



3.2 Chainsaw milling in natural tropical forests: a case study in Bolivia

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Background

Approximately 15 years have passed since the implementation of Forestry Law No. 1700, making it possible to strengthen the knowledge of forest operations and management, incorporate new stakeholders, reach important development in the process of voluntary forest certification and democratize access to the forest. Chainsaw milling, prohibited by the Bolivian forestry regime, continues to create much controversy, even though many forest users — mainly informal and therefore considered illegal — consistently make use of this practice.

This article assesses the groups involved (directly or indirectly) in chainsaw milling in two regions of Bolivia's lowlands: north of La Paz and north of Cochabamba. The project implemented in-situ monitoring and evaluation of chainsaw milling, including production and transport costs, processing yield, sales in the local market and economic benefits, and recorded perceptions about the use of chainsaw milling.

We looked at jobs directly generated through chainsaw milling in various locations in the two departments. A survey was carried out in 2006 with the following stakeholder groups: forest producers; indigenous communities; local social groups; chainsaw organizations; and traders in forest products.

Survey results

The survey monitored the use of chainsaws for sawing wooden planks, which is prohibited by law. Results are provided for the villages, each of which is characterized by specific user types, topography and accessibility. Prices are expressed in Bolivianos (Bs), with an exchange rate of 7.07 Bs: US\$1.



THE MAJOR CHALLENGE IN ADDRESSING CHAINSAW MILLING ACTIVITIES IS HOW TO IMPLEMENT A CONTROL SYSTEM IN AN EFFECTIVE AND EFFICIENT WAY, WITH A COMMITMENT FROM THE COMMUNITIES THEMSELVES.

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Cochabamba rainforests

Municipalities of Ivirgarzama and Puerto Villarroel, Carrasco Province

The rainforests region is flat, with many rivers of various sizes and with moderate to easy access to the forest. Usually, the trees are located on agricultural plots and are privately owned. The average distance from Ivirgarzama to Cochabamba, capital of the department, is 230 km.

Chainsaw millers cut up to four trees per day, depending on the species. A skilled operator can produce between 250 and 300 pt (pt = board foot; 424 pt equals 1 m³ solid sawnwood).

The product at this stage is chainsawn wood blocks. Typical dimensions of these planks are 10 centimetres (cm) thick by 18 cm wide by 2 metres (m) long. Although the initial recovery rate for milling logs using chainsaws is about 54% of log volume, the irregular shape of the block requires it to be reprocessed to a more regular form with a brush and circular saw blade. This reduces the final recovery rate to 33%.

The profitability of a chainsaw milling operation is about 0.75 Bs/pt for the tree harvester. When this amount is multiplied by an economic daily production between 250 and 300 pt, it generates a daily earning between 185 and 225 Bs. The tree harvester can generate this amount without having to get a permit and without a management plan approved by the respective authority. Moreover, the land manager or tree owner where the tree is taken most often does not authorize its harvest. Consequently, the gross profit goes to the chainsaw miller.

The price of planks in the local market of Cochabamba is 2.50 Bs/pt (Table 1). Intermediaries earn between 1 and 1.30 Bs/pt for purchasing the wood planks landed along a river or gathering place and selling them at the local market in Ivirgarzama or Puerto Villarroel. Although trade in chainsaw milling products is an illegal activity that carries a great risk, as shown in Table 1, it is encouraged by the profits and by the economic opportunities for intermediaries.

Table 1. Chainsawn planks: production costs and market price in Cochabamba (Bs/pt)

stage	costs	price
cost of chainsaw milling at the stump	1.00: operator: 0.25 tree owner: 0.75 (if authorized)	
cost of transport in the forest (up to 500 m distance)	0.15 to 0.20	
cumulative plank price at the forest gate		1.15–1.20
intermediary's price at the local market		2.50
transportation cost to Cochabamba	0.75 (1,500 Bs to transport 2000 pt)	
broker's market price in Cochabamba		3.20–3.50

In Cochabamba trucks transport at least 212,000 board feet of illegal timber every month. This cargo volume requires at least 25 trucks (one truck transports on average 8,500 board feet). The estimated annual volume of chainsawn wood in the market in Cochabamba exceeds 2.5 million board feet; this is equivalent to 6,000 m³ of sawnwood or 11,100 m³ in roundwood.

The sale of this product in the city of Cochabamba generates profits of about 1.00 to 1.50 Bs per board foot. Because of the low quality of the chainsawn blocks— they are rough-edged and imprecisely squared — they are not exported.

La Paz

Caranavi Rainforests

The region is hilly, with steep slopes and moderate to difficult access. Trees are not privately owned, but are obtained from public land or protected areas (PAs). The rivers serve as the means of transport; the average distance from Caranavi to La Paz is 200 km.

Chainsaw milling for sawing and squaring generates the following levels of remuneration. Costs, which range depending on whether the wood is soft or hard, are summarized in Table 2:

- Chainsaw operators who own their own equipment (chainsaws) earn 0.30–0.50 Bs/pt for managing their teams and processing the logs into blocks or planks.
- Operators who do not own their own chainsaws earn 0.10–0.50 Bs/pt for solely managing the team and producing chainsawn wood blocks. Their assistants earn a daily wage of 20–30 Bs.
- The people who transport the planks to the collection site (*lomeado* or *jalete*), a distance of up to 500 metres, charge 0.15–0.20 Bs/pt.
- The cost of transport from the forest to Caranavi is 0.20–0.30 Bs/pt.

If the product is sold in the town of Caranavi, planks from softwoods are sold for 1.0 to 1.50 Bs/pt. The prices are a bit higher for planks from semi-hardwood or hardwood species, namely 1.50 to 2.0 Bs/pt or 2.0 to 3.0 Bs/pt respectively. The price of a plank in the city of La Paz can reach between 3.00 and 4.00 Bs/pt for semi-hard timber and between 4.00 and 4.50 Bs/pt for hardwood.

The distance from Caranavi to La Paz is 185 km. It is estimated that around ten trucks per day are leaving the area with timber, all going to the city of La Paz. The trucks carry an average of 75,000 board feet of sawn timber per day; based on this amount, around 18,000,000 pt of timber (approximately 2,500 trucks) is transported annually from the Caranavi zone to the city of La Paz. This equals 42,450 m³ of sawnwood or 128,645 m³ of roundwood. These estimates are based on information provided by chainsaw operators in the area.

Table 2. Production costs and market prices for chainsawn lumber in La Paz (Bs/pt)

stage	cost	price
cost for chainsaw cutting at the stump	direct sale by owner of the wood: 0.30 to 0.50 (operator owns chainsaw) 0.10 to 0.50 (operator does not own chainsaw)	
cost of transportation* in the forest at the collection site (up to 500 m distance) to an intermediary collection point	0.15 to 0.20	
price of planks at the forest gate collection point received by the chainsaw operator		1.20 to 1.50 (softwood) 1.50 to 2.50 (semi-hard wood) 3.00 to 4.00 (hardwood)
cost for transporting* the timber from the forest to Caranavi	0.20 to 0.30 Bs/pt, depending on whether the timber is from soft or hard wood.	
local market price in Bs/pt in Caranavi** received by the rescuer		1.0 to 1.50 (softwood) 1.50 to 2.00 (semi-hard wood) 2.0 to 3.0 (hardwood)
transport costs* to La Paz	0.35 to 0.40	
broker market price in La Paz		3.00 to 4.00 (semi-hard wood) 4.00 to 4.50 (hardwood)

* Operating costs for unloading are around 60 Bs for a truck with around 8,000 pt.

** Despite the greater distance to the local market, the price of wood in Caranavi is lower than in the forest because the means of transport is the main river.

Palos Blancos

The city of Palos Blancos is located in Sud Yungas Province in La Paz Department. The city is located approximately 285 km from the city of La Paz. The population mostly comprises indigenous Mosestenes, as well as Aymara and Quechua people.

Wood blocks (*cuartoneado*) produced by chainsaw millers are transported to the town of Palos Blancos and/or the surrounding area (Table 3).

Table 3. Wood prices in Palos Blancos and surrounding area

species density	price of wood blocks (Bs/pt)
softwood	0.80–1.00
semi-hard wood	1.20–1.50
hardwood	1.50–2.00

The prices of sawn or wood block timber in the production sites are very similar, as are costs. This area is farther from the departmental main market in the city of La Paz. To make the product more competitive and achieve a better price, chainsaw millers attempt to incorporate some degree of further processing. Carpenters have settled in the small town of Palos Blancos; they further process dimensional or pre-cut lumber from chainsawn blocks or planks and recover waste for the production of parquet for floors. This additional processing reduces the overall yield.

Yields of processing logs to wood in Palos Blancos

Determining the yield of processing logs to wood blocks was based on local information received from chainsaw operations for the specie *Platimiscium ulei* (Fam. *Leguminosae*). The average log volume was 2.16 m³. During the processing of planks using chainsaws, 1.06 m³ was recovered in the process, a recovery rate of 49%. The recovery process and processing of timber planks into dimensional wood for floors resulted in an average total recovery rate of 30% for the carpenters in the town of Palos Blancos.

Conclusions

The wood harvested in the survey was illegal; i.e., it was not authorized by the national authority. The raw materials used have a questionable origin. Stakeholders do consider it relevant whether the timber comes from slash and burn agricultural practices, conversion, national lands or from PAs in the regions (Carrasco National Park in Cochabamba and Madidi National Park and Pilon Lajas Biosphere Reserve in La Paz).

Performance

The average yield for the processing of logs in planks or blocks with chainsaws, with or without reprocessing by nearby sawmills, is around 33%. This is very similar to the yield for planks processed by chainsaw milling with a bandsaw mill. Chainsaw milling for wood processing creates opportunities for local forest users. Trees used for the lumber should come from areas with authorized management plans.

Economic possibilities

Supplying local timber markets provides substantial revenue when large volumes are traded. It can provide economic benefits to people living in rural areas, although most chainsaw milling is done informally.

People involved in these wood processing activities consider their involvement a short-term opportunity to compensate for a drop in market prices of the products which they have traditionally traded, including coffee and citrus. The continuing low prices of these products and a lack of possibilities for processing raw material for a higher value, encourages timber poaching.

The use of chainsaw milling techniques can generate good economic returns. The use of the chainsaw does not demand a large investment. Around US\$2,000 is needed for equipment and a small production unit, compared with more than US\$200,000 to establish a sawmill. This does not take into account the financial resources needed for exploitation and processing operation or the operational skills required.

The chainsaw can become an extraordinary tool for development if it is used to harvest and process timber from areas with approved management plans, that are difficult to access, or in areas with steep slopes where construction of roads can cause irreversible damage to the ecosystem. The increasing use of chainsaws results in more people becoming involved. This further degrades the forest and jeopardizes its future productivity.

Chainsaw milling in public forests and PAs, and the subsequent marketing of timber in local markets, generates a supply of illegal timber. Together with the failure to control illegal logging, this results in a continuing loss of forest values and governance over forest lands and PAs.

Achieving sustainable development in chainsaw use

The absence of regulations for the purchase and registration of chainsaws, along with weak regulatory mechanisms, makes chainsaw milling activities very difficult to control, especially in situations of poor governance.

The state has invested only in agricultural production systems in the area. This leaves the forest as an area with no control and often without an owner, which people can enter freely and alleviate their economic needs. Andean migrants consider land areas with tropical forests as “not worked” and available for conversion to other uses, even though these are not legally allowed.

The control of illegal activities is very difficult, due to the remoteness of and lack of access to the areas in question. The major challenge in addressing chainsaw milling activities is how to implement a control system in an effective and efficient way, with a commitment from the communities themselves.

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