Investing In Sustainable Tropical Hardwoods
Teak from Commercial Plantations

An Overview by Green Investment Services

www.greeninvestmentservices.com
INTRODUCTION

In conjunction with complex social, economic and political issues, increases in demand for affordable, high quality tropical hardwoods during the twentieth century resulted in deforestation on an unprecedented scale. The economic and environmental consequences of this policy have resulted in a change in attitude in recent decades as the necessity to achieve sustainability through strategic, long-term planning and forest management has been identified.

As a result, large scale, commercial plantations have been established throughout the tropics with the support of governments and international trade organisations. This more enlightened approach has seen increased employment and prosperity among the local populations within the production regions, a constancy of supply and greater stability of price for the consumer, coincident with diverse ecological benefits.

Whilst the current global economic crisis has undeniably had a debilitating effect on the majority of the world’s residential and commercial construction sectors, demographic projections coupled with predicted massive increases in construction in developing countries, most notably China and India, indicate that the long-term outlook for the world timber market is extremely healthy. Indeed, The United Nations Food and Agriculture Organisation estimates that, as a result of population growth, the world consumption of wood products will rise by a staggering sixty percent over the next twenty five years.

Although originating as a species in South-East Asia and the Indian subcontinent, teak has been successfully cultivated across the tropics from Africa to Central America for well over a century. Renowned for its appearance, toughness and workability, teak is a highly versatile timber with a panoply of end uses across sectors as diverse as marine construction and high class furniture, picture framing and musical instruments. Continued diminution in supplies of teak from natural forests concurrent with massive predicted growth in demand will inevitably result in constantly increasing utilisation of teak sourced from commercial plantations.

“Ethically they make sense long term, but do they make profits?”
Deforestation

A DWINDLING RESOURCE

Resulting in a spectrum of adverse consequences, deforestation is the removal of all or most of the trees in a forested area. A longstanding issue, deforestation accelerated rapidly from the 1960s and has been a major concern for the international community since at least the 1970s.

Efforts to accurately measure the extent and speed of the loss of forested areas across the planet have proved difficult for a variety of reasons, and whilst it is widely believed that the rate of deforestation has slightly reduced in recent years. The United Nations Food and Agriculture Organisation’s Global Forest Resource Assessment 2005 suggests that some 7,300,000 hectares are lost annually; this is an area roughly equivalent to that of Panama or Sierra Leone.

Recent decades have seen the dwindling of supplies of several species from natural forests with a consequential increase clear woodland to convert land for arable use or as livestock grazing. It is common for subsistence farmers to clear a few acres for themselves employing a process known as “slash and burn” whereby all the trees in an area are cut down and burnt thus increasing fertility (albeit temporarily) and avoiding the logistical difficulties and expense associated with removal.

“Simply put, timber does not need to rise in price in order to become more valuable...”

CAUSES

The causes of deforestation are a complex intermixture of social, political and economic factors.

SMALL SCALE AGRICULTURE

The extent to which local farmers are responsible is a matter of considerable dispute but there seems little doubt that agriculture is one of the biggest single factors involved. The United Nations Framework Convention on Climate Change (UNFCCC) states that subsistence farming alone is responsible for up to 48% of all forest losses. Farmers
The secretariat of the UNFCCC considered that the production of timber and associated products from non-sustainable forests was responsible for some 16 percent of the world’s deforestation. This starkly contradicts a study carried out by the World Wide Fund for Nature in 1997 which concluded that commercial logging was the single biggest factor in the destruction of the global forest and accounted for the clearance or degradation of up to 500,000 hectares every week. The truth probably lies somewhere between these two positions insofar as the effects of commercial timber harvesting vary dependent on the severity or otherwise of the methods employed on a country by country basis.

Since the 1960s, the removal of forests to provide greater pastoral areas available for cattle ranching has been the predominant issue resulting in increased deforestation in the Amazon region of Brazil. Rapidly rising revenues for beef encouraged entrepreneurial farmers to expand massively over a reduced timescale. Simultaneous improvements in infrastructure and reductions in fuel prices had the effect of lowering transportation costs, which generated still greater profits and provided yet more incentive for expansion. These favourable economic conditions, when combined with Brazil’s liberal land tenure policy meant that the ranch-developing farmers proceeded virtually without restraint towards converting massive areas from rainforest into pasture. A 2004 World Bank Working Paper indicated that some 91% of all land deforested in this region since 1970 had been given over to livestock grazing.

Civil engineering projects on a colossal scale have resulted in some major contributions to the worldwide reduction in forested areas. The construction of dams for the purposes of hydroelectricity generation has resulted in significant woodland losses affecting many nations across the developing world. For example, the construction of the Balbina Dam as part of Brazil’s hydroelectricity programme has caused the flooding of approximately 2,400 square kilometres of rainforest.

Mineral extraction by opencast mining and the cutting of the associated access roads has a significant effect on the area of forested land cleared across many developing countries desperate for foreign exchange earnings. In Jamaica, for example, bauxite mining, which is the island’s most significant source of foreign revenue after tourism, is the single greatest influence on the rate and amount of deforestation.

Many developing nations still depend on wood as a primary source of fuel and energy. Indeed, more than two billion people worldwide rely on firewood on a daily basis and firewood accounts for as much as 85% of third world countries’ wood production. The UNFCCC suggests that 5% of global deforestation is a direct result of harvesting timber for use as a fuel.
The widespread destruction and degradation of tropical forests has given rise to a bitter symphony of adverse consequences affecting the natural world and generating complex socio-economic issues. Some of the results of deforestation are highlighted below but it should be stressed that this is far from being an exhaustive list.

SOIL EROSION

Soils in tropical forests are typically very thin and of poor quality. The vast majority of nutrients contained therein are cycled from decomposing leaves, plants and fauna from within the forest itself and the incidence of external nutrients is therefore negligible. Tree root systems stabilise the soil and, consequentially, limit erosion. However, when deforestation occurs by cutting or burning, the fragile topsoil is rapidly washed away by heavy tropical rains. Whilst the remaining soil is enriched by nutrients released from rotting vegetation or ash, this effect is temporary and within a few years the nutrient levels are insufficiently high to support agriculture.

REduced biodiversity

Tropical rainforests stand beside coral reefs as the most endangered of the world’s ecosystems. By definition, large scale deforestation results in the destruction of habitat thereby limiting the opportunity for life to exist; animals which rely on trees for food, water, shelter and breeding sites simply disappear. Some of the other effects of the destruction or degradation of the tropical forests are, however, more subtle. The removal of the highest ‘canopy’ trees, for example, leads to the demise of certain smaller trees and plants which had been reliant on them for shade and hydration. Furthermore, the fragmentation of the tropical forests means that only those species capable of migration over considerable distance will survive; thus many smaller creatures are being systematically reduced in numbers or else completely eradicated. Plant species are also affected since the loss of soils and the reduction in bird and animal numbers inhibits the potential for pollination whilst the pollution associated with deforestation has at times had a catastrophic effect on amphibian and fish species.

pollution of waterways

Deforestation is particularly common adjacent to rivers as they provide readymade highways for access and removal. When soils in these regions are eroded, chemicals such as mercury which have accumulated naturally in the soils over periods of perhaps 100,000 years are released directly into the waterways. Bacteria acting upon this released mercury can transform it into highly toxic methyl mercury which induces disorders in the nervous system and brain when ingested. Studies are being undertaken to track the progress of methyl mercury through the food chain and to determine the health effects of current low level exposure on humans.

“In the timber industry, Paulownia is looked upon as the Aluminum of timber…”
While growing, plants and trees remove carbon from the atmosphere during photosynthesis. Thus, forests have historically acted as a store for large amounts of the world’s carbon. This carbon is inevitably released as a result of the decomposition of vegetation after cutting or through the burning of forests. It is also widely accepted that trees contribute to biosphere stability by absorbing significant levels of airborne pollutants.

Although the extent to which mankind is contributing to an overall rise in global temperature is still disputed, the overwhelming weight of scientific opinion is that human activity is a significant factor associated with climate change. Scientists have estimated that deforestation in the tropics is responsible for approximately one-fifth of all greenhouse gas emissions.

In order to increase areas available for agriculture, industrial logging or other commercial activities, indigenous populations have been removed from their land. In many countries these displaced peoples are then reduced to farming on much smaller areas. As a consequence soil is overworked and the nutrient levels are rapidly depleted thereby rendering the area obsolete for agricultural purposes. The outcome is that within a few years the peasant farmers are unable to sustain themselves. The social imbalance is often further exacerbated where tax incentives encourage wealthy developers towards greater colonisation of former rainforests.

Trees and plants play a significant role in the water cycle through:
- Canopy interception of precipitation and subsequent evaporation;
- Facilitating the infiltration of water into the ground via macropores created by the roots;
- Limiting surface water runoff which is retarded by organic residue, stems and trunks;
- Enhancement of soil properties resulting from the composting of organic residue which increases the capacity of soils to retain moisture;
- Regulation of atmospheric humidity by transpiration. 99 percent of water absorbed at the roots is released by this mechanism.

Since forest destruction inhibits a region’s capacity to absorb, store and recycle moisture, precipitation fails to percolate into the ground from where it would be released slowly; rather it is rapidly dispersed as surface water runoff. Reduced atmospheric moisture as a consequence of this loss of transpiration ultimately leads to a drier climate. A study of a region in northwest China indicated that annual rainfall was reduced by one-third over a thirty year period following deforestation.
The International Monetary Fund reported in their World Economic Outlook (April 2010) that, following the recent financial crisis and subsequent global economic downturn, the global economy suffered negative growth in Real GDP of -0.6037% during 2009. Preliminary figures for 2010 indicate that a general recovery is underway and strengthening. The report went on to state that:

The global economic recovery now underway was stronger than previously forecast, although it was still subject to some variability;

- Financial conditions are generally easing;
- Capital was once again flowing to emerging economies;
- Multi-speed recovery was expected to continue in 2010-11;
- Inflation pressures are generally subdued; and
- Global demand was rebalancing.

This overall positive message was reinforced with the prediction that Real GDP in the global economy was set to rise by 4.2% during 2010 and to continue to rise at, or just above this level, until at least 2015.

It’s value consistently increases irrespective of market trends...

IMF forecasts for the next five years indicate that the global recovery already underway in 2010 will continue to consolidate. Enhanced economic growth in emerging and developing economies, particularly the rapidly expanding economies of China and India, will continue to stimulate increases in demand for timber for construction and furniture sectors. Other sectors from paper manufacturing to packaging will also make meaningful contributions to an overall substantial increase in demand.

By far the most significant determinant in unprecedented levels of demand for wood, however, is sure to be the rate of increase of global population. A 2004 United Nations report into demographic trends predicts that population across the emerging and developing nations of Africa and Asia will continue to rise precipitately; world population, which has already risen by around 260% since 1950, is anticipated to rise by around 30% to approximately 9 billion by the year 2050. In itself, this increase would have a telling effect on demand levels; coupled with rises in individual’s wealth and aspirations, the inevitable rise in standards of living will provide further stimuli.
In China alone, the urban population is expected to increase from the current level of 530 million to 875 million by 2030. To put this into perspective, in order to provide houses for this additional population, 50 cities equivalent in size to Greater London would have to be constructed.

One UN Food and Agriculture Organization study suggests that demand for timber products in China alone could grow by as much as 30% over the next five years, and 60% by 2030.

Changing attitudes towards environmental issues are also beginning to have a positive effect on the demand for wood. Somewhat surprisingly, perhaps, the largest contribution to the UK’s renewable energy supply comes not from wind, wave or solar sources but from biofuels in the form of wood pellets and chips. This sector, rapidly expanding among the world’s advanced economies, has created a demand for low quality timber which never existed before.

In the long term it is not altogether unlikely that a corresponding increase in demand could result from a similar cultural shift among the world’s developing and emerging economies as levels of wealth and education increase.

Market Trends

Long-term analysis of historical tropical timber prices is problematic since, mainly as a result of adverse political and economic situations throughout tropical timber producing countries, insufficient reliable data exists to allow truly meaningful interpretations to be made.

The body of information available is regularly either contradictory or contains obvious overestimations. Some exceptions do exist such as figures stretching back to the 1960s for Myanmar teak from natural plantation harvests is questionable, however.
Whilst not entirely congruent, the best available long-term yardstick is timber price data from non-tropical sources. Analysis of this information stretching back 200 years indicates that timber has provided an average annual investment return of 6.5% over this extended period; and, since it was the only asset class to experience rises during three of the four market collapses of the twentieth century, it seems to lack the volatility of some commodities and can be considered more of a safe haven.

While tropical timber markets undoubtedly experienced higher than normal levels of uncertainty as a result of the global economic downturn, certain positive factors were highlighted which are directly attributable to the product’s unique properties. Because flexible harvesting and forest management opportunities minimise pressures to sell during times of reduced prices, the impact on wood prices was less pronounced than on other commodities.

Producers defer harvesting until they consider market conditions have moved sufficiently in their favour; uniquely, since the trees continue to grow, this postponement has the effect of further increasing yield and value. The versatility of timber encouraged producers to access diverse market opportunities. The wide range of end uses to which timber can be put (timber, firewood, pulp, round, sheet, sawn, etc) enabled producers more easily to explore alternative outlets. Producers identified the possibility of combining timber, non-timber forest products and environmental services to seek optimum mixes of forest output in varying economic conditions.

“The impact on wood prices was less pronounced than on other commodities…”
The rapid and widespread acceleration of the destruction and degradation of tropical forested areas from the 1960s onwards provoked previously unheard of levels of anxiety amongst the international scientific and political communities.

Studies were initiated to ascertain the extent and effects of the damage already inflicted and to project the likely scenario should the situation continue unconstrained. The findings of this research painted a very disturbing picture; catastrophic consequences were predicted to occur both locally and globally. Ecology and the environment became buzzwords in a new vocabulary as the realisation dawned that the fundamental requirement was to formulate and implement a strategy to limit the damage being done and to manage forested areas in a sustainable manner, sympathetic to social, political, economic and environmental pressures at both local and international levels. The response, while it had to be rapid, also required to be measured.

The approach adopted by bodies such as the International Timber Trade Organisation (ITTO) has been to encourage countries to designate land as Permanent Forest Estate (PFE) for the sustainable production of timber and other forest goods and services. This methodology encourages countries to adopt sustainable forest management techniques which allow revenues to be earned whilst preserving the inherent values of the forest. Local people are employed and communities are sustained by the production of timber and other forest products and services.

The creation of managed, sustainable plantations within the PFE has produced a number of beneficial effects, not least of which is that the burden of supply from the natural tropical forest has been reduced enabling more of this fragile ecosystem to be preserved. In addition to limiting the consequences of deforestation, the ITTO has stated that policies which promote a robust, plantation-based wood industry can make a substantial contribution to economic development and rural employment.
The creation of managed, sustainable plantations within the PFE has produced a number of beneficial effects, not least of which is that the burden of supply from the natural tropical forest has been reduced enabling more of this fragile ecosystem to be preserved. In addition to limiting the consequences of deforestation, the ITTO has stated that policies which promote a robust, plantation-based wood industry can make a substantial contribution to economic development and rural employment.

In recent decades, as the need to guarantee future timber supplies has been identified, most of the timber producing countries within the tropics have developed and expanded the area utilised for commercial plantations. The majority of these commercial tropical plantations are situated in Asia and it is this region, driven by the rapid expansion of the Chinese and Indian economies, which has witnessed the greatest percentage increase in the area thus covered. It should not be understated, however, that the levels of growth in both the African and Latin American regions were themselves significant during the period 1990-2005. Although the total area covered by commercial plantations continues to increase steadily, overall they still account for somewhat less than five percent of the total global forested area. ITTO predictions indicate that the area of commercially forested estate will increase rapidly in the next few decades, particularly in Asia and Latin America, to meet the anticipated increased demand for construction within the fast-growing economies of Asia.

As with any investment decision, the development and expansion of commercial tropical forest plantations will involve the consideration of global, regional and local factors. A similar correlation exists between levels of investment in commercial forestry and macroeconomic conditions as for most other commercial sectors: investment levels rise with consumer confidence when the business climate is buoyant, and fall during less certain times.

A number of factors more specific to commercial tropical forests which require careful consideration are largely dependent on the political and socioeconomic conditions existing in a particular country.

TRANSPORT INFRASTRUCTURE
This has significant cost implications for raw material supply and primary product sales. (Cont.)
COMMUNICATIONS INFRASTRUCTURE:
The successful, rapid transmission of information can promote the integration of a company’s operational areas and enables contact with markets and consumers.

ENERGY INFRASTRUCTURE:
The availability and cost of energy impacts on strategic, operational decisions such as the viability of wood processing.

SOCIAL INFRASTRUCTURE:
Water, sanitation, health and education programmes influence the availability and productivity of local labour.

LABOUR CONDITIONS:
Employment legislation influences wages and working hours producing effects on cost and profitability.

GOVERNANCE:
Judicial transparency over issues of private property rights and the strength of contracts is fundamental to investment decisions.

LAND USE POLICIES:
Many areas within the tropics indirectly restrict the development of forests by creating incentives for agriculture and animal husbandry.

FOREST RESOURCE:
The speed at which timber grows within a region is the key determinant in productivity. The quality of the yield is also fundamental.

“Several tropical countries have established progressive forest policies...”

Heightened awareness of the environmental agenda has resulted in various international political initiatives intended to increase the total global forested area and reduce the burden on the natural forest.

• The Kyoto Protocol’s Clean Development Mechanism, is an innovative pricing mechanism intended to promote the establishment of plantations.

• Plantation development in certain poorer tropical countries is increasingly being linked to poverty alleviation, sustaining and developing communities and recovering degraded land. This development is likely to increase dependent on available international finance.

Several tropical countries have established progressive forest policies which incentivise plantations which reduce the burden on natural tropical forests.
Because of its aesthetic qualities, toughness and durability, teak has long been prized as one of the world’s most valuable tropical hardwoods. The relatively high productivity levels afforded by teak compared with other common tropical hardwoods such as mahogany, combined with greater resistance to blights and pathogens, has seen teak successfully cultivated in plantations over several centuries. It remains the timber most in demand for high quality end uses in the furniture sector, and for the manufacture of durable, decorative components in the marine and construction sectors.

Native to, and still predominantly found in Southeast Asia and the Indian subcontinent, the spread of teak throughout all of the tropical regions has been increasing steadily since the early twentieth century. The first plantation in Africa was established in Nigeria in 1902, quickly followed by similar ventures in Togo, Ivory Coast and Ghana where there are some 40,000 hectares under cultivation today. Expansion continued in the second half of the twentieth century when small, experimental plantations were established in Florida and Hawaii at the same time as commercial plantations were initiated in Brazil and Costa Rica.

The aesthetic quality of teak is enough to ensure that it is a highly regarded timber for decorative uses. In addition, it is also extremely durable and resistant to weather, with further high coefficients for the resistance of moisture, acids, alkalis and fire and does not significantly contribute to metal corrosion. Because it is such a tight-grained species it is considered to be one of the finest timbers in terms of workability; very high tolerances can be achieved through moulding, planing, sanding, boring and turning.

“The aesthetic quality of teak is enough to ensure that it is a highly regarded timber…”
These properties make it an extremely versatile timber with a diverse range of applications.

- Marine construction – particularly for components exposed to or in contact with water
- Veneer
- General carpentry timber
- Railway sleepers, carriages, wagons and coaches
- Door and window frames
- Decorative architectural components
- Staircases
- Flooring
- Decorative and general purpose plywood
- Parquet flooring
- Mouldings and picture framing
- Exterior furniture
- Musical Instruments and toys

Suspicious that teak grown in plantations was of inferior quality to that obtained from natural forests appear to have been unfounded. Various studies have determined that, although plantation trees grow faster than natural forest trees, the relationship between growth rate and strength is insignificant and that there was no significant difference in wood density.

CURRENT SITUATION

The total area of natural teak forest worldwide was estimated at approximately 28 million hectares in 1990. Mainly as a result of significant shifts in political attitudes, recent decades have seen dramatic reductions in the supplies of teak derived from these natural forests while, at the same time, demand for teak products has stayed at historically high levels.

This has inevitably increased focus on supplies from sustainable, commercial teak plantations where the area under cultivation has increased to almost 6 million hectares worldwide.

Conventional wisdom held that the ideal climate for teak occurred in regions where minimum and maximum monthly temperatures were between 13 and 40 degrees Celsius and annual rainfall was between 1,250mm and 3,750mm, including a dry spell lasting for at least four months. Small plot studies in Malaysia, however, indicate that teak grows equally well or better in hotter, wetter areas where no dry season exists.

Trials have demonstrated that whilst teak can grow in a variety of soils, the overall quality of the product is determined by the depth, structure, porosity and hydroscopic properties of the soil. Best results are achieved in deep, well-drained fertile soils, particularly where these exist on volcanic substrata or alluvial deposits.

“Returns can be delivered after a minimum period of three years...”
At present, teak accounts for approximately 75% of the global high-value tropical timber trade. No excess supply exists so this share would inevitably increase if supply levels could be enhanced. Preliminary advances in genetics and improvements in forest management have seen considerable productivity gains and there is understandable confidence in forecasts of further improvements in yield resulting from continued development in these fields. In countries where the investment climate remains favourable, continued expansion is anticipated in line with increases in demand, particularly in regions where significant productivity increases have accrued from efforts to improve forest practice.

It is also likely that growth in the levels of private investment in commercial teak plantations will occur as the incentives to minimise destruction of natural teak forests increase with new political initiatives; additional restrictive legislation will continue to preclude harvests from natural forests with plantations inevitably gaining market share; and heightened ecological concerns amongst consumers are increasing pressures on producers to supply timber from sustainable sources.

In conclusion, because teak combines high productivity through fast growth with high quality timber, and because it can be grown in various climatic and soil conditions, the outlook for sustainable, commercial teak plantations in the tropics looks bright. Technological advances which increase wood quality and a reduction in supplies from natural forests prompted, at least in part, by the environmental concerns of consumers will be the driving forces that promote plantation timber in the international markets.

“By investing in timber plantation programs you are helping our planet live longer...”