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Hardwood Timber Supply & Demand in Asia
*An Opportunity for Hardwood Plantation
Investment*



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Introduction

Asia's economic growth has driven regional timber demand growth of over 20% CAGR between 1980 and 2008.¹ Regional timber demand has been based on growth in both export-oriented processing and manufacturing industries and domestic consumption. Timber is broadly divided into two categories: softwood and hardwood. Softwoods are used primarily for construction timber, newsprint and cardboard manufacture, with relatively limited use for appearance grade applications such as furniture and flooring. Hardwood timber was also traditionally used for general construction in Asia where it was the only form of timber available, but this is being displaced by growing softwood log and lumber imports. On international markets hardwood is now used primarily for appearance grade applications such as furniture, flooring, and where a harder or more durable wood is needed (e.g. window and door frames) and heavy duty plywood (e.g. concrete formwork and flooring for shipping containers). Hardwoods are also the main source of kraft pulp used in papermaking.

Softwood timber, including spruce, pine, fir, and other species is largely produced from the extensive natural forests of Russia, Northern Europe, and North America, as well as high productivity plantations in Latin America, New Zealand, Australia, and South Africa. Hardwood timber, including Eucalyptus species, oaks, maple, beech, and a myriad of tropical hardwoods like Meranti, Merbau, Acacia, rubberwood and teak, has been produced from the natural forests of central Europe, North America, Australia, southern South America, and the tropical regions of Asia, Africa, and Latin America. There is a high productivity hardwood plantation resource, primarily of Eucalyptus and Acacia, in Latin America, Australia, and Southeast Asia, but these plantations are largely dedicated to the production of pulpwood.

While it is arguable that the natural softwood forests of the world are capable of supporting continuing demand growth for softwood timber, there is no question that hardwood forests have been largely depleted, and there has been insufficient investment in higher value hardwood plantations. The wood supply deficit for tropical hardwoods appears to be tightening as supply from natural forest resources is exhausted and plantation resources struggle to keep pace with Asian demand growth. This is likely to become more acute in the future as the aging, but wealthier, populations of China, South Korea, Japan, and Europe, and a growing middle class in India, drive demand for higher value consumer goods like hardwood furniture, kitchen cabinets, and flooring. The combined effect of rising demand and declining supply will lead to a growing hardwood timber supply deficit across Asia, and we expect this will translate into rising real prices. In this paper, we argue that these market dynamics call for a strategy to invest in tropical hardwood plantations in Southeast Asia, in close proximity to the growing Asian demand.

Regional Hardwood Supply

Traditionally, logs from Southeast Asia's natural forests supplied domestic and regional timber markets. However, regional log production has declined steadily over the past three decades. Natural forest log production more than halved over a 15 year period in Malaysia from 37.3 million m³ in 1994 to 18.3 million m³ in 2009² (see **Figure 1**). An even steeper rate of decline has occurred in Indonesia where natural log production fell from 17 million m³ in 1995 to 5 million m³ in 2008.

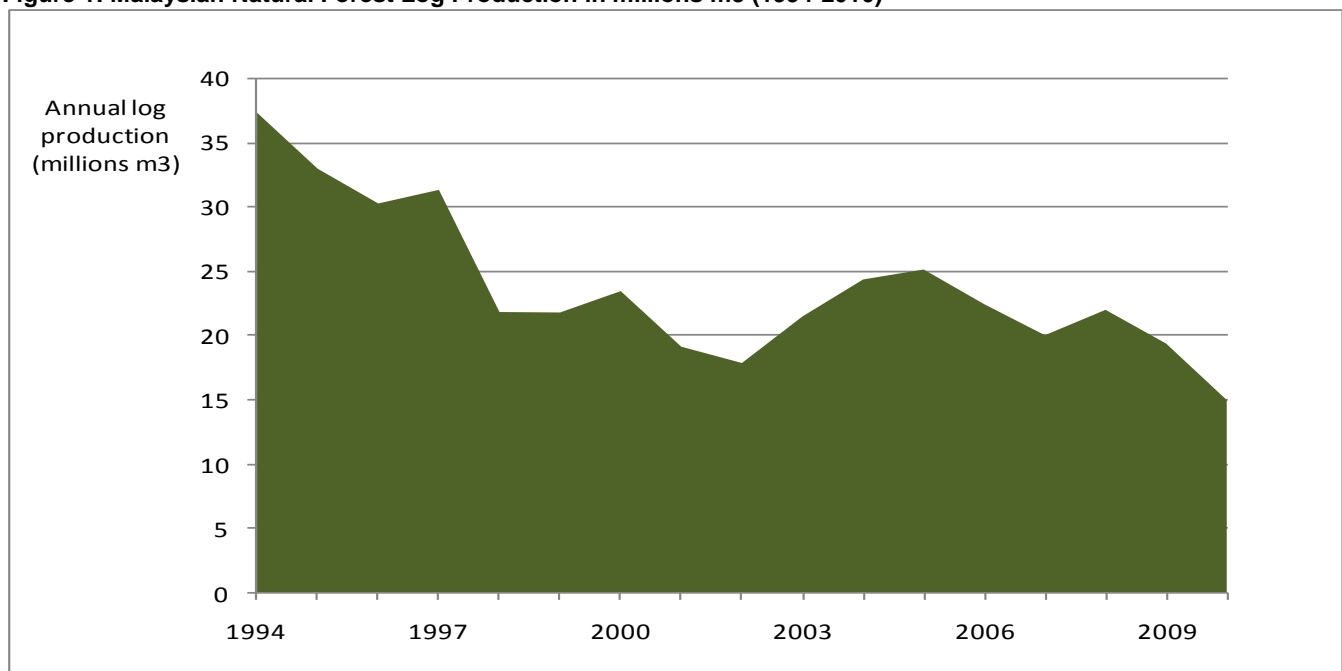
The natural forests of Southeast Asia are complex and support a myriad of tree species, most of which have no current commercial use. Logging operations generally involve establishing extensive road systems to seek out

¹ CAGR = compound annual growth rate; Source: FAO State of the World's Forests 2009.

² ITTO Country data.

and remove the limited number of commercially valuable tree species from each hectare. Government regulations usually restrict harvesting to the largest trees (e.g. greater than 60 cm diameter) leaving younger trees to grow on and become the future crop. These forests may then take 30+ years to recover from the initial logging operation before they again produce a harvestable crop of high value timber. In some cases the forests are re-logged for pulpwood or lower grade timbers before sufficient time has elapsed for the forest to regrow a harvestable crop of larger trees, which can cause the forest to become choked with weedy vines and fast-growing pioneer species further slowing down regeneration of the commercially valuable tree species. In many countries across the region, government has imposed harvesting quotas or logging bans in order to protect the forests, especially those providing watershed protection functions, whilst for other areas of such degraded forest, often the final step is conversion to agribusiness such as oil palm plantation. Conversion of large areas to agriculture and the associated salvage logging yield from remnant natural forest cover has helped to sustain log production at higher levels that would otherwise have been obtained through selective timber harvesting. However, the rate of forest conversion is slowing, even in Indonesia³, and where it does, log production levels have fallen rapidly. In the Malaysian state of Sabah, for example, natural forest log production has declined from 6 million m³ to a little over 2 million m³ as the expansion of the state's oil palm plantations has slowed. Papua New Guinea and the Solomon Islands still show high or even increasing logging rates, but this is ultimately unsustainable and sooner or later will lead to a collapse in log production.

Figure 1: Malaysian Natural Forest Log Production in millions m³ (1994-2010)



Source: ITTO

The consequence is that sustainable natural forest harvesting is not a realistic option for supporting timber demand growth in Asian markets. The natural forests are complex ecosystems, and their growth is often slow relative to dedicated timber plantations. For example the recovery of natural forests may take 30+ years to

³ Ministry of Forestry in: Mongabay (25 May 2012). Indonesia's deforestation rate falls, says Ministry of Forestry, <http://news.mongabay.com/2012/0526-deforestation-indonesia-map.html> accessed June 12 2012.

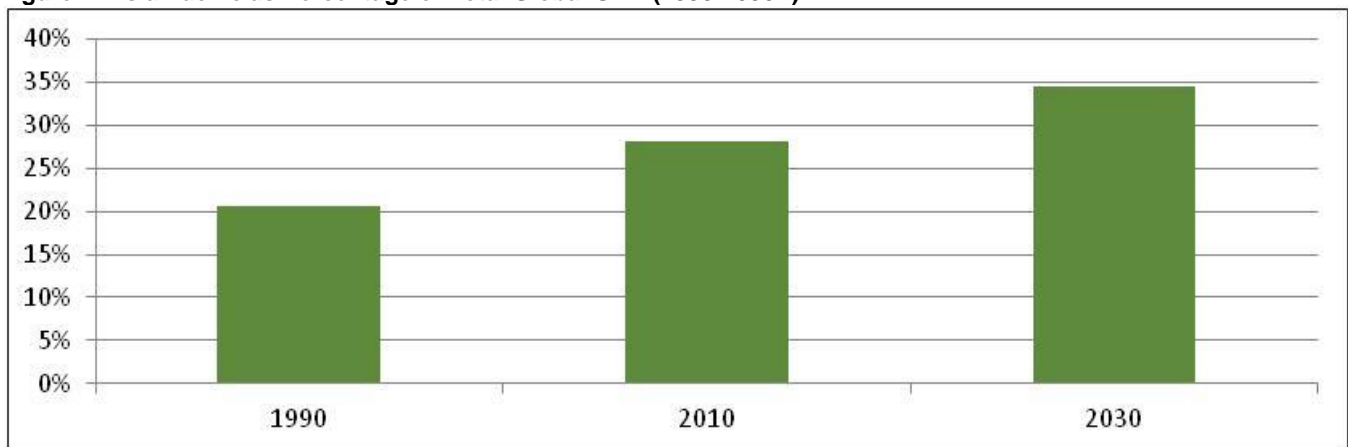
support a harvest of 30 cubic metres per hectare. On the other hand a high yielding *Acacia mangium* plantation grown on a long rotation for sawlog production may produce 20 cubic metres per hectare per year, and up to 30 cubic metres per hectare per year when grown on a shorter rotation for pulpwood. The consolidation of timber production into high productivity plantations is ultimately the most logical solution to sustainable timber supply, and can lead to some kind of final balance between areas dedicated to production and areas dedicated to conservation. The goal should be to secure areas of high conservation value (e.g. watershed protection, critical habitat, and other features), and consolidate key agribusiness and timber crop development into defined estates (oil palm, rubberwood, and timber plantations). However, while oil palm has proven highly lucrative and starts to produce a cash yield within four years of establishment, timber plantations have been less attractive to investors because positive cash yield can take 15 years or more. As we show in the next section, this could lead to timber supply shocks over the next 3-5 years as the US economy and housing starts recover from the subprime mortgage and subsequent financial crisis.

Regional Hardwood Demand

Over the past decade, China's fast-expanding economy, unprecedented urbanisation rate and consequent boom in housing starts and domestic consumption of timber products has turned the country into the world's largest importer of hardwood logs and sawn timber⁴. However, many other rapidly growing economies in the region have contributed to the timber demand growth of over 20% CAGR since 1980⁵. The most prominent of these today are India, which is the world's main market for teak, Malaysia and Vietnam, which have substantial export-oriented hardwood furniture manufacturing industries, and Indonesia, which has burgeoning domestic consumption as well as its own export-oriented furniture industry.

Timber demand is highly correlated with new housing starts and GDP on both an absolute and per capita basis,⁶ and as Asia is likely to continue to lead the world in both housing starts and GDP growth over the coming decades (see **Figures 2 and 3**), the region will see the largest rise in wood consumption of any region.

Figure 2: Asia Pacific as Percentage of Total Global GDP (1990-2030E)



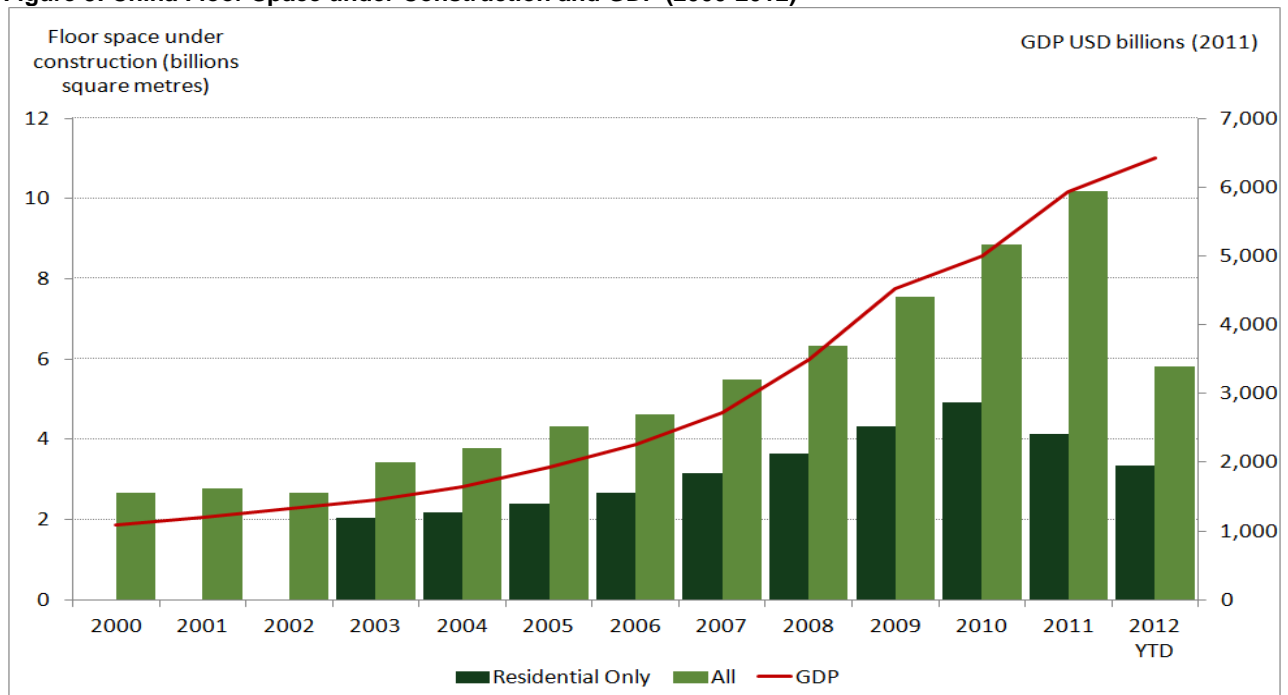
Source: FAO.

⁴ Center for International Trade in Forest Products (2011). *Economic and Environmental Aspects of China's Wood Products Industry*. <http://www.cintrafor.org/publications/newsletter/C4news2011winter.pdf>, accessed May 2012.

⁵ FAO (2009). *State of the World's Forests 2009*. Rome: Food and Agriculture Organization.

⁶ FAO (2008). *Global Forest Products Consumption, Production, Trade and Prices*; Forest Research Group, Forest Research Notes, vol. 5, no.4, Fourth Quarter 2008.

Figure 3: China Floor Space under Construction and GDP (2000-2012)



Source: Source: Statistics China (floor space) and IMF GDP data.

Note: 2003 is the first year residential property development was split out from the wider data set.

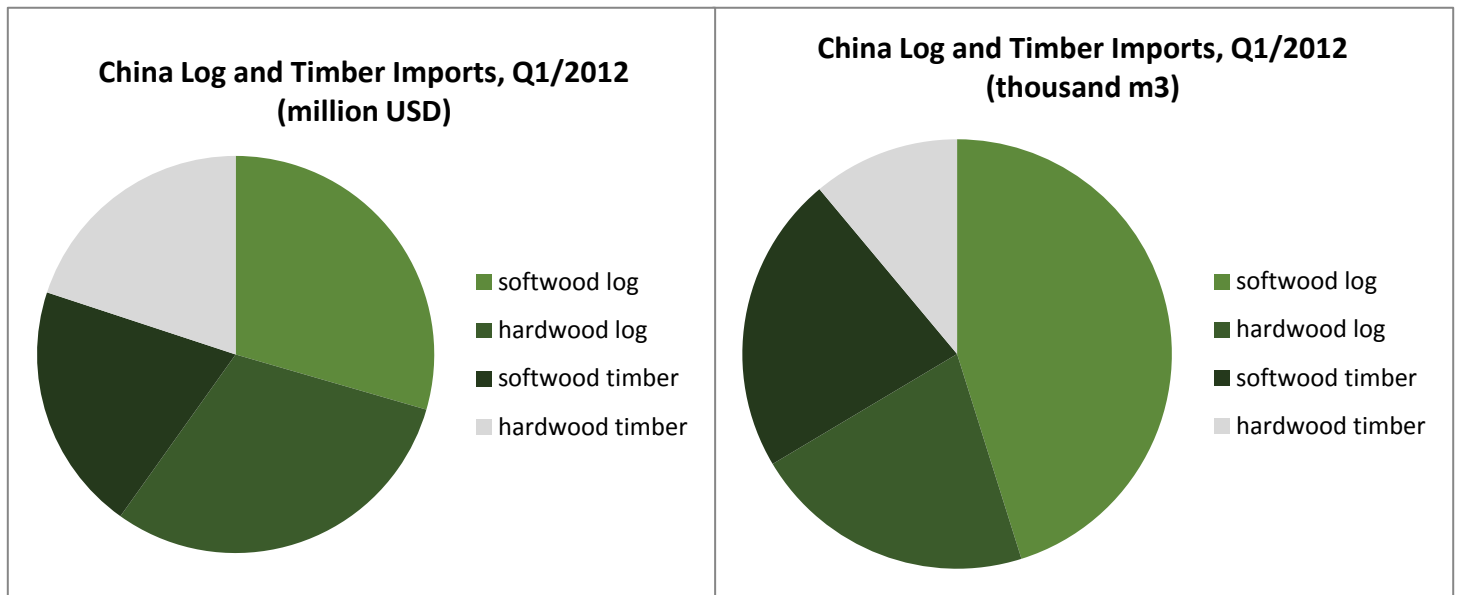
Another key driver of timber demand is demographics. Rapid population growth in countries like Indonesia and the Philippines drives demand for new housing and furniture, whilst ageing populations in China, Japan, and South Korea drives demand for hardwoods for home renovation including higher value flooring and furniture.

The demand growth in Asia over the past few decades has had dramatic impacts on wood flows into and within the Asian region. Led by China, there has been a dramatic increase in timber imports from North America, Africa, Latin America, and Oceania to support growing timber processing and consumption. Chinese timber imports in 2011 were 15 times higher by volume than in 2001, and log imports were up three-fold from ten years before. The total value of imported logs and timber increased from US\$630 million dollars in 2001 to almost \$US8 billion dollars in 2011⁷.

This constant upward trend in Chinese imports came to a halt in late 2011 when the government intervened to cool off the property bubble, construction activities slowed and inventories of logs and timber at many Chinese ports reached very high levels. As a result of lower demand for wood products, log import volumes during the first three months of 2012 were down 9.1 million m³ (6.6%) from the same period in 2011. However, hardwood logs and timber imports both continued to rise over the first 3 months of 2012 from the same period in 2011, recording gains of 5% (logs) and 10% (timber), and overall timber imports were 4.6 million m³, up 5.1%. The breakdown of Chinese timber imports in **Figure 4** shows that hardwoods represented approximately a third of imports by volume (round wood equivalent) in the period, but due to their higher value, their share by value was over half.

⁷ Wood Resource Quarterly. April 2012.

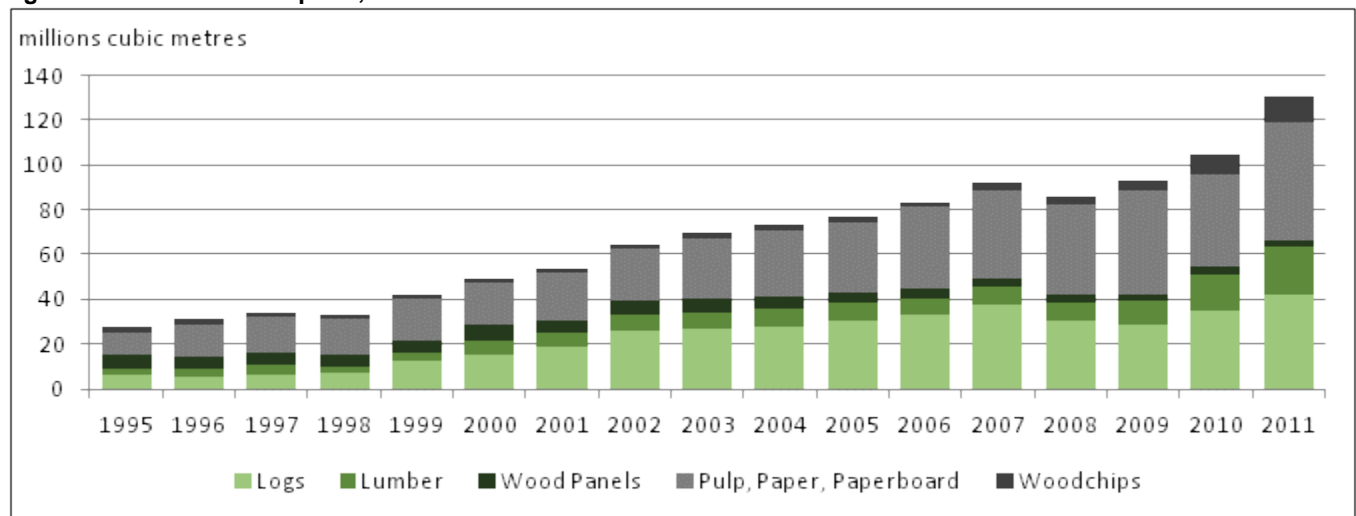
Figure 4: China Log and Timber Imports by Volume and Value, Q1/2012



Source: International Wood Markets (2012). China Bulletin May 2012.

China consumes 75-85+⁸ of its domestic production, so its imports are strongly correlated with incremental GDP growth and housing starts. Despite conflicting data, commentators are in broad agreement regarding China’s wood supply deficit. Even allowing for ongoing investment in plantation forests, China continues to face challenges in meeting its demand for wood. **Figure 5** shows the increase in import of timber in China over the past fifteen years.

Figure 5: China Timber Imports, 1995-2011

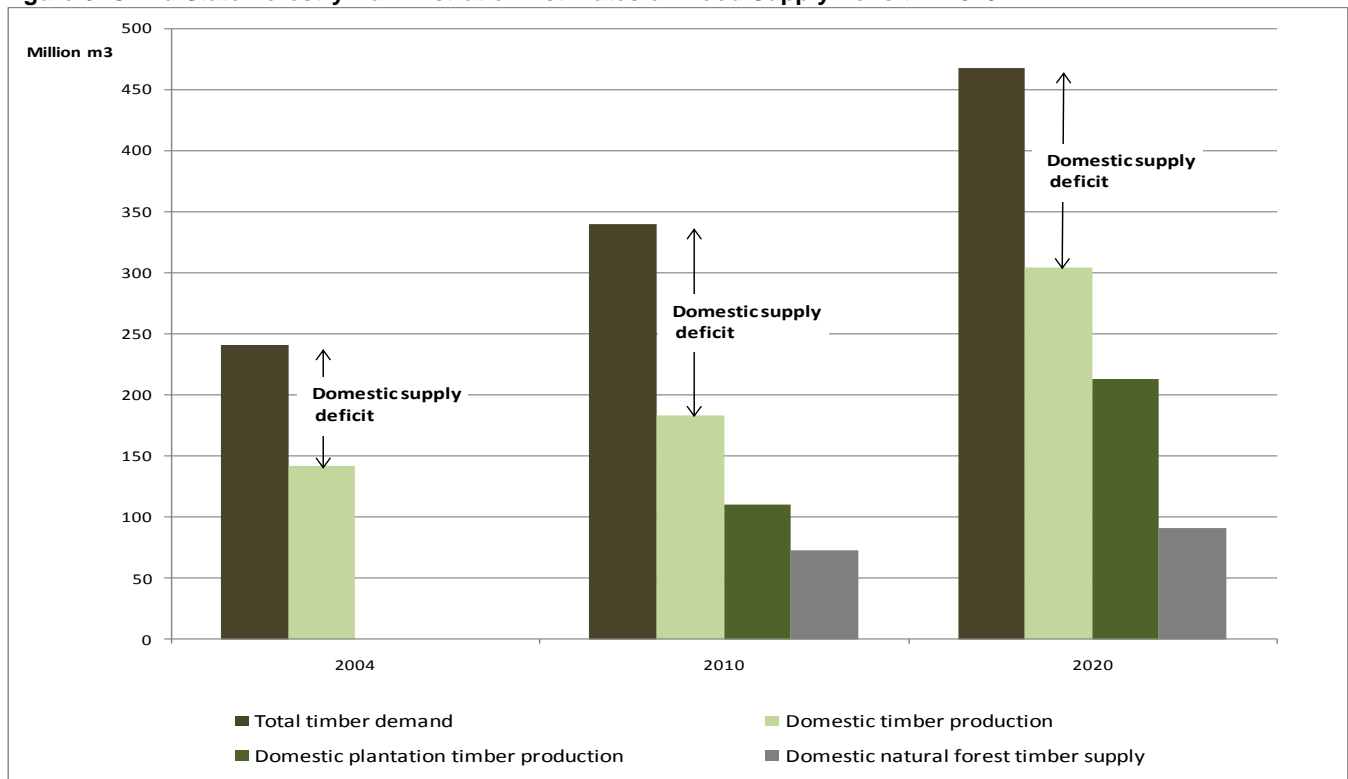


Source: New Forests’ analysis of FAO, RISI, and International Wood Markets data.

⁸ Taylor, Russell – International Wood Markets (2011). Presentation to PwC Global Paper and Forest Products Conference, May 2011.

The shortfall in wood supply and increasing timber imports are unlikely to be addressed by domestic timber supply, even in the medium to long term, particularly given that timber demand is rising in line with GDP growth while the Chinese government has curtailed logging in water catchments. China's State Forest Administration (SFA) optimistically expects domestic timber supply to rise from 180 million m³/annum in 2010 to reach 300 million m³/annum in 2020, whilst at the same time it also anticipates that industrial demand (not including private use or fuel wood) will increase to 467 million m³/annum (excluding recovered paper), leaving a deficit of 167 million m³/annum (see **Figure 6** below). However, ITTO reported the deficit had reached 150 million m³ in 2011 and believe the gap will grow to over 180 million (roundwood equivalent) by 2015⁹.

Figure 6: China State Forestry Administration Estimates of Wood Supply Deficit in 2020



Source: China State Forest Administration.

Over the three years, 2009-2011, Chinese demand growth supported global timber markets that would have otherwise been depressed by slow housing markets and general economic conditions in the US and European Union. US housing starts collapsed from a peak of approximately 1.6 million units per annum to only 600,000 in 2011, but the housing market there is expected to begin recovering in 2015-2017. It is at that point when the continuing process of Chinese urbanisation will compete with the US housing recovery for timber products, and markets may substantially tighten.

⁹ ITTO September 2011

Investment Opportunities for Hardwood Timbers

Market data suggests that the high growth rate of wood consumption in Asia will continue and the hardwood wood supply deficit will widen, due to declining natural forest log production and a notable absence of plantation resources dedicated to solid wood production. We anticipate that supply constraints, economic recovery in the United States, continued rapid urbanization in China, a growing Asian middle class, and aging societies in China, Japan, Europe, and North America will combine to support sustained real price increases for hardwood timber over the next two decades and may lead to an acute wood supply crunch in the next 3-5 years if the US economy and housing market picks up rapidly over that period.

Observers suggest that in order to secure the necessary raw materials to meet its wood supply deficit, the Chinese government will need to provide incentives to Chinese enterprises to invest in overseas timber plantations. This was similar to the strategy pursued by the Japanese pulp and paper industry in the 1990s. Chinese companies have already been active in securing natural forest logging concessions in Latin America, West and Central Africa and in Papua New Guinea. As these logging concessions are exhausted, we expect to see well-funded Chinese companies seeking opportunities to secure hardwood timber plantation resources globally, actively supported by the Chinese government. Regions of particular interest will include Africa, South America, and Southeast Asia. We also expect that this Chinese investment will drive up asset prices in the medium term.

There are an estimated 264 million hectares of production and watershed protection plantations around the world today,¹⁰ which represent about 6% of the world's forest cover. About 40 million hectares are high-yielding plantations that can produce at an average of 10 to 20 m³ per hectare per annum over a full rotation, and of that about 15 million hectares are hardwood with the remaining area in softwood.¹¹ However, most hardwood plantations to date have been established to provide pulpwood or charcoal, and investment in plantations of longer rotation, higher value hardwood timbers for solid wood applications has been limited. It can take 15 to 20 years to bring on new high value hardwood plantation timber supplies, and therefore a strategy to secure existing plantations over the next two to three years could generate high returns from both income and asset revaluation.

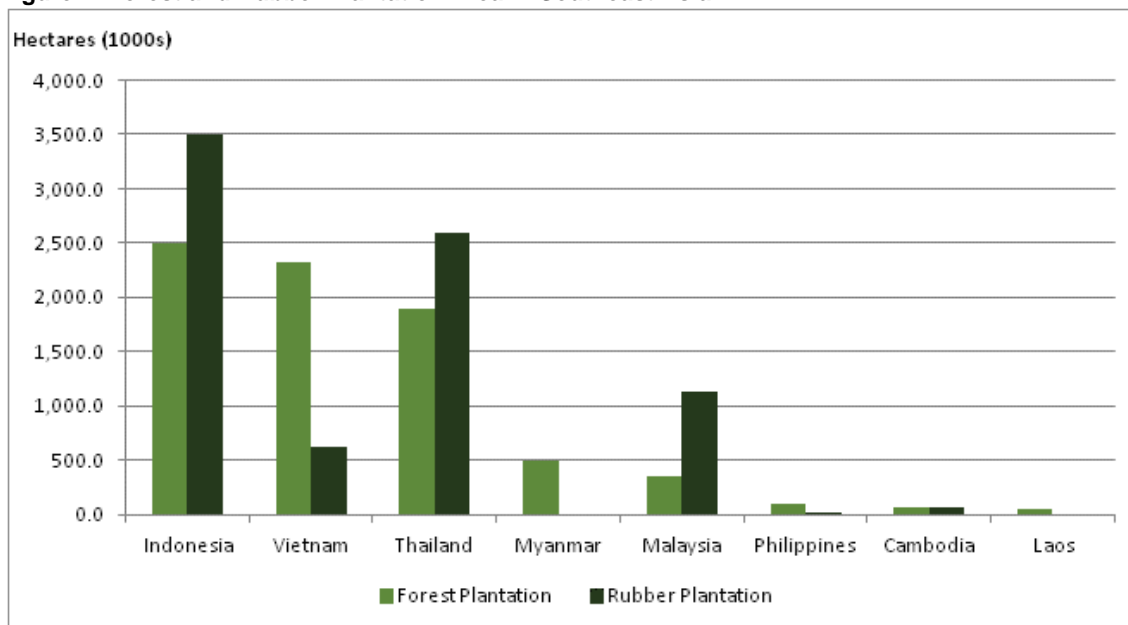
The highest potential for high-yielding hardwood plantation development is centred in tropical regions, including Southeast Asia and parts of Africa and Central and South America, which offer attractive growing conditions. However, Southeast Asia is likely to be a focal point for institutional grade investments in timber plantations for hardwood saw logs in the next few decades, because the region offers globally competitive growing costs and growth rates, large areas of land zoned exclusively for forestry, considerable experience in plantation management (e.g. oil palm, rubber, pulpwood plantations) and processing, and low shipping costs into Asian markets relative to other competing plantation regions.

Across the region there is today an estimated combined area of more than 7.5 million hectares of forest plantations, excluding rubber and smallholder areas (see **Figure 7**), almost all of which are short rotation pulpwood plantations to supply regional and Northeast Asian mills. The plantation area roughly doubles with the inclusion of rubberwood plantations.

¹⁰ FAO (2011). State of the World's Forests 2011. Rome: Food and Agriculture Organization.

¹¹ New Forests estimate.

Figure 7: Forest and Rubber Plantation Area in Southeast Asia



Sources: FAO (2010), ITTO (2011), and New Forests estimate.

The target asset base of plantations across Southeast Asia includes three main asset types for timber investment:

- Greenfield sites suitable for rubberwood cultivation and immature rubber plantations established by local entrepreneurs with soft loan support from the government of Malaysia looking to exit at attractive pricing.
- State-owned forestry enterprises across Indonesia, Vietnam, and Thailand looking to privatise assets to raise capital.
- Private companies with access to greenfield sites or undercapitalised hardwood plantations of *Acacia mangium*, *Eucalyptus spp.*, *Gmelina arborea* suitable for growing a combination of saw, veneer, and pulp logs across Indonesia, Malaysia, and potentially Cambodia.

Conclusion

In this paper we have argued that hardwood timber supply from traditional natural forest logging is reaching its end, and that high-value hardwood timber plantations have not been established at anywhere near the scale needed to replace this supply or meet growing demand. The demand for hardwood timbers is growing steadily in Asia, driven by urbanisation and housing construction, rising GDP and per capita GDP, and the aging demographic of many regions. Thus with supply faltering and demand growing, there appears the potential for real price appreciation in hardwood timber markets. This may occur rapidly in the next three to five years as supply shortages come up against the recovery of the US housing cycle in 2015-2017 and the continuing demand growth from China, India, and Southeast Asia. Given that Southeast Asia has a significant land base and supportive public policies for hardwood plantation development, New Forests has proposed a strategy to secure a portfolio of existing hardwood plantations assets, primarily within Malaysia, Indonesia, and Vietnam. These may include existing high-quality teak and rubberwood assets or lower quality rubber, acacia, and eucalyptus plantations that can be improved with higher quality genetic material and with international best practice forestry operations and management systems.