

# Portable sawmills and SFM in the Amazon

***An ITTO project's innovative financing mechanism had a major impact on the uptake of new technologies***

**by Vicente A. Molinos**

ITTO consultant  
(molinos.vicente@gmail.com)



**Saw ready:** Log harvested for portable sawmilling in Ucayali forest concession. *Photo: R. Carrillo*

Between 2004 and 2010, an ITTO project (PD 233/03 Rev. 2 (I)) implemented in Peru investigated the application of intermediate technologies for sustainable forest harvesting. This article summarizes an ex-post evaluation of this project carried out in 2012. The evaluation included visits to forest operations and mills impacted by the project and interviews with forest regulators, project beneficiaries, forest and mill technicians and credit agents in the Peruvian Amazonian regions of Loreto, Madre de Dios and Ucayali, as well as project executives and policymakers in Lima.

## Forests under pressure

Peru has 79 million hectares of natural forest, making it the second-most forested country in South America after Brazil. The majority of these natural forests are tropical lowland forests east of the Andes mountain range. About 19 million hectares are allocated as protected areas such as national parks and conservation reserves and another 24 million hectares are zoned as permanent production forests in the Amazon. As of 2011, only about 1% (260 000 hectares) of these production forests had been independently certified as under sustainable forest management (SFM).

Seventy-seven percent of Peru's 29.5 million people live in urban areas. This urban population is growing at 1.6% per year, generating enormous social pressure and a steady flow of internal migration to rural areas. Because arable land comprises less than 6% of Peru's total land area and permanent pasture lands comprise less than 14%, natural forests continue to be encroached on by agriculture, as well as by formal and informal mining operations.

For the last two decades, Peru's forest sector has been shifting from a destructive extractive activity to an industry based on the sustainable use of a range of products and ecosystem services under management regimes that aim to conserve the forests. Progress towards this kind of industry has been uneven between regions, however, and sustainability suffered a major setback when political leaders enacted laws and regulations that encouraged small-scale logging concessions and short-term timber harvest permits, sometimes overlaid on mining concessions.

Peru's forest sector is working to have these laws and regulations changed and to apply the relevant lessons learned by forest management practitioners elsewhere, including in neighboring Amazonian countries, to encourage SFM. For example, the national forestry agency, *Dirección General Forestal y Fauna Silvestre* (DGFFS), has introduced longer (40 year) renewable concessions that provide a certain level of security for investment. In the Madre de Dios region, smaller concessionaires have consolidated into larger tracts that are more likely to be economically viable.

## The ITTO project

The objective of PD 233/03 Rev.2 (I) was to contribute to the sustainable technical and environmental development of Peru by introducing intermediate technologies for forest harvesting and timber use. Specifically, it aimed to improve the productivity of small and medium-sized concessionaires and other forest producers operating in the Peruvian Amazon by giving them access to a low-capital technical option that would enable them to use more of the available timber resource.

A typical timber-harvesting operation in the Peruvian Amazon uses only 2–3 species and extracts only 2–3 m<sup>3</sup> of timber per hectare on a 20–30 year cutting cycle. The forests could sustain a harvest at least five times greater than this, but tree growth is distributed between 30 species or more, most of which are ignored by operators because of their low value or the difficulty in milling them. For example, the very hard and dense timber of shihuahuaco (*Dipteryx* spp.), known in the flooring trade as cumarú, cannot be sawn with the 16 horse-power portable circular sawmills traditionally used in the Peruvian Amazon. Because shihuahuaco logs do not float, transport by river is either not possible or very costly. An important part of the ITTO-funded project was to introduce a low-cost, portable sawmill technology suitable for sawing these very hard woods, thus increasing the range of species that can profitably be harvested. Increasing the level of timber use also requires a more developed wood products industry cluster that is closer to the forests but well linked to downstream value chains in construction, millwork and furniture. A range of investments in manufacturing, road infrastructure and equipment is required, and small and medium-sized forest enterprises need greater access to commercial credit.

## Inputs

The ITTO project was executed by FONDEBOSQUE, a unit of the DGFFS created in 2002 to promote forest investment. The project featured regional technical units based at Iquitos, Pucallpa and Puerto Maldonado under a national technical coordinator.

The project created a financial mechanism that enabled selected beneficiaries (small and medium-sized concessionaires and timber producers) to access commercial credit so they could purchase a pre-defined technological package that included a portable sawmill, saw-filing accessories, simple log and lumber transport carts, and a winch powered by a chainsaw engine. The financial mechanism had three components:

- *a dissemination program and beneficiary selection system* to promote and implement forest management and annual harvest plans, as legally required;
- *a guarantee fund* to back a new commercial credit line by Caja Municipal de Ahorro y Crédito Maynas, an established microcredit savings and loan bank with branches throughout Peru, including in Pucallpa and Iquitos; and
- *technical assistance and training* for sawmill operation and maintenance and the provision of assistance to develop business plans and monitor economic performance to facilitate loan repayments.

## Results

Under the project, 14 portable sawmills were purchased in 2004–2009 through commercial loans made by Caja

Maynas. Eleven of the 14 loans had been repaid in full by 2010, and the final cost of the guarantee fund (US\$96 470), was leveraged into loans at a 15-to-1 ratio.

Efforts to disseminate technology through videos and demonstrations reached a total of 258 people. Six simple technical manuals were produced, and 1500 sets of these were printed and disseminated. Forty-two operators were trained in sawmill use and maintenance in ten field courses held in various places in the region. The project's quantitative targets were met, although gaining legal approval and permits from the regional forestry agency regulators often caused long and costly delays.

## Impacts

The project had the following impacts:

- *Rapid adoption.* About 15 new portable sawmills have been sold to producers in the region since December 2010 without the credit facility guaranteed by the project. This suggests that portable sawmills are an economically viable technical option for sawing very hard species and for improving the harvesting logistics and cash-flows of smaller producers. The project undoubtedly played an important catalytic role in bringing the technology to the region and demonstrating its feasibility.
- *Local adaptation.* Over 50 portable sawmills have been built at small mechanical workshops in Peru since the beginning of the project. These are local adaptations of the introduced technologies, built with heavier materials and costing less than imported versions. They are designed to work on a semi-stationary basis and are powered by electricity.
- *Increased use, production and export of hard species.* Portable sawmills and their local adaptations are now used at forest sorting yards to saw very hard species and to break down defective over-mature logs, reducing transport costs from distant forests. The value of Peru's sawnwood exports of very hard species trebled between 2005 and 2011, to US\$68 million.

Of even greater importance, perhaps, was the innovative financial mechanism demonstrated by the project to the financial industry, which has traditionally avoided lending to the forest sector in Peru. The project may help smooth the way for small and medium-sized forest enterprises to gain greater access to much needed resources to finance more efficient and sustainable operations.

## Lessons

The main lessons learned from this 5-year project were:

- Innovative financial mechanisms that provide forest enterprises with access to credit can have a major impact on the adoption of new technologies.
- Product and market developments must be better integrated with technological improvements so that



## ... Portable sawmills and SFM in the Amazon

investors in new technologies can sell their products into new markets, reducing the need to compete with traditional products and informal operators.

- Projects of this nature should partner with training entities to provide for continued and growing demand for qualified workers.
- The high transaction costs of complying with present forest regulatory practices can be counterproductive to the goals of SFM.

### Peru's forestry potential

Peru's trade in traditional forest and wood products has a net deficit of about US\$600 million per year, mainly due to the country's significant imports of paper and paperboard products. There are major opportunities to increase forest-based income and employment from natural production forests in Peru by using them wisely—that is, sustainably. These opportunities need to be demonstrated to politicians, who often see natural forests as either impediments to growth or as untouchable natural monuments.

In Peru's diverse Amazon forests, the viability of timber harvesting requires relatively large concession areas (in the author's experience, 60 000 hectares or more). The multi-product and mixed-species timber harvests available in the Amazon demand a diverse cluster of specialized and complementary enterprises, where each can use a portion of the harvest to its highest potential.

Before the needed investments in private manufacturing and infrastructure can be made, forest management concessions must be part of a comprehensive strategy for regional land-use planning, zoning and human settlements, backed by the effective government enforcement of tenure rights. The Madre de Dios region illustrates this potential well, with about 260 000 hectares of natural production forests under certified sustainable management and the potential for this area to be expanded. The region is also a possible stop-over on an airline route from Lima to Cuzco (and nearby Machu Picchu), so its potential for nature-based and adventure-oriented tourism is sizable. However, a gold rush and agricultural encroachment are destroying landscapes, ecosystems and the social fabric.

### Peru's tasks

The DGFFS should put in motion a process of 'learning by doing' that will strengthen bottom-up policy design processes based on the well-balanced and effective participation of the various regional interest groups. This should be done to:

- shape policies and laws;
- enable the decentralized implementation of policies; and
- streamline regulations and help enforce their compliance.



**Bush saw:** Portable sawmill at a sorting yard in Madre de Dios. Photo: Maderyja

The DGFFS should engage experienced international specialists to help design and implement a multi-year, phased strategy to promote the forest and natural resource sector in selected regions, as follows:

- Phase I—develop multi-sectoral visions;
- Phase II—identify investment projects; and
- Phase III—create a national sustainable forest-based development fund.

The proposed national sustainable forest-based development fund should be developed with a privately managed, second-tier development bank that specializes in the forest sector. It would be steered by a high-level public–private board and managed transparently under criteria of public and open competition. It would have an initial endowment and recurrent earmarked funds.

### A role for ITTO

ITTO could design and implement a follow-up 2-phase project linked to forest concessionaires in a given region. Such a project could facilitate use of the proposed national sustainable forest-based development fund to expand timber use and develop key products and markets, including value-added manufacturing of lesser used species.

In addition, ITTO could include stakeholder groups in technical cooperation projects in ways that strengthen their organizations and their capacities to cooperate with each other. These groups could include:

- regional associations of forest producers and industries;
- local communities;
- regional training entities;
- regional regulatory entities; and
- regional non-governmental organizations.

*The project ex-post evaluation report and project training videos are available in Spanish at [www.itto.int](http://www.itto.int) or on request from the ITTO Secretariat ([carrillo@itto.int](mailto:carrillo@itto.int)). The author acknowledges the data and logistical support provided by companies that participated in the project as well as by the DGFFS and its regional offices.*