Chainsaw milling – improving timber production and rural livelihoods on farms and in drylands

'Freehand' timber milling with chainsaws is now common in tropical forests and increasingly so outside them, even though there are high risks of injury and fatigue associated, and questions concerning timber quality and legality. Chainsaw attachments that produce quality timber safely and efficiently are increasingly available, especially suitable outside forests where trees are few, scattered, inaccessible, of poor form or small size, and capital to invest in milling equipment is limited. This policy brief is aimed at those involved in making and implementing policy in the forestry and wood processing sectors, and companies involved in manufacturing and selling chainsaws, accessories and milling equipment, to promote training, supply appropriate equipment and develop markets.

Chainsaw milling Grevillea robusta on-farm in Kenya.

The future of timber production is not from forests

Increasing timber consumption means most countries are now net timber importers. More natural forest is being conserved for 'the global good', and what remains has to be protected from conversion to agriculture or urban development and managed sustainably. Plantations will continue to supply high volumes of timber for industry, but this will not be enough – so where is the timber of the future going to come from?

The timber we demand will have to come from outside forests, and farmland and drylands have already showed potential with the application of appropriate knowledge and technology. Some countries such as China, Kenya and India have been pioneers in producing timber from farms and land unsuitable for food production. This should be applauded, highlighted and promoted, and increasing the supply of cheap timber from presently timber-deficit regions will also reduce demand for illegal timber from natural forests.

The potential of chainsaw milling

Outside forests, low tree densities and volumes mean many common forestry practices are not viable. Sawmilling machinery suitable in such situations must be portable, able to efficiently cut small diameter, short and sometimes crooked logs, and of low enough capital cost to be economical if milling only a few cubic metres a week. Chainsaw mills fit all these criteria.

Mills are simple frames or guides attached to the chainsaw, and there are a large range available (see footnote). They have characteristics making them appropriate for a limited number of operations within forests but show enormous potential for low volume farm forestry, agroforestry and dryland applications, such as where log extraction and transport is difficult, damaging or too costly, and/or poor form or non-standard log size makes conventional sawmill conversion uneconomic.

Overcoming chainsaw milling myths

"Chainsaw milling is very wasteful, with a wide cut, and produces curved boards with a very rough finish". This may be true if a part-time operator or worker mills 'freehand', but use of a chainsaw attachment and ripping chain produces quality boards with a bandsaw-like finish, much improved recovery, and reduces risks of accidents. Reduced kerf chains are also available.

Chainsaw attachments can also turn firewood to timber, processing logs that other sawmills would not accept. Logs 30 cm long or 15 cm diameter can be milled, with timber possible from branch wood, bent, damaged or oversized logs, offcuts, and reclaimed building timber, or street and fence trees likely to contain nails or other metal.

Using a frame mill to cut extra boards from a side slab that would otherwise have been firewood.

As part of a DFID-funded research project, the global knowledge on chainsaw milling was reviewed. A chainsaw milling training manual and series of posters including all commercially available attachments were produced along with other publications (see footnote). Selected chainsaw mills were also demonstrated in farm forestry and dryland zones in Kenya where they had never be seen before, to great interest.

Chainsaws and livelihoods

Being relatively low cost and easy to use, chainsaws are accessible to more people than any other means of timber processing, except the axe and handsaw. Pitsawing is still widespread though its use is declining rapidly, being replaced with chainsaw milling. However, most chainsaw operators do not own their own saw, usually hiring, renting or 'borrowing'. Many operators are saving up in hope of one day becoming an owner-operator, or even being able to just rent out their machine without having to do the hard work.

All operators say they are better off now than before they began using a chainsaw, when most were without regular paid work. But chainsaw milling freehand has a high risk of injury and fatigue. Safety clothing is rarely used in the tropics and even basic precautions are ignored. Removing chain depth gauges is also common, increasing cutting speed but also risks of 'kickback', and poor posture and high vibration and noise levels have other long-term impacts. The use of chainsaw attachments would greatly reduce these problems.

Banking with planking?

Trees are savings banks. In agriculture and agroforestry systems, farmers can turn them into cash during low-income years, during droughts, if crop/ livestock prices fall, or if money is required to pay for hospital or school fees, marriages or funerals. Inexpensive portable sawmills can add greatly to the value of withdrawals from the 'bank', by adding value through milling. The revenue from sawn timber will be much larger than that received from selling standing trees to merchants, who may also exploit farmers' financial plight.

On farms and in drylands, trees have rarely played a significant role in rural incomes, though increasingly the need for diversification and indirect benefits are encouraging tree planting. A greater quantity, quality and diversity of timber products will have secondary effects locally, stimulating further processing such as furniture or craft making, transport, and a trade in tools, materials and equipment. More money to tree owners and processors from value addition will increase cash flow, chances for re-investment, and general benefits to the local economy. Adding value to trees will also improve chances for more planting and management.

Chainsaw milling Prosopis juliflora, a dryland weed in Kenya. Note homemade 'slabbing rails' for the first cut.

Ways forward?

The technology for low-cost wood conversion with chainsaw exists, some of it over 50 years old, and news will spread rapidly once the potential is shown. Markets exist, and will adapt as soon as supplies increase. But skills need to be taught, with training identified as the single most important need. This is the greatest challenge, and one not for extension workers alone, but also for machinery manufacturers and dealers who will gain from developing enterprises, it being in their best interests to invest in such knowledge sharing.

Increasing the role timber plays in rural incomes

This can be achieved if those involved in making and implementing policy in forestry and wood processing acknowledge and take steps to:

1. Promote training in chainsaw safety, use and milling.
2. Make appropriate tools and machinery available.
3. Develop markets, also for lesser-known species.

Turning farmlands and drylands into timber producing areas, equipped with the appropriate skills and tools, is a realistic goal. But to achieve this will take the efforts of committed individuals at all levels, to raise awareness and provide training, equipment and markets. This will ensure that chainsaw milling makes a positive – rather than a negative – contribution to rural livelihoods and forest conservation.

For further information contact Nick Pasiecznik (npasiecznik@wanadoo.fr), or see 'Turning Trees to Timber: A Chainsaw Milling Manual' and other project outputs (http://chainsaw.gwork.org/, www.hdra.org.uk, or write to International Research Department, HDRA, Coventry CV8 3LG, UK.)
This publication is an output from a research project funded by the United Kingdom Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID. R8510 Forestry Research Programme.