable for a wide range of end uses; and ease of establishment. Commercial pulpwood plantations are not usually thinned or pruned and

are harvested at 6-7 years. Trees are harvested for sawlogs at 10 – 12 years.

A. crassicarpa is a moderately large tree up to 30 m tall which reaches its best development in the south of Papua New Guinea and West Papua, Indonesia. It was first tested in China and Thailand in the early 1980s and subsequently in neighboring countries such as Indonesia, Malaysia and Vietnam. Over 200,000 ha of commercial plantations have now been established in Sumatra, Indonesia, where it is being grown on highly organic soils with a low pH that may be waterlogged occasionally

(Midgley, 2000). The tree has outstanding, as yet largely untapped, potential for other very difficult sites in South-East Asia. These include planting above saline seeps in northeast Thailand for groundwater recharge control, and reforestation of acidic, infertile sands with seasonal waterlogging and shallow hardpan in central Vietnam. *A. crassicarpa* also has potential in agroforestry and is now being grown for fuelwood in woodlots by 3,000 farmers in Tabora district, Tanzania, following its introduction in 1988 by the International Centre for Research in Agroforestry (Midgley, 2006).

Natural hybrids between *A. mangium* and *A. auriculiformis* (*Acacia* hybrid) were recorded in Sabah by Sim (1987) with some displaying greater vigour, increased apical dominance, finer branching and greater pulp yields. In Vietnam, *Acacia* hybrid is now the dominant stock for planting because the best selected hybrid clones have demonstrated high growth performance in many regions of Vietnam (Kha 2001). By the end of 2004 this species accounted for 127 000 ha in Vietnam and in 2004 alone, 46 000 ha of the hybrid were planted (van Bueren 2005).

Acacia pulps. *Acacia* pulps are suitable for tissue, fine paper, bible paper, directory stock, envelope paper and carbonless base paper. They provide a pulp with very high density of very short fibres, which give smoothness and high levels of opacity.

In 1995, the first trial shipments of acacia pulp were presented to the European market. Since that time the amount of pulp available internationally has increased steadily. In 2002, the large Indonesia producers, Asia Pulp and Paper, APRIL, PT Tel and Kiani Kertas increased production to an estimated 1.9 million tonnes and if expansion plans are achieved and the Indonesian pulp sector becomes largely plantation-based, the quantity of acacia pulp on the international market could grow to in excess of 4 million tonnes by 2010.

Current Chinese spot prices for tropical acacia pulps (US\$630 per tonne at August 2006) would place the global value of tropical acacia pulp at about US\$2.5 billion in 2010 if production targets are met and prices maintained.

Pulp yields vary within species and between the two major commercial species *A. mangium* and *A. crassicarpa*. Typically, the basic density of *A. crassicarpa* (500 – 540 kg/m³) is greater than that

of *A. mangium* (450 – 500 kg/m³) but the pulp yields are slightly lower; typically 51% for *A. crassicarpa* and 52.5% for *A. mangium*.

Acacia as solid timber. Most tropical acacia timber used as solid wood is *A. mangium*. The timber is of medium density and can be sawn easily, planed to a smooth surface, polished, drilled and turned. The wood is fairly stable, and it dries without serious defects when suitable kiln schedules are used (Midgley, 2006). The wood is also stable, with shrinkage from fresh to air-dry of around 6.4% tangentially and 2.7% radially, and fibre that is relatively straight and only in certain cases is found to have interlocked grain (Yamamoto 1998). It is very durable when exposed to weather but not in contact with the ground. The heartwood is moderately resistant to preservative treatment. It makes excellent particle board, and is suitable for furniture and cabinet-making, light structural works, agricultural tools, boxes and crates. It has been sliced for veneer and is frequently finger-jointed.

A large market for acacia wood is developing in Vietnam where it is a part of the country's booming wood products export business. In 2006, the value of exported finished wood products from Vietnam will reach US\$2.6 billion (Fig. 1.9). In excess of 80% of the raw material for this valuable industry is imported, including *A. mangium* logs of Malaysian origin. These sawlogs are typically small, rarely exceeding 30 cm dbh and as small as 10 cm small-end diameter (sed).

The prices received at the mill gate for acacia logs in Vietnam are quite variable (Table 2.3). In 2003, prices were US\$35–80/m³ with a strong premium being paid for larger logs. The price being offered for acacia pulp wood during the same period was US\$14–26/m³. Imported logs of *A. mangium* from Malaysia were being landed at the port near Ho Chi Minh City for about US\$76/m³ which is the top end of the price range being offered for local logs at the mill gate.

As a pioneer in growing acacia, Malaysia is now a major exporter of acacia wood. Several companies actively export both logs and processed sawn timber. For example, FOB log prices were around US\$50 /m³ and finger-jointed timber US\$900 /m³ FOB in 2005 (Table 2.4).

Date	Site	Product	Price (US\$/m ³)
Apr 2003	Quang Tri	At farm gate: about 30 cm dbhob	43
Sep 2003	Hue	At mill gate: 15–20 cm sed	38
Sep 2003	Hue	At mill gate: 20–30 cm sed	45
Sep 2003	Hue	At mill gate: >30 cm sed	52
Sep 2003	Ho Chi Minh City	At mill gate: 20 cm sed	80
Sep 2003	My Xuyen (near Hue)	At mill gate: >20 cm sed	35–40
Sep 2003	Hue City factories	At mill gate: >20 cm sed	45–58

Table 2.3. Examples of prices paid for acacia logs in Vietnam and used as solid timber for furniture. The data were provided mainly by provincial forestry officials but were largely corroborated in the field.

Company	Product	Capacity (per month)	Price (US\$/ m ³ FOB)
High Quality Wood Sdn Bhd	Logs >20 cm sed	3000–6000 m ³	52
	KD S4S lumber	10–50 containers	450–480
	KD tiles	10–20 containers	490
	KD finger-jointed laminated T&G timber	5–20 containers	900
Dagangan Hdn		Sawn timber in various lengths to 1 m	250
Amazon Timber Sdb Bhd		Air-dried sawn timber 2" □ 3" to 2 m length	230/ tonne
Indonesia (misc suppliers)		Kiln dried sawn lumber (Hardyanto, pers comm)	100

Table 2.4. Some examples of the marketing of ‘acacia’ wood in Malaysia in 2005. Prices are per cubic metre unless otherwise stated.

2.3 Rubber:

Rubber (*Hevea brasiliensis*) is a tree of 25 metres in its native occurrence in the Amazon Basin. As a plantation species, 20 hectares were first established in 1896 in Malacca. It has a productive life of 32 years; 6 years to maturity and 25 years of production.

South East Asia has 85% of the global area under rubber and produces 77% of the world’s natural rubber production. Table 2.5 shows the estimates of areas of rubber plantations in major growing countries and the variation in productivity.

Country	Area ('000 ha)	Production ('000 MT)	Productivity (Kg/ha)
Indonesia	3483 (1)	2066 (2)	670 (7)
Thailand	2083 (2)	2959 (1)	1345 (2)
Malaysia	1613 (3)	1169 (3)	789 (6)
China	644 (4)	486 (5)	1333 (3)
India	578 (5)	743 (4)	1595 (1)
Vietnam	450 (6)	415 (6)	880 (4)
Sri Lanka	165 (7)	94 (7)	802 (5)
% share in World	90	91	1059 (avg.)

Table 2.5. Growers of natural rubber. (Viswanathan, 2006).

In the early plantations of rubber in 1905 typical rubber yields were 200-300 kg/ha. By 2005, the average yield in Thailand had grown 1345 kg/ha through a dedicated long-term commitment to breeding, new and sophisticated agronomy and management.

A major feature of the industry has been the emergence and domination of smallholder systems. In SE Asia, 73% of production is provided from smallholdings with 90% in Thailand, 89% in India and Malaysia and 83% in Indonesia. One of the major challenges facing Hevea rubber production is provision of cheap labour to collect latex. As societies become

wealthier, fewer people are available to work on rubber estates. Most of the labour for Malaysia's rubber estates is now imported from Indonesia.

A feature of the rubber industry is that prices follow trends found in most commodity products with boom periods followed by periods of declining and static prices. Recent prices for natural rubber have been extremely attractive and rubber cultivation has become very profitable (Figure 1.13). However, Figure 2.6, derived from World Bank figures and recent market trends demonstrates the long-term volatility of world rubber prices.

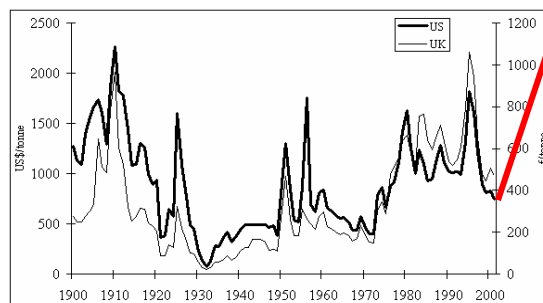


Figure 2.6. Historical prices for natural rubber.

As rubber plantations become overmature and latex productivity falls, the wood becomes available for industry. There are about 12 million m³ of wood available for regional wood industries – particleboard, medium density

fibreboard and solid wood. This resource has formed the foundation for a very successful rubberwood furniture industry. Durst *et al* (2004) provides an overview of the emergence of this important regional wood resource.

2.4. Teak:

Teak (*Tectona grandis*) is a tall deciduous tropical hardwood which occurs naturally in a

discontinuous distribution in peninsular India, Myanmar, Laos and Thailand (Fig. 2.7).

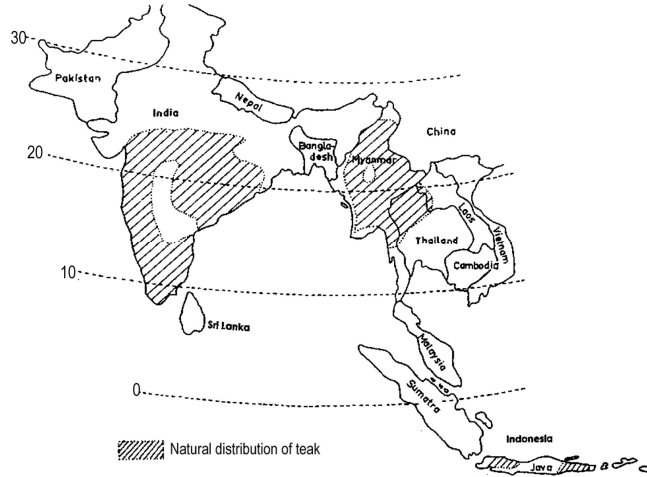


Figure 2.7 Natural distribution of teak (Gyi and Kyaw Tint 1998)

Teak is one of the world’s premier timbers for which demand outstrips supply. The timber is mellow in colour, ranging from golden to brown, with a fine grain and smooth texture. Compared with other industrial woods teak is a medium weight, strong wood of average hardness. Because of its strength, pleasing colour and attractive figure and favourable working and finishing properties, teak is one of the most popular tropical hardwoods, in high demand for furniture, shipbuilding, decorative building components (such as doors, window frames and flooring), construction materials and reconstituted products.

Teak plantations have been established successfully in over 36 tropical countries. Estimates of areas vary with Ball *et al* (1999) estimating that the net area of global plantations in 1995 was 2.2 million hectares. Pandey and Brown (2000) concurred with this figure and concluded that the rate of new establishment of teak plantations has slowed notable since 1990. Teak is now cultivated widely in many tropical countries with over 90% of the plantation estate in Asia with India and Indonesia accounting for over 75% of the plantation resource (Figure 2.8).

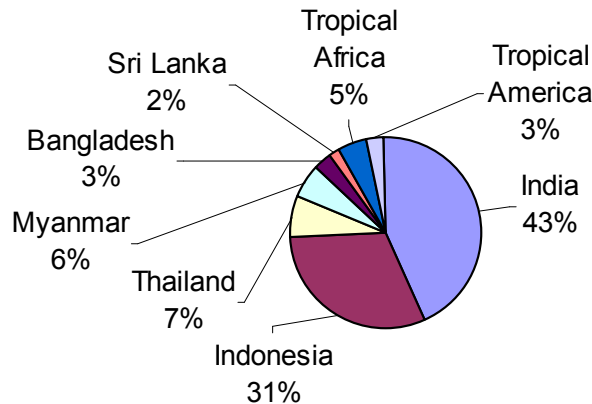


Figure 2.8 . Global distribution of teak plantations (Bhat and Ma, 2004).

Bhat and Ma (2004) have adopted a more optimistic figure, using FAO's Global Forest Resources Assessment data (FAO, 2000) which indicate that 5.7 million hectares (or 3%) of the world's forest plantations of 187 million hectares were teak (Table 2.7).

The great majority of the world's teak plantations have been established under government planting programs particularly in India, Indonesia, Myanmar and Thailand which account for 87% of the world's teak plantations (Pandey and Brown, 2000) (Fig. 2.9). Ball *et al*

(1999) report a general shift from establishment of large scale teak plantations by the public sector to increasing numbers of smaller plantations, grown largely by outgrowers who incorporate trees into farming systems, or as small blocks to meet long-term commercial needs. This trend has been particularly noticeable in Lao PDR where an estimated 95% of the plantation base of 15 000 ha is owned and managed by smallholders (Midgley *et al* 2006).

Sub-region	Estimated net area of teak plantation	Estimated annual planting
West Sahelian Africa	4.02	0
East Sahelian Africa	14.85	-
Moist West Africa	87.88	4
Southern Africa	2.80	0
Tropical Africa	109.55	4
South Asia	1099.60	55
Continental Southeast Asia	302.28	26
Insular Southeast Asia	706.01	12
Tropical Asia	2107.89	93
Tropical Oceania	3.03	0
Central America	22.29	4
Caribbean	8.06	-
Tropical South America	2.72	0
Tropical America	33.07	4
TOTAL	2253.54	101

Table 2.9. Estimated net plantation area of teak by sub-region, 1995 ('000 ha) (Pandey and Brown, 2000)

The global price for teak logs depends upon quality, size, age and origin. Padmanabha (in Midgley *et al* 2006) offered the following guidelines for FOB prices for teak logs from plantations:

- US\$169 per m³ for 6-y-old poles 13 cm in diameter (at mid-log length) and 8 m long
- US\$270 per m³ for 10-y-old logs 18 cm in diameter (at mid-log length) and 8 m long

- US\$450 per m³ for 14-y-old logs 24 cm in diameter (at mid log-length) and 8 m long
- A\$750 per m³ for 18-y-old logs 31cm in diameter (at mid-log length) and 8 m long.

FOB price for teak logs with diameter above 16 cm from Guatemala was US\$240 per m³ in early 2006 (ITTO 2006) with 70% of the exports destined for the Indian market. The average FOB price from Guatemala was US\$219 per m³ in 2005.

Suppliers of plantation teak to international markets believe that there is only a small risk of teak prices dropping over the next 30 years because of the high demand and the long rotation. The importance of certification in the global marketplace is also increasing and, although certain traditional teak markets are not

yet too concerned with this, many teak producers will seek to meet the various criteria of sustainable forestry management and certification under credible schemes, in order to ensure the long-term viability of their ventures (Midgley *et al*, 2006).

3

World Standards for Plantations: Sustainable Plantation Management

Sustainability involves balancing economic, environmental and social issues in a business operation. Most responsible commercial plantation ventures are committed to sustainable business practices which move business development towards ecological, social and economic sustainability. Sustainability is inseparable from good corporate governance.

Large companies in the forest products sector seek to supply customers with products and services that satisfy various needs related to needs for furniture, printed communication, packaging and construction purposes. Among these needs is an assurance for end-consumers that products meet certain environmental and social standards.

Transparency is vital to effective, long-term engagement with communities and clients. Open discussion and interaction with all governmental and non-governmental stakeholders is fundamental.

3.1. Principles of Sustainability in Plantation Forestry

Despite general agreement that tree plantations must be managed sustainably, the meaning of sustainable forest management as the basis for corporate policy and decision making remains generally vague and open to interpretation that varies between individuals, companies, and even countries. Within the plantation forestry industry, a paradigm shift from the classical approach of sustained yield to approaches committed to the principles of sustainable forest management has occurred. Sustainable plantation forestry is based upon a holistic approach to land management. Nambiar (1997) identifies the basic tenets of inter-generational fairness, the moral responsibility current generations have to their descendants, and the role of natural assets (such as forests) in meeting the needs and obligations of current generations. He suggests a core set of goals for helping define sustainability:

- to ensure that the trend in plantation production is non-declining over successive harvests;
- to protect and if possible enhance the quality of the soil and water values in the plantation environment;
- to promote incentive, innovation, and profit for the business of growing and utilizing wood;
- to improve the economic and social benefits to the community.

There can be other goals; and biodiversity values are accommodated. The single-minded pursuit of any one goal (such as commercial wood production), while disregarding other values is unacceptable. It is also impractical to expect that structure, composition, and function of plantation forests should mimic those of native forests. Nambiar stresses that “*Wood production with environmental care*” should be the primary goal for growing plantation forests.

The 4 core principles are emerging to encompass the concept of sustainable plantation management:

- **Sustainable productivity:** Growers will ensure that the trend in plantation production is non-declining over successive harvests. Plantations will maintain productivity and aim to increase productivity in successive rotations and promote incentive, innovation and profit for the business of growing and utilizing wood;
- **Social Sustainability.** Growers and their financial supporters will seek to improve economic and social benefits of their projects to the community. Plantation programs will respect the rights of local communities and enhance the economic and social wellbeing of their workers and communities. Investors will have well defined policies of Corporate Social Responsibility. Labour needs and plans for skills development will be clearly demonstrated. Issues of gender will be addressed.

- **Environmental Sustainability.** Investors and growers will protect and if possible enhance the quality of the soil and water values in the plantation environment and enhance biodiversity conservation through management strategies which can include the maintenance of riparian vegetation and understory, the design of buffer zones and corridors of adjoining native vegetation and sympathetic harvesting techniques.
- **Corporate Governance.** Investors must demonstrate that they have adequate resources and skills to successfully and profitably manage plantations sustainably. They

will demonstrate systems of public and corporate accountability and abide by laws and regulatory frameworks. They will adopt a position of transparency in their dealings with authorities and communities.

These principles are applicable to all commercial agronomic and forestry ventures and are consistent with the principles of modern company management. Some of the major companies either currently investing in the plantation sector of Lao PDR, or considering options (Oji Paper, UPM, Stora Enso) have well developed corporate policies and practices that are consistent with sustainable plantation forestry



Figure 3.1: The Principles of Sustainable Plantation Management.

Sustainability of Productivity

Sustained forest productivity is the foundation on which the sustainable business of forestry rests. A central goal of modern plantation management is to ensure that the trend of forest productivity is non-declining or is positive over successive rotations and harvests while maintaining and enhancing the quality of the soil resource base in perpetuity. The measures of productivity are generally net primary production to wood yield or production of plantation products such as latex (Nambiar, 1996). The central goal is achievable; and, with scientifically-based management, ongoing overall improvements in wood yield from plantations are being achieved across a range of soil and environmental conditions in radiata pine plantations in Australia and eucalypt plantations in Brazil (Nambiar, 1997, Brinkley and Stape, 2004). The enhancement of the productive capacity of the soil wherever possible is a good fundamental basis for sustainability.

Nambiar *et al* (1998) identified a number of factors that contribute to unsustainability of production at a management unit level:

- loss of soil quality: initiation or acceleration of soil degradation processes, which decrease productivity and increase cost of amelioration and production;
- a weak or inappropriate genetic base unadapted to the environment;
- threats from pests and diseases, an issue requiring continuous monitoring and integrated management plans;
- adverse environmental effects, for example off-site negative impacts on the quantity and quality of water in the ecosystem; and
- poor management: often a common reason for failure and leading to unsustainable extractive practices.

Sustainability is neither static nor absolute. The concept when applied to commercial plantation forestry is continuously reshaped through changing variables, values and needs. The variables include the expanding role of plantations and expectations from them, ongoing change in productivity through biophysical interactions and management interference, environmental change, social aspirations, political policies and markets (Nambiar 1999).

Emerging world standards are consistent with the concept of sustainable plantation management. Several codes and guidelines have been developed as guidelines for interpretation when developing national standards for plantation development.

3.2 Sustained Productivity of Commercial Plantations.

In Brazil, growth rates of eucalypt plantations have steadily improved over several rotations from 10 m³/ha/yr in the 1960s to 40 m³/ha/yr today through a combination of improved silviculture, site preparation and fertilization, improved species selection, selection of genotypes and clonal propagation techniques. In southern China, production from eucalypt plantations has increased from 6 m³/ha/yr to over 18 m³/ha/yr over the past 20 years with many modern, well managed plantations commonly achieving growth rates in excess of 25 m³/ha/yr. Similarly, improvements in management in rubber plantations have seen a steady increase in productivity.

In addition to the obvious productive elements of soil fertility and genetics, there are management practices of weed control and management of pests and diseases which are core activities within a sustainably managed plantation.

Weed control. Weeds compete directly with the planted trees for light, soil moisture and nutrients. In commercial plantations in most parts of the world, it is common to conduct both a pre-planting and post planting control of weeds using both mechanical and chemical means. Control of weeds is a vital part of successful plantation silviculture and this generally continues until crown closure is approached.

Pests and diseases. Some regional plantations are increasingly relying on planting material from a very narrow genetic base. A lengthy program of clonal reproduction and selective

breeding has produced eucalypt, acacia and rubber varieties that have very desirable industrial properties but may be susceptible to environmental stresses and diseases. A small number of clones of a small number of varieties would offer a serious risk to productivity through pests and diseases. Given the capacity for diseases and insect pests to inflict severe and rapid damage upon commercial plantations, a disease and pest monitoring program and a disease resistance genetic selection program are vital components of commercial R& D programs.

Given appropriate commitment to the basic parameters underpinning sustainable productivity, there should be no barriers in sustainable wood production from acacia and eucalypt plantations.

3.3 Commercial Plantations and Ecological Sustainability.

Concern is often expressed at the expansion of commercial plantations because of perceptions that they harm the environment and especially that they are 'sterile' and lack biodiversity. These concerns have an obvious justification where exotic plantations have replaced biodiverse natural forests but are questioned when the plantations replace degraded, underutilised forestland or former farmlands. It is unrealistic to expect plantations to mimic native forests. Jactel et al, (2005) offered empirical studies of the biodiversity values of different types of plantation forests in temperate and tropical countries and demonstrated that plantation management can be adapted to favour biodiversity outcomes.

Sayer *et al* (2005) observed that plantations may relieve pressure on natural forests. Plantations advocates argue that their activities provide wood that would otherwise have to come from natural forests. This is partially true but in many cases plantation wood is destined for different markets and end uses than the wood from natural forests.

Commercial plantations can support a diverse understorey fauna and flora. The understorey flora may yield benefits in improved sustainability and productivity of the plantation trees (Bernhard-Reversat, 2001). Although plantations are almost never as valuable for biodiversity as natural forests, most plantations do have biodiversity and catchment protection values. Sayer *et al* (2005) observed that these

values are often under-rated by plantation managers. A valuable review of this topic is provided in IUFRO (2003).

Plantation companies often control large areas of land, not all of which is put under plantations, the spatial arrangement and land cover of the non-planted area can be important for biodiversity. Many countries have laws requiring plantation schemes to include set-asides of natural forest or riparian strips of forest. In some situations these can be very valuable for a variety of wild species. The plantations may provide a buffering function and enhance the protection of these forest patches.

Studies from Brasil, perhaps the world's most successful grower of commercial fast-growing plantations, have found that, by providing adequate distribution of native forest remnants in the landscape, plantations may act as sinks for species accumulation, increasing their role in biodiversity conservation. Plantations can also be managed as an intermediate step for native forest restoration in degraded areas. To enhance their potential role in biodiversity conservation, management strategies can include the maintenance of understorey, changes in harvesting techniques and the design of buffer zones and corridors with native species. There are examples of many short rotation eucalyptus plantations having woody species richness comparable to native forest fragments (Engel *et al.*, 2005).

Water: Commercial plantations in several countries (India, Australia, South Africa, for example) have been the subject of criticism because of their high water use. Studies in India and in South Africa indicate that, when water resources are limited, the area, location and management of plantations must be carefully considered to avoid conflict with other water users (Calder, 1994). Detailed data on the water use and water balance of plantations are essential both to evaluate their environmental impacts and to design optimal land use strategies in catchments where wood production is an important economic component. Water use by plantations is a site-specific issue, with parameters changing with climate and rainfall, soil types and groundwater access.

3.4 Commercial Plantations and Social Sustainability.

As access to native forests becomes limited, more wood for industrial use will come from tree

plantations. Commercial plantations can provide a range of materials useful at the local level and offer a viable option for asset accumulation and commercial sales by smaller growers. Unfortunately, outside the commercial sector, there has been a poor history of technical success in poorer countries where about 50 – 60% of plantations are failures (Nambiar, pers comm.).

Pulp mills are capital intensive investments. A typical large modern BHKP mill will cost in the order of US one billion dollars. It is vital for their economic viability that they run at capacity and there are adequate and sustainable supplies of raw materials. Ideally, pulp and paper companies prefer to exercise control over the plantations which provide their raw material needs. In some countries such as Brasil and Uruguay this can be achieved through purchase of land and self-management of large areas of high-yielding plantations. Given the complex land ownership/ land tenure issues in mainland Asia, it is unlikely that any one company will be able to control a resource base sufficiently large to supply a modern pulp mill (Fig. 1.12). It is inevitable that smaller growers and plantation managers will become an intimate part of the wood supply equation and industry partnerships with smallholders will expand. Such relationships are increasing elsewhere in the world and there are now many examples of successful out-grower schemes in Brazil, Indonesia, India and South Africa. Detailed descriptions of outgrower and smallholder schemes are offered in Enters and Durst (2004).

Critical ingredients to the success of out-grower schemes are transparency and trust. Transparency ensures that everyone knows what the arrangement is and that there is no ambiguity. Trust will ensure that the buyer offers a fair price and that the seller does not offer wood to alternative markets.

A strong attraction of large industrial facilities is that they offer opportunities for skills enhancement and employment. Estimates of employment created by a pulp mill integrated with a 100 000 ha plantation estate are of the order of 40 000 (van As, 2005, pers. comm.) including all mill activities, silviculture, harvesting, transport, service industries and social support. This will vary from country to country as social and management conditions change.

It is not unreasonable for local communities to benefit from the opportunities offered by

profitable plantation programs. Creation of local wealth and assets are important benefits. However, creating employment opportunities is not the same as creating wealth. If rural people are deprived of the use of their lands in the process of plantation establishment and are offered opportunities as poorly paid plantation labour as compensation, then poor farmers (with land) simply become poor plantation labourers (without land). For the rubber sector in particular, labour is mostly provided by the poorest sector of the community at low rates of payment. Accrual of real benefits for rural families and communities comes through the creation of wealth and assets via a number of means including:

- Smallholder ownership of plantations (assets)
- Sale of produce – wood, latex etc. (wealth)
- Improved infrastructure (new roads offer access to markets, schools, hospitals)
- Development of skills (alternative employment opportunities)
- + employment

Employment is only one part of a broader package of benefits which will accrue to rural people associated with major plantation programs.

In pursuing these opportunities associated with plantations, the issue of gender is an important consideration. Plantation projects have the potential to benefit men and women equally within a community however project proponents must ensure that both men and women are offered equal opportunity to participate in projects and share benefits. In some cases opportunities for plantation employment simply add to the large workload of rural women. In remote rural areas (where most commercial plantation projects are located), levels of female literacy are often low and needs to be addressed. For modern companies with a public commitment to Corporate Social Responsibility, gender issues in remote areas offer an opportunity to make a genuine contribution to the communities with whom they work.

There are number of World Standards which offer guidance to the development of a sustainable plantation sector. Among these are:

- Draft Planted Forest Code. (FAO)
- Guidelines for the establishment and sustainable management of planted tropical forests. (ITTO).
- Code of Practice for Industrial Tree Plantation Development in the Tropics. (CIFOR)
- International Finance Corporation's Performance Standards on Social & Environmental Sustainability including performance standards for:
 - Social and Environmental Assessment and Management Systems
 - Labour and Working Conditions
 - Pollution Prevention and Abatement
 - Community Health, Safety and Security
 - Land Acquisition and Involuntary Resettlement
 - Biodiversity Conservation and Sustainable Natural Resource Management
 - Indigenous Peoples
 - Cultural Heritage
- International Finance Corporation's Policy on Social & Environmental Sustainability
- Elements of Sustainability in the Plantation Forest Industry (WWF).
- Standards to meet various certification schemes (FSC, PEFC etc).

3.5 Harvesting and Transport

Important but frequently overlooked parts of sustainable plantation management are the needs for harvesting, transport, processing and export.

Harvesting and transport of raw material are expensive and critical parts of the supporting operations for wood chip export - ones that are expensive and where considerable savings can be made if done efficiently. Delivery of adequate quantities of wood at internationally competitive costs is essential if capital intensive pulp mills are to run efficiently and profitably. Wood must

be available to the mill every day, in all weather and throughout cultural calendars. If wood is to be exported through Vietnam to China or elsewhere, then shipping schedules have to be met and wood supplies provided on time.

Harvesting must be conducted in a fashion which is efficient, safe and environmentally friendly, (bearing in mind that the costs of harvesting and transport can often exceed the costs of growing!). Well-trained operators working in a safe environment help minimise accidents and enhance efficiency. Environmental considerations for harvesting operations include slash retention, erosion of snig tracks, soil compaction around log dumps and loss of nutrients if bark is removed from the site. In countries with seasonally wet climates such as Lao PDR, consideration must be given to conduct of operations during the wet season when waterlogged sites and roads can limit operations. Eucalypt logs can be difficult to debark if the bark is allowed to dry on the log. This and the efficiency gained through not transporting significant weights of bark influence most modern commercial operations to debark at site. Slash and residue retention are important in maintaining soil moisture and nutrients between rotations and the systems used should aim to minimise soil disturbance and erosion.

Well designed roads which respect the access needs of communities are needed to accommodate the transport needs of large volumes of wood. Detailed transport plans

developed with local engineers and in consultation with communities will consider communication, training needs, efficiency, local employment opportunities, worker and community safety, cost effectiveness, monitoring, and alignment with corporate operating principles.

It may be necessary to change commonly used local systems for harvesting and transport because:

- They may be more expensive than international norms and present safety issues.
- The large volumes of wood that will need to be transported will require a labour force too large to effectively manage and presents risks through the uncertainty of available labour throughout the year.

Transport and roading are important for both communities and the companies. The community regards roads as an opportunity to improve access to markets and other social infrastructure and facilities such as schools and hospitals. The company recognizes the social importance of roads and acknowledges the risks associated with large trucks travelling on narrow roads through small villages. The service industries to meet the needs of a large transport fleet (fuel, maintenance) need to be considered. Should the project expect to bring large numbers of contractors and workers from other areas, then issues of accommodation, schooling and health (including sexual health) need to be considered.

4

The Plantation Sector in Lao PDR

4.1 General.

Current global trends and regional influences offer a strong logic for the development of a vibrant and modern plantation sector in Lao PDR. Demands for raw materials are substantial and are strongly correlated with regional economic growth and offer Laos opportunities to attract long-term and sustainable investments. Lao PDR has considerable potential for commercial plantations for the following reasons

- Climate and site conditions suitable for growing of trees.
- Low population density.
- Availability of degraded forest areas that can be used for tree plantations.
- Flat or undulating terrain.
- An existing road infrastructure that is gradually being upgraded.
- Closeness to large markets in neighboring countries
- Low costs for land lease.
- Competitive costs for labour and inputs.

The area of unstocked or underutilised forest land on slopes of less than 20% and outside NBCAs in five provinces of central Lao PDR (Bolikhamsay, Khammouane, Savannakhet, Saravan and Champassack) is estimated to be around 900,000 ha. This region is likely to be the focus for commercial wood fibre investments and is close to the Thai and Vietnamese markets and, if wood is exported through Vietnamese ports, Japanese and coastal Chinese markets. Transport costs to such markets remain relatively high, although they may be reduced if major transport infrastructure is developed and equipment modernized.

The provinces in the north and the south of the country, owing to their climates and land availability have become a focus for rubber investment and smallholder plantations of teak in

Luang Prabang and other northern provinces continue to expand.

4.2. Policies and Strategies.

There is strong Government support for a viable and profitable plantation sector in Lao PDR. The Government's major development objectives under the National Growth and Poverty Eradication Strategy (NPGES) seeks to make resource development and growth part of a strengthened and enabling macro-economic environment². Future growth enhancing investments and development priorities that reflect the economic potential of the country's natural resource base have been identified by the Government as a vehicle for increasing national revenues and, thus, poverty eradication. Hydropower, mining, tourism and wood- and agro-processing industries are the highest priorities for investments leading to economic growth and increased revenues. Macro-economic stability, private sector development, trade facilitation and regional integration policies and strategies all feed into expanding this resource base to promote economic growth nation-wide.

The Forestry Strategy³ offers a history and context for the plantation sector in Lao PDR. Tree planting has been a national priority since liberation and in 1979, PM's Provision N° 74 promoted tree planting on bare land, and in 1980, June 1st was designated National Tree Planting Day. Under the current 5-Year National Socio-Economic Development Plan (2001-2006), tree planting for commodity production is strongly promoted, with a target of 134,000 ha. Annual planting areas and seedling production targets are set in the National Socio-Economic Development Plans and distributed to Provinces for implementation.

With respect to legislation, besides the Forestry Law, MAF Regulations N° 196/2000 on Tree Plantation Development, and N° 1849/2000 on Tree Plantation Registration and the annual PM

² Source: National Growth and Poverty Eradication Strategy

³ Forestry Strategy to the Year 2020 of the Lao PDR. July 2005.

Orders regulating forestry activities (PMO 11/99; PMO 10/2000; PMO 15/01, and PMO 18/02) provide important support for tree planting.

To achieve targets, GoL provides incentives, including allocation or lease of land for tree planting, property rights on planted trees, land tax exemption for registered plantations and free distribution of seedlings to farmers and organizations. A reforestation fee levied on logs and NTFPs harvested from natural forests is also used in nursery construction, seedling production and plantation development. The GoL has an ambitious target of 500,000 ha of tree plantations and 70% forest cover by 2020.

4.3. Laws relating to Plantation Establishment.

There are a complex series of laws and regulations relating to the development of the plantation sector in Lao PDR and these have been the subject of some recent comprehensive studies⁴

Commercial plantation development is subject to a number of laws and regulations in Lao PDR. The recent study completed on behalf of the Asian Development Bank identified 26 pieces of legislation (laws, decrees, regulations, orders) that govern different aspects of forest plantations and associated industrial processing (Figure 4.1).

⁴ Recent studies:

- Sigaty, T. (2003). Report of Legal Framework of the Forestry Sector for Forestry Strategy 2020, Lao PDR. Consultant's Report to FSIP, Department of Forestry. 123pp.
- ADB. 2005. Policy and Regulatory Framework: The Legal Context to Establish Lao Plantation Authority. 11pp.
- Chansomphu, P., Vongsamphanh, O. and Sirivath, H (2006). Rights and Duties of Land and Forest Resources Use and Management at the Village Level. Consultant's Report to JICA (FSIP). 25pp.

No	Title	Date	Issuing Authority
1.	Constitution	6 May 2003	People's Supreme Assembly
2.	Foreign Investment Promotion Law	22 Oct 2004	National Assembly
3.	Business Law	18 July 1994	National Assembly
4.	Tax Law	14 October 1995	National Assembly
5.	Forestry Law	9 November 2005	National Assembly
6.	Land Law	21 October 2003	National Assembly
7.	Law on the Processing Industry	3 April 1999	National Assembly
8.	Environment Protection Law	5 March 1999	National Assembly
9.	Presidential Decree 3 on Land Tax	12 August 2000	President
10.	Council of Ministers (CM) Decision 23 amending six sections of Decree 47 on Tax System and Tables (including forest products)	18 April 1990	Council of Ministers (may be replaced)
11.	PM Decree 187 on Abolishment of Export Duties/Royalties for Agricultural Products	2 October 1994	Prime Minister
12.	PM Decree 186 on Allocation of Land and Forestland for Tree Plantation and Forest Protection	12 October 1994	Prime Minister REPEALED
13.	PM Decree 150 on Implementation of Presidential Decree 03 on Land Tax (12 August 2000)	22 October 2000	Prime Minister
14.	PM Decree 310 Implementation of Foreign Investment Promotion Law	12 October 2005	Prime Minister
15.	PM Decree 60 on Approval of Annual Plan of Tree Planting, Wood Harvesting and NTFP Collection 2001-02	13 October 2001	Prime Minister EXPIRED
16.	PM Decree 59 Sustainable Forest Management of Production Forest Areas	22 May 2002	Prime Minister
17.	PM Order 15 on Management of Forest and Forestry Business	3 August 2001	Prime Minister
18.	PM Order 3 on Continuation and Expansion of Land Arrangement and Land and Forest Allocation	25 June 1996	Prime Minister
19.	MAF Regulation 196 on the development and promotion of sustainable tree planting	15 August 2000	Minister of MAF
20.	MAF Regulation 535 Management of Village Forests	18 June 2001	Minister of MAF
21.	MAF Order 234 on Control of Tree Planting and Tree Plantation	9 November 1995	Minister of MAF REPEALED
22.	MAF Order 227 on Implementation of Tree Planting, Timber Harvest and NTFP Collection, 2000-2001	23 October 2000	Minister of MAF EXPIRED
23.	MAF Instruction 377 Customary Use of Forest Resources	17 April 1996	Minister of MAF

24.	MAF Instruction 822 on Land-Forest Allocation for Management and Use	2 August 1996	Minister of MAF
25.	MAF Instruction 1849 on Registration of Plantations	7 October 1999	Minister of MAF
26.	MOF Instruction 203 on Export Duties (implementing PM Decree 187)	4 March 1995	Minister of MOF

Figure 4.1: Legislation, laws, decrees, regulations and orders relevant to development of forest plantations

Sigaty (2003) noted that the Forestry Law, Articles 33-38, outlines the comprehensive framework for management of tree plantations and mandates MAF to issue standards and regulations to promote proper techniques for tree planting. To implement the Forestry Law, MAF issued Regulation 196 on Development and Promotion of Tree Planting (2000) and Instruction 1849 on Registration of Tree Plantations (1999). Other legislation has been issued recently promoting development of tree plantations to supply domestic wood-processing factories. PM Order 18 on Forest Resource Management Policy for 2002-03 bans the export of unprocessed logs and sawn timber from natural forest and requires each wood-processing factory to have a tree plantation for internal factory use and PM Decree 46, Art. 2, fn 17 bans the issuance of new foreign investment licenses to wood-processing factories intending to use natural timber as raw material.

Sigaty's paper summarised these laws and others relating to Land Law and Investment Law and associated regulations relating to the plantations sub-sector and this summary is attached as Annex 3.

During the course of this study it became clear that the complex laws relating to land use and allocation were not widely understood and that there was confusion among those responsible for implementation. Particular areas of misunderstanding in the English language translations available were the levels of authority and responsibility for land allocation between Provincial and National agencies.

Under Forestry Law (Art. 14), the levels of authority are:

- the district administrative office for areas up to 3 hectares, with the approval of the Provincial or Vientiane Capital Agriculture and Forestry Service.
- the provincial or Vientiane Capital administrative office for areas of more than 3 hectares up to 100 hectares, with

the approval of the Ministry of Agriculture and Forestry.

- the Ministry of Agriculture and Forestry for areas of more than 100 hectares up to 10 000 hectares, with the approval of the government.
- the GoL for areas of more than 10 000 hectares with the endorsement of the National Assembly.

Under the MAF Regulations 196: *Tree Planting (Article 6): Tree Planting on Public Lands*, tree planting on State public land by individuals or private investors requires permission from:

- DAFO Chief for < 100 ha;
- Provincial Governor for 101 to 500 ha, with recommendation of DAFO and PAFO;
- Minister responsible for MAF for 501 to 1000 ha, with recommendation of Governor, PAFO and Mayor(s);
- GoL for > 1000 ha, upon recommendation of the Minister responsible for MAF.

Under the Investment Law, the Provincial Department of Planning and Investment may approve Category 1 investments (which include plantations) up to US\$3 million.

In addition, a recent paper⁵ commissioned by the Lao Land Titling Project II with GTZ support identified areas of ambiguity between various laws (Figure 4.2). This study highlighted a lack of clarity regarding responsibility for allocation of land between Provincial and National

⁵ Schumann, G., Ngaosrivathana, P., Soulivanh, B., Kenpraseuth, S., Onmanivong, K., Vongphansipraseuth, K. and Bounkhong, C. (2006). Study on State Land Leases and Concessions in Lao PDR. Land Policy Study No. 4 under LLTP II Sponsored by: Lao- German Land Policy Development Project (German Contribution to the Lao Land Titling Project II in Lao PDR)

agencies. It also suggested a lack of consultation with traditional land owners in the process.

	Laws/ Decrees	National Assembly	Government	Ministries/ Particular Organization at central level	Provinces	Districts
1	Prime Minister's Decree No. 301/PM, 12 Oct. 2005, on the Implementation of Law on Promotion of Foreign Investment (Articles 52, 53)		>US\$ 20 million and investments of type 3 (telecommunication, land, mineral, hydropower concession)	*IPMC < US\$ 20 million of investments types 1,2, and 3 **IPMC President signs investment > US\$ 10 million ***IPMC Deputy President signs investment <US\$ 10 million	*Local IPMC (Capital, Savannakhet, Champassak, Luang Prabang) for investment type 1 < US\$ 5 million **Local IPMC of other provinces for investment type 1 < US\$ 3 million	
2	Prime Minister's Decree 101/PM, 20 April 2005, on the Implementation of Land Law (Article 16 on Change in land use purpose)		>10,000 hectares on proposal by NLMA, relevant services and administrative authorities, with the approval of the National Assembly	NLMA on proposal of relevant services, and agreed upon by administrative authority, and approved by the Government >100 hectares and <10,000 hectares	Administrative authorities on proposal of local LMO and relevant services >3 hectares and <100 hectares	Administrative authorities on proposal of local LMO and relevant services < 3 hectares
3	Ministerial Direction of the Minister of Finance no. 2085/MoF, 1 Oct. 2004, on Implementation of Law on State Assets (Article 10 on transfer, lease, concession particularly of State land...)		>100 billion kip	MOF <100 billion kip	Finance Division <10 billion kip	Finance Unit has no right to lease, grant concession...
4	Land Law, 21 Oct. 2003 (Article 65 on land lease and concession)	>10,000 hectares				
5	Agriculture Law, 10 Sep. 1998 (Articles 70, 71, and 72)			Ministry of Agriculture and Forestry "studies and comments on applications seeking to conduct large scale or significant agri-business."	Provinces' Agriculture and Forestry Divisions "study and comment on applications seeking to conduct agri-business within their areas of	"District Agriculture and Forestry Bureaus allocates land within their areas of responsibility."

					responsibility.”	
6	Electricity Law, 12 April 1997 (Article 9 “Size of business”)	>50,000 KW on proposal by Government	2,000 to 10,000KW		100 to 2,000KW decided by provincial authority with approval of Ministry of Industry and Handicrafts. (Article 20 of the same law exempts investors to have to ask for concession if the business is less than 2,000 KW)	<100KW decided by district administrative authority with approval of province
7	Forestry Law on 11 October 1996 (Article 14 Transformation of forest land to use for some other purpose. This article is used as legal basis for land concession purporting to tree plantation or agri-business. This Article 14 contravenes Article 15 of the same law which “absolutely prohibited from using dense or reed natural forests for planting their trees which forests can themselves grow as natural forests.”)		Government >10,000 hectares with approval of National Assembly	Ministry of Agriculture and Forestry >100 hectares and <10,000 hectares, with approval of Government	Provincial/ Capital authorities >3 hectares and <100 hectares with approval of Ministry of agriculture and Forestry	District authorities < 3 hectares with approval of provincial Agricultural and Forestry Division

Figure 4.2. Areas of Contradiction for Responsibility for Land Allocation (from Schumann *et al*, 2006).

Recent investments in the rubber sector offer examples of the results of this ambiguity; rubber concessions in excess of 1000 ha and some of 10 000 ha were reported to have been approved at Provincial level without approval from National level.

Most State land that has not yet been developed commercially, leased or conceded is considered forest land and the authority to allocate would logically lie with those responsible for forest land. However there is a complex mosaic of traditional use, protected forest, forest reserves,

production forests, rehabilitation forests, degraded forests and defoliated land and allocation for plantation use is not a straightforward task.

In addition to the authority and responsibility for allocating land, there are reported shortcomings regarding enforcement of these laws. Responsibilities are unclear and the capacity and willingness to enforce appears weak.

It appears that this lack of clarity and complexity can be capitalised upon by unscrupulous

investors and there is an urgent need to gain clarity regarding the primacy of the different laws (which laws are considered first) and the exact levels of authority and responsibility for allocation.

4.4. Concessions.

Despite low population densities and substantial areas of land, the study by Schumann *et al* (2006) found that the very low earnings from state land leases and concessions indicate that GoL has not yet fully developed this income source. In 2004-2005, total revenues from state land assets amounted to US\$ 7.2 million, representing only 0.24% of GDP. Further, powers to conclude lease and concession agreements in agriculture and forestry are spread among various state authorities and the allocation of different ceilings (financial investment and land size) for both investment approval and leasing and concession contracts to central or local authorities do not seem to be compatible.

There is some considerable practical attraction in offering concessions for substantial areas of underutilised land. Major and credible investors require a certain core area for their operations. From this, other benefits will flow. However, allocation of State land which belongs to the Government of Lao PDR and its citizens remains a very sensitive issue. This is the experience in neighbouring countries:

A recent study in Cambodia (ADB, 2006) identified strong links between land alienation and people trafficking and concluded that loss of land increases vulnerability to trafficking. The single greatest factor contributing to the vulnerability (of livelihoods and social fabric) of ethnic minority groups was **loss of land**.

In Thailand, Mahannop (2004) found that *“the single major obstacle to large-scale plantations, is not the shortage of investment funds, not the lack of government policy but **unsettled land disputes.**”*

The current process for allocation of concessions in Lao PDR is far from clear and administrative responsibilities are ambiguous. It is anticipated that the Lao- German Land Policy Development Project at the National Land Management Agency and the proposed Lao Plantations Authority will both address this issue. At the time of writing, it was reported that the situation regarding allocation of concessions in Lao PDR was to be reviewed to offer better clarity in process.

4.4.1 Concession Land rents.

Land rents (either via leases or concessions) appear to be low by regional standards. It is unfortunate that some of the conditions related to allocation of State lands are not in the public domain. Some concession rates and land rents quoted to this consultant are low by regional standards. Schumann *et al* (2006) found it challenging to obtain exact details of the land rents and concession rates, but, according to their informal sources, and sources available to this consultant, land rents of US\$3 per year are commonplace and further, that land rents are not payable in some cases until wood harvest/ rubber production comes on line – 7 years for fast-growing eucalypts and 6 years for rubber. For a 10 000 ha concession, this equates to a \$210 000 subsidy to the company (and loss for the GoL) or, for a 50 000 ha concession, a subsidy in excess of US\$1 million. At more realistic annual land rates of US\$20 per hectare (considered reasonable by this consultant) such over-generous arrangements equate to a subsidy of \$1.4 million for a 10 000 a concession, or US\$7 mill for a 50 000 ha concession. If these unsubstantiated conditions for land concessions are true, there would appear to have been an opportunity missed to gain significant Lao equity in such projects.

Land rents in neighbouring countries are significantly higher than those in Lao PDR. In the main eucalypt-growing areas of Guangxi Province in southern China, typical land rents are US\$70/ha/yr (Cossalter, 2005; UNDP, 2006). In Thailand, the rental rate for degraded forest rented from the Royal Thai Forest Department was 62.5 baht/ha/year between 1992 and 2001. In 2002, rents were increased to 625 baht/ha/year (US\$17) in the first rental period and 1 250 baht/ha/year (US\$34) for an extension. (Mahannop, 2004). In Vietnam, land rents are complex and are off-set against several Provincial and District taxes, however informal sources suggest that these total at least US\$20 - 30 per hectare per year.

However, low land costs alone do not attract investors. A range of investment enabling procedures constitute a package that will attract serious, high quality international investors. Analyses completed as part of the ADB studies supporting the Lao Plantations Authority clearly demonstrate that land rents are a relatively small part of the costs for an integrated pulp mill project.

4.5 The main species in Lao PDR

The Forestry Strategy found that some 146,600 ha of commercial plantations have been established, predominantly in the Central region. It is estimated that out of these planted areas about 66% have survived (more than 70% of seedling survival rate) and constitute the current tree plantation stock.

Individual farmers and entrepreneurs contribute the largest area to the national total planted area (47.5%), with an average planted area of between 20 and 30 ha. Smallholders constitute the largest tree-owning group but on average have smaller plantations (~1.8 ha), altogether accounting for 30% of the total area planted under the project. At the other end of the scale, participating companies constitute 1% of clients but, with average plantation size of 200 ha, contribute almost 10% of the area, with households contributing the remaining 13%.

4.5.1 Teak

In Laos, teak is one of the country's most valuable timber species. Recognising the value of teak and the limitations of supply from native forests, teak plantations were initiated in Laos in 1942. In response to strong and sustained market demand for teak timber and in response to perceptions of future wood shortages, the Government and land owners have encouraged and established small plantings of teak in Laos for over 30 years. A large proportion of the teak plantation estate in Laos was established and is being managed by private, small-scale owners and for this reason accurate estimates of areas are difficult to make. The total area of teak plantations in Laos are in excess of 15 000 hectares (FAO, 2001 and assumed annual plantings). Luang Prabang Province has the greatest concentration of teak plantations in the

country, an estimated 12 000 ha of which 98% belongs to farmers and the private sector. Much of this resource is confined to areas close to road or river access because of transport needs for logs or future sale of plantations.

Teak plantations are usually established in association with swidden agriculture, in what is often known as the "taungya" system. Trees are interplanted for 3 years with agricultural crops such as upland rice, sesame and pineapples; this process offering adequate weed control and protection during the early years of establishment.

The importance of teak to local communities and to the national economy encouraged the Lao Government to establish the Teak Improvement Centre at Keng Ben, near Luang Prabang in 1991

At harvesting, trees of a minimum 15 cm dbh are selected by the grower and offered to the buyer. It is estimated that over 7000 m³ of plantation-grown teak is harvested annually in Luang Prabang Province alone and it is predicted that this will rise to 40 000 m³ annually by 2012. Such a resource of high value, plantation grown tropical hardwood clearly offers attractive investment possibilities for processing rather than the export of low-value "squared" logs (Midgley *et al*, 2006).

Growers are greatly disadvantaged through lack of access to market information. The prices they receive for their standing trees are far less than what could be reasonably expected from a fair market. Lack of market information has also contributed to smallholders selling their plantations during times of extreme financial stress for very low prices. Tables 4.3, 4.4 and 4.5 offer current prices for standing trees in Luang Prabang, delivered logs in Thakhet and for "squared" logs delivered to northern Thailand (Midgley *et al*, 2006).

Tree girth/diameter (cm)	Price (kips/tree)	Price (US\$/tree)
70/22	70 000	7.00
80/25	80 000	8.00
90/29	90 000	9.00
>100/32	150 000	15.00
>150/48	1 500 000	150.00

Table 4.3. Scale of prices for standing trees (2006, Luang Prabang sawmill)

Log diameter (cm)	Price (US\$/m³)
15 - 19	137.50
20 - 29	177.50
>30	237.50

Table 4.4. Delivered prices for teak logs, Thakhet (2005 ADB study)

Log (cm)	section	Price per cubic metre	
		Baht	US\$
10 × 10		7000	184
20 × 10		10000	263
10 × 15		12000	316
20 × 15		14000	368
20 × 20		14000	368

Table 4.5 Delivered mill door prices for 2 metre squared logs, Vientiane, 2006. (For export to Thailand)

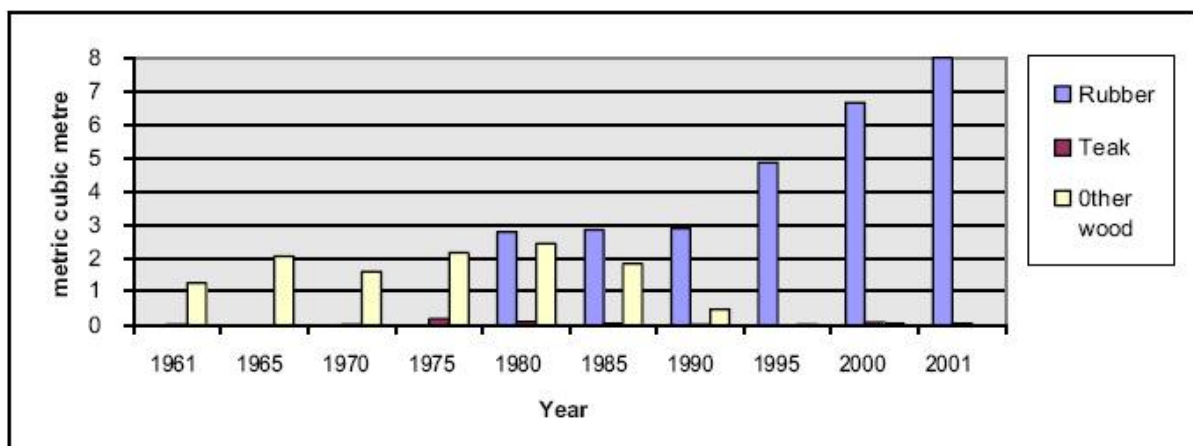
Although teak cultivation offers benefits and provides attractive incomes for growers, poor silvicultural management of teak plantations and inferior genetic material were two technical limitations identified.

4.5.2 Rubber

There are an estimated 20 000 ha of rubber plantations in Laos and these are dominated by eight domestic and foreign companies with an average investment total of more than US \$800 million, (Malychansy, 2006). Foreign investors control 70 percent of rubber tree plantation areas, with the remaining 30 percent still in the hands of domestic investors. It is expected that investments in rubber will expand to 227 000 ha by 2010, primarily in the northern provinces and the four southern provinces. Prospects for development of smallholder plantings of rubber appear promising and in May 2006, 150 representatives from China, India, France, Thailand, Vietnam, Malaysia, Indonesia, Cambodia and Laos met to discuss development of rubber production in Laos. The workshop

established a dialogue regarding the trends and issues in rubber development in Laos and the region, identified technical options to strengthen smaller rubber production plants in Laos, and developed areas of follow-up for both research and extension. Further details of the meeting can be gained from the NAFRI website: <http://www.nafri.org.la>

Rubberwood has become a major timber species in the ASEAN region. In Thailand, as solid wood production from natural forests and teak plantations has declined, supplies from rubber plantations have increased dramatically (Figure 4.6). In 1982, rubberwood was valued at 120 baht/tonne. It increased to 550 baht/tonne in 1993 and 900 baht/tonne in 2002. Due to the increasing prices for natural rubber latex, supplies of rubberwood are tight and Thailand's rubberwood furniture sector is now importing substantial amounts of rubberwood from Myanmar. Trends in rubberwood use in Thailand and other neighboring countries will have obvious impacts upon the rubber sector in Laos.



Sources: National Statistical Office (1990-1995) and RFD (1996-2001); data for rubber (1990-1996) Forestry Research Centre (1997)

Figure 4.6: Increase in rubberwood harvests in Thailand 1961 – 2001.

Challenges for rubber in Lao PDR were identified by the recent rubber workshop. One of the challenges was that there is no obvious national focus for rubber in Lao PDR⁶ and growers are disadvantaged through lack of access to market information.

Among the other immediate needs identified by the workshop in a thorough list of recommendations, included a review of the broad situation of rubber planting in Laos, and to:

- Develop a research-extension support program for the rubber sector
- Draw lessons on the impact of industrial tree plantations (environmental, social and economic factors)
- Consolidate lessons learned regarding provision of credit
- Preparing guidelines on formation and management of smallholder rubber groups and associations
- Prepare draft standards for contracts with agribusiness investors and train provincial and district officials.

Annex 5 suggests a project which will provide market information as a response to the rapid and

⁶ . During a search for the proceedings of the recent 1st World Rubber Summit in Bangkok, it became unclear if a Lao delegate attended and if Lao rubber interests had been represented. Unfortunately the knowledge that such a Summit would have delivered is generally unavailable to Lao growers and rubber stakeholders.

uncontrolled growth of rubber in Lao PDR and to lead to a more comprehensive proposal to understand the rubber supply chain in China and the dynamics of the Chinese rubber, its capacity, anticipated future needs and its likely impacts upon the rubber plantation sector (and landscapes) of Lao PDR.

The attractiveness of the current rubber markets has hidden some of the long-term volatility associated with the global rubber markets over the past 100 years. Examination of this volatility would suggest that widespread planting of rubber offers an element of risk. Under current contract arrangements, the large part of this market risk falls upon the grower. In addition, an undefined number of clones are being established in Lao PDR. Anecdotal evidence suggests that one or two clones dominate the plantings in northern Lao PDR. This presents a further risk should the plantings become subject to pests or diseases.

4.5.3 Agarwood

Agarwood, the “Wood of the Gods”, is a resinous wood used as incense, for medicinal purposes and perfumery and has been traded and highly appreciated for thousands of years. A strong connection exists between use, religion and curative properties, and elaborate traditional and religious ceremonies are known from around the world. Most agarwood comes from trees belonging to the genus *Aquilaria* of the family Thymelaeaceae. There are 17 species of *Aquilaria* distributed from NE India to Indonesia and Papua and New Guinea. Only one species (*Aquilaria crassna* Pierre ex Lecomte,

“maiketsana”, “mai dam” or “mai hom”) has been recorded from Lao P.D.R. This species is highly valued for agarwood, and natural stands have been heavily exploited throughout its range. The increasing rarity and continued high demand and value of agarwood has led to a marked increase in interest in plantation establishment particularly in the southern Bolevens area of southern Laos. Some of these plantations have been financed via public investment and managed to meet prospectus demand. Many growers were unaware of the risks presented by the rapid expansion in agarwood plantings in Vietnam and the accompanying technology for inducing heartwood formation. Most of the publicly available promotional material on agarwood markets has been promulgated by the companies encouraging investment and there is a need to offer some dispassionate market assessment of the likely future markets for agarwood.

By the end of 2005, there were an estimated 4418 ha planted in Lao PDR and the Lao Plantation and Cash Crop Business Association estimates that 20 million trees have been planted. Nearly all of the trees recently planted have been established by investment companies however there remains a significant smallholder interest in this species.

4.5.4 Eucalypts/ Acacias

Eucalypts grow very well in Lao PDR where they have been planted for over 50 years. A great deal of scientific effort has gone into identifying species, provenances and hybrids which suit the variety of soils and growing conditions in the country. The main species are *E. tereticornis* and *E. camaldulensis*, and hybrids with other species such as *E. urophylla* and *E. grandis*. *E. pellita* has demonstrated pleasing growth on many humid sites. The success in Laos of hybrids developed in breeding programs in Vietnam, China and Thailand demonstrate the attraction of regional networks when dealing with eucalypts.

Tropical acacias also grow well in Lao PDR. *A. mangium* has demonstrated good growth rates over a variety of sites but has struggled with poor site preparation, weed competition and poor nutrition. Recent trials of *A. crassicarpa* and the *A. mangium* x *A. auriculiformis* hybrids from Vietnam demonstrate the potential of these species which have become well established and productive in other parts of SE Asia.

Despite the obvious commercial success of professionally-managed plantations where MAI can exceed 20 m³/ha/year, productivity of many smaller eucalypt and acacia plantations has been disappointing and much below that experienced in China, Thailand or Vietnam. A 2002 survey of *E. camaldulensis* plantations established with ADB finance in Vientiane and Savannakhet provinces found frequent failures or very low growth rates in smallholder plantations and higher growth rates and survival in plantations established by commercial firms and self financing planters. The low growth rates experienced were not representative of the potential of the sites, rather a symptom of inexperienced management by small growers. Owners of larger sized stands, who tend to invest more per unit area in fertilizer application, mechanical site preparation and management achieved higher MAIs. There is a misguided view among many smallholders that eucalypts do not require fertiliser or maintenance. This is at odds with experience in nearly every other eucalypt-growing country. To change and challenge this mistaken view will be a major task of extension officers should smallholders wish to grow eucalypts to international standards.

There are opportunities to improve early growth and survival. Nursery stock is one; high quality, container-grown plants from the more sophisticated nurseries have shown improved growth and successful early establishment.

There have been a number of reasons why the growth rates experienced in the smaller eucalypt and acacia plantations in Lao PDR have been disappointing:

- **Technical back-up.** Growing commercial eucalypts requires technical skills and disciplined silviculture. Many of the smallholders who chose to grow eucalypts were unaware of the discipline required and the experienced technical extension services to demonstrate techniques were not available. Thus plantings were not fertilised, poorly maintained or left unprotected against cattle and buffalo.
- **Reliable financial advice** for small and medium growers was lacking. Growers had unrealistic expectations of the low cost of establishment and potentially high returns. Adequate demonstration and impartial professional advice was unavailable to these growers.

- **Established and reliable markets** and market information were unavailable to farmers. The returns they received from their tree planting ventures were generally poor and they were discouraged from investing further.

However, there are sufficiently large areas of successful, commercial eucalypt and acacia plantations in Lao PDR to be positive about the plantation expansion.

Lao markets for eucalypt wood for poles, sawn wood and wood fibre vary and are dominated by the needs of the Phoenix Pulp Mill in Khon Kaen (Siam Pulp and Paper) and Advance Agro and, to a smaller extent, the needs for Burapha's small eucalypt sawmill. Interviews with village growers again demonstrated that they are disadvantaged through lack of access to current, reliable market information. Current farm gate prices for debarked pulp logs were reported as 1000 baht/green tonne (~US\$27) and US\$20 per log for 30cm dbh log for sawing

4.6. Research and Development

Successful plantation programs are underpinned by strong programs of R&D. Knowledge of species performance, provision of high quality germplasm, management of soil fertility and impacts on society and the environment all require strong R&D support. The plantations sector in Lao PDR is supported primarily by NAFRI and its networks of national (NUoL and other institutions) and international research partners. NAFRI is well connected with international research efforts through these partnerships and through membership of IUFRO and the Asia Pacific Association of Forest Research Institutes (APAFRI). Its relationship with CSIRO (Australia), for example, has assured access to germplasm for assessment and genetic improvement of eucalypts. Commendable and long term strategic donor support (especially via Sida) has been offered over many years and this has led to a core of well-trained scientists with many of the skills to support the plantations sector.

National research groups (including NAFRI) will have to make an effort to become acquainted with the business of plantation investors to examine where their research efforts will have the most relevance. In turn, it is in the best interests of the investors to support these institutes through contract research, maintaining a core of skilled scientists who are well

acquainted with the needs of the industry. Services that will be required include analytical laboratories for soil and foliar analysis, identification of pests and diseases and supply of quality seed for outgrowers who are not supported by larger companies.

4.7 Extension Services

The National Agriculture and Forestry Extension Service (NAFES) was established in 2001 and is a department within the Ministry of Agriculture and Forestry. All forestry extension projects and services are the responsibility of NAFES which includes the Forest Plantation and Reforestation Extension Centre and what was formally the Lao-ADB Tree Plantation Project. At the Provincial level, there is a Provincial Agricultural and Forestry Extension Service (PAFES) which is in charge of extension activities, training and project management. At the field level, the District Agricultural and Forestry extension Service (DAFES) is responsible for delivery of extension services relating to agriculture, livestock and fisheries, forestry and irrigation. At the end of the ADB-funded Industrial Tree Plantation Project responsibility for field implementation was shifted to NAFES and some skills were developed/maintained relating to plantation eucalypts. Whilst recognised for strengths in agricultural extension, the standards and capacity for forestry extension are limited. It was reported that District staff may not have the skills and experience to adequately provide extension services in the plantation sector because of limited training in management of commercial plantation species such as rubber and eucalypts.

It against this background that the proposed Lao Plantations Authority will place trained extension officers in each of its cluster zones (Champassak/ Saravanh, Bolikhamsay, Vientiane Municipality/Province). It proposes to service the needs of Khammoune and Savannakhet through the regular LPA staff who provide back-up to the larger commercial growers.

The extension staff spoken with felt that up to date market information would be extremely useful in maintaining relationships with smallholder growers. They also felt that they needed specialist training to meet the expectations of village-level growers. If smallholder plantings of eucalypts, rubber or teak are to meet their full potential, there is a

clear need to strengthen delivery of extension services.

4.8 Development of National Standards

National standards are the foundation for success in the plantation sector. They shape operations for the plantations themselves and form the basis for consideration of the impacts on society and the environment. They form a foundation for assessment of success and compliance with national laws or terms of contracts. Through its Vision (consistent with national policies – see below) and its commitment to the principles of Sustainable Plantation Management (Part 3) the GoL will expect that Lao plantations will meet highest international standards. It will encourage investors to seek certification through one of the international certification systems. Establishing a single set of national standards to suit a broad range of investors (and growers), a broad range of species and products (solid wood, wood chips, natural rubber) and social and environmental conditions across many sites in Lao PDR and monitoring of these investments is challenging; expensive, time consuming and technically demanding. Lao PDR will require assistance to develop national standards and to develop the skills and motivation of those responsible for upholding the standards.

In developing national standards, the GoL may wish to seek guidance from the following:

- Draft Planted Forest Code. (FAO)
- Guidelines for the establishment and sustainable management of planted tropical forests. (ITTO).
- Code of Practice for Industrial Tree Plantation Development in the Tropics. (CIFOR)
- IFC/World Bank policies on social and environmental sustainability and Performance Standards
- Elements of Sustainability in the Plantation Forest Industry (WWF).
- Standards to meet various certification schemes (FSC, PEFC⁷ etc).

4.9 Development of a Vision for the Plantation Sector in Lao PDR

Sections 4.2 and 4.3 offer some background to the supportive policies, laws and regulations that underpin the Lao plantation sector. Whilst comprehensive, this collection of support does not offer a clear focus for the plantations sector. What is the plantation effort directed towards. This is what is commonly called a Vision, a term embraced by Government, industry, investors, growers and financing institutions which offers a sense of common purpose. Once a shared vision is in place, sector policies have more meaning and a clear objective is offered for sector strategies.

As an example, the development of a plantation vision for Australia “The 2020 Vision” began in 1997. It was developed in recognition of the emerging opportunities for renewable timber production and the need to offer focus and common purpose to Governments at Federal, State and local Levels and the industries. The 2020 Vision is a strategic partnership between the Commonwealth, State and Territory Governments and the plantation timber growing and processing industries. The overarching principle of the Vision strategy is: *To enhance regional wealth creation and international competitiveness through a sustainable increase in Australia's plantations based on a notional target of trebling the area of commercial tree crops by 2020.* For further details on the Vision 2020 for Australia, visit: <http://www.plantations2020.com.au/>

⁷ The Programme for the Endorsement of Forest Certification schemes. See: www.pefc.org

The Vision
As enshrined in national policies

Sector Policies

Sector Strategies

In line with the principles of sustainable plantation forestry; sustainable productivity (and profitability), sustainable social commitment, environmental sustainability and good governance, and consistent with existing GoL policies and strategies, consideration should be given to the development of a Lao Vision for the plantation sector. A national vision would

incorporate Lao aspirations for high quality (world class) and economic growth and express a Lao commitment to its people and the environment (sustainable management). The term for the Vision (for consideration) might be “*A World Class Sustainably Managed Forestry Sector*”



5

Matching Investors Needs with Lao Expectations

There has already been a considerable corporate interest in investment in the plantation sector of the Lao PDR. In this section an assumption has been made that the demands of large growers will fuel market opportunities for small and medium growers.

Some of the world's largest companies have recognised the plantation opportunities that might be present in Laos and two (Oji Paper and Grasim – part of the Aditya Birla Group) have

commenced operations. Three others (APP, UPM and Stora Enso) have all been in Lao PDR in recent months to examine options. These companies are substantial global corporations with commitments to international shareholders, clients and stakeholders. An investment in Lao PDR would fit obviously with their larger corporate goals and strategies.

Company rankings

PWC Global Forest and industry Survey, 2005

2004 Ranking	Company	2005 Sales (US\$ bill)
1	International Paper	24
2	Weyerhaeuser	22.6
3	Georgia Pacific	****
4	Stora Enso	16.8
5	Kimberly-Clark	15.9
6	Svenska Cellulosa	13.3
7	UPM	11.8
8	Nippon Unipac	10.1
9	Oji Paper	10.3
20	Asia Pulp and Paper	4.5*
Unlisted	Aditya Birla (Grasim)	8.3

Figure 5.1 . Company rankings in terms of international sales.

5.1 Judging Investors

The true size and capacity of these companies (±US\$10 bill) can be assessed against the entire annual budget for the Lao PDR of US\$0.6 billion. Although it can be difficult to distinguish between such wealthy and powerful companies, the following offers some guidelines. It is useful to remember during negotiations that companies would not begin a dialogue with Lao PDR unless it was in their best commercial interests to do so. Most of the reputable companies have details on their websites and these details will include:

Corporate policies, especially Codes of Conduct

Policies relating to Corporate Social Responsibility: Society and the Environment

Reports of Financial and Technical Success including experience with wood supply from plantations

Statements on Governance/Accountability: Since the collapse of unsound corporate entities such as Enron, respectable companies have

been at pains to establish their high levels of governance and accountability

Transparency. As companies become more involved with the community, they become obliged to share more information with the community. A policy of transparency can go a long way towards avoiding conflicts as some later stage.

Annex 4 offers some background on some of the international companies that have expressed interest in the plantation sector in Lao PDR. Of particular interest are the policies on sustainable plantation management and on corporate social responsibility.

5.2 Investors judging Lao PDR

In dealing with global corporations, it must be remembered that they have two great responsibilities – a responsibility to offer shareholders a reasonable profit and return on investment and a responsibility to clients to offer a product of acceptable quality and price. In addition, publicly listed companies will consider the potential impact of an investment upon share price.

The risks associated with an investment located in Laos will be carefully analysed:

- **Technical risks** are those which are associated with the actual business of growing trees – risks such as disease, fire and insect predation,
- **Financial risks** are those associated with such as the impact of escalating fuel prices on transport costs
- **Sovereign risks** are associated with the possibility of the GoL taking over the investment.

A vital parameter for consideration in investment in a commodity such as wood fibre is the mill door delivered price of wood fibre. This figure is normally US\$/dry tonne and includes costs of land + growing costs (establishment, management) + harvesting + transport. The world average is currently of the order of ~US\$28/m³.

Investors in the plantation sector are seeking long term relationships with their national hosts because the timeframes for tree products investments are long. Such lengthy investments require national administrative stability. Just as

Lao PDR might display faith in allocating 50 000 ha into the management care of a foreign company, foreign companies must have faith that the political and administrative stability of a country will remain steady over the investment.

It can be seen for this that low land cost is not the only criteria that a company will consider in assessing the merits of a location for investment. In addition to the above, companies will consider infrastructure, taxation treatment, export controls, facilitation and administrative support after investment has commenced. For example, it may be reasonable to raise land rents from \$3 to \$20 per hectare but to offer a suite of services in return for this increase.

5.3 Framework of self-defined standards (within national guidelines)

Given the proven track record of some of the global companies and their commitment to the principles of sustainable plantation forestry, the GoL might consider implementing a framework of self-defined standards (within national guidelines) for selected large investors.

In return for the stability and economic opportunity offered by Lao PDR, investors will commit to the proposed Lao Vision and the principles of sustainable plantation management and respond in detail in their applications to CPI. The details offered in the application will include verifiable indicators of compliance and form the basis for the formal contract. These details will also be the basis upon which the investment project is monitored and audited annually. Immediately a concession has been allocated, the company will arrange for baseline colour satellite imagery (suggested 2.5 metre resolution) to be provided to the CPI as a tool in project monitoring and auditing.

Annual reports from investors will address progress against the investors' own standards and criteria and include electronic copies of GPS outlines of project operations and plantations established and related up-to-date imagery (B&W at 5 metre resolution). Satellite imagery and GPS records of operations will be major monitoring and auditing tools over the life of the project.

In response to the commitment to transparency, and to the extent possible in maintaining corporate confidentiality and intellectual property rights, applications and progress reports will be available publicly on the Web.

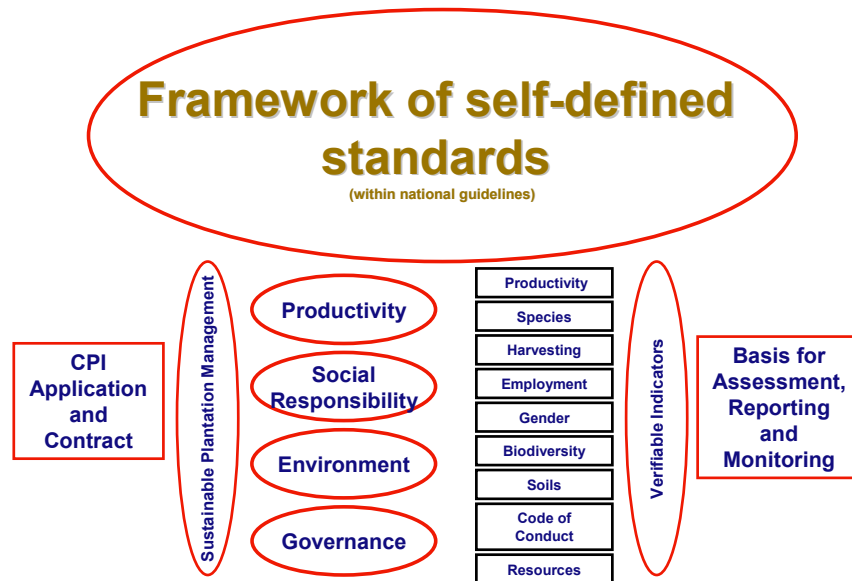


Figure 5.2. Framework of self-defined standards for selected global companies.

This approach has the benefit for corporations committing to their own high standards which are consistent with national standards in the countries within which they operate. The use of satellite imagery and GPS minimises the need for extensive field monitoring of project progress.

Whilst the framework of self-defined standards might be appropriate for selected large experienced global public companies, it may not

be applicable for smaller foreign private companies (such as those from Thailand, Vietnam and China), and domestic investors with plantation areas below (say) 2000 ha. It is for these small investors that the national standards (discussed in 4.8 and recommended in 8.4.1) will have strong relevance. The standards will be the basis for guiding operations and for establishing necessary levels of technical and extension support.

6

Building opportunities for smallholders

In Part 3, the benefits that accrue to local communities through commercial plantation development are described. The point is made that accrual of real benefits for rural families and communities comes through the creation of wealth and assets via a number of means including:

- Smallholder ownership of plantations (assets)
- Sale of produce – wood, latex etc. (wealth)
- Improved infrastructure (access to markets, schools, hospitals)
- Development of skills (alternative employment opportunities)
- + employment

Recent experience in Thailand and China has clearly demonstrated the potential of smallholders to contribute to wood flows of commercial wood and supplies of natural rubber latex and for the smallholder growers to benefit considerably from this activity through sales of produce. Recent studies in Lao PDR (Midgley *et al*, 2006) describe the benefits that accrue from smallholder teak plantings in northern Laos.

Wood, and to a lesser extent, rubber have the advantage of being able to be managed and harvested in response to market demands or the growers' financial needs. Smallholders' trees maintain value in the plantation when markets are depressed and can be harvested when market conditions are attractive.

A great many models for smallholder plantings have been tried in Lao PDR and elsewhere with varying success. The model which enjoys most favour in Lao PDR for both rubber and wood fibre at the moment is an equity sharing financial model, commonly known as the 2 + 3 Model and adopted by LPA. The smallholder contributes land and labour (2) and the institution/investor access to finance, technology and markets (3). Other models of smallholder engagement have been tried in China and Thailand. Several commercial companies with large demands for wood fibre in China use 2 types of scheme for engaging smallholders;

- **Contracted plantations:** long-term procurement contracts with small plantation growers. The company offers a guaranteed minimum price \geq local market price.
- **Membership (outgrower) plantations:** Trees planted on farmer's and village lands. The company provides loans and technical assistance in exchange for an agreed share of wood produced. The company may purchase additional wood, above the specified share at market rates. This is similar to the Lao 2 + 3 Model.

In China both direct contracts and shareholding models have been used successfully and have shown a number of benefits and risks (Table 6.1).

Option	Grower		Commercial Partner	
	Benefits	Risk	Benefits	Risk
Shareholding Option 1. Meet all direct costs of labour and fertiliser and provide the partner a 30% share of nett revenue at harvest at Year 6	Potentially can receive a greater return than from land rental alone. Receive employment through labour opportunities	30% share of what revenue? Uncertainty if the Market price or company's mill door price?	Land costs until harvest at Year 5 are reduced.	Partner may become discontented.
Shareholding Option 2. Pay a flat negotiated establishment fee of to the grower and provide the partner a 30% share of the wood harvested	Potentially can receive a greater return than from land rental alone. Receive employment through labour opportunities	30% share of what wood? Who measures the wood? Contract harvester can	Land costs until harvest at Year 5 are reduced. Attractive for growers if establishment fee is competitive.	Partner may misuses establishment fee or become discontented. No control over management standards. Complex to manage
Land rental. Pay a formally agreed rent (with the capacity for review) and arrange plantation establishment corporately	Reliable and unambiguous. Periodic Review of rental rates. Minimum inputs. Receive employment through labour opportunities	Market rentals might increase ahead of review.	Maintain control of plantation standards. Simple to manage.	Might have to pay above market land rental rates to establish themselves in the market
Self managed plantations. Use local contacts and knowledge to accumulate land and use privately available funds to finance operations.	Reliable and unambiguous. Minimum outside involvement. Periodic Review of rental rates. Minimum inputs. Receive employment through labour opportunities	Based largely on trust and community contacts. Market rentals might increase ahead of review.	Can take advantage over local Maintain control of plantation costs and standards. Simple to manage and can quickly respond to situations.	Limited capital limits inputs and productivity is reduced. Poor knowledge base may limit productive options.

Table 6.1 Benefits and risks for smallholder models used in Guangxi, southern China.

In Thailand the market demands for latex and wood fibre are very attractive and few smallholders, other than the very poor, need encouragement or large support to participate.

Security of land tenure and ownership of planted trees are basic needs for any smallholder grower. This has been addressed in the LPA proposals and functions through the Government's issue of

Temporary Land Use Certificates (TLUC) on a 3-year rolling basis. After the initial 3 years, according to this policy, if a TLUC holder is determined to have put the land under productive use, TLUCs can be turned into a permanent land deed. Unfortunately this does not always happen in Lao PDR because Government institutions may do not have the capacity to survey and certify land use.

The recurring theme for successful smallholder and outgrower schemes is that of communication and trust. The growers are constantly in touch with the market and the market values the growers as reliable suppliers. Both parties share a confidence in the fundamental attractiveness of the tree growing business.

6.1 Risks for Smallholders

Smallholders are vulnerable and are frequently asked to assume a disproportionate share of the risk associated with tree plantations. They often do not possess the technical knowledge and resources to make full use of the opportunities offered through smallholder schemes. To succeed, reliable and competent back-up is required to assist with financial or technical problems; this is often missing.

Market risks. In the case of a commodity product such as rubber, there are considerable fluctuations in world prices. Smallholders can suffer if there are decreases in global demand or prices. Coffee and copra are two examples where commodity prices have had impact upon Asian growers.

Technical risks. Smallholders are vulnerable to the impact of diseases or pests. In Lao PDR there is a poor capacity for rapidly identifying pests and diseases and recommending mitigating measures. Reportedly only a few clones are being used in rubber plantings in northern Laos and this presents a high risk in the event of an outbreak of a pest or disease.

6.2 Sources of Support for Smallholders

Sources of technical support and administrative and financial advice for smallholders of teak, rubber or wood fibre species are limited in most areas of Lao PDR. For wood fibre growers, the LPA will assume a formal supportive role in its 3 cluster areas, however for rubber growers there are no independent sources of information. In the model contracts for rubber offered to farmers in the northern provinces, the contract arrangements appear inequitable – the farmer accepts most of the technical and market risk and does not own the trees at the end of their productive life!

If smallholders are to see the same benefits in Laos as they have seen in neighbouring countries, then strong market information and technical back-up will be essential.

6.3 Role for Growers Cooperatives

In some countries there are very strong grower's cooperatives or associations to look after the needs of the smallholders. For instance, in Thailand, the world's largest producer and exporter of natural rubber, there are strong support mechanisms in place. Three major state-owned organizations support the rubber industry, all of which report to the Minister Agriculture and Cooperatives. They include: the Office of the Rubber Replanting Aid Fund (ORRAF), the Rubber Estates Organization (REO), and the Rubber Research Institute of Thailand (RRIT). The role of ORRAF is to support the rubber farmers with financial assistance as well as to facilitate the movement of their raw rubber production to the marketplace. RRIT is responsible for research and development into rubber planting stock and tapping methods in order to increase yields. REO is the state-owned plantation organization, which controls approximately 10 percent of the rubber plantation area in Thailand. The Thai Government intends to create a new Rubber Authority of Thailand (RAOT) to merge these entities and strengthen support available to growers (Suanprasert, 2006).

Until recently, there were no such associations in Lao PDR but two groups that have recently been approved for operation are: The Lao Tree Plantation and Cash Crop Business Association (LTPCCBA) and the Sustainable Tree Plantation & Livestock Promotion Association (STPL). These organisations represent a voice for the small and medium growers and can be the conduit for supply of market information, standard contracts and operational guidelines consistent with national standards. The need for grower's cooperatives to share market information is demonstrated by a comparison of the prices paid for teak logs in Luang Prabang and Thakhet (Tables 4.3 and 4.4). Companies and institutions (such as LPA) can use growers' associations to mutual advantage.

There would be considerable benefit for Lao smallholders and those responsible for promoting and supporting smallholder tree planting schemes to gain first hand exposure of the dynamic smallholder eucalypt and rubber sectors in NE Thailand. Annex 7 suggests a study tour to offer this exposure.

6.4 Possibilities for Group Certification

Certification of plantations to international standards offers market access for plantation wood, and in some cases, offers a price premium over wood which has not been certified. It is possible to certify smallholder plantings of fast-growing species such as eucalypts and acacias and slower-growing teak. It is a complex operation for which there is international support. Organisations such as the Tropical Forest Trust (www.tropicalforesttrust.com) and WWF have worked with communities in other countries (Vietnam, Indonesia for example) to gain “group” certification for small locally owned and managed plantations. Such certification would offer market benefits to Lao growers. The prospect of group certification for smallholders and certification for plantations established by large investors has considerable

merit and is consistent with the concept of sustainable plantation management and with trends in other parts of the world.

There are approximately 12 000 ha of teak plantations in Luang Prabang Province. This significant resource is owned largely (96%) by smallholders in many small and scattered blocks from 0.1 – 1 ha in extent. These blocks have been established on land which was cleared for swidden agriculture a long time ago. Despite the market attraction of high value, plantation grown hardwoods, the prices received by the growers for this smallholder owned resource are generally below what international markets would suggest. The prospect of plantation certification deserves consideration in Lao PDR and the teak plantings of Luang Prabang would be a useful first model where the benefits to be gained from certification could be clearly demonstrated.

7

The Road Map and Challenges for the Plantation Sector in Lao PDR

Clear legal and administrative processes are essential foundations for the success of any long-term enterprise. In addition to offering the basis for management, they offer the foundations for monitoring, auditing and, if necessary, enforcement. For an investor, clear legal and administrative processes are an essential part of the “package” that is considered in making investment decisions.

7.1 Clear legal precedence and processes

Section 4.3 discussed legal issues surrounding the plantation forestry sector in Lao PDR and shared (as an example) the contradictions in legal responsibility for land allocation identified by Schumann et al (2006). Whilst such contradiction and confusion exists, the process for implementation of investment projects slows down. The situation also offers opportunities for unscrupulous investors to take advantage of uncertainty to the detriment of Lao PDR.

Confusion within the legal context generates another level of confusion in the administrative implementation of laws. Who is responsible for implementation of laws and regulations? Who has authority to approve allocation of land of different sizes and approve conversion of degraded forest land (for example).

For outsiders, who mostly rely upon imprecise English translations of the Lao law, the legal context for the plantation sector is confusing. There is an urgent need to offer clear, concise and interpretation of the laws and to offer unequivocal advice on the precedence that different laws enjoy. Annex 6 outlines a small project to collate, interpret and offer comment on legal precedence for relevant laws, regulations and decrees pertaining to plantations.

7.2 Clear administrative processes and responsibilities

Within the existing laws and regulations, there is confusion in the administrative processes which

uphold and enforce the laws. Annex 1 is an attempt to offer a suggested process for investment application, approval and monitoring. Whilst global investors have the technical and financial resources to complete comprehensive feasibilities and subsequent applications, they need access to existing data from the GoL. Among these required data are technical data such as maps, GIS surfaces, soil descriptions and growth data for different species on different sites. Large investments will have needs for roads and facilities to export products. It is common sense that these infrastructure components of an investment are complementary to existing development programs of the GoL and frequent sharing of information is essential to ensure best outcomes for all parties. Specifically, the following issues were identified:

- Required format and content detail for applications and approvals.
- What are the main criteria used as the basis for assessment for applications and contracts
- Who has responsibility to assess applications and negotiate contracts
- Who will approve the final contracts
- Who will monitor project progress at both technical and national development levels.
- Realistic timelines for implementation of parts of these processes.

The largest challenges identified for promoting the plantation sector are those surrounding allocation of land. The criteria for land identification and allocation need to be made public and understood. The delineation of the mosaic of village forests, production forests, areas of cultural significance and areas available for commercial plantations is a complex technical issue, made more complex when the social needs of communities are included. From material made available to this consultant,

confounding issues in the land allocation process include:

- **Lack of clarity which laws will be used.** Some administrators prefer to use Investment Law when accommodating foreign investors. Some prefer to use Land Law or Forest Law. Ultimately, a mix of laws will form the basis for land allocation to plantations but this mix needs to be clear.
- **Unclear authority and responsibilities.** The authority and responsibility for identification of suitable plantation lands is unclear and allocation at remains unclear (Sections 4.3 and 4.4 offer further detail). What are the levels of authority at national, provincial and district levels?
- **Community consultation.** The traditional close links between rural Lao communities and the forests has been well described in an extensive literature on the subject. The reliance of communities on NTFPs (for example) demonstrates how important forest lands are for the rural poor. Lack of community consultation is clearly unacceptable for a global company with a commitment to Corporate Social Responsibility however there is considerable ambiguity regarding the level of consultation regarded as acceptable
- **The Conversion Process.** The conversion process from degraded forestland to plantation is a dramatic process. Within degraded areas of forest there are often some trees which some people would like to keep. The parameters to classify forestland as degraded or productive can be blurred and a good deal of professional judgement is required. The standards for the actual conversion process must include protection of riparian zones and respect for sites of religious or cultural significance. The conversion process must involve community consultation.

- **Monitoring of progress and contractual obligations and auditing.** There is a need to assess and monitor investments in the plantation sector but responsibility for monitoring is unclear and capacity to assess is weak.
- **Enforcement.** Whilst it is expected that all investments will be implemented in an efficient, profitable and sustainable manner and the differences can be resolved in an amicable fashion, the Lao PDR has a sovereign right to enforce laws should there be breaches. There are many laws relating to plantation sector but the responsibility for enforcement is unclear and capacity to enforce appears weak. It is unclear which agencies have the responsibility for identifying breaches in contract and which agencies and personnel have the responsibility to follow enforcement through to a just end. From information offered to this consultant, it appears that investors are very respectful of the Investment Laws but can be casual about Forest Laws.

7.3 The Lao Plantation Authority (LPA)

The GoL, with the support of the ADB, has acknowledged the national importance of the plantation sector and is in the process of establishing the Lao Plantation Authority. The LPA has a draft mission to:

...efficiently and economically implement the Government's policies to improve the livelihood of the rural poor and of make Lao PDR a major producer of wood products by leading the campaign to establish commercially viable plantations of a variety of sizes and species while respecting the environment and helping to conserve natural ecosystems

As a national focal point for plantation investment, the LPA will provide, amongst a wide range of project activities:

- **Land use planning:** Consultative selection and delineation of suitable

land. LPA will set up a land registry and facilitate the issuance of land-use certificates to livelihood planters after they have established their credentials as serious operators at the end of the first 8-year rotation.

- **Guidelines/ Compliance of the Conversion Process.** LPA will facilitate the enforcement of environmental and social safeguards.
- **A full-package service to smallholder farmers** for establishing livelihood plantations of (~5 ha/household) and,
- **A one window service for national and international companies** for industrial plantations and a service for the GoL to perform due diligence on potential investors.

As part of the rationale for establishing the LPA, the GoL and the ADB recognised many of the current challenges being faced in establishing a commercial plantations sector in Lao PDR. These included:

An ineffective land-use planning and tenure system which constrains the development of livelihood and large-scale industrial plantations. This process for issuing and registering land-use certificates is constrained by inadequate capacity of existing Government institutions, although it is provided for by the Land Law. It is essential that issuance of land-use certificates is synchronized with the plantation rotation cycle.

The relevant rules and regulations need refinement and clarification. Land lease agreement negotiations with the Government for industrial plantations, are time-consuming and foreign direct investment (FDI) procedures in this subsector are not always transparent.

Plantation management guidelines, appropriate to the scale/type of plantations, will be developed and made operational. In particular, harvesting and transit rules will be rationalized to avoid marketing and delivery delays and minimize rent-seeking opportunities. Similarly, plantation logs and woodchips should be exempted from export duties and restrictions so that the foreign exchange earning potential of the sub sector is fully realized.

The ADB studies supporting the Project found that current institutional and staff capacity constraints are preventing Lao PDR from (i)

developing a vibrant plantations sub sector, and (ii) capturing the economic development potential of its land and water resources. The Forest Plantations Development Project (the Project), which supports the establishment of the LPA, will address these institutional, human resource, and technological constraints.

The LPA has an important and obvious role in completing the “Road Map” and offers an opportunity for the GoL to provide a focussed service to the plantation sector. It is vital that this new authority enjoys the support and confidence of all government public and investor stakeholders. Without this support, there is a risk that it will simply add to the lack of clarity in process for investment and operation that has characterised the plantations sector.

7.4 Instruments for Implementation

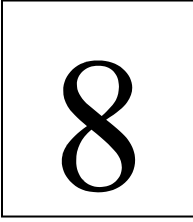
The current national policies and strategies and the proposed Vision will all require a range of instruments for effective implementation. These need to be clearly identified and responsibility allocated. Among these instruments are:

Institutional Instruments. Effective policy-setting agencies and administration support. An effective bureaucracy is the GoL tool in facilitating the implementation of plantation-related initiatives however various agencies such as DoF, the National Land Management Agency, CPI and the Department of Finance. All of these agencies must work towards a common purpose and possess the skills to professionally support the needs of the plantations sector. The LPA will become an important institutional instrument for the development of the plantation sector.

Financial Instruments. A variety of financial instruments can be used to foster a vibrant plantations sector. The FAO publication, *What does it take? The role of incentives in forest plantation development in Asia and the Pacific.* (Enters and Durst, 2004) outlines the broad range of loans, grants, tax incentives and subsidies that have been used in plantation development. It makes considerable sense for investors to be offered incentives for production of wood and creation of productive plantations which contribute to common good rather than offer direct subsidies (or overly cheap land) as an attraction early in the investment. An effective banking and financial sector is vital to manage funds, disburse grants, transfer money and transact loans.

Regulatory Instruments. The laws and administrative processes described in this chapter and the capacity to enforce these are essential for the smooth development plantation sector. Whilst there are many regulatory instruments in place, there must be clarity in understanding and a willingness to enforce laws for them to be effective.

Human Resources. All successful sectors depend upon well-trained and motivated people. Without these, the successful development of the sector will be dependent upon foreign skills. Training programs which meet the anticipated future needs of the industry are vital and for this reason, institutions such as NUoL must be part of the dialogue surrounding the expansion of the Lao plantation sector.



Conclusions and Recommendations

8.1. Setting Principles.

A successful and vibrant plantation sector must contribute to national policies and be based upon laws and regulations of the Lao PDR. In addition, the sector must be based on basic principles aimed towards excellence. The 4 core principles which underpin the concept of sustainable plantation management are emerging as major shaping influences in world plantation forestry (see Part 3).

Sustainable productivity

Social Sustainability

Environmental Sustainability

Corporate Governance

These principles have helped guide world standards and codes and offer a strong foundation for expansion of the plantation sector in Lao PDR.

It is recommended that the GoL and the Lao plantation community accept the concept of Sustainable Plantation Management with its 4 pillars of productivity (profitability), society, the environment and governance.

8.2 Creating a Vision

A vibrant plantation sector needs a Vision which describes the rationale and aspirations for plantation development. A Vision will be consistent with existing national policies and regulations of Lao PDR but describe to the world and its stakeholders Lao aspirations for world class technical standards, productive and profitable ventures, the environment and society. Despite a large body of supporting laws and regulation, and a large body of public and private support and goodwill, Lao PDR lacks a Vision to help focus its national plantation efforts. Such a vision must have application and meaning across the 3 main plantation types: wood fibre, rubber and high value solid wood. It is also important that the Vision be focussed and has resonance in

Lao language and culture and in the languages of foreign investors.

It is recommended that a Vision be adopted to guide the development of the plantation sector. A possible Vision that may be considered:

A World Class Sustainably Managed Plantation Sector.

Once the concepts of Sustainable Plantation Management and a Lao Vision are accepted, subsequent actions can be given priority.

8.3 Creating the Road Map

The current national policies and strategies and the proposed Vision will all require a range of instruments for effective implementation. These need to be clearly identified and responsibility allocated and the instruments maintained. Among these instruments are:

Institutional Instruments. Effective policy-setting agencies and administration support. An effective bureaucracy is the GoL tool in facilitating the implementation of plantation-related projects however various agencies such as DoF, the National Land Management Agency, CPI and the Department of Finance must work towards a common purpose and have the skills to professionally support the needs of the plantations sector. The LPA will become an important institutional instrument for the development of the plantation sector.

Financial Instruments. A variety of financial instruments can be used to foster a vibrant plantations sector - a broad range of loans, grants, tax incentives and subsidies have been used in plantation development. Incentives for production of wood and creation of productive plantations offer more benefit than direct subsidies.

Regulatory Instruments. The laws and administrative processes described in this report and the capacity to enforce these are essential for the smooth development plantation sector. Whilst there are many regulatory instruments in

place, there must be clarity in understanding and a willingness to enforce laws for them to be effective.

Human Resources. All successful sectors depend upon well-trained and motivated people. Training programs are essential for the success of the Lao plantation sector.

Consistent with the development and maintenance of these instruments, the following are recommended:

8.3.1 Laws and regulations

Section 4.3 discussed legal issues surrounding the plantation forestry sector in Lao PDR and the contradictions in legal responsibility for land allocation. Such confusion within the legal context generates another level of confusion in the administrative implementation of laws. Who is responsible for implementation of laws and regulations? Who has authority to approve allocation of land of different sizes and approve conversion of degraded forest land (for example).

For outsiders, who mostly rely upon imprecise English translations of the Lao law, the legal context for the plantation sector is confusing. There is an urgent need to offer clear and concise interpretation of the laws and to offer unequivocal advice on the precedence that different laws enjoy. There is a need to collate, interpret and offer comment on legal precedence for relevant laws, regulations and decrees pertaining to plantations.

It is recommended that a compilation be made of all of the national laws (Forestry Law, Investment Law, Land Law), decrees and associated regulations and this made available to all those with an interest in plantation development, including investors and those with responsibility for land allocation and enforcement.

It is recommended that formal legal advice be sought to clarify precedence for various laws as they relate to land allocation for plantations.

8.3.2 Processes

Clarifying processes.

Annexes 1 and 2 offer suggestions directed towards clarifying processes related to investment in the plantation sector. The largest challenges identified for promoting the

plantation sector are those surrounding allocation of land. The criteria for land identification and allocation need to be made public and understood. The delineation of the mosaic of village forests, production forests, areas of cultural significance and areas available for commercial plantations is a complex technical issue, made more complex when the social needs of communities are included. Confounding issues in the land allocation process include:

- Lack of clarity which laws will be used.
- Unclear authority and responsibilities and related timelines.
- The Conversion Process.
- Monitoring of progress and contractual obligations and auditing
- Enforcement.

It is recommended that a process of consultation be initiated to clarify, publish and disseminate processes and gain engagement and support from all levels of administration with GoL. This may be done through a series of seminars or facilitated meetings with all stakeholders.

8.3.3 Community consultation

Community consultation is vital to the process of conversion of degraded forestland to plantations. Long term success is dependent upon positive community engagement. National associations such as the Lao Tree Plantation and Cash Crop Business Association (LTPCCBA) and the Sustainable Tree Plantation & Livestock Promotion Association (STPL) can contribute to engagement with growers and communities. International agencies can assist the GoL which may wish to engage stakeholders such as WWF and IUCN which have a commitment to the policies of the Lao PDR

It is recommended that the dialogue already initiated with communities be expanded and that the skills and interests of national and international stakeholders remain a part of this consultation.

8.3.4 Support for the LPA

The LPA offers an opportunity for the GoL to provide a focussed service to the plantation sector. It is vital that this new authority enjoys the support and confidence of all government public and investor stakeholders. Without this

support, there is a risk that it will simply add to the lack of clarity in process for investment and operation of the plantations sector.

It is recommended that as soon as the LPA becomes a legal entity, it begins a program of engagement with all stakeholders and that this program has the highest Government and administrative support.

8.4 Strengthen the capacity to support the Vision

8.4.1 Development of National Standards

Development of national standards consistent with the Lao commitment to Sustainable Plantation Management and its pillars of productivity, society, the environment and governance will be essential to the long-term success of the Lao plantation sector. World standards (Part 3) offer guidance to the development of a sustainable plantation sector.

It is recommended that the Department of Forestry facilitate broad consideration of FAO's Code, ITTO Guidelines, CIFOR's Code of Practice, WWF's statement on elements of Sustainability in the Plantation Forest Industry and the international standards for certification to establish a set of national standards for the plantation sector.

8.4.2 Training and development of skills

Lao PDR will require people with technical, social and environmental skills to support a sustainably managed plantation sector and that these people be supported with appropriate hardware and infrastructure to carry out their tasks.

It is recommended that a training needs analysis be conducted to assess the needs for the plantation sector (wood fibre, rubber and high value hardwoods) and that this be linked with an analysis of the supporting hardware and infrastructure to be put in place.

8.4.3 Extension and Industry Support. High standard technical support and administrative and financial advice for smallholders (rubber, teak and eucalypts) are vital for successful smallholders programs. Sources of advice for smallholders of teak, rubber or wood fibre species are limited in most areas of Lao PDR.

For wood fibre growers, the LPA will assume a formal supportive role in its 3 cluster areas, however for rubber growers there are no independent sources of information. Potentially, by 2010 this will leave over 200 000 ha of Lao PDR under rubber plantations without any national focus or technical support. Engagement with Lao Tree Plantation and Cash Crop Business Association (LTPCCBA) and the Sustainable Tree Plantation and Livestock Promotion Association (STPL) offers opportunities for dissemination of standard contracts and technical advice.

It is recommended that, as a matter of some urgency, that a national focus for rubber industry be established and that the recommendations from the recent rubber meeting relating to extension support be implemented, especially those relating to standard contracts.

It is recommended that a manual of operations for wood fibre plantations be prepared and distributed to interested parties.

8.4.4 R& D support

Successful plantation programs for wood fibre, rubber and high quality hardwoods are underpinned by strong programs of R&D. Knowledge of species performance, provision of high quality germplasm, management of soil fertility and impacts on society and the environment all require strong R&D support.

It is recommended that NAFRI and other research providers such as the NUol and other research institutions remain strongly engaged with the commercial plantations sector through support from GoL, investors and donor agencies.

8.4.5 Management Information Systems

Detailed record keeping will be central to monitoring and assessment of national progress and individual plantation investments and provide a basis for auditing. It is important that the format for monitoring is consistent with that used for the Department of Forestry's Management Information System so that all records can be centrally stored and analysed at different levels. Modern satellite imagery offers the opportunity to use geo-referenced, dated imagery as a central tool in monitoring. The use of these tools can offer quick and accurate

assessments of project progress. In addition, reporting processes can include GPS coordinates for planted areas and other project operations which can be subsequently included on the DoF GIS system.

It is recommended that GoL adopt a comprehensive system of monitoring using modern methods of GIS, GPS and satellite imagery and this be combined with data of species performance, soils and landscape to fit within the Management Information System currently being developed within the DoF.

8.5 Increasing profitability of smallholdings

8.5.1 Market information to growers All smallholder growers of plantation species (rubber, eucalypts/acacias, and teak) have been disadvantaged through lack of information on the market value of their plantations or produce. The emergence of large commercial growers will generate their own market forces and changing regional resource availability has an impact upon prices. Changing world prices for hardwood pulps also influence prices which might be offered to medium and small growers.

It is recommended that the LPA, when established, offers a readily available service of market trends for plantation products (wood fibre, logs, rubber latex) and prices as part of its comprehensive extension program.

8.5.2 Possibilities for Group Certification

Certification of plantations to international standards offers market access for plantation wood, and in some cases, offers a price premium over wood which has not been certified. It is possible to certify smallholder plantings of fast-growing species such as eucalypts and acacias and slower-growing teak. It is a complex operation for which organisations such as the Tropical Forest Trust (TFT) (www.tropicalforesttrust.com) and WWF can offer guidance and assistance via their supporting bodies. have worked with communities in other countries (Vietnam, Indonesia for example) to gain “group” certification for small locally owned and managed plantations. Such certification would offer market benefits to Lao growers. The prospect of group certification for smallholders and certification for plantations

established by large investors has considerable merit and is consistent with the concept of sustainable plantation management and with trends in other parts of the world. There are approximately 12 000 ha of teak plantations in Luang Prabang Province. This significant resource is owned largely (96%) by smallholders in many small and scattered blocks and offers an opportunity to demonstrate the benefits of group certification.

It is recommended that the TFT and WWF be encouraged to examine possibilities for certifying smallholder plantations in Lao PDR and examine the teak plantings in Luang Prabang as a pilot project.

8.6. Urgency

Several other countries are seeking the attention of the major credible pulp and paper companies to establish wood fibre resource bases. These countries include Australia, Uruguay, Brasil, Madagascar and Mozambique and they all offer different attractions to multinational investors, including land, and supporting mechanisms of government policies, financial incentives, national standards, infrastructure and stability. Lao PDR must compete with these other countries for wood fibre investment. In response to wider opportunities within the region, some multinational companies have already expressed an interest in Lao PDR. These companies have already begun operations (such as Oji Paper) or are exploring options in Lao PDR (such as UPM and Stora Enso). These companies have strong regional interests and are experienced in establishing and managing productive and profitable eucalypt plantations and have strong corporate commitments the principles of Sustainable Plantation Management via policies relating to Corporate Social Responsibility, the communities within which they work and the environment. It is not necessary (or desirable) to attempt to attract all companies, regardless of experience or corporate standards, to Lao PDR.

It is recommended that the GoL establish some parameters for judging a good corporate investor and use these to target a few selected world standard companies who will bring their high corporate standards and skills and experience to Lao PDR.

In this context, it is further recommended that the GoL offer

selected companies which have a clear commitment to sustainable plantation management the opportunity to submit investment applications with self-defined standards.

8.7 Send the Message

If Lao PDR is to secure the interest of world plantation leaders it must send a clear, consistent and positive message to these investors.

It is recommended that Lao PDR develops and disseminates a consistent and positive message through trade shows, focussed presentations, and its representation in foreign countries:

- ***Lao PDR has land and supportive policies***
- ***Lao PDR would like to encourage investment from companies/groups willing to share the Lao Vision for World Class Sustainably Managed Plantations.***
- ***Consistent with national, Lao PDR expects a strong commitment to smallholder wood production as part of sustainable plantation management.***

9

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Annex 1. Suggested Process for Investment Application. Approval and Monitoring

Activity	Action by	
	Investors	GoL
Investment proposal and contract	Submission (Ref. Annex 1)	Required format and content detail. Commitment to provide access to data Basis for assessment Who will assess Criteria for approval Who will approve
Negotiation		
Approval	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Line agencies directs process.</div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">CPI directs process.</div>
Detailed Management Plan	Submission (incl. plans for core plantation areas and outgrower schemes)	Required format and content detail. Basis for assessment Who will assess Criteria for approval Who will approve
ESIA	Independent Institutional Consultant acceptable to GoL	Guidelines for ESIA incl. thresholds for plantations of different size. Basis for appraisal of ESIA
ESIA consideration and negotiations on recommendations		
Annual Plans (before annual operations begin)	Submission	Definition of ongoing operations. Required format and content detail. Basis for assessment Who will assess Criteria for approval Who will approve

Operations	<p>Implementation.</p> <p>Ongoing interaction with stakeholders.</p>	<p>Expected levels of interaction with:</p> <ul style="list-style-type: none"> • GoL • Communities • Smallholders
Annual Reporting	<p>Submission of Report. Incl. Financial/Legal compliance + Technical standards consistent with Dof MIS.</p> <p>Accompanied by GPS coordinates for operations and 5m resolution B&W satellite imagery (or better) covering operations.</p>	<p>Required format and content detail for annual reports.</p> <p>Basis for assessment</p> <p>Who will assess</p> <p>Criteria for approval</p> <p>Who will approve</p>

Annex 2. Draft format for applications by medium – large plantation investors in Lao PDR

Investors will offer an overall project summary and include details of their proposed approach and operations within the context of sustainable plantation management.

In submitting their applications the investors may seek guidance from:

- Draft Planted Forest Code. (FAO)
- Guidelines for the establishment and sustainable management of planted tropical forests. (ITTO).
- Code of Practice for Industrial Tree Plantation Development in the Tropics. (CIFOR)
- IFC/World Bank policies and performance standards
- Elements of Sustainability in the Plantation Forest Industry (WWF).
- Standards to meet various certification schemes (FSC, PEFC etc).

Project Summary. To include:

- Project Objectives.
- Proposed investment: Shareholders, Owners, sources of funding.
- Location:
- Area of plantation:
- Area of outgrower plantations:
- Anticipated production levels:
- Proposed processing facilities:
- Expected rates of return:
- Identified Risks

The final proposal and documentation to be used as the basis for the contract will be accompanied by a geo-referenced colour satellite image to 2.5 metres resolution (both hard and electronic copies).

Project details within the context of sustainable plantation management.

Sustainable productivity: Investors will demonstrate that plantations will maintain productivity and aim to increase productivity in successive rotations and promote incentive, innovation and profit for the business of growing and utilizing wood. Investors will offer proposed operational details for their plantations and means of verification.

- **Proposed Operational Calendar and Timelines to the end of Rotation 1:** To include land demarcation, site preparation, planting and maintenance, roading, harvesting and transport.
- **Species proposed:** Details of species/clones to be used. Sources of planting material (own nurseries, imported etc). Quarantine procedures for import.
- **Proposed Product Outputs:** For example, natural rubber latex, solid wood, wood for wood chips/pulp. Anticipated levels of production.
- **Land selection:** Details of land sought for the investment. Technical processes to be followed. Maps, Soil types, Existing vegetation
- **Roading Standards:** Roads to be safe, economical and minimise loss of productive forest area. Minimise sedimentation and disturbance to excluded areas. Good surface and side drainage. Watercourse crossings. Technical details to be offered.
- **Plantation Silviculture and Management**
 - Clearing and Site preparation
 - Nurseries. Location, capacity, seed Vs vegetative propagation, transport to the field

- Planting procedures – timing, spacing
- Use of fertiliser
- Use of pesticides and herbicides
- Maintenance and Weed control
- Protection – maintenance of plantation health (pests, diseases) and protection from fire
- **Harvesting Operations.** Felling methods (Chainsaws, axes?). Transport to the roadside. Wet season harvesting.
- **Log Transport Systems.** Size of trucks, axle limits, appropriate for road standards.
- **R&D support and use of best knowledge.** Anticipated R&D needs and how these will be met. Contribution to Lao R&D capacity.
- **Details for monitoring plantation performance.** Permanent Sample Plots (PSP) for growth and survival, monitoring of soils, plantation health and water quality.
- **Technical details for outgrower schemes.** Species/ clones to be used. Delivery of seedlings and fertiliser to smallholders. Follow-up contact, maintenance of standards and monitoring.

Social Sustainability. Investors will demonstrate the economic and social benefits of their projects to the community. Plantation programs will respect the rights and beliefs of local communities and enhance the economic and social wellbeing of their workers and communities. Investors will have well defined policies of Corporate Social Responsibility. Labour needs and skills development will be clearly demonstrated. Investors will offer details in their proposal and provide means of verification.

- **Communication with local communities and stakeholders.**
- **Understanding and respect for local customs.** Customary beliefs relating to particular areas of forest.

- **Impacts and benefits to local communities.** Including opportunities/details for smallholder involvement or the development of outgrower schemes.
- **Proposed smallholder contract principles.**
- **Labour and skills requirements:** Sourcing of labour. Anticipated skills requirements.
- **Methods of recruitment and payment of wages:**
- **Resolution of disagreements**
- **Channels for communication:**
- **Demonstration of transparency:**

Environmental Sustainability. Investors will demonstrate an understanding of the unique biodiversity of Lao PDR and respect for the country's Environmental Laws. Their operations will protect and if possible enhance the quality of the soil and water values in the plantation environment and enhance biodiversity conservation through management strategies which can include the maintenance of riparian vegetation and understory, the design of buffer zones and corridors with native species and sympathetic harvesting techniques. Investors will offer details in their proposal and provide means of verification.

- Proposed treatment of riparian areas, steep lands and maintenance of high standards of water quality in streams.
- Commitment not to encroach into areas of stocked forest
- Management of the Conversion Process from degraded forest land to plantations.
- Respect for forests of cultural/ religious significance.
- Plans for maintaining biodiversity in the concession area
- Approach to minimise erosion and soil movement
- Use of herbicides, pesticides and fertilisers

Corporate Governance. Investors will demonstrate that they have adequate resources and skills to successfully and profitably manage plantations. Commit to Lao regulatory frameworks and transparency in their dealings with Lao authorities and communities. Investors will offer details in their proposal and provide means of verification.

- Provide evidence of Corporate Accountability
- Provide evidence of a Corporate Code of Ethics

- Provide evidence of adequate financial resources to make best use of land allocated.
- Provide evidence of skills and experience to make best use of the land allocated.
- Provide evidence of capacity to supervise contractors so that they meet stated operational standards and standards of behaviour.
- Provide evidence of their approach to transparency

Annex 3. Legislation Relevant to Development and Management of Tree Plantations (from Sigaty, 2003; updated by Kitamura, 2006)

ARTICLE	TEXT	RELEVANCE
<i>Constitution</i> Article 16	The State protects and promotes all forms of State, collective and individual ownership, as well as private ownership of both domestic and international investors who invest in Lao PDR.	Property rights of foreign investors and villagers in tree plantations shall have protection by the State under the legal system.
Article 17	The State protects the rights of ownership and ensures the right to use, transfer and inherit land owned by the national community.	Tree plantation owners and individuals planting trees on private land may have ownership, use rights.
<i>Foreign Investment Promotion Law</i> Article 3 Promotion of Investment	Foreign investors may invest in all business sectors in the Lao PDR... The State promotes foreign investors investing in business sectors and areas of investment as provided in Article 16 and 17 of this law by establishing policies on customs, taxes, regulations, measures and provision of information, services and other facilities to foreign investors.	Foreign Investors may invest in and operate tree plantations.
Articles 4 Protection of Investment	Assets and investment of foreign investors shall be fully protected by laws and regulations of Lao PDR without seizure, confiscation or nationalization, except if necessary for public purposes, in which case the foreign investors shall be compensated in accordance with laws and regulations.	Foreign investors' assets and investments (planted tees) shall be protected under the law.
Articles 5 Forms of Foreign Investment	Foreign investors may invest in the following forms: 1. Business Cooperation by contract; 2. Joint venture between foreign and domestic investors; 3. 100% foreign owned enterprises	
Article 14 Personal Income Tax of Foreign Employees	Foreign employees working in a foreign investment enterprise shall pay personal income tax at the rate of 10% of their total to the Lao government.....	Income tax set at 10% for foreign employees .
Article 16 Promoted Activities	The Government determines promoted activities as follows; 1. Production for export 2. Agriculture and forestry activities, agro-forestry and handicraft processing activities 3. 4.	
Article 17 Promoted Zones	The Government specifies 3 promoted zones based on geographical location and socio-economic conditions as follows; 1. Mountainous, plain and plateau zones with no economic infrastructure to facilitate investments 2. Mountainous, plain and plateau zones with a certain level of economic infrastructure suitable to accommodate investments to some extent 3. Mountainous, plain and plateau zones with good economic infrastructure to support investments	Better incentives on taxes and duties are given in the order of zones in this article.

ARTICLE	TEXT	RELEVANCE
Tax Law Article 9 Turnover Tax	Import of crop seeds and plantation timber shall be exempt from turnover taxes.	Turnover Tax exemption.
Article 12 Import Tax for Forestry Products	An import and sales tax of 5% for wood, rattan and furniture products.	Import and Sales tax of 5%.
Articles 27, 31 and 38 Profit Tax	Profit tax for forestry business set at 20%, but foreign investors may receive exemption or discount.	Tax rate for foreign investment in tree plantation will be set pursuant to concession agreement with GOL (See FIL, Art. 16). Certain agreements have provided a 4-year holiday, then scaled rate thereon.
Tax Law (contd.) Articles 29 & 30 Foreign Income Tax	Foreign citizens making profit in Lao PDR may be subject to income tax. Villagers, farmers are exempt from income tax for agricultural and forestry activities.	Foreigners subject to income tax, whereas villagers are exempt from such tax for forestry activities.
Land Law Article 5 Protection of Holder of Land Use Right	The State protects the legal interest of the holder of land use right by allowing effective, peaceful and long-term use of land and by ensuring the protection right, use right, usufruct right, transfer right and inheritance right.	Land lease and user rights for a tree plantation shall be recognized by the State if consistent with appropriate legislation. Not applicable to TLUCs
Article 9 Land Management	State has authority over land management for the whole country in a uniform and coordinated manner whereby the Government assigns management responsibilities to the national land management organization in coordination with concerned Ministries . . . and assigns management of concerned land type to Ministry of Agriculture and Forestry, Ministry of Industry and Commerce.....	The national Land Management Organization under the Prime Minister's Office has authority over centralized management for land use policy, planning, land leasing, titling and registration.
Article 13 Lease of Land	The State gives the authorization to Lao citizens to lease land for a maximum period of not over thirty years; period may be extended depending on each case... The actual determination of the lease period shall be made on the basis of the characteristics and size of the operation...	Limits on lease periods may be extended based on activity and size. Plantations leased by Lao citizens would need to seek extension of time limit.
Article 19 Forestland	Forestland area is the area of all land parcels covered by forest or not covered by forest yet determined by the State to be forestland according to Forest Law.	Definition of forestland includes degraded and defoliated land for tree plantations.
Article 21 Scope of Forestland Use Right	The State gives authorization to individuals and families for long-term, efficient use of deforested or degraded land for an area not over three ha per labor force in a family. Any person intending to lease more has right to apply to State based on their actual capacity to produce.	State allocates (TLUC) three ha of degraded land in a village boundary per laborer in a household for tree planting. More land can be requested from village and district authorities.
Article 22 Allocation of Use Right for Forestland	The District Administrative Authority has responsibility, in coordination with the Village Administrative Authority, to allocate the use of forestland to individuals and organizations by issuing temporary land use certificates (TLUC) for three-year	A three-year temporary land use certificate (TLUC) is the legal mechanism for the district to lease degraded

ARTICLE	TEXT	RELEVANCE
	term. If managed properly during this initial term, then the lessee may request the “Land Management Office(s) to issue a Land Title for long-term use.	forestland to villagers for tree planting. No TLUCs have been converted to permanent title yet. Tree plantations should be aware of rights under TLUC within concession and village boundaries.
Land Law (contd.) Article 65 Land Lease or Concession Period	State may lease land to foreign investors up to a period of 50 years and may be extended by the Government. State may lease land within a specific economic zone to a foreign investor for 75 years and extend upon approval of the National Assembly. Land lease for area greater than 10,000 ha shall be approved by National Assembly. Determination of lease term shall consider size, characteristics and condition of each operation.	State may lease land to foreign investors for tree plantation for 50-year terms (extended by GOL) or 75-year terms in specific economic zone (extended by NA). NA shall approve leases, in addition to the PM Office, for tree plantations over 10,000.
Article 67 Obligations	Obligations in land leasing for foreign citizens and their organizations...are as follows: 1) Using land in conformity with objectives; 2) Not causing damage to land quality not causing negative impacts on natural or social environment; 3) Not violating the rights and interests of other persons; 4) Complying with right-of-way issues; 5) Paying the lease or concession on land and other fees related to use of the land; 6) Complying fully with other land regulations.	List of obligations for non-Lao citizens and their organizations that lease or concede land.
Forestry Law Article 6 Promotion and Propagation of Forests	The State promotes individuals and organizations to participate in the preservation, rehabilitation, planting of trees and propagation of forestry resources by issuing policies, rules and measures in order to make forests an abundant, valuable and natural resource.	Policy goal by State and mandate to issue regulations (MAF Reg 196 and MAF Instruction 1849) to support tree planting and rehabilitation of forest.
Article 7 Rights and Benefits	Individuals and organizations that the State has assigned forests or forestland have the right to receive compensatory benefits (i.e. use of wood, harvesting forest products, etc.) according to relevant regulations.	Tree plantation operators entitled to receive incentives and benefits from forestland leased by the State.
Article 13 Assignment of Forest and Forestlands	The State assigns the rights to use degraded forestland to individuals and organizations according to their labor and financial capacity to plant and rehabilitate forests for an area not exceed three ha for each laborer in a family. In case more is needed, the State may lease more depending on capacity of the organization. The State shall permit enterprises to use degraded forestland to plant trees on a case by case basis. Individuals and organizations are prohibited from using dense or reed natural forests for planting trees.	State shall allocate degraded forestland to organizations or individuals for tree planting based on capacity. Limit to 3 ha per family member or more for an organization on a case by case basis. No clearing or tree planting in natural dense forest (exceptions have been issued for construction within plantation area).

ARTICLE	TEXT	RELEVANCE
Article 21 Degraded Forests	Degraded forestland are those heavily damaged with no forest cover and defoliated, separate from area assigned for regeneration to be used for planting, permanent agro-forestry, livestock production or other purpose stated in the national socio-economic development plans.	Definition of degraded forest. Tree planting shall occur on degraded forestland not appropriate for regeneration.
Forestry Law (contd.) Article 23 Undertaking Forestry Activity	Individuals or organizations may undertake forestry activities provided that approval has been received from the relevant forestry administration agency.	Must receive approval from relevant forestry management organization (see Art. 59) to carry out forestry activity, such as operating plantations
Article 24 Registration of Forestry Activities	Registration of forestry activities shall be conducted according to the Investment/Business Laws...	Forestry activities, such as tree plantations, must be registered (see FIL and MAF Instruction 1849).
Article 27 Cut planted trees	Harvest of self planted trees for family use shall be reported to the village administrative authorities for notice and inspection. If wood is transported to another district then a report shall be made to DAFO for inspection. Harvest of planted trees for commercial purpose shall be approved by PAFO through a request to DAFO.	Harvest and Transport requirements for planted trees. Compare with MAF Reg 196, Art. 14 that requires permit approval from DAFO rather than PAFO.
Article 33 Purpose of Planting and Rehabilitating Forests	Tree planting and forest regeneration shall preserve and propagate national forest resources in order to provide a non-exhaustible supply of wood/NTFP products and to balance protection of water sources, land, marine and wildlife species and the environment with revenues for the State, organization and individuals.	Policy goal for tree planting and forest regeneration
Article 34 Promoting Tree Planting	The State promotes individuals and organizations to plant trees by issuing various suitable policies for domestic and foreign investment (i.e. credit policies, taxation, species of flora and trees, lease extensions and increase land areas) pursuant to regulations.	Mandate to State to support tree planting through policy inputs in relevant land, tax and resource sectors.
Article 36 Location and Species for Planting	Tree planting shall be conducted on allocated degraded forestland or vacant land and lands where there has been approved timber harvest for which there are plans to use such for some other purpose.	Location for tree planting shall be limited to degraded lands and areas harvested under a management plan not appropriate for regeneration.
Article 37 Plans for Planting Trees and Rehabilitating Forests	State forest development plans and local forestry agencies under the recommendation of local administrative authorities shall be responsible for drafting tree planting and short-term, medium-term and long-term forest rehabilitation plans, stating species of trees to be planted and locations for planting or rehabilitation, both in rural and urban areas, as well as the budget and labor force to conduct the activities.	Guideline on tree planting information in forest development plans prepared by local forestry officials under recommendation of administrative authorities.
Article 38 Regulations for Planting and Rehabilitating Forests	The Forest Administration shall issue proper techniques and standards for tree planting and forest regeneration to ensure appropriate planting and rehabilitation practices. MAF has duty to issue regulations to promote and implement techniques relevant to the natural succession of species, production of species and planting, selective cutting, cleaning forests, and other technical measures relevant to planting and rehabilitating	MAF has mandate to issue regulations on standards and techniques for tree planting and regeneration activities. (see MAF Instruction 1849, but still need guidelines for plantation management plan

ARTICLE	TEXT	RELEVANCE
	forests.	and STP).
Forestry Law (contd.) Article 53 Right to Transfer Forest and Forestlands	The transfer is the delivery of possession of the forest and forestland that one has developed to other person to benefit the advantages that one has created. The transfer shall be notified the relevant authorities and shall undertake new registration and pay the fees according to regulation.	An investor may freely transfer an interest in land, a lease and planted trees. Villages may not transfer interest in TLUC, but may transfer rights to trees planted on such land.
Article 54 Right to Succeed to Forest and Forestland	The succession, possession of the forest and forestland is the succession of the said rights to the children, nephew, nieces, father, mother or the relatives after the possessor of the forestland was dead. The succession must be notified the relevant authorities and shall undertake new registration and pay the fees according to the regulations.	Degraded forestland, either under a tree plantation or TLUC, may be passed to third parties or family members through inheritance.
Articles 56 Lease of Forest or Forestlands	Forests and forestlands may be leased or licensed to individuals and enterprises for planting, preservation, and extraction activities...	Enterprises and individuals may lease forestland from the State for the purpose of plantation.
Presidential Decree 3 Land Tax	No translation available.	Important provisions in this Decree are covered in PM Decree 150 implementing it (see below).
PM Decree 150 On Land Tax Article 2 obligation to pay land tax	Persons and organizations using land are required to perform land tax obligations pursuant to Article 60 of the Land Law and Presidential Decree 3 on Land Tax.	General rule is that individuals and organizations shall pay land taxes, however, several exemptions apply especially for registered tree plantations and foreign investors.
Article 3 Definition of Land Tax	Land tax is an annual tax assessed and collected on the basis of the used land area.	Land tax collected annually. Amount owed based on size of land used.
Article 4 Leased Lands	...Local persons, organizations or foreign investors leasing or receiving a land concession for which a rental or concession fee is paid according to a contract will not pay land taxes until the contract expires, while the land lessor who owns the right to use the land is required to pay land taxes...	If leasing land, the lessee does not have to pay land taxes, but the lessor (owner of the land) does.
Article 6 Classification of Agricultural and Forestry Lands	The agricultural-forestry land areas to be considered as basis for tax assessment are: 3.6 Tree and crop plantations which are mixed plantations of all types of trees, including industrial trees, medicinal trees, fruit trees and crops in an integrated manner as prescribed by the agricultural-forestry authorities.	Tree plantations are classified for land tax purposes. Tree plantations may receive land tax exemption upon registration under MAF Instruction 1849.
PM Decree 150 (contd.)	1.1 Lowland Tree and Crop Plantation (Kip per ha) Urban: 10,000K	Outline of tax rates for land classified as tree or crop

ARTICLE	TEXT	RELEVANCE
Article 8 Land Tax Rates	Special Economic: 9,000K Rural: 8,000K 1.2 Upland Tree and Crop Plantation (Kip per ha) Urban: 9,000K Special Economic: 8,000K Rural: 7,000K 1.3 Highland Tree and Crop Plantations (Kip per ha) Urban: 8,000K Special Economic: 7,000K Rural: 6,000K	plantation.
Article 16 Land Tax Exemption	Exemption of tax on agricultural-forestry land: 4. Duly registered tree planting land area in accordance with the rules and principles effective in the sector of agriculture and forestry covered with at least 1,100 trees per hectare is exempted from land tax;	Land that has trees planted at a density of 1,100 per ha is exempted from land tax. Promotes government policy of reforestation. Compare with MAF Reg 196, Art. 19.
<i>PM Decree 59 Sustainable Management of Production Forest Areas</i> Article 4 Identification of PFAs	A forest area to be identified as PFA shall include...forest area and forestland in an appropriate location...high concentration of natural forest coverage...	Production forest areas are areas already covered with natural forest, and therefore are not suitable for plantation forests. Plantation forests should be established on degraded forestland as classified under the Forestry Law (see articles 21 & 36 above).
<i>PM Decree 187 on Abolishment of Export Fees for Agro Goods</i> Article 3 Implementation	MOF shall issue implementing legislation to list the products to be exempt from royalties or export duties.	This Decree does not specifically list any products for exemption, but mandates MOF to issue such guidelines. See MOF Instruction 230 (1995).
<i>PM Decree 301 on Implementation of Foreign Investment Promotion law</i> Article 16. Agricultural and forest business, agricultural and forestry processing and handicraft.	16.1. Agricultural and forestry activities mean investment in agricultural plantation, cattle raising and industrial tree plantation to get raw material and commodities to sell in and outside the country. 16.2. Activities of agricultural and forestry processing mean investment in the commodities by using raw materials or the agricultural and forestry products (excepted production from natural forest) in the country. 16.3. Activities of handicraft production mean investment in the handicraft production using Lao skills to produce value-added handicraft products. Investment in this sector, before receiving the advantages of the promotion of the investment must meet the condition: -a registered capital of more than 300,000 US\$.	
Article 25. Activities relating to the concession of rights to be granted by the	These activities (category 3) [different of List 1 which is open to foreign investment without restrictions, and List 2 which is open to foreign investment with conditions] are related to the concession of rights from the government and area as follows:	

ARTICLE	TEXT	RELEVANCE
government.	<p>25.1. Activities of concession in general, meaning activities in communication, transport, land concession, in particular, that has to be written down in an agreement with the government through negotiation with the following steps:</p> <ol style="list-style-type: none"> 1. Create a MOU [memorandum of understanding]; 2. Create a Activity Development Agreement [ADA]. 	
Article 52. Investment Promotion and Management Committee (IPMC) at central level.	<p>IPMC at central level has the following rights and duties:</p> <p>52.1. To consider all issues pertaining the investment within the country.</p> <p>52.2 To agree in accepting the investment of category 1,2, and 3 with an amount less than 20,000,000 US\$;</p> <p>52.3. Foreign investment of more than 20,000,000 US\$, and investment of category 3, IPMC has to ask for consideration and approval by the government.</p>	
Article 53. IPMC at local level.	<p>IPMC at local level is composed of:</p> <p>53.1. Decision to agree:</p> <p>The 4 provinces such as: Vientiane CC, Savannakhet, Chamapassak, and Louang Prabang have the right to authorize investment of category 1 and amounting less than 5 million US\$.</p> <p>Excluding the 4 provinces, all other provinces can decide to accept investment of category 1 amounting less than 3 million US\$.</p>	
PM Order 15 Management of Forest and Forestry Business Article 8 Plantation Promotion	<p>Logging and NTFP harvesting shall go together with plantation. Provinces...wood and NTFP processing factories, enterprises and individuals throughout and local authorities shall be responsible for and certify plantation plans for timber and NTFPs...</p> <p>The Government promotes the investments for timber and NTFP plantations by applying the policy on land use and land allocation in Article 13 of the Forestry Law.</p>	<p>Government shall promote the establishment of tree plantations...strong policy directive.</p> <p>See PM Order 18 (2002) for more recent GOL support for incentives to promote tree plantations as a replacement for natural timber.</p>
PM Order 3 Land Forest Allocation Article 6 Right of Use	<p>...The right to use land by foreign residents...shall be acknowledged by the State under the form of lawful lease or concession.</p>	<p>Foreign entities may only lease the land or receive a concession from the government.</p>
PM Order 3 on Land Forest Allocation (contd.) Article 7 Promotion of Afforestation	<p>MAF shall coordinate with local authorities to promote afforestation within the land use allocation policy to be conducted on degraded forestland in order to promote:</p> <ul style="list-style-type: none"> • Allocate degraded land to families for afforestation based on their level of labor and financial capacity; • Contract with foreign investors to promote afforestation to supply factories and export with support of local labor. 	<p>Government promotes the policy of tree planting, including giving facilities to foreign investors for investment in this sector.</p>
Article 8 Monitoring	<p>Relevant state agencies shall monitor use of allocated forestland, including villagers and foreign investors, and focusing on the following potential infractions:</p> <ul style="list-style-type: none"> • Leaving land vacant for 3 years; • Damaging quality of land and environment; • Fail to pay land taxes or royalties or lease fees; or • Fail to comply with forestry legislation. 	<p>Use of land for plantations, both TLUCs and 50-year leases to foreign investors, shall be strictly monitored by relevant state agencies (DAFO, villages).</p>

ARTICLE	TEXT	RELEVANCE
	Violation may be subject to warning, fine, loss of land use or court proceedings.	
MAF Regulation 196 Tree Planting Article 1 Purpose	Regulation and development of sustainable tree planting aims to reduce dependence on timber from natural forests and promote investment of planting at all levels for maximum economic, social and environmental benefits.	Policy statement for establishment and promotion of tree planting.
Article 2 Purpose	Definitions of the following terms: tree planting, plantation, degraded forestland, fallow forestland, planted trees, cutting rotation, planting space, thinning and plantation maintenance.	Plantation broadly defined as tree planting by anyone on degraded land, not suitable for agriculture, in an area greater than 1600 m ² . Degraded forestland defined as area with no possibility of regeneration.
Article 3 Planting Systems	Planting systems for a tree plantation are: 1) Tree planting according to plantation standards; and 2) Tree planting according to agro-forestry system.	Standards provided for two methods of tree planting to be utilized depending on the conditions.
Article 4 Technical, socio-economic impact assessment	A technical social and economic impact assessment is required for any tree plantation more than 5 ha, including a group of neighboring parcels that total 5 ha.	Requirement to conduct EIA or STP for plantations greater than 5 ha. Guidelines should be developed to prepare a STP and plantation management plan scaling the requirement based on the size of the plantation (small, medium, large) and exempting villagers and plantations under 5 ha (see STP formats piloted in ADB project implementation).
Article 5 Tree Planting on Private Lands	Individuals and organizations wishing to carry out tree planting on their own land, including land which is not prescribed for agricultural development...can do so directly without any permission, but must follow correctly the provisions of Article 3 of this regulation.	No GOL permission necessary for tree planting on private land or allocated land that is classified as degraded forestland. This would include allocated land to villagers.
MAF Reg 196 Tree Planting (Contd.) Article 6 Tree Planting on Public Lands	Tree planting on State public land by individuals or private investors need permission from: <ul style="list-style-type: none"> • DAFO Chief for < 100 ha; • Provincial Governor for 101 to 500 ha, with recommendation of DAFO and PAFO; • Minister of MAF for 501 to 1000 ha, with recommendation of Governor, PAFO and Mayor(s) • GOL for > 1000 ha, upon rec of Minister of MAF. 	Approval for tree planting on State public land based on size. Regardless of size, local authorities should be involved in the planning and authorization.
Article 7 Application Procedures for Foreign	Foreign investors and companies intending to invest in tree plantations shall: <ul style="list-style-type: none"> • Submit letter of interest to FIMC pursuant to Law on Foreign Investment; 	Procedural requirements for foreign investors to gain permission and licenses for tree plantations. Note

ARTICLE	TEXT	RELEVANCE
Investment in Tree Planting	<ul style="list-style-type: none"> • Sign MOU with FIMC and inform MAF of MOU in order to coordinate with local authorities on feasibility study; • Submit feasibility study, technical and economic assessment, management and operating plans to FIMC; • Upon GOL approval, FIMC will issue investment permit, then MAF shall issue business license. 	decisions in 2003 from CPC to streamline FIMC approval processes and eliminated registration fees.
Article 8 Import and Export of Tree Genetic Resources	PAFO shall approve all import and export of genetic tree resources, including seeds.	Import and export of these resources approved by PAFO. Additional approvals required from other agencies related to imports and exports.
Article 9 Production and Transportation of Seedlings	Production and transport of seedlings must comply with MAF requirements.	Production and transport of seedlings must comply with relevant rules. Unclear whether these rules have been promulgated.
Article 10 Tree Planting Operations	<p>The following activities within a tree plantation shall comply with technical standards issued by MAF:</p> <ul style="list-style-type: none"> • Site preparation; • Seedling/Tree Planting; • Protection of plantation; and • Road and firebreak construction. 	Tree plantation activities shall comply with MAF technical standards.
Article 11 Maintenance & Thinning Ops.	Thinning/maintenance operations must be carried out in accordance to the schedules formulated in the approved plantation management plan without any additional permission. However, DAFO must be informed about such operations.	Thinning and Maintenance carried out according to schedules in management plan. DAFO should be informed when taking place.
MAF Reg 196 Tree Planting (contd.) Article 12 Registration of Plantation	<p>Plantations should:</p> <ol style="list-style-type: none"> 1) Register with authorities stated in MAF Reg 1849; 2) Request village authorities to do a preliminary measurement of plantation area, spacing, tree species, in order to draw a map and issue a certification; and 3) Prepare and submit to DAFO for consideration and issuance of registration: <ul style="list-style-type: none"> • Written application letter; • Residence certificate; • Land title certificate; • Previous land tax receipt; and • Plantation certificate issued by VFV with map. 	Steps necessary for Plantation registration as required in Article 24 of the Forestry Law. See also MAF Instruction 1849.
Article 13 Management, Inspection, Monitoring and Evaluation	<p>Monitoring and inspection of plantations shall be conducted on a regular basis to ensure:</p> <ul style="list-style-type: none"> • Compliance with Forestry Law, Article 36; • Quality control of seedlings; • compliance with MAF standards for site clearing, land preparation and road construction; • implementation of plantation management plan; <p>Within two weeks of a monitoring activity, the forest official</p>	Monitoring and reporting carried out on a regular basis by assigned government staff, with input from plantation staff.