The great plantation expansion

Expanding the area of forest plantations to meet escalating demand for wood requires more support for small and medium-sized forest-growers, especially in the tropics

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Wood crop: Plantations are an increasingly important source of industrial raw materials, including in the tropics. *Photo: M. Pekkanen/Indufor Oy*

The global demand for wood is expected to escalate in coming decades, yet current rates of establishment of new forest plantations are inadequate to meet this demand. This article looks at projected wood demand, expected growth in the plantation sector, and the measures that might be required to stimulate growth among small and medium-sized forest-growers and to ensure that the sector is economically, socially and environmentally sustainable.

Expanding the industrial forest plantation estate

According to Indufor (2013a), the total area of industrial, fast-growing forest plantations worldwide in 2012 was 54.3 million hectares (ha). The countries with the largest areas—all with more than 5 million ha—were the United States of America, China and Brazil. India and Indonesia were the next-largest growers of industrial forest plantations, with over 2.5 million ha each. Among the regions, Asia had the largest total area, followed by North America and Latin America. Africa, Oceania and Europe also had considerable areas of industrial forest plantations (Figure 1).

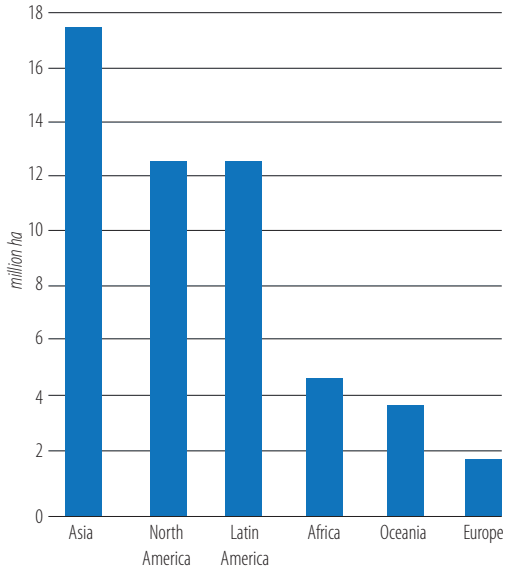
Indufor (2012) projected that the global industrial forest plantation area would increase to 91 million ha by 2050, amounting to an annual expansion rate of about 1.8%. Asia and Latin America are expected to see the biggest growth, with the industrial forest plantation area increasing in those regions by about 17 million ha and 15 million ha, respectively, by 2050. The industrial forest plantation estates in Africa and Oceania are also predicted to grow.

According to Indufor (2012), the supply of industrial roundwood from industrial plantations will increase from just over 500 million cubic metres (m^3) in 2012 to about 1.5 billion m^3 in 2050. This increase will be driven mainly by the projected growth in area of these plantations, complemented by increases in productivity due to improvements in harvesting and clonal technologies, forest plantation management efficiency, and fertilization and silvicultural practices.

The key underlying driver of industrial forest plantation development will be increasing demand for wood, driven by growth in populations, economies and per capita consumption, especially in emerging economies. The growing economic importance of markets such as Brazil, China and India will be an important driver of demand. Improved infrastructure, including sea ports, will help producer countries gain access to larger international markets and thus contribute to the increasing demand for wood. In addition, a shift away from the traditional fossil-fuel-based economy towards a low-carbon economy, driven by climate and energy policies and declining stocks of fossil fuels, will increase the use of wood biomass for energy, construction, bioproducts and many other purposes, adding to overall wood demand.

At present, forest plantations satisfy about one-third of the global industrial roundwood demand. Indufor (2012) estimated that, by 2050, plantation-based wood could satisfy about 35% of total industrial wood requirements. This implies that the supply of plantation wood will grow at about the same rate as demand for industrial roundwood and that forest plantations alone will be unable to meet the demand for industrial roundwood. Natural and semi-natural forests in the boreal and temperate zones, which currently supply the majority of global industrial roundwood, will continue to be the biggest source of this raw material.

Figure 1. Area of industrial forest plantations, by region, 2012



Source: Indufor (2013a).

Nevertheless, there is an urgent need to increase the share of plantation wood from the tropics in the global wood supply in the long term, for two reasons. First, natural forests in the tropics are often harvested at unsustainably high rates. Thus, it is likely that a move to sustainable forest management in natural tropical forests will decrease the supply of wood (moreover, the total area of natural forests is still declining in the tropics). Second, while there is scope for an increase in wood supply from natural and semi-natural forests in the boreal and temperate zones—for example, the sustainable yield of forests in the Russian Federation is estimated at over 500 million m^3 per year, but the average annual harvest there in past years has been only about 125 million m^3—such an increase is unlikely due to limitations related to logistics, profitability and ownership structure.

Continued efforts are needed to sustainably develop forest plantations in both already-established and promising forest plantation countries in Asia (notably China, India, Indonesia and Malaysia), Latin America (notably Argentina, Brazil, Chile, Paraguay and Uruguay) and Africa (notably Angola, Ghana, Liberia, Mozambique, Rwanda, Uganda, the United Republic of Tanzania and Zambia). If such development is to accelerate, a number of challenges will need to be overcome.

Challenges

Emergence of small and medium-sized forest-growers

In most countries with potential for plantation expansion, the number of small and medium-sized forest-growers is expected to increase in coming decades. These growers will face stiff challenges in moving up the value chain, however, because they lack the muscle to negotiate with market operators, middlemen and big buyers. They also usually have inadequate market information and rely on middlemen to determine the volume, quality and price of their wood stock.

Land tenure

In many Asian and African plantation countries, land is owned mainly by the state, and securing land title for plantations can be difficult. In China, for example, the process of transferring land-tenure licences is bureaucratically complex and usually time-consuming; in Indonesia, lease and concession regulations are often unclear. Obtaining tenure rights can cause social conflicts and thus induce reputational risks, especially for foreign plantation investors.

Land-use competition

Globally, the competition for land is increasing, driven mainly by demand for food and other agricultural commodities as well as for fiber, wood and bioenergy. In Indonesia, for example, the competition for land between forest plantations and agriculture is intense. This is particularly so with oil-palm plantations: according to some estimates, such plantations are more than ten times more profitable than forest plantations for pulpwood. Land-use competition pushes up land prices, with the effect that forest plantations shift towards new frontiers.

Environmental degradation

In some countries, forest plantations have gained a poor reputation by expanding at the expense of native vegetation and neglecting soil and water conservation. For example, much of the forest plantation area in Indonesia was previously natural forest; plantations there have also been established on drained peat land, causing the release of a large amount of carbon dioxide. In the Lao People's Democratic Republic, plantation companies can secure forest concessions from the government, harvest the timber on that land, and then sell the land and concession rights to a third party, with a range of negative ecological and social impacts. Biotic and abiotic damage caused by the monocultural nature of most industrial forest plantations also raises concerns. In some areas, forest plantations consisting of species with high transpiration rates are blamed for reducing the availability of water for other uses.

Social issues

The ambiguous situation regarding statutory and customary land-use rights causes considerable difficulties in parts of Africa, Asia and South and Central America. In many countries, indigenous people and other local communities rely on customary rights, whereas forest-plantation companies are usually required to follow statutory licensing and tenure processes. The statutory system does not always recognize or respect customary land rights, which could mean that a land purchase made by a forest-plantation company causes the loss of land-

use rights for local people. In some countries, the state does not allow forest-plantation developers to take local people's wishes into consideration, even if they would like to do so. This situation is a serious challenge for foreign companies working in developing countries, not least because sometimes forest-plantation companies end up as stakeholders in local conflicts that were initiated long before they entered the area.

Governance

In many Asian and African countries with potential for forest-plantation development, insufficient law enforcement is a serious problem. For example, Uganda has no shortage of good laws and regulations to protect forests and trees, but they are implemented inadequately. The key factors contributing to this situation are poor funding and limited institutional and human capacity to patrol forests and markets, detect and deter offences, prosecute cases and educate stakeholders. To add to the challenge, many law enforcement officers, such as police, magistrates and customs officials, lack the practical ability to identify legal documents (licences and receipts) and marks on timber. In general, weak governance systems, along with political and economic instability, incur high transaction costs affecting the entire plantation investment cycle.

Investment gaps

Many developing countries with suitable physical environments for growing forest plantations lack sufficient investment in plantation development. Indufor (2013b) identified insecure land tenure, political, social, environmental and reputational risks, and the limited understanding of forest-sector investments among financial institutions as the key barriers to investment in forest plantations in such countries. In addition, the upfront cost of preparing forest plantation investment projects is high due to a lack of adequate information about the forest resource.

Supportive measures

To make the worldwide plantation expansion sustainable by overcoming the challenges discussed above, the following measures should be undertaken.

Building alliances, coalitions and cooperatives

Associations and cooperatives of small and medium-sized forest-growers can assist members to benefit from economies of scale, access information and negotiate successfully with buyers and suppliers. Associations and cooperatives can also help growers to obtain access to professional and reliable partners and to integrate into broader supply chains. Government and non-government support for forming associations and cooperatives should be provided incrementally and based on performance.

Small and medium-sized forest-growers, and their associations and cooperatives, can also benefit from partnerships with larger companies by gaining better access to markets, market information and technical and financial knowhow. Larger companies benefit from such partnerships by building their supply and by gaining deeper and broader community involvement, thereby improving the acceptability of their operations and reducing reputational risk. Through their associations and cooperatives, small and medium-sized forest-growers may be able to afford greater mechanization in plantation management and harvesting, thereby increasing productivity and decreasing production costs.

Increasing availability of financing for responsible and sustainable investments

In many developing countries, the lack of longer-term and reasonably priced loans is a major constraint on plantation investment. There is a need for continuous efforts to develop tailored loan facilities in existing national development banks or other financial institutions, particularly targeting small and medium-sized forest-growers who are unable to access loan financing from abroad. Existing national and regional funds and/or financial institutions that are investing in private forestry and processing, with good track records, should be supported and provided with additional capital.

Building awareness and capacity

Many national and regional financial institutions that have not financed forest investments lack understanding of forest assets as an investment class. Often, financial institutions and investors do not know how to assess risks related to plantation investments, nor are they familiar with the forestry business in general; therefore, they are reluctant to deal with it. There is a need to educate financial institutions on the basics of forest asset valuation, plantation investment, and risk.

Improving sector governance and transparency

Comprehensive governance reforms are needed in some potential plantation-expansion countries, especially in Africa and Asia, to, for example, streamline and increase the transparency of processes for issuing licences and permits. This would help reduce the risk of corruption and excessive bureaucracy and expedite the execution of investments.

Providing secure land tenure

In many countries, there is a need for policy and legislative reforms or to put previous reforms into effect to establish clear, transparent and cost-efficient procedures for land acquisition and leasing. Social safeguards and related community consultations should also be put in place to avoid land-grabbing and conflicts with local communities. In many countries, cadastral systems and land-allocation maps require improvement.

The development of forest plantations in Brazil

Brazil is one of the world's leading industrial forest-plantation countries, with about 6.5 million ha of such plantations composed mainly of eucalyptus and pine species. In the past three decades, the country has been able to develop significant forest industries based on systematic investment in forest-plantation development. This development accelerated in the 1970s and 1980s, thanks to incentive schemes comprising subsidies and tax exemptions that were able to create a critical mass of plantations.

Public investments in, for example, major infrastructure development and research and development (R&D) have accelerated private investments. The government supported R&D into plantation technologies and their extension to users, especially through the Brazilian Company of Agricultural Research (EMBRAPA). Many private companies have now developed their own R&D and extension programs as part of their tree-farming schemes.

The main underlying reasons for Brazil's success with forest plantations have been: the availability of land for forest-plantation development, with excellent tree-growing conditions; pre-existing infrastructure; developed technology; access to markets; and favourable policies towards forest investment.

The main remaining obstacles are general weaknesses in the business environment, conflicts with civil society related to large-scale land ownership, and the use of monocultures that threaten biodiversity and local social development. Over time, however, forest companies and other forest-plantation developers have become more practised in developing socially and environmentally sound models that take the concerns of civil society into account. Environmental legislation, which was initially seen as a constraint, has compelled companies to improve their performance and also facilitated financing from sources that demand sustainability.

Introducing targeted incentives and removing disincentives

In some countries, well-planned tax arrangements and other targeted incentive schemes have proved effective in boosting plantation development. Such schemes are especially effective when measures have already been taken to secure macro-economic, political and institutional stability, access to land, and clear resource tenure, complemented with access to good infrastructure and extension services (see Box).

Incentives of various types have triggered investments in forest plantations that have been sufficient to attract investment in downstream processing. In a number of cases, such investments in downstream processing have, in turn, mobilized further investment in forest plantations by ensuring that there will be a well-paying market for the timber. Ultimately, conditions should be such that forest-plantation investments are driven not by government incentives but by a competitive, efficient market. At the same time, it is important to assess and remove the negative impacts of incentives that apply in other sectors and which might act as disincentives in the forest sector (e.g. agricultural incentives that lead to deforestation).

Based on experiences worldwide, an effective forest-plantation incentive program should:

- be performance-based—focusing on high survival rates and high productivity;
- combine direct incentives with indirect enabling incentives. In most countries, indirect enabling incentives are usually well justified, especially on aspects like improved land tenure, infrastructure development and technical assistance;
- be temporary in nature—have a finite lifespan and be phased out at a certain point in time;
- be inclusive rather than exclusive—supporting small, medium-sized and large forest-growers; and
- comply with the best environmental and social standards.

Develop tested plantation models, and build R&D capacity

Locally adapted and tested plantation models are necessary for securing high growth rates and resistance to pests and disease. Large-scale plantation investors can afford to develop and test such models themselves, but small and medium-sized operators cannot. It would be highly beneficial, therefore, for government to carry out R&D to develop such models and to provide related extension services, especially for small and medium-sized operators.

Developing and disseminating risk-mitigation tools

Forest plantations are prone to investment failures due to pests, disease, fire and other threats. The probability of investment failure can be controlled partially by good management (e.g. effective fire-prevention measures), but such risks are difficult and expensive to remove entirely. There is a need to develop risk-mitigation tools, for example in the form of insurance schemes or risk guarantee funds. Such arrangements would buffer small and medium-sized forest-growers from financial catastrophes and thus would lower the bar for investing in plantations.

In addition to all of the above, many longer-term measures can be undertaken, such as intra- and extra-sectoral reforms, and improved political and economic stability, which are beyond the forest sector and apply to the overall business environment but which would contribute considerably to sustainable forest-plantation development.

References

Indufor. 2012. Strategic review on the future of forest plantations in the world. Report for the Forest Stewardship Council, Bonn, Germany.

Indufor. 2013a. Indufor Plantation Data Bank. Helsinki, Finland.

Indufor. 2013b. Review of constraints to private financing flows for sustainable forest management, wood production and primary processing in tropical and other developing countries. Report for the World Bank, Washington, DC, USA.

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