The allure of plantations

Many tropical countries want to develop industries based on tropical forest plantations but may lack the information to do it properly

by
Ivan Tomaselli

STCP Engenharia de Projetos Ltda
Curritiba, Brazil

TIMBER production in natural tropical forests is set to decline. It already appears to have plateaued: tropical industrial roundwood production in ITTO producer member countries has remained in the range of 122–126 million m³ for the last five years (ITTO 2006), well below the 140 million m³ achieved in the early 1990s. A further decline in the industrial timber harvest in natural tropical forests can be expected in the medium term (as predicted by Leslie 1999).

The tropical forest industry is therefore looking for alternative sources of timber supply. Imports are one option; another is plantation timber.

Forest plantations in tropical countries are portrayed by some as a saviour of natural forests because they can be highly productive and cost-effective and have the potential to substitute natural forests in timber production. Moreover, they can help drive economic development by providing downstream industries with a reliable supply of raw materials.

Some tropical countries are already encouraging major plantation programs and others are contemplating similar moves. But a lack of reliable information on the prospects for tropical plantations is hindering development and increasing the risk that poor strategic decisions will be made. In early 2006, ITTO commissioned the Brazilian consultancy company STCP Engenharia de Projetos Ltda to examine issues related to plantation development in the tropics. Are domestic plantations needed or desirable? Will products from tropical plantations be competitive in the marketplace? How much will certification act as a market-driven incentive for tropical plantation development?

This study used data gathered from field visits to selected countries, questionnaires completed by stakeholders in the regions of interest, secondary sources such as technical reports and the internet, and STCP's own databases, to build a picture of the current status of plantation development in the tropics and to make recommendations for the future. This article summarizes the study's main findings.

How much area?

Table 1: Area of tropical forest plantations for industrial uses, 2005

REGION	TOTAL AREA ('000 hectares)	AREA OF PRODUCTIVE FOREST PLANTATION ('000 hectares)	PRODUCTIVE AREA As % of total
ASIA-PACIFIC	54 073	24 640	46
AFRICA	4730	3528	75
LATIN AMERICA & CARIBBEAN	8805	8036	91
TOTAL	**67 608**	**36 136**	**53**

Source: FAO (2005), adapted by STCP

Current plantation area

The study focused on softwood and hardwood plantations growing in tropical countries for industrial uses; 'tropical countries' were taken to be all countries with all or the greater part of their territories between the tropics of Capricorn and Cancer. All countries combined possess an estimated 67 million hectares of tropical forest plantations, of which almost 80% are in the Asia-Pacific region, 13% in Latin America and the Caribbean and only 7% in Africa. *Table 1* shows the total and estimated productive (that is, capable of producing a commercial harvest) industrial forest plantation area in the tropics and its distribution among the three tropical regions. Of the 36 million hectares considered to be productive, 68% are in the Asia-Pacific region.

Eucalyptus is the most widely planted tree in the tropics, comprising 24% (8.6 million hectares) of the productive forest plantation area. Pine, with 6.4 million hectares, is also important, as is rubber (also 6.4 million hectares, although some of this may not be available for timber harvesting). Another widely planted tree species is teak.

Production

Table 2 shows the total estimated industrial roundwood production in tropical countries in 2004 and that part of the total estimated to have been derived from plantation forests. Note that these totals include production from plantations outside the tropics in countries straddling the tropical zones. The total industrial roundwood production in the tropics was about 322 million m³, of which almost half (47.5%) was from plantations. In Latin America and the Caribbean, plantations make a significant contribution to total industrial roundwood production (63% in 2004). This is due largely to the pulp industry, which relies heavily on plantation-grown fibre. The contribution of plantations to industrial production is also high in Asia (46%) but relatively low in Africa (8%).

The figure shows the end-uses of total and planted industrial roundwood in tropical countries by segment (sawnwood, plywood, pulpwood, particleboard, hardboard and medium-density fibreboard—MDF). Plantations supply more than 80% of total roundwood volume for the particleboard, pulp, MDF and hardboard sectors; this is not surprising because

How much volume?

Table 2: Estimated industrial roundwood production in tropical countries, 2004

TROPICAL REGION	INDUSTRIAL ROUNDWOOD PRODUCTION ('000 m³)		PLANTATION SHARE (%)
	TOTAL	FROM FOREST PLANTATIONS	
ASIA-PACIFIC	144 000	66 800	46.1
AFRICA	44 000	3580	8.0
LATIN AMERICA & CARIBBEAN	134 000	84 900	63.4
TOTAL	**322 000**	**155 280**	**47.9**

Source: STCP fieldwork

all are suited to a supply of small-diameter logs, whereas the sawnwood and ply sectors have historically used larger diameter logs. Despite this, 31% of all sawnwood is produced from plantation timbers such as rubberwood, pine and, to a lesser extent, eucalyptus. Countries with large pine plantations—such as Brazil, Chile and New Zealand—are now important players in the international market.

Brazil, Indonesia, Thailand, Malaysia and India are the major producers of manufactured products based on tropical plantation timber. These countries will likely remain competitive in this area, with the potential to further increase their share of world markets in selected plantation-based products such as pulpwood, sawnwood and some reconstituted wood panels.

Prospects for plantations

Tropical forest plantations have some significant potential comparative advantages over other timber sources. In particular, they can achieve mean annual increments that are, on average, 5–10 times higher than those in natural forests and often significantly higher than what non-tropical plantations can achieve. The production costs of plantation timber are therefore lower, meaning that tropical plantation timber is cheaper than timber from natural forests or from temperate plantations.

For higher-end uses, however, plantation timber has its limitations. Forest plantations generally produce timber of inferior quality for solid wood products compared to that obtained from natural forests and therefore usually fetch lower prices. Prices for teak logs from planted forests, for example, are much lower than for logs from natural teak forests because they contain more juvenile wood and sapwood, and have much smaller diameters.

This does not prevent plantation timber from being used in solid wood products; on the contrary, the low price helps capture market share. Log prices for rubberwood are low compared to those from natural forests, which, coupled with wide availability and reasonable workability, has allowed rubberwood products to gain new markets, including in value-adding sectors such as furniture manufacture.

The success of the pulp industry in the tropics, mainly in Brazil, can be explained largely by the strong competitiveness of plantation timber. Pulp production costs in the tropics are among the lowest in the world thanks mainly to the low cost of plantation wood, guaranteeing a competitive advantage for the pulp industry.

The plywood industry is also gradually moving towards plantation timber. In recent years, pine from plantations has become widely accepted by the plywood industry. The high quality of the product coupled with its low price has made it a winner in the international market. Brazil, followed by Chile, is now by far the world's largest plantation pine plywood producer and its largest softwood plywood exporter, overtaking traditional exporters like Canada and Finland. Brazil accounts for one-half of European softwood plywood imports and almost two-thirds of US softwood plywood imports.

Eucalypts from plantations also have the potential to displace some timbers for plywood production, while *Eucalyptus* veneer is penetrating the laminated veneer lumber sector. The main reason for the success of tropical plantation timbers is the lower cost of delivered logs, but they also often attract less environmental pressure, have lower transaction costs, and are generally subject to less regulation and bureaucracy.

Brazil, followed by Chile, is now by far the world's largest plantation pine plywood producer and its largest softwood plywood exporter, overtaking traditional exporters like Canada and Finland.

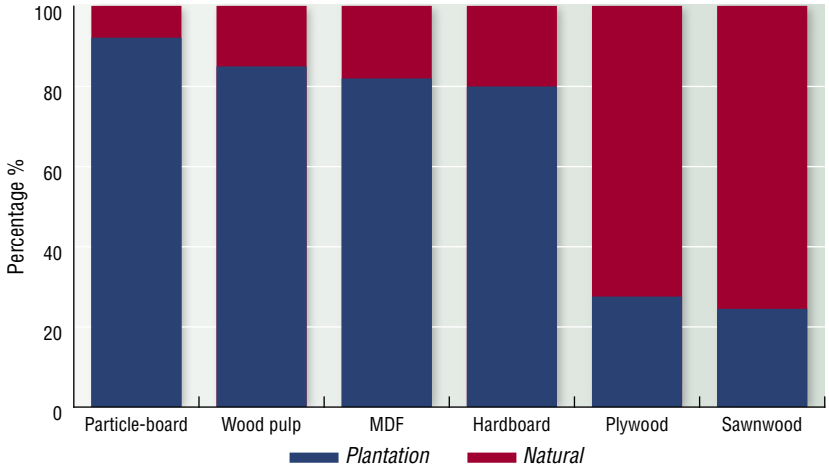
Nevertheless, there are still problems to be solved. A large portion of *Eucalyptus* veneer, for instance, is of relatively low grade due to the presence of knots and other wood defects intrinsic to the species. On the other hand, industrial technology is developing rapidly and many of the quality problems of fast-grown timbers are starting to be solved or at least greatly reduced. There is also still much to be done on the marketing side. *Eucalyptus* wood is regarded almost universally as a low-quality product, and this perception needs to be changed if wood value is to increase. Similar problems apply to *Acacia* plantations.

Forest certification

Table 3 shows that about 3.2 million hectares of planted forests were certified in the tropics in 2004. More than 90% of these were in Latin America and the Caribbean and a large part of that was associated with Brazil's pulpwood industry. In general, the area of certified forest plantations for products other than pulp is still negligible in the tropics. It is worth noting that the area of certified forest plantations

Splitting uses

End uses of natural forest and plantation industrial roundwood



Source: FAO (2004), adapted by STCP

How much is certified?

Table 3: Certified tropical forest plantations, 2004

REGION	COUNTRY	TOTAL PRODUCTION AREA	CERTIFIED AREA BY CERTIFICATION SCHEME *('000 HECTARES)*			
			FSC	PEFC	MTTC	TOTAL
LATIN AMERICA & THE CARIBBEAN	Brazil	5597	1818	762.7[1]	–	2580.7
	Colombia	141	58.5	–	–	58.5
	Ecuador	167	1.4	–	–	1.4
	Costa Rica	152	40.4	–	–	40.4
	Venezuela	863	139.7	–	–	139.7
	Others	778	–	–	–	–
	SUBTOTAL	***7698***	***2058***	***762.7***	**–**	***2820.7***
AFRICA	Zambia	75	1.0	–	–	1,0
	Zimbabwe	141	85.7	–	–	85.7
	Others	3244	0.0	–	–	0.0
	SUBTOTAL	***3460***	***86.7***	**–**	**–**	***86.7***
ASIA-PACIFIC	Indonesia	4841	51.4	–	–	51.4
	Malaysia	1750	12.5	–	77.0	89.5
	Thailand	4920	0.9	–	–	0.9
	Others	13 183	0.0	–	–	0.0
	SUBTOTAL	***24 694***	***64.8***	***0.0***	***77.0***	***141.8***
TOTAL		**35 852**	**2209.5**	**762.7**	**77.0**	**3049.2**

[1]*Under the Brazilian CERFLOR system (mutual recognition)*
Source: World Resource Institute website (accessed 2006), adapted by STCP.

almost doubled in the four years to 2004 in Latin America and the Caribbean, stayed more-or-less the same in Africa and declined in Asia-Pacific.

Policy issues

In the past, a major obstacle to plantation forest development has been a lack of clear government policies; where such policies have been present it has not always been obvious who should implement the policies and by what instruments. Even today, forest policies in most of the countries covered in this study focus on natural resource management and protection, social and community forestry, and wildlife conservation. Only in a few cases do they also cover commercial plantation development and the promotion of forest-based industry.

While the responsibility of forest management and timber production is tending to shift towards the private sector and communities, there is a lack of coherent support for such a shift. Policies to promote forest plantation development need to consider, among other things, the involvement of smallholders and tree farmers in the timber supply chain.

Industrial development

Investing in industrial plantations without taking into consideration industrial development is another frequent mistake in the forest development policies of tropical countries. As a result of several distortions, many tropical countries have relatively large forest plantation areas but a timber industry based largely on natural forests. This clearly shows that merely establishing plantations is not sufficient; processing and marketing must also be promoted. The technology required for plantation timber-based industry is different to that required for an old-growth resource, and this means that moving into plantations will also require investments in the industry. Low-technology processing results, in most cases, in a low-priced commodity product. In many cases this results in unprofitable operations and resource depletion.

Incentives

Some countries—notably Brazil and Malaysia—that have provided strong incentives in the past to encourage forest plantation development now have strong forest-based industries and important positions in domestic and international markets. These incentives have promoted social improvement by generating employment, reducing environmental pressure on natural resources and facilitating the economic strengthening of stakeholders, including in many cases at the level of local communities. However, while government incentives and subsidies are important, they are only part of the equation.

Supporting communities and private sector

While the responsibility of forest management and timber production is tending to shift towards the private sector and communities, there is a lack of coherent support for such a shift. Policies to promote forest plantation development need to consider, among other things, the involvement of smallholders and tree farmers in the timber supply chain. Mechanisms to guarantee and facilitate market access to these sources of supply are needed and require research, education and market intelligence. Financial incentives or

subsidies are also often needed to encourage the involvement of communities and out-grower schemes in enlarging the forest plantation base.

Good information

Good decision-making requires good information, but this is largely lacking in the forest plantation sectors of many tropical countries. Policy-makers must understand that information and market intelligence are among their most important tools and devise policies to encourage better data and analysis and to promote investments. Inadequate information makes monitoring and enforcement ineffective.

What ITTO should do

Forest plantation-based industries are likely to expand in the tropics as long as they are attractive to investors. This will depend on the macroeconomic and political climate, which affects the forest sector indirectly, as well as on factors intrinsic to the forest sector.

The main activities that should be supported by ITTO and implemented by member countries are in most cases directed towards factors intrinsic to the forest sector; they form part of a general strategy to develop markets for tropical timber and, to a greater or lesser extent, are already under way. They include: (i) the development of national information systems on the production and trade of plantation timber products; (ii) increased cooperation among stakeholders; and (iii) work to identify and reduce trade barriers.

To support industrial development in the tropical timber plantation sector, ITTO should concentrate efforts on: (i) assisting professional skills' improvement programs; and (ii) promoting private investments by providing reliable information to stakeholders, encouraging financial banks to create or improve their forest investment portfolios, and assessing portfolio risks. ITTO should also support market development for plantation timber by: (i) promoting database development and dissemination (markets, industry and trade); and (ii) undertaking special studies and analyses.

In general, ITTO actions do not target government decisions in sectors outside the forest sector. Nevertheless, ITTO can take a number of actions to influence non-sectoral policies that would benefit the forest plantation-based sector. These include:

- **international trade:** ITTO should continue to work to open markets to tropical timber products, including through reductions in tariff and non-tariff trade barriers and policies that combat illegal logging and illegal forest products trade;
- **government transparency:** a lack of transparency has greatly affected the development of forest-based industry in a number of countries. ITTO can assist its members to address this issue;
- **fiscal environment:** by encouraging governments to take actions related to their fiscal policies, ITTO can help reduce the tax burden on the forest sector and create incentives to develop an efficient forest plantation timber industry;
- **legal framework:** ITTO can contribute to the debate revolving around improving the legal aspects of forestry and forest industry and trade;
- **labour:** ITTO can collaborate with government and industry in support of professional training and continued education in tropical countries; and
- **credit mechanisms:** ITTO can provide guidance and support for the creation of innovative financial mechanisms for the development of a plantation-based industry in producer countries.

The main activities that should be supported by ITTO and implemented by member countries are in most cases directed towards factors intrinsic to the forest sector; they form part of a general strategy to develop markets for tropical timber and, to a greater or lesser extent, are already under way.

References

FAO 2005. *State of the world's forests 2005.* FAO, Rome, Italy.

ITTO 2006. *Status of tropical forest management 2005*. ITTO Technical Series 24. ITTO, Yokohama, Japan.

Leslie, A. 1999. For whom the bell tolls. ITTO *Tropical Forest Update* 9/4. ITTO, Yokohama, Japan.

World Resources Institute website. http://earthtrends.wri.org (accessed 2006).

This article is based on the reports of two related studies carried out for ITTO: 'Report on the market study on tropical plantation timber products' and 'Monitor and Assess the Environmental, Social and Economic Costs and Benefits of Forest Plantation Development and Utilize that Information to Promote New Plantations – Study Report'. The full reports are available on www.itto.or.jp or from the ITTO Secretariat (itto@itto.or.jp)