

# **The State of Play of Tropical Hardwoods**

**Forces determining the pattern of production and trade  
and prospects for small scale timber producers  
in Papua New Guinea**

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## Introduction

This document examines two issues. Firstly, it discusses the main forces that are currently shaping the production and trade of tropical hardwoods at the global and sometimes regional and country level. Secondly, recommendations are presented as to how small scale timber producers and community managed forests in Papua New Guinea can establish viable enterprises.

The nature of the project is market research. Information was sourced from secondary sources and personal contacts.

The approach to this market research comprises three components:

1. Collection and presentation of publicly available data – internet, library resources and through personal contacts.
2. Desk top analysis of data to identify patterns and trends.
3. Discuss initial findings and recommendations before finalising the report.

All unit values quoted are in US dollars, unless indicated otherwise.

## The State of Papua New Guinea's Forests

The forests on the island of New Guinea represent the third largest tropical rainforest on the planet, after the Amazon and Congo forests.

For Papua New Guinea (hereafter referred to as 'PNG'), approximately 33 million of its 45 million hectares of its land mass is forested. It is estimated that 15 million hectares of this is suitable for forestry, representing approximately one third of PNG's territory.<sup>1</sup>

The 2008 State of the Forests Report analysed the forest changes that have occurred in PNG over a thirty year period from 1972 to 2002. It found that by 2002, almost one quarter (23.8% or 7.8 million hectares) of the forests existent in 1972 have been destroyed or degraded. The drivers of this change in forest cover have been:

- Logging accounted for 48.2% of forest change.
- The expansion of shifting cultivation by local villagers into primary forests accounted for 45.6%. This is most prevalent in the Highlands regions where population densities are highest.
- Forest fires (4.4%), plantations (1.2%) and mine operations (0.6%) make up the balance of forces contributing to forest change.

As at January 2006, 33 commercial logging concessions were in production, covering an area of 5.25 million hectares, representing 15.9% of PNG's 33 million hectares of diverse forest biota. In contrast there was only 27,000 hectares of Forest Stewardship Council certified forest.<sup>2</sup>

The report reached two major conclusions. Firstly, if current trends continue, it estimates that 83% of the commercially accessible forest area will have been cleared or degraded by 2021.

Secondly, PNG's population is growing at 3.2% per annum and is expected to reach almost 9 million by 2020. The demand to clear forests to cultivate food will therefore continue to rise. Over 80% of the population is rural based, and have a heavy reliance on forests to provide a wide range of needs including food production which is undertaken through the process of shifting cultivation.<sup>3</sup> Forest clearing for subsistence food production is reaching a ceiling in the most densely population areas of PNG.<sup>4</sup>

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<sup>1</sup> PriceWaterhouseCoopers, Economic Analysis and Potential of PNG Forest Industry, November 2006, p.7

<sup>2</sup> Internaitonal Institute for Environment and Development, Exploring Fair Trade Timber (2006) p.51

<sup>3</sup> The University of Papua New Guinea, The State of the Forests of Papua New Guinea, (2008), p.17.

<sup>4</sup> *ibid.*, p.96

## Change Drivers for the Forestry and Wood Processing Industries

There are seven dominant forces that are shaping the global forestry and wood processing industries.

- The availability of, and access to tropical native forests continues to decline. In response to this, government policies in many tropical countries are actively supporting the value added production and export of industrial round wood into at least primary processed wood products. The cost of dry bulk shipping is another factor encouraging the trade of higher priced, lower volume processed wood products.<sup>5</sup>
- Forest production and wood processing is relocating from northern temperate zones to the southern tropical and sub-tropical zones. This is occurring because the cost of input resources such as land and labour in these regions are substantially lower, and higher productivity is available from favourable climate and soil conditions. These regions also have the greatest potential for growth in the consumption of forest products.
- Plantation grown resources are becoming the dominant source of wood supply. The lower cost, secure supply and consistent quality of plantation species is resulting in substitution away from tropical timber products in product areas such as plywood and decking. Certification and chain of custody registration designed to validate that the timber has been harvested in a sustainable manner is easier and less costly with plantation resources managed successfully over a long period of time, compared generally to tropical timbers.

South America now has 21% of the world's forest area and 30% of the growing stock. The majority of this region's commercially harvested timber is now sourced from plantations - approximately 75% of Brazil's and 100% of Chile's industrial harvest.<sup>6</sup>

As a result of genetic improvements in the main species used, eucalypts and loblolly pine (*Pinus taeda*) in Brazil and *Pinus radiata* pine in Chile, productivity levels achieved are unmatched in the rest of the world.<sup>7</sup> Use of advanced silvicultural, harvesting and the latest processing technologies, coupled with favourable climate and soil conditions has resulted in a highly competitive cost for logs and wood products.

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<sup>5</sup> The Baltic Dry Freight Index reached a peak of 11,900 in June 2008. Reflecting the slowdown in global economic activity and trade that has occurred in the second half of 2008, this Index stood at 885 points as at 31 October 2008.

<sup>6</sup> PricewaterhouseCoopers, Risks and rewards. Forest, paper and packaging in South America. 2007. Cited at: [www.pwc.com/fpp](http://www.pwc.com/fpp).

<sup>7</sup> *ibid.*,

- The rise of China as a producer and consumer of wood and wood products has distinctly changed the flow of global trade of logs and processed wood products.
  
- Climate change is beginning to have an impact on timber demand. Building codes are being adjusted and 'green buildings' are emerging incorporating more wood. New electricity power stations are being proposed with wood as their fuel source. Wood is being considered as a biomass source for the production of fuel and chemicals (biorefineries).
  
- In developing countries, growing populations are encroaching on forested lands as people seek land for food production and other valuable products that the forest yields.
  
- The Russian Federation has the largest forest resource of any nation in the world. Russia's 809 million hectares represents 50% of the world's forests.<sup>8</sup> The prospects for the development of the sawmilling industry in Russia are strong given its low cost for wood, energy and labour.<sup>9</sup> Government policies are designed for Russia to emerge as a major low cost producer and exporter of coniferous wood products.

These trends in the production and consumption of plantation grown resources versus native tropical hardwoods show a clear bifurcation between these two product classes.

Plantation resources and their derivatives (engineered wood products) are capturing a growing number of markets and applications such as plywood and decking that were once the domain of native tropical hardwoods.

The reduced supply and increased cost in accessing remaining native tropical hardwood forests has driven rising prices for this product class. Whereas tropical hardwoods in the past were used liberally in many structural and appearance applications, their high prices is seeing their use restricted to appearance grade applications, at least in the advanced industrial economies.

This scarcity for at least 'select grade' tropical hardwoods should result in less price volatility as this product class is increasingly being viewed as a high value, almost 'luxury' type product.

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<sup>8</sup> Killman, W. and Whiteman, A. 2006. The Russian forestry sector in the global forest products market: trends, outlook and opportunities for development. Presentation to the VII International Forestry Forum, Saint Petersburg, Russian Federation, 10-13 October, 2006.

<sup>9</sup> Nilsson, S. 2006. The role of emerging countries in the paper and forest products world markets: China, India, Russia: The role of Russia. Paper prepared for the FAO Advisory Committee on Paper and Wood Products Forty-Seventh Session, Rome, 6 June 2006.

Cited at: [http://www.fao.org/docrep/009/j8386e/j8386e07.htm#P235\\_15033](http://www.fao.org/docrep/009/j8386e/j8386e07.htm#P235_15033)

## Primary Processed Wood Products: Production, Trade & Price Data

Data on the production, trade and price movements of tropical solid wood products presented here forth has been sourced from the International Tropical Timbers Organisation<sup>10</sup> (hereafter referred to as “ITTO”). This data accounts for the overwhelming majority of tropical timber production, trade and consumption. Data is for the year 2006, unless indicated otherwise.

### Round wood (logs)

Round wood is wood in its natural state as felled, with or without bark. It can be used for industrial purposes, either in its round form (e.g. as transmission poles, wharf piles) or as raw material to be processed into products such as sawn wood, veneer, panel products or pulp.

The production of tropical round wood in 2007 was 126 million m<sup>3</sup>.

Brazil, Malaysia, India and Indonesia accounted for almost three quarters of production and like other producing countries, process a large percentage of their round wood into wood products. These countries, together with China account for almost three – quarters of all consumption of tropical logs in 2005 and 2006. This reflects a focus on value added processing and growing internal domestic demand for wood products - the proportion of logs consumed domestically in Asia was 88% (2006 – 2007).<sup>11</sup>

Interestingly, Malaysia’s tropical log production has been declining since the mid 1990s in line with government policy to implement sustainable forest management.

Latin America has the highest conversion of logs manufactured into at least primary products among the three major tropical log producing regions.

Table A: Log conversion and export

Major Tropical Log Regions	Conversion into Primary & Secondary Wood Products	Logs exported as a % of Log Production
Latin America	98.8%	1.2%
Africa	81%	18.9%
Asia Pacific	88%	12%

Source: International Tropical Timbers Organisation, Annual Review and Assessment of the World Timber Situation, 2007.

<sup>10</sup> International Tropical Timbers Organisation, Annual Review and Assessment of the World Timber Situation, 2007.

<sup>11</sup> International Tropical Timbers Organisation, Annual Review and Assessment of the World Timber Situation, 2007. p.16

Exports of tropical logs were 13 million m<sup>3</sup>, valued at \$2.1 billion. Malaysia dominates the trade in export logs, followed by PNG, Myanmar, Gabon and the Republic of Congo. Malaysia's exports are declining as supply becomes scarcer and domestic processing into higher value added products expands.

The importation of tropical logs by all countries (including non ITTO members) reached 16.5 million m<sup>3</sup> in 2006. China dominates world imports, importing 7.6 million m<sup>3</sup>, or 46% of all tropical log imports in 2006. Its imports have almost tripled since the mid 1990's with PNG, Malaysia, Myanmar, Gabon and the Republic of Congo providing the bulk of supply. China's major log species imports, by volume, are okoume (*Aucoumea klaineana*) followed by Keruing (*Dipterocarpus* spp.).

Following China, the next largest importers are India (3 million m<sup>3</sup>), Japan (1.4 million m<sup>3</sup> with Meranti (*Shorea*) being the major log import species) and countries within the European Union (1.1 million m<sup>3</sup>). Imports into Europe, sourced principally from Africa have dramatically declined since 1985. The industry expects this decline to continue as log exporters process an increasing percentage of round wood into wood products.

Tropical round wood prices can vary considerable, given the wide range of species and quality that is available (this contrasts with softwood markets where there are fewer species). The price of the major traded tropical round wood species, Mahogany, Teak and Meranti have shown strong nominal and real price gains since 2003.<sup>12</sup> These price gains reflect, until very recently, strong global economic conditions, robust housing and construction activity and the rise of the frontier or BRIC economies.<sup>13</sup>

China remains at the centre point of global log imports and in the corresponding growth in exports of manufactured wood products. Total log imports (tropical and temperate) were 35 million m<sup>3</sup> in 2006, an increase of 16% from the previous year. Non tropical log imports (28 million m<sup>3</sup>) were sourced substantially from the Russian Federation. Plantation resources are being increasingly used as substitutes for tropical logs for the manufacture of wood products such as plywood.

In summary, beginning in the mid 1980's, the trend in the volume of trade of tropical logs has been declining. The shift towards more value adding is being driven by the growing wood demand of expanding populations and economies in Asia, Africa and Latin America, and government policy in places such as Malaysia, Indonesia, Cameroon and Ghana emphasising downstream processing and the exporting of value added products. It is only selected African states, PNG and Myanmar that continue to export a significant volume of tropical logs.

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<sup>12</sup> Nominal prices are actual Free on Board (FOB) measured in US\$ per cubic metre. Real prices are current FOB prices measured against the baseline of 1990 US\$ where the effects of price inflation have been removed during the intervening period so as to give a comparison of real values only.

<sup>13</sup> BRIC refers to the fast growing economies of Brazil, Russia, India and China and the growing level of consumer purchasing power within these countries.



## Sawn wood

Sawn wood refers to round wood that has been cut into planks or boards from logs. It is used in house framing and roof trusses, flooring, window frames and doors, decking, pergolas, cladding and in furniture manufacture and cabinetry.

The production of tropical sawn wood in 2006 was 39 million m<sup>3</sup>. The housing and construction sectors are the main drivers affecting the production, trade and price level of sawn wood products.

Brazil (14.7 million m<sup>3</sup>), followed by Malaysia (5.3 million m<sup>3</sup>), India (4.9 million m<sup>3</sup>) and Indonesia (3.9 million m<sup>3</sup>) are the largest producers, accounting for 74% of total production. These countries, as well as China, are also the major users of sawn wood, accounting for 76% of total consumption.

Exports accounted for 11 million m<sup>3</sup>, down almost 16% from 2005. The major exporters are Malaysia, followed by Indonesia, Thailand and Brazil.

Imports of sawn wood were 7.9 million m<sup>3</sup> in 2006. China dominates world imports and its major suppliers are Thailand (30%), Indonesia (19%), Malaysia (16%) and Brazil (14%). Intra Asian trade accounts for 60% of world trade.

Similar to logs, there are marked differences in sawn wood prices by species and grade. The prices of major sawn wood species supplied from Africa (Mahogany, Wawa, and Odum) Malaysia (Dark Red Meranti, Seraya Scantlings) and South America (Peruvian Mahogany, Brazilian Jatoba) have shown a trend of rising nominal and real prices since 2001.

Demand for sawn wood, both tropical, temperate hardwood and coniferous species are expected to continue to exhibit steady long-term growth given its position as a preferred material in the construction industry, and its status as the only truly renewable building material.

## Veneer

Veneers are thin layers of wood produced by peeling or slicing logs. Tropical veneers are used as a decorative face in furniture, solid composite flooring and wooden doors.

The international market for tropical veneers is relatively small with production totaling 3.4 million m<sup>3</sup>.

China (750,000 m<sup>3</sup>), followed by Malaysia (612,000 m<sup>3</sup>), Brazil (300,000 m<sup>3</sup>), India (270,000 m<sup>3</sup>) and Cote d'Ivoire (233,000 m<sup>3</sup>) are the largest producers. China, with 22% of all production, is also the largest user of tropical veneer, consuming 827,000 m<sup>3</sup> for furniture and other secondary wood product applications.

Exports accounted for just over 1 million m<sup>3</sup>. Malaysia, followed by Brazil, Gabon, Cote d'Ivoire and Ghana are the major exporters. There is a trend of declining exports of Malaysian veneer due to declining log supplies and utilisation of veneers in Malaysia's value adding wood processing industries.

Imports of veneer were 925,000 m<sup>3</sup> in 2006. The Republic of Korea (22%), followed by Taiwan (12%), France (11%) and China (10%) are the main importers. The European Union accounts for almost 40% of total imports with the majority of imports being sourced from African producers. China's imports have been declining as locally produced veneer from imported logs has become their main source of supply.

The market for tropical veneer is specialised and prices vary considerably depending on the species and their grade(s). There are no benchmark species whose price reflects overall trends. The average import price per m<sup>3</sup> in 2005 and 2006 was \$642 and \$709 respectively. The corresponding export price was \$589 and \$687.

Table B: Major tropical veneer species exported and average price, \$ / m<sup>3</sup>  
2006

Exporter	Major species exported	Average Price, \$US / m <sup>3</sup>
Brazil	Shorea spp.	3,314
	Cedrella fissilis	1,256
Cote d'Ivoire	Ceiba pentadra, Pycnanthus angolensis, Bombax costatum, Chrysophillum spp., Antiaris Africana	437
Ghana	Ceiba pentadra	293
	Aningeria spp.	1,067
	Antiaris Africana	675
	Khaya ivorensis	1,901
	Pterygota macrocarpa	747
	Celtis mildbraedii	363
	Entandrophragma cylindricum	1,070
	Tieghermella heckelii	724

Source: International Tropical Timbers Organisation, Annual Review and Assessment of the World Timber Situation, 2007.

NOTE: Average price for Cote d'Ivoire species are for 2005.

## Plywood

Plywood is a type of engineered wood made by slicing wood into thin veneers and gluing the veneers together under heat and pressure to form a sheet.

Plywood production totalled 20 million m<sup>3</sup> in 2006. Similar to sawn wood and veneer, plywood production and demand is driven by the general level of housing construction activity.

Malaysia (5.4 million m<sup>3</sup>), followed by China (4.4 million m<sup>3</sup>), Indonesia (3 million m<sup>3</sup>), India (2.1 million m<sup>3</sup>) and Brazil (1.5 million m<sup>3</sup>) are the major producers, accounting for 82% of total production. Taiwan, Japan, Ecuador, Philippines and France are the other significant producers.

Indonesia has experienced declining plywood production in recent years due to a reduction in log quotas and more effective enforcement against illegal logging resulting in the reduction in the availability of tropical logs.

Exports amounted to 10.6 million m<sup>3</sup>. Malaysia (49% of exports), followed by Indonesia (25%), China (9.3%) and Brazil (5.3%) are the major exporters.

The major users of tropical plywood are Japan, China, India, US and the Republic of Korea. China and India have seen a rapid increase in their respective plywood production and consumption in the last decade, destined for their fast growing construction and export industries. Most of China's log imports are converted to plywood with the country now the second largest producer and third largest exporter of this product. Rising labour, energy and raw material costs in China, together with the removal of government export incentives may lead to a lessening of exports.

Imports of plywood reached 8.8 million m<sup>3</sup> in 2006. Japan (3.5 million m<sup>3</sup>) followed by the United States (1.5 million m<sup>3</sup>), the Republic of Korea (1.1 million m<sup>3</sup>) and Europe (1 million m<sup>3</sup>) are the dominant import markets.

The price of plywood, all grades (concrete form panels, floor bases and thin panels) surged from mid 2003 until late 2007. Indonesian moisture resistant plywood (6-18 mm) hovered around \$158 m<sup>3</sup> for most of 2002 and early 2003. By mid 2007, prices rose to \$410 m<sup>3</sup> due to strong growth in new house construction in the United States and the United Kingdom, a declining supply of logs and bottlenecks in shipment. Prices have since weakened, reflecting reduced construction activity in the United States, Europe and Japan.

Among tropical timbers, Okoume is the world's preferred plywood species.<sup>14</sup>

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<sup>14</sup> International Tropical Timbers Organisation, Review of the French Timber Market, November 2005, p. 181

While tropical plywood dominates the international plywood trade, softwood plywoods and substitute panel products are growing and displacing tropical hardwoods. With the exception of France and the United Kingdom, the tropical portion of plywood imports among ITTO importing countries declined between 2004 and 2006.

The strength of the Japanese economy is a key determinant on the price of plywood given it is the world's largest consumer. Japan's imports of plywood with at least one outer ply being from tropical species have been declining since 1995. Softwoods, Russian larch and Japanese larch and sugi have now become the dominant species used by Japanese plywood manufacturers. By 2006, 70% of Japan's domestic plywood production utilised coniferous species.

## Papua New Guinea's Log Exports

The forestry sector in PNG has little to no forest plantations with most activity involving harvesting of natural forest resources. It is orientated almost exclusively towards the export of tropical round wood – it is one of the few countries remaining that is exporting logs and not moving to sawn products. Primary processed wood products are negligible, and there are few export orientated processing facilities.<sup>15</sup>

Log production in 2006 was 2.8 million m<sup>3</sup>, of which 2.6 million or 93% was exported.<sup>16</sup> China received 78% of PNG's exports, with the remainder destined for Japan, the Republic of Korea, India and Thailand. In February 2008, the Minister for Forestry announced that PNG plans to phase out log exports by 2010. The reason for this initiative is for PNG to gain greater control over illegal logging and promote the expansion of oil palm cultivation and the downstream processing of timber.

Commercial forest plantations began in the early 1950's and currently there is 62,277 hectares of plantations. The major species planted are Acacia Mangium (Acacia), Eucalyptus deglupta (Kamarere), Pines (various species), Tectona grandis (Teak) and Terminalia brassii (Talis). The PNG Forest Authority aims to develop 240,000 hectares of sustainable commercial forest plantations by 2030. To achieve this target, the authority will require a significant increase in funding and staff numbers.<sup>17</sup> Promotion of lesser known species is limited.

PNG's production of sawnwood, veneer and plywood is negligible relative to industrial roundwood and has remained relative stable over the period 2003 – 2006. The data for sawnwood, veneer and plywood production should be viewed with caution as it has been estimated from other sources.<sup>18</sup>

Table C: PNG's Production, 2003 – 2006, m<sup>3</sup>

	Year			
	2003	2004	2005	2006
Logs	2,350,000	2,250,000	2,536,000	2,908,000
Sawn wood	60,000	60,000	61,000	61,000
Veneer	80,000	80,000	80,000	80,000
Plywood	12,000	12,000	12,000	12,000

Source: International Tropical Timbers Organisation, 2007 Annual Review and Assessment of the World Timber Situation, p.80.

<sup>15</sup> PNG Forest Industry Association, Economic Analysis & Potential of PNG Forestry Industry (November 2006), p. 8

<sup>16</sup> International Tropical Timbers Organisation, 2007 Annual Review and Assessment of the World Timber Situation, p. 90.

<sup>17</sup> PNG Forest Authority website: [www.forestry.gov.pg/site/page.php?id=11&print=1](http://www.forestry.gov.pg/site/page.php?id=11&print=1)

<sup>18</sup> International Tropical Timbers Organisation, 2007 Annual Review and Assessment of the World Timber Situation, p. 15

The main export destinations are Australia, New Zealand, Fiji and other Pacific island nations. Australian and New Zealand importers have indicated that demand for sawnwood and veneer, particularly 'select grade' has been strong up to mid 2008, after which the decline in building activity has seen demand for these products decline.

The Woodage is Australia's largest customer for PNG certified timber. The demand for certified timbers remains strong, yet there is insufficient supply to meet this demand. Architects are the major customer group. Moreover, architects, interior designers and specifiers know little about tropical hardwoods and tend to predominantly request 'select' grade timbers. To expand the market for PNG tropical hardwoods, these dominant customer groups need to be informed as to the different types of timber grades and species that are available and to which applications they are suitable.

## Prospects for small scale timber producers and community managed forests in PNG

The best markets for green sawn timber from small scale timber producers and community managed forests in PNG are those that offer the highest price and are sympathetic to small volumes and variable quality. Traders, be they local timber merchants or overseas importers that are prepared to aggressively promote and educate customers about both common and lesser known tropical hardwood species and the utility of non 'select' grade timbers need to be targeted.

High prices are critical to the success of these forest enterprises as significant resources are needed to manage, process and transport timber resources. High prices improve the incentive to conserve the resource and grow the enterprise.

High prices and profit margins are achieved by making a product unique and convincing buyers that the utility they receive extends beyond the functional utility of the product – emotional, moral, spiritual or other intangible gains are perceived by the customer.

Certification and fair trade are two approaches that are used to differentiate wood products. Australian customers buy PNG certified wood products because of ethical considerations or have been requested by their customers (e.g. architects). In only some cases is a price premium achieved.

Forest Stewardship Council (FSC) certification was initially designed for larger plantation enterprises where economies of scale and established access to markets could justify the expensive transaction costs and time required in achieving certification.

For community based timber producers, the key questions they need to determine is whether there is demand for their product and what prices are traders and the end buyers prepared to pay? Are these markets local and / or overseas? Certification should only be pursued once the community has established sales in a market and can partner with NGOs or overseas importers that are prepared to assist with this process.

The commercial viability of the small scale timber producer or community managed forests should first be proven, identifying the most valuable markets and least cost way to access. Sales and cash flow should be the first priority so as to give the communities the resources they need to help them to overcome the inherent structural problems they face – small volumes, variable quality, delivery problems, deficient business and technical know how and high cost structures. The earlier that a steady income stream can be achieved, the more likelihood that the community will stay engaged with the enterprise and build local capacity to sustainably manage their resource. Communities should first seek out the least cost way to access the highest priced markets before seeking certification and other fair trade labelling schemes.



The timber emanating from PNG community owned forests need to be distinguished via marketing to discriminating buyers – develop a ‘story’ about the community, people and their history to emotionally engage end buyers and how their purchases will progress the community’s capacity building measures. Simple marketing focusing on the people of the community with statement of origin could be used.

Sympathetic and committed traders, either local timber merchants or overseas importers need to be located who are committed to both working with the communities, promoting their timbers and paying high prices so that more benefits of the value chain accrue with producers and. These buyers will face higher transaction costs in dealing with community based forest enterprises compared to ‘normal’ commercial sources.

## Forces Determining Price

The clearance price for tropical round wood and processed products is a net result of the complex and dynamic interaction between the many forces that affect the availability of supply and the strength of aggregated demand.

Where price differences for a particular product occurs in different countries, this is the result of trade barriers, government regulations, differential shipping costs and currency movements that creates bias in the otherwise competitive structure of this market.

On the supply side, the major forces that influence price are:

- The availability of and access to logs. Bans on round wood exports (Indonesia) and export quotas (Cameroon, Republic of Congo, Gabon) restricts supply. This results in a rise in price for this primary product with a corresponding flow on effect through the rest of the production value chain (ceterus paribus, or all other things remaining the same).
- The competition for wood as a raw material from competing uses e.g. electricity generators and 'bioeconmy' industries that may emerge where wood is used to produce fuel and high value chemicals.
- The cost of processing logs and wood products - rising labour costs along coastal China is seeing a relocation of some secondary wood processing industries to lower cost Vietnam.
- The cost and availability of dry bulk shipping – the Baltic North Sea Index, a leading indicator of dry bulk shipping costs rose dramatically in recent years. Paradoxically, as high transport costs absorb more of the value of the timber species, this encourages tropical timber producers towards downstream processing of wood products and the trading of higher value, lower volume wood products.
- Export tax benefits - the Chinese Government is winding back such incentives.
- Export quotas – Peru's annual export quote of 23,239 m3 on *Swietenia macrophylla* (mahogany) has restricted supply, producing higher prices for this species and promoting substitution to other lesser known species.

- Illegal logging tends to undercut the international price for logs and wood based products as these logs tend to be offered for below the cost of a legal operation. It is estimated that Indonesia loses approximately \$ 1 billion per annum in tax revenue from the illicit trade in timber.<sup>19</sup>
- Prices for some logs and wood products are known to temporarily spike during the annual monsoon period of October to January when it can be difficult to harvest logs in wet conditions.<sup>20</sup>
- Infrastructure, logistics and public services in some exporting countries can disrupt supply.

Tropical logs that have been available and easy to access have long since been sourced. Commercial harvesting from primary forests is moving to more remote and difficult areas where the marginal cost of log extraction will continue to rise and be passed on to users.

On the demand side, the major forces that influence price are:

- New house construction, renovations and the general level of construction activity in the United States, Europe and North Asia is the largest driver of aggregate demand for wood products. Population growth, household formation and the general strength of economic activity drive the construction sector.
- The competitiveness and uptake of softwoods and non tropical hardwoods. One reason attributed to the decline in European Union tropical hardwood imports is the availability of non tropical hardwoods from East European countries.<sup>21</sup> Softwood timber products enjoy substantive advantages as they are a low cost homogenous product, offer reliability of future supply and generally incur lower certification costs.
- The competitiveness and uptake of substitutes such as steel, plastic, concrete, glass, PVC and plastic composite decking materials.
- Fashion changes. The emerging demand for environmentally certified wood products and the move towards lighter coloured timbers among certain European countries can shift demand and rapidly influence price. Some species, such as mahogany or walnut can be viewed as being 'noble', thereby commanding a higher price.

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<sup>19</sup> PNG Forest Industry Association, Economic Analysis & Potential of PNG Forestry Industry (November 2006), p. 24

<sup>20</sup> International Tropical Timber Organisation, Tropical Forest Update, 18 January 2008, p. 21

<sup>21</sup> International Tropical Timbers Organisation, 2007 Annual Review and Assessment of the World Timber Situation, p. 22.

- Import tariffs. The European Union has placed high tariffs on some tropical plywood products containing the species meranti and okoume, resulting in higher prices for users.
- Standards. The European Union in 2004 made the 'CE marking' apply to the manufacture of structural plywood. This led to an immediate shortage of 'CE marked' product, resulting in increased prices until manufacturers could adjust to the new requirements.<sup>22</sup>
- Anti dumping duties. In mid 2005, the United States imposed anti dumping duties ranging from 4.5% to 198% on wooden bedroom furniture imported from China, resulting in increased prices and a reduction in demand.<sup>23</sup>
- Import bans. The European Union banned the import of logs and wood products from Myanmar from October 2007. In December, the US introduced the Burma Democracy Promotion Act that outlawed the importation of timber from Myanmar. These actions would be expected to shift demand to other tropical log species or substitutes, resulting in a decline in price for Myanmar logs, *ceteris paribus*. What took place was that prices for Myanmar's tropical timbers rose as demand from other countries displaced buying from the US.
- Movements in currency. For exporters, an appreciating currency increases the price of their exports, and vice versa when their currency is depreciating (*ceteris paribus*). The appreciating Brazilian currency in recent years has made the purchase of Brazilian timber in other currencies more expensive. This price increase is amplified for buyers in the United States who are experiencing a depreciating United States dollar.

The most significant demand side factor on the influence of price is the strength of the US, followed by the United Kingdom, European and Japanese new housing construction markets which are the main destinations for a significant proportion of tropical wood products.<sup>1</sup>

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<sup>22</sup> Ibid., p. 30.

<sup>23</sup> Ibid., p. 35.

## Price Movements for Peruvian Mahogany

South American mahogany (*Swietenia macrophylla*) is a species that was in high demand by the US housing market. In 2002, the Brazilian government imposed a total ban on the logging, processing and trade of its entire mahogany species. This was followed in 2003 by the inclusion of this species on the CITES register.

The effect of this intervention was:

1. Peru entered the market gap created by the Brazilian government's decision and became the major supplier of mahogany to the US market.
2. Demand from a fast growing US new housing market led to high price rises.
3. In 2005, the Peruvian government introduced an export quota, restricting supply and thereby placing further upward pressure on prices.
4. As prices rose, substitution occurred as consumers shifted demand to other species such as khaya, sapelli, ipe and garapa. Higher prices has the effect of promoting lesser known species
5. Increasing demand led to a rise in price for khaya from \$394 m<sup>3</sup> in 2001 to \$814 m<sup>3</sup> at the end of 2007.
6. This substitution to other species resulted in a decline in demand and prices for Peruvian mahogany.
7. The severe decline in US new house construction as well as the depreciating US currency has reduced demand for all of these species, with prices correspondingly falling.

## Trends in Major Producing Countries

**Cameroon.** Beginning in 1994, logging companies can export a maximum of 30% of their logs during the first five years of operating, with the remainder 70% reserved for local processing. After five years, 100% of logs are to be processed locally. Lesser known species can be exported as logs in order to promote them in international markets.

Cameroon suspended 27 logging firms in 2008 for failing to justify the origin of the timber they were exporting.

**Gabon.** The new log export quota introduced in 2007 intends to reduce the share of logs in the total export mix to 25% by 2012. Other measures are being used to promote sustainable forest management and timber processing.

**Ghana.** The supply of its major species, teak and mahogany is fast declining. Incentives to bring lesser used species to the attention of international markets and value add through downstream processing are underway.

**Indonesia.** Significant efforts are being applied to the monitoring and regulation in the harvesting and trade of tropical forest products. The Dutch private sector building industry has mandated that they will only purchase Indonesian wood products that were legally harvested and from sustainable managed forests.

**Malaysia.** The Government's Ninth Malaysian Plan (2006 – 2010) employs multiple strategies to promote processing value added to Malaysia's timber resources – tax rebates, providing land infrastructure and establishing designated Timber Processing Zones. An increasing number of species, including lesser known species are also being utilized and traded.

**Brazil.** The total area of forests plantation is 5.4 million hectares and an additional 550,000 hectares are being established annually.

The growth in the production of hardwood sawn timber in recent years has been relatively stagnant in part due to the transition to sustainable forest management under the National Forest Program introduced in 2000. Under the National Forest Program, those licensed to harvest native forests are required to submit plans demonstrating the sustainability of their activities. The government has been taking strong measures to ensure compliance with this Program which has disrupted harvesting in native forests and the production of native hardwood products.

**Guatemala.** Priority is being focused on the harvesting and marketing of lesser known species due to shortages of traditional species such as cedar & mahogany.

**Guyana.** Emphasis is being placed on increasing value adding activities through downstream processing. Lesser used species are being used more extensively as more international companies with experience in promoting new species establish operations in Guyana.

**Peru.** Forest legislation is promoting the downstream value adding processing, production chain integration and optimal utilization. The other major trend is the focus on the harvesting and processing of a larger number of species – domestically, over 300 species are being marketed and most of these are lesser known species.

## Tropical Hardwoods in the United States

In a global perspective, the United States is the dominant player in the wood market. It is the world's largest producer, consumer and importer of primary and secondary wood products.<sup>24</sup> US imports of tropical hardwoods are in the form of processed products such as plywood, flooring and decking in higher priced applications, and sawn wood that occupies high priced niches such as boat building, mouldings and furniture.

Tropical hardwood imports for flooring have seen the fastest growth in recent years and are estimated to account for 17% of the 222 million square meters of hardwood flooring installed in 2005.<sup>25</sup> However in the context of the huge US wood market, tropical wood products represent just 1-2% of total consumption.<sup>26</sup>

It is estimated that 2006 US imports of tropical wood products, not including furniture, was \$1.6 billion, growing at an annual compound rate of 14.9% since 2001 and representing 7% of total wood imports.<sup>27</sup>

New house construction activity drives the wood product market and the level of demand for tropical hardwoods. Since the 1970's, new houses have grown in size from an average of 226 to 365 square meters, and are being constructed with more amenities such as higher grades of flooring, featured timber works and exterior decking.

New housing starts peaked in 2006 at 1.9 million units and since then have contracted to an annual rate of 965,000 new units by July 2008, weakening demand for wood products.<sup>28</sup> The depreciating US currency has added to the decline in demand for imported tropical hardwoods.

The issues that are confronting tropical wood producers are:

- Forest certification is gaining adherents from some large distributors and retailers. US importers believe that certification is not likely to result in a price premium, but it may help to secure and legitimise the trade in certain tropical species. This is in response to concerns by the US general public about illegal logging and the destruction of tropical forests.<sup>29</sup>

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<sup>24</sup> International Tropical Timber Organisation, Report on the Review of the US market for Tropical Timber Products, July 2007, p.13

<sup>25</sup> *ibid.*, p. 17

<sup>26</sup> *ibid.*, p.13

<sup>27</sup> *ibid.*, p. 18

<sup>28</sup> The Age Newspaper, August 20, 2008

<sup>29</sup> International Tropical Timber Organisation, Report on the Review of the US market for Tropical Timber Products, July 2007, p.3



- New flooring technologies involving the use of plastic composites or the use of hardening and colouring agents combined with low value species are beginning to gain market acceptance, particularly in the more environmentally conscious US west coast states who are early adopters of sustainable forest managed products.<sup>30</sup>
  
- The severity of the decline in new housing starts in the US which has now spread to the United Kingdom, Spain, Ireland, New Zealand and Australia.

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<sup>30</sup> *ibid.*, p.3

## Certification and Sustainable Forest Management

Certification and Sustainable Forest Management (hereafter referred to as “SFM”) are gaining international prominence, although appear to be at the early stages in most tropical countries, where its technical and financial viability at a commercial scale is being assessed.

An ITTO review of SFM in 2006 found that only six producer countries have the on the ground capacity to manage their forests sustainable. Many countries do not have enough information on which to formulate policies for SFM, nor do they have sufficient trained people, technical support and funding.<sup>31</sup> Local and international environmental non government agencies (NGOs) such as the World Wildlife Fund, Greenpeace, Friends of the Earth and the ITTO appear to be the drivers at the local level in the establishment of SFM practices in tropical countries.

On the demand side, the efforts of NGOs in northern European countries appear to be an important contributor in the raising of awareness about illegal and non sustainable logging practices. Tropical round wood and sawn wood imports have fallen in this region by 70% between 1973 and 2003.<sup>32</sup> Certified plantation softwood from Nordic and other countries have to a large extent replaced tropical timber imports.

The large importers of the United States and particularly Europe are leading the drive to eliminate illegal logging and promote SFM. They are using non tariff barriers to restrict or eliminate imports of tropical hardwoods from particular countries unless there is compliance with particular regulations.

- The United States Congress is amending the Lacey Act so that it would become illegal to import, sell or process timber illegally harvested outside the US. This places an obligation on importers to prove the legality of timber products.
- An increasing number of commercial species (e.g. mahogany) are beginning to be governed by the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES) restricting supply of these species listed on this Convention.
- The European Unions efforts to mitigate illegal logging and reduce trade in illegal timber products between exporting countries and the EU is through the EU Forest, Law Enforcement, Governance and Trade Initiative (FLEGT).

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<sup>31</sup> ITTO, Brochure – Measuring Up: Assessing progress towards sustainable forest management in the Tropics

<sup>32</sup> International Tropical Timber Organisation, Review of the French Timber Market, November 2005, p.

- In October 2007, the European Union announced a ban on wood products imported directly from Myanmar as well as from other countries such as China utilizing Myanmar's timbers.
- France issued a Public Procurement Decree in 2005 so that 100% of wood procured by government institutions by 2010 would be sourced from sustainable forests.<sup>33</sup>
- In January 2007, the German government introduced new regulations requiring federal government bodies to purchase wood products only from sustainable managed forests.
- European owners of West African concession of over 2 million hectares have been working towards certification that will deliver industrial quantities of logs, sawn wood, veneer and plywood.<sup>34</sup>

In the case of PNG, there is a low level of support for SFM from government and logging companies. The few examples of forest certification that exist are due to committed individuals, NGOs and international donors.<sup>35</sup>

Certain European buyer groups have demanded certified tropical timbers, yet have been frustrated by the lack of available supply and the unwillingness of customers to pay an additional premium for certification. They believe that only when SFM timbers become a significant product category will prices adjust to reflect the real cost of certification.

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<sup>33</sup> *ibid.*, p.56

<sup>34</sup> *ibid.*, p.64

<sup>35</sup> Institute for Global Environmental Strategies, Forest Certification in PNG: Progress, Prospects and Challenges, Occasional Paper No. 1, October 2007, p.17

## Conclusion

The days when tropical timber was imported because it represented the cheapest mass raw material available are over. Established tropical timbers on the world market are in increasingly short supply and this trend is expected to continue

The inherent durability, stability, workability and aesthetic appearance of many tropical hardwoods are superior to those of most competing timbers and other building materials. Rising prices are reflecting these unique characteristics and tropical timbers are now the material of choice for up market end uses in the home, office, shops, restaurants and airports.

The value of tropical timbers that have well known end applications will continue to rise in real terms over the long term (barring a massive and to date unprecedented increase in supply from tropical plantation resources that would exceed demand).

In the short term, prices will vary according to the cyclical nature of global economic growth and specifically new house construction and renovations. Overwhelmingly however, the supply of harvestable tropical species is declining and demand is expected to at least remain strong as a result of burgeoning population growth (expected to reach 9.6 billion by 2050) and the unprecedented rise in real incomes driven by the emergence of the new frontier economies.

This is evident in the shift towards downstream value adding activities by many tropical countries. The European industry estimates that Africa's saw log exports will disappear in the next 10 – 15 years, replaced by sawn wood and other finished wood products.<sup>36</sup>

For those small scale timber producers and community managed forests in PNG, NGO's and other organisations should focus on building communities capabilities to cleverly market their resource and adapt to market forces. Institutionalising certification to achieve sustainable forest management practices should wait until the community has accumulated some surplus resources from their enterprise which can then be directed to pursue this activity.

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<sup>36</sup> International Tropical Timber Organisation, Review of the French Timber Market, November 2005, p. 80