

## Peruvian smallholder production and marketing of bolaina (*Guazuma crinita*), a fast-growing Amazonian timber species

### Call for a pro-livelihoods policy environment

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#### Key points

- In Amazonia, certain native fast-growing timber species perform well in local smallholder management systems.
- Fast-growing timber from second-growth forests and fallows is an important source of income for local producers.
- Bolaina (*Guazuma crinita*) timber has an established national market. The species is well suited to sustainable smallholder forest management and timber production, processing and marketing.
- Opportunities for farmers who are also small-scale forest managers to improve their livelihoods by producing and selling timber are limited by the lack of a supportive legal framework.
- Policies and regulations on timber harvesting and trade should facilitate markets for timber sustainably produced in smallholder forests.

#### Production and marketing of bolaina timber in Peru: An opportunity for smallholder producers

In the Amazon region of Peru, most smallholder farmers produce wood products either for their own use or for sale as a regular contribution to their livelihoods. However, the policy and regulatory environment does not facilitate the marketing of such products (Sears and Pinedo-Vasquez 2004). If poverty alleviation is a national priority, economic opportunities linked to productive activities by economically vulnerable people should be promoted rather than discouraged.

Peruvian smallholder farmers in the Amazon manage mosaics of productive fields, pastures, forest patches, woodlots and fallows. Timber production is one component of the highly diversified livelihood strategies employed by farmers in the region. A number of studies have shown that farmers use traditional local knowledge and technologies developed by forestry agencies to enrich their lots with useful tree species, including both slow-growing, higher-value hardwoods and fast-growing “cheap” timber species (Padoch and Pinedo-Vasquez 1996; Sears and Pinedo-Vasquez 2004; Putzel et



**Figure 1. Sites where specimens of bolaina are collected, indicating the distribution of the species in the Western Amazon region.** Data acquired from Missouri Botanical Garden and New York Botanical Garden online herbaria.

(Map: M. Agus Salim/CIFOR)

### Box 1. Ecological characteristics of bolaina that make it suitable for management in traditional farm–forest mosaics

The timber species bolaina blanca (termed simply “bolaina” in this brief) is suited to management by Amazonian smallholder farmers because of its natural ecological characteristics. Bolaina is a pioneer species that colonizes forest gaps, including agricultural fallows, through wind dispersal of its small seed capsules (see Figure 2) at the beginning of the rainy season; the seeds are minute and abundant, and germinate readily on alluvial soils common in the region (Díaz González 2007). In floodplain fallows, bolaina grows quickly, with an average diameter increase of 4.8 cm per year, such that poles can be harvested after 2 years and small-diameter sawtimber (15–20 cm dbh) in 11–12 years (Sears and Pinedo-Vasquez forthcoming). The trees grow in dense stands of up to 1200 trees/ha in a young fallow (<3 years) and up to 500 mature trees ( $\geq$  25 cm dbh) per hectare after management by smallholders for sawtimber (Padoch et al. 2008; see also White et al. 2005).



**Figure 2. Seed capsules of bolaina, each containing ca. 20 seeds, disperse naturally into forest gaps and farmers' fields.**

Photo: A. H. Gentry/Missouri Botanical Garden

Local farmers manage this natural ecological niche of bolaina while engaging in other agricultural activities. Clearings made to prepare land for crops are an ideal habitat for bolaina. When several seed trees are left at the borders of newly cleared and burned fields, the seeds naturally disperse and germinate. Thus, farmers may prepare a new field for several rotations of cash crops such as maize and beans while leaving seedlings of bolaina to grow, with the field left fallow to produce a stand of timber ready for harvest several years later. Farmers may also facilitate regeneration by introducing seeds or may transplant seedlings from one area to another or from a nursery. Because bolaina is tolerant of flooding, it is ideal for management in seasonally flooded areas near rivers and streams. Furthermore, in the area surrounding Pucallpa in the regions of Ucayali and Huanuco, farmers can float logs by river to nearby mills at harvest time, which greatly reduces their transportation costs.

al. 2011). However, even though local governments and NGOs encourage tree planting by farmers, the regulatory environment does not create the optimal conditions for smallholders to market the timbers they produce. Forestry laws are geared toward large-scale forest management and require permits based on management plans that are not feasible for smallholder farmers to develop. Land titling programs, recently decentralized in Peru, tend to target titling of cleared cropland and exclude land considered as forest, which can include managed stands. As argued elsewhere (Sears and Pinedo-Vasquez 2004), it does not make sense to apply the same laws to smallholder producers as to large-scale loggers. Laws governing timber markets should distinguish between timber that is produced (planted and/or managed) and that extracted from natural forest. In addition, Land titling should take into account the diversified livelihoods of smallholders who maintain agricultural mosaics incorporating timber production.

The purpose of this brief is to highlight some of the recent research on the production and markets for bolaina

(*Guazuma crinita*), a timber species that occurs naturally in great abundance in the floodplain forests of the Ucayali River watershed in the Peruvian Amazon (Figure 1). Like its relative *Guazuma ulmifolia*, which grows in a wider variety of habitats throughout Latin America (Orwa et al. 2009), bolaina is a fast-growing, low-density timber that, because of its natural ecological characteristics, has great potential for sustainable production by smallholder farmers (see Box 1). For this reason, the stock of *G. crinita* in local forests has substantially increased, as smallholders are preserving stands and encouraging natural regeneration of the species in recognition of its commercial importance (Díaz 2007). Recently, it has also been used in government and NGO reforestation projects (Meza et al. 2006; IIAP 2009; Cornelius 2010).

Until 2007, bolaina was mostly traded locally in the Ucayali River area for housing construction, largely in villages and in the expanding low-income neighborhoods surrounding cities such as Pucallpa, where at one point 65% of houses had walls made of narrow bolaina boards (*tablillas*) (Padoch

et al. 2008; see also Toledo 1997). Local use of bolaina began to increase as more valuable timber species were traded internationally. The market for bolaina gradually expanded across the Andes, to Lima and elsewhere. After the 2007 Peru earthquake, demand for bolaina boards surged for use in emergency prefabricated houses. Since then, bolaina has come to be one of the top 20 species harvested nationally, according to official production figures (Ministerio de Agricultura 2011).

This brief presents a strong case for the revision of regulations on smallholder timber harvesting and marketing. With a more favorable legal and policy environment for farm-produced timbers, small-scale landowners in Amazonia would be able to increase their income from bolaina and other tree species whose characteristics favor sustainable management in smallholder forest–farm mosaics.

In the following sections, we describe how bolaina production contributes to smallholder livelihoods and how smallholders participate in the local bolaina production chain in our study area. We then propose several measures that regional and national policy makers could adopt to create improved conditions in which smallholder producers could benefit more from their forestry and timber marketing activities.

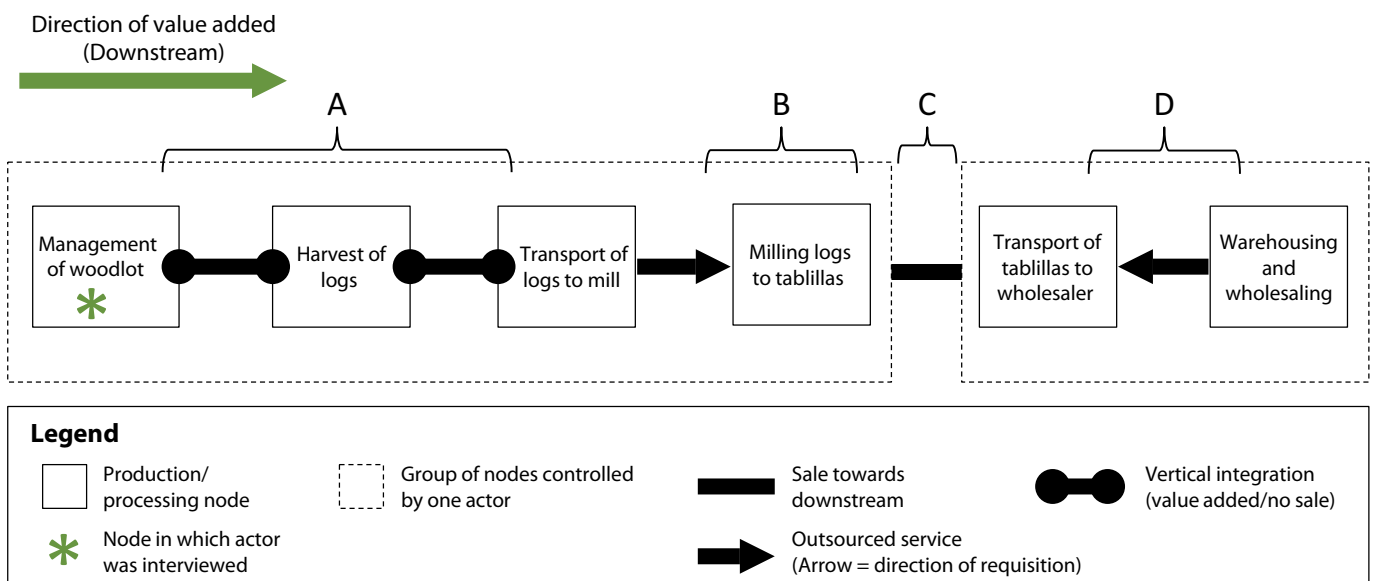
## The contribution of bolaina timber production and processing to smallholder livelihoods

Previous studies (Sears and Pinedo-Vasquez forthcoming) identified the local actors involved in managing and harvesting bolaina trees, transporting and transforming logs into *tablillas*, and marketing the product. In multiple scenarios, woodlot owners participate to varying degrees along the production chain, increasing their potential profits by adding value or by selling at different stages of the productive process.

Using a value chain approach, we interviewed 59 actors in the bolaina production chain in the vicinity of the city of Pucallpa, a logging, timber-processing and transportation hub on the Ucayali River, during two research trips in 2012.

We mapped the stages of value addition from management of woodlots to marketing of the consumer product, shown as “nodes” in Figure 3, as well as the types of relationships or “links” between the actors active in those nodes. The purpose of this analysis was to understand the factors affecting smallholders’ decisions about, and changes in, their

### Bolaina value chain configuration in Pucallpa area



**Figure 3. Example of one configuration of the value chain for bolaina *tablillas* in the area of Pucallpa,** in which the smallholder (woodlot owner-manager) is active in three nodes of value addition (A: timber management, harvesting, and transportation) and contracts out a fourth (B: transformation), thus investing in producing a product with several degrees of value added. The smallholder then (C) sells the product (*tablillas*) to a wholesaler, who (D) outsources the transportation of the *tablillas* from mill to warehouse.

**Table 1. By engaging in processes of value addition, including harvest, transportation and transformation, producers of bolaina can greatly increase their profits.**

The estimates shown here, based on interviews with smallholder producers, small-mill operators, and sellers of bolaina *tablillas*, illustrate how inputs of relatively small amounts of capital and involvement in productive activities can potentially bring great benefit to producers. Based on units established previously (Sears and Pinedo-Vasquez in press), and estimates of price and cost data derived from field interviews, ownership of a chainsaw, small mill, and mill and truck (high capital) can increase a producer's profits by 23%, 400%, and 464%, respectively (without taking into account labor costs). Thus a family with sufficient land, free labor and the equipment to engage in some degree of processing can earn substantially more profits by transforming and marketing bolaina products themselves, than by selling standing trees or logs. All monetary amounts are given in Peruvian nuevos soles (ca. US\$0.35).

Unit*	Quantity	Unit price	Revenue	Model 1 (Low capital)		Model 2 (High capital)		Primary capital required to add value
				Costs	Profit	Costs	Profit	
Tree	200	6	1200	N/A	1200	N/A	1200	Land
Log (3 per tree)	600	3	1800	510	1290	210	1590	Chainsaw (S/.2500)
<i>Tablillas</i> sold at rural mill	4800	1.4	6720	2250	4470	1446	5274	Small mill (S/.12,000)
<i>Tablillas</i> sold in Pucallpa	4800	1.8	8640	3978	4662	2655.6	5984	Small mill and truck (S/.28,000)

participation in value addition. We included as nodes the management of woodlots, the harvesting of logs, and the processing of logs into *tablillas*, as well as the transportation of the product between nodes and the process of sorting and storing the product for sale (warehousing).

We found that smallholders in our sample were involved in somewhere between one and five nodes of value addition, and a number of them reported having integrated more "downstream" (i.e., more processed, closer to final market) activities over time. Thus, a common model of production and marketing featured an individual or family who had first sold standing trees to roaming loggers but had later harvested the entire crop and transported the logs for sale to a mill. Others went a step or two further in adding value by contracting a mill to process the logs into *tablillas* for sale, either on the spot or further downstream in Pucallpa where prices are higher. A number of small-scale millers were also (or had been) smallholder producers of bolaina timber.

In several nodes of the value chain, women were active in some aspect of production. In the management of natural regeneration, female family members often collect seeds and select seedlings for transplanting, if that is part of the management undertaken on a particular farm. Women in families that harvest bolaina often provide meals for workers, including hired labor. However, in our sample, women reportedly did not participate in the heavy labor associated

with felling or milling the wood. At the marketing end of the value chain, women often manage timber depots and relationships with buyers.

Factors affecting decisions about whether to engage in a higher level of value addition include the availability of affordable labor, such as family labor; the cost of the transportation of materials, which depends on a number of factors, including vehicle ownership and proximity to roads (for transportation by truck) or rivers (for floating logs downstream); and ownership of equipment, such as chainsaws and radial saws. When conditions favor adding value, smallholders are able to increase their profits by taking control of the processing, transportation and sale of finished products in urban markets to local wholesalers or buyers from elsewhere, including Lima (Table 1).

Another factor that determines whether it makes sense to engage in value addition is the risk involved in transporting logs and timbers for processing and to the market. In Peru, forestry laws are designed to promote large-scale concession forestry and control illegal logging. Smallholder-produced timber is generally seen as illegal and small-scale landowners often lack the means to obtain the paperwork needed to comply with the forestry laws. For this reason, producers of bolaina are often stopped by the ecological police and other law enforcement personnel and have to pay bribes or risk losing their product.

## Recommendations

Previous studies on the Pucallpa area and the research on smallholder bolaina product value chains described here show that the management of bolaina is an important source of income for families living and farming on floodplains in the region. However, several policy-related impediments prevent such families from maximizing their benefits from producing bolaina and similar timbers and processing and marketing value-added products. Recent changes in land-titling practices by the Ucayali regional government have meant that farm families that occupy and manage a parcel of land for years may only be able to gain title over the areas cleared for agriculture, but not for land tree cover or forest fragments. If their claims to tree lots and adjacent forests are not recognized, they lose legal access to the resource. Forestry laws, as noted above, do not favor the production and marketing of wood by small-scale producers, who have to operate under the radar and undertake unreasonable risks in taking the timber they have grown to the mill and the market. Often, the trees cut for local processing are under the legal minimum cutting diameter, yet this minimum was established to protect the natural regeneration of timber trees in natural secondary and old-growth forest, and not for intensively managed stands and plantations.

A number of cases point to a trend where smallholders are increasingly adding value by harvesting their own trees, transporting them to mills and sometimes acquiring capital to mill the wood themselves. This is a model for rural development that should be favored by policies targeting poverty alleviation and local economic development, and even supported through rural assistance programs and credit schemes.

Given these impediments and lost opportunities, we make the following recommendations to policy makers and rural development agencies:

- Create a new set of regulations governing the production and transportation of bolaina and other fast-growing managed timbers that are produced through smallholder fallow management. These regulations would allow the harvest and sale of poles and small-diameter (<25 cm) logs, but would need to include some form of monitoring to prevent the overexploitation of naturally occurring stands.
- Classify bolaina (and potentially other species) as an agricultural product to facilitate marketing and minimize confusion of these timbers with endangered natural forest species.
- In titling lands occupied by small-scale farmers, take into account their management of woodlots, including bolaina stands, in determining the size and boundaries of titled parcels. Sustainable management of timber in

fallows should be encouraged as part of a diversified livelihoods strategy that includes management of a variety of ecological niches and the species that exist in them.

- In rural assistance programs and credit schemes, provide small-scale farmers with the necessary support to improve their market position through the acquisition of basic capital (equipment) in production and processing value chains, including for bolaina and other species with the potential for sustainable production.

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This research was carried out by CIFOR as part of the CGIAR Research Program on Forests, Trees and Agroforestry (CRP-FTA). This collaborative program aims to enhance the management and use of forests, agroforestry and tree genetic resources across the landscape from forests to farms. CIFOR leads CRP-FTA in partnership with Bioversity International, CIRAD, the International Center for Tropical Agriculture and the World Agroforestry Centre.



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