

Chainsaw milling in Ghana

An overview of the issues

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In spite of being banned in 1998, chainsaw milling continues to be a major supplier of lumber to Ghana's domestic market. It also helps sustain rural economies and livelihoods. This overview, largely based on a case study of chainsaw milling in Ghana, was produced within the framework of the 2007–2012 project "Developing alternatives for illegal chainsaw milling in Ghana and Guyana through multi-stakeholder dialogue."² It examines the evolution of the policy, legal and institutional framework of the chainsaw enterprise, and provides insight into the social, political, legal and economic factors that drive it. The overview provides recommendations for a more effective regulation of the practice to meet stakeholder needs and to help Ghana achieve sustainable forest management goals.



Introduction

Chainsaw milling is the on-site conversion of logs into lumber for commercial purposes using chainsaws. Illegal chainsaw milling and trade is one of the main forest governance issues in Ghana. A range of policies, laws and institutions have evolved to govern and control the practice. Although chainsaw milling was outlawed in Ghana in 1998, the ban has failed to address the activity, and it continues to flourish.

Chainsaw milled timber is the main source of supply for the growing domestic market and its production generates rural incomes and employment. Chainsaw milling has raised significant public debate and led to intense conflict, but an approach as to how to deal with it in policy and in practice has not yet been developed.

It is crucial to develop options that take into consideration the merits of the claims for banning chainsaw operations. Two main assumptions underlie the ban:

- chainsaw milling is wasteful, and using it to supplement sawmilling will lead to a rapid degradation of forest resources and the environment.
- allowing chainsaw milling to take place will lead to enormous monitoring challenges that the Forestry Commission does not have the capacity to deal with.

This summary document addresses the following questions:

- How did chainsaw milling evolve and what has been the policy response to it over the years?
- What led to the ban of chainsaw operations and to what extent has the enforcement of the ban been successful?
- What are the key social, political, economic and market drivers of chainsaw milling?
- What is the legal framework for the practice and to what extent does this enhance or complicate enforcement?
- What are the economic, social and environmental advantages and disadvantages of using chainsaws to sawmill timber compared to other forms of milling?
- How does the overall policy, legal and institutional framework, including tenure and access rights, affect chainsaw operations?

The forestry sector in Ghana

Ghana's forests cover about 1.6 million hectares (ha); see Table 1. This figure is down from eight million ha at the beginning of the 1900s, which indicates a high rate of deforestation. Some forest resources are located in the approximately 260 production- and protection-forest reserves, and a significant proportion is located outside these areas. These off-reserves consist of a mosaic of patchy secondary forests, sacred groves and communal forest lands. Significant timber resources outside forest reserves also exist on farmlands, especially cocoa farms; farmers traditionally used trees to provide shade for their cash crops. Ghana has been harvesting timber at unsustainable levels, sometimes four hundred percent of the official allowable cut. Off-reserves provide a substantial proportion of the harvest (70 percent), which is mostly undocumented and largely carried out by chainsaw operators (Parren et al. 2007).

Currently, timber rights are granted in the form of long-term Timber Utilisation Contracts or temporary permits such as timber utilisation permits (TUPs) and salvage permits. Although TUPs were intended to be used for non-commercial use of the forest, such as supplying timber for community development projects, there is evidence that they have been abused and used for commercial purposes.



In the past, the Ghanaian timber industry has been oriented to exports, and chainsaw milling has helped meet the domestic demand, which is increasing. Today, chainsaw milling supplies at least 80 percent of timber for the domestic market. It has been the main supplier to the domestic market of prime hardwoods with a high export value, such as Iroko.

Table 1.
Key facts
about forestry in Ghana

*3.3 million m³ is a conservative estimate by the FC; 4.4 million m³ is based on the case study
** 450,000 m³ is a conservative estimate by the FC; 1.3 million m³ is based on the case study; see Table 2

Land area	238,500 km ²
Population	22.5 million
Forest area (forest reserves)	1.6 million ha (16,000 km ²)
Off-reserve forest area	400,000 ha (4,000 km ²) spread over an area of 6 million ha
Allowed annual cut	2 million m ³ per annum (0.5 million m ³ in forest reserves; 1.5 million in off-reserve forests)
Installed processing capacity	5 million m ³ per annum
Production	3.3–4.4 million m ³ per annum *
Local lumber production	450,000–1.3 million m ³ per annum **
Deforestation rate	65,000 ha/year
Contribution to GDP	6%

Institutional and legal framework

Chainsaw milling has gone through several phases. It was a recognized enterprise before the 1980s, after which time registration by District Assemblies became required. In 1991, direct controls were instituted; logging procedures and post-logging inspection measures were tightened. In 1998, chainsaw milling was completely prohibited by law.

There is overwhelming evidence that the ban has been ineffective. Enforcement is complicated by inconsistencies in sector policies and in the very laws that proscribe chainsaw milling. Outlawing chainsaw milling for domestic consumption and using official waybills for chainsawn lumber in spite of legal restrictions on the transportation of chainsaw milled timber, for example, are particular problems. It is inconsistent to prohibit the supply of chainsawn lumber without requiring the use of TUPs to address community timber needs. It is also inconsistent to ban chainsaw milling without cracking down on timber markets that openly sell illegal lumber.

Ghana's tree tenure system effectively vests tree ownership and management rights in the state. This alienates communities and farmers even though in practice they decide the fate of trees on their lands. In addition, the financial benefits of timber revenue accrue exclusively to District Assemblies and traditional authorities (chiefs), not farmers. Over the years, this has served as an incentive for farmers to connive with chainsaw operators who are willing to pay them directly for the trees growing on their land.

The chainsaw subsector

Chainsaw enterprises are generally small in scale and loosely structured in terms of organization. Chainsaw milling is often carried out by a small group of operators with assistants who help mill the lumber and transport it from the felling site to access roads. Chainsaw operations are mostly financed by dealers from urban centres who trade lumber in the timber markets, although some individual operators are reportedly self-financing.

Farmlands constitute the most important source of timber and farmers are by far the most important partners to operators, even though timber dealers and carpenters are also involved. Local people also work in the industry as tree spotters and assist in actual operations and transportation.

Processing involves a portable chainsaw, which requires little capital investment; in addition, rural labour is available at relatively cheap rates. The lumber is mostly cut into large beams that are brought to resaw points and cut into various marketable dimensions.

Even though chainsaw lumber mainly supplies the local market, overland export to neighbouring countries is on the increase.



Impacts

Chainsaw lumbering and its ban have had numerous social, economic and environmental impacts on Ghanaian society. Some of these impacts differ from those of mainstream sawmilling; this needs to be considered when developing legal and policy initiatives to address chainsaw milling.

Production and consumption

A high local demand has contributed to the upsurge in chainsaw lumber production.

The price of chainsawn lumber is relatively low, averaging approximately 40 percent of the price for sawmilled lumber. Operators do not pay taxes or rent for trees and their production cost is low. Sawmills pay corporate tax, stumpage fees, social security for workers and income tax in addition to production costs. The high local demand for lumber is not being met by legal supplies from sawmills. In addition, chainsaw milling provides a wider range of species and dimensions of lumber: 25 different lumber dimensions were recorded. The four major species processed by operators are Dahoma, Ofram, Wawa and Mahogany.

Based on analysis from the study, it is estimated that chainsaw milling consumes over eight hundred thousand trees per year, providing approximately a million cubic metres of lumber to the domestic market (Table 2).

Table 2. Employment, production volumes and revenues of chainsaw milling in Ghana

Direct CSM-dependent jobs (stump site)	41,000
Indirect CSM-dependent jobs (processing)	45,000
Number of trees felled by chainsaw operators	818,160 trees
Production: volume of trees felled	2.4 million m ³
Lumber produced	0.9–1.3 million m ³ *
Revenue for communities/farmers	GHC 9.8 million (USD 7 million)
Gross revenue retained by chainsaw operators	GHC 3.7–5.4 million (USD 2.7–3.9 million)
Revenue lost by the FC	GHC 25.5 million (USD 18.2 million)

Amounts estimated by the study, per annum

*Estimated total volume of wood processed by chainsawyers at recovery efficiency rates of 30 and 43 percent, the minimum reported and experimental values from case study were used as the range

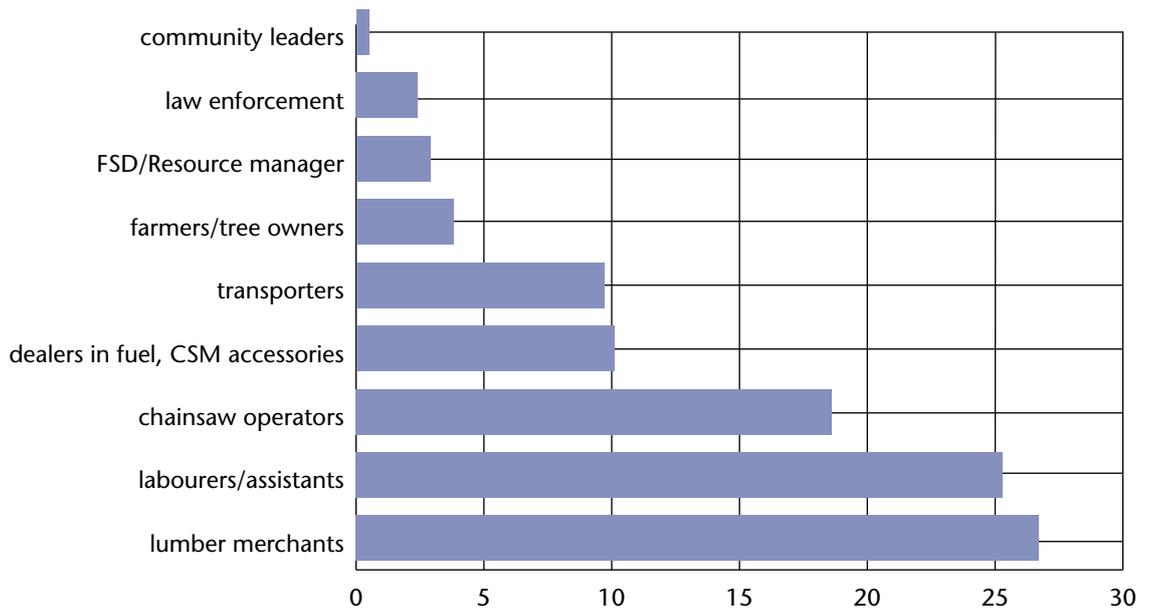
As previously mentioned, farmlands are the most important sources of timber for chainsaw operators; only two percent of operators said they obtained timber from Forest Reserves. Operators prefer farmlands for several reasons: they find high-quality timber trees there; they are less likely to be arrested; access routes are already available for conveying lumber; and the activity opens the land for more farming activities. Farmers were identified as the most important contact persons for negotiating access to trees. This is largely due to the perception of the majority of operators (85 percent) that farmers are owners of the trees. Operators also understand the practicality of negotiating directly with farmers rather than attempting to obtain an official permit; not surprisingly, lumber dealers (and operators) were unlikely to approach officials for permits.

In the study, 86 percent of the lumber retailers interviewed obtained their stock of boards from chainsaw millers, compared to 14 percent who obtained their lumber from sawmills. Just over half of bench-saw millers got their supply of boards from chainsaw millers. Chainsawn lumber was purchased by individual consumers (41%); small-scale carpenters (33%) and other building contractors (29.4%), government institutions (8.6%) and large-scale carpenters (13.5%).

Revenues

Chainsaw milling is profitable. Even though chainsaw operators capture about 19 percent of revenue, the distribution of profits is skewed towards the urban timber dealers who sponsor the operations (Figure 1).

Figure 1.
Distribution
of chainsaw
revenue



Chainsaw lumber production helps sustain rural economies and livelihoods in six ways (Figure 2): employment; community benefits such as provision of schools and wells; informal taxes collected by District Assemblies; supply of lumber; supply of firewood; and services such as transportation.

The most important economic benefit to rural communities is the provision of jobs. The study established that about 86,000 people are involved in chainsaw-related operations and trade (a figure that is probably increasing), compared to approximately 100,000 people in the formal logging industry.

This is significant given Ghana's unemployment rate, which is generally 20 percent in most rural areas of the country. The growing domestic demand for lumber acts as an incentive to support these jobs.

The three most important related jobs identified by communities were carrying boards, loading boards and involvement in actual milling. Most people employed in chainsaw operations are also involved in agriculture or farming. Chainsaw lumbering tends to supplement agricultural income rather than replace it. Chainsaw operations contribute significantly to household budgets: more than half of the people involved in chainsaw activities earn 80 percent of their household income from it.

Chainsaw milling has also contributed to the emergence of community enterprises, including carpentry shops, lumber markets and charcoal production.

State revenue

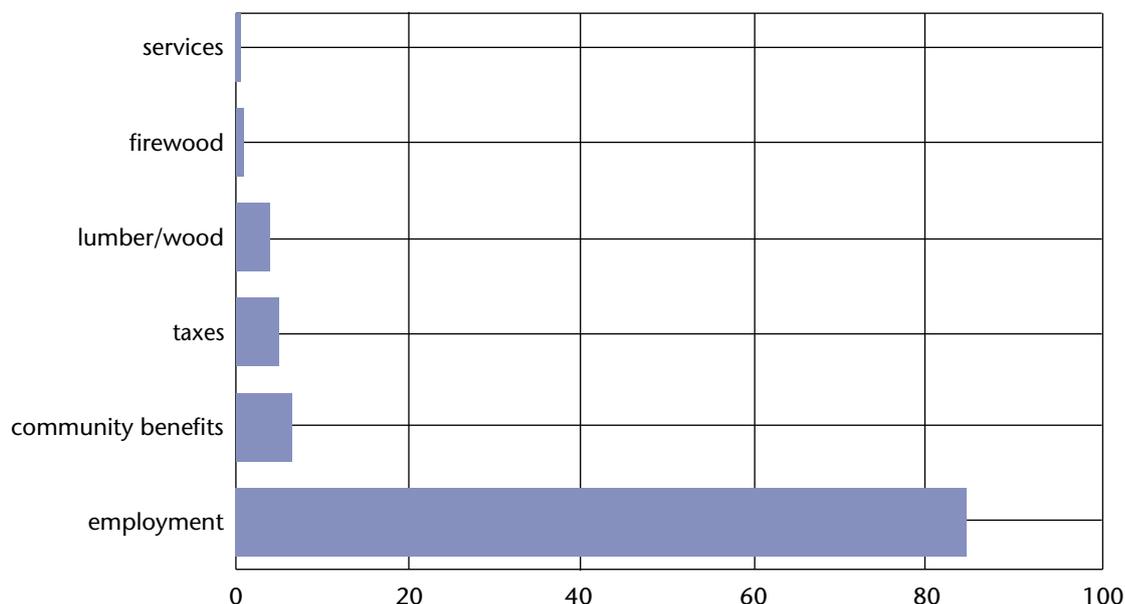
Chainsaw operators do not currently pay a stumpage fee for trees they fell because of the absence of a legal framework. The loss of stumpage revenue to the state is potentially more than USD 18 million per annum. This exceeds the stumpage fees collected from licensed loggers; between 2000 and 2003, the Forestry Commission (FC) collected an average of only USD 9.1 million per year.³ Ghana's FC has the lowest rate of rent collection in West Africa (reportedly less than 50 percent).⁴ Assuming that 40 percent of the potential stumpage from chainsaw operators could be captured under a regularized regime,⁵ this would translate into about USD 7 million per annum.



Currently, the fees paid by chainsaw operators to farmers/land-owners correspond to about 38 percent of the potential stumpage revenue that would have been collected by the FC. Even if the government was willing to pay this amount (USD 7 million) to farmers/land-owners to compensate them for protecting these trees, it could still retain revenue of about USD 11 million annually.

Figure 2.
Economic contribution of chainsaw lumber production to rural economies

Note: Data obtained from the eight forest districts studied in the project



Willingness to pay for trees

Even though chainsaw operators pay some fees to farmers/landowners for cutting trees, this revenue is illegal as it is not paid to the FC. All chainsaw operators interviewed during the case study were willing to pay the FC for the trees they cut (Table 3), although their preferences varied: about half preferred to pay tax on timber; about one-third wanted to pay monthly permit fees; and one tenth wanted to pay tax on their income.

Table 3. Operators' willingness to pay for trees

Quality of tree	Minimum–maximum Ghana cedi (GHC)	Average (GHC)	Comparison with stumpage of US\$7.5/m ³ (or 22.5/tree)
high	5–300	33.9 (\$24)	6 percent more
medium	4–150	17.7 (\$8)	65 percent less
low	2–50	9.4 (\$7)	69 percent less

The summary data in Table 3 suggest that the average price that operators were willing to pay for high-quality timber compares favourably with the stumpage fee currently paid by licensed loggers. In terms of the way in which chainsaw activities should be regularised, at least 70 percent of operators want concessions for registered groups of operators, 18 percent want individual permits and 6 percent want small concessions for individuals. Most operators were in favour of any system that allowed for organized groups.

One key economic challenge, however, is the failure to market chainsawn lumber at a price that would enable it to be sustainable. In the absence of government regulation of chainsaw milling practices, the lumber obtained from chainsaws with improved milling attachments (such as the portable sawmill, Logosol) is likely to be subject to price manipulation by dealers. This may make it difficult for these operators to compete with cheaper chainsawn lumber in the local market.

Recovery efficiency

Chainsaw milling is reputed to be a wasteful method of converting timber into lumber. A comparison of the recovery efficiency of three different milling techniques⁶ shows that a portable sawmill such as Logosol increases processing efficiency by at least 6 percent over free-hand chainsaw milling (Table 4).

Table 4. Comparison of recovery efficiencies

milling technique	Processing efficiency				
	Log recovery (%)	Lumber recovery (%)	Lumber production rate (m ³ /hr)	Fuel consumption rate (litre/m ³)	Processing cost (GHC/m ³)
sawmill	not measured	53.9	—	—	—
Logosol (M7)	67	49.6	0.43	10.8	131.64
free-hand chainsaw	70	43.5	0.52	8.4	88.23

The data were not conclusive on which technique had lower investment and operational costs, or whether the revenues generated were significantly different. This was mainly because the market did not distinguish between portable-sawmilled lumber and chainsawn lumber in terms of price.

Conflict

Even though chainsaw operators and farmers face significant conflicts, they seem to be coping within constructive limits; therefore, chainsaw milling cannot be said to have grave social consequences for farming communities. In fact, there is a high incidence of farmer-operator cooperation with regard to chainsaw operations.

In general, conflicts are part of the everyday struggle over commercial access to timber. Although only 59 percent of farmers were paid some compensation for the damage to their farms inflicted by logging, this is no worse than the percentage indicated by other studies that included licensed loggers.

Severe conflicts can arise between the Forest Services Division (FSD) and operators due to FSD confiscation of sawn timber and haulage trucks. In some cases these encounters have reportedly resulted in lorry accidents, injuries and even death.

Environmental impacts

The most pervasive argument against chainsaw milling has been its negative environmental impact. The case study, which includes the results of an environmental impact assessment of chainsaw milling, noted several negative environmental consequences compared to conventional logging:

- the estimated logging intensity can be as high as seven trees/ha, which exceeds the standard of two to three trees/ha;
- some valuable tree species are felled below recommended size limits;
- most chainsaw operators do not practise directional felling; this can lead to the destruction of young trees and agricultural crops;
- chainsaw operators have carried out a significant invasion of ecologically sensitive sites such as globally significant biodiversity areas and convalescent areas of production forest reserves.



In terms of logging waste and impact on soil and forest canopy, however, chainsaw milling can be less destructive than conventional commercial logging. The actual impact of chainsaw milling in terms of ground area exposed to soil hardening and erosion, canopy gap and recovery volumes observed in the study does not differ significantly from data obtained from conventional logging.

The problems related to chainsaw milling seem instead to stem from lack of technical know-how and from the illegal framework within which it operates. A regularised environment could support administrative development and capacity building to address issues like directional felling, logging intensity and choice of sites.

The available resources for logging and chainsaw milling are dwindling: 90 percent of operators interviewed for the study said that timber was less available than previously. The main reason for this is unregulated harvesting by both chainsaw operators and conventional logging operations; 72 percent of operators admitted that this had contributed to the scarcity of timber. This situation may force chainsaw operators in the near future to target protected areas such as forest reserves, as these remain the only areas with commercial timber trees. This may create serious conflicts; chainsaw operators would then have to compete with licensed loggers for trees.

The ban

The chainsaw milling ban has not been effective in addressing indiscriminate logging. Most stakeholders agree that the ban on chainsaw milling has not worked to stop the practice, lessen the pressure on forest resources or reduce conflict between stakeholders.

Surprisingly, at least half of the District Forest Managers interviewed during the case study agreed with most of its observations and suggested that the ban be revisited. Lumber dealers felt that criminalizing chainsaw operations leads to loss of revenue to the state due to non-collection of taxes. Another side effect is the corruption of officers and the confiscation of lumber.

Six major factors contribute to the ineffective enforcement of the ban:

- corruption among FSD officials;
- corruption among law enforcement agencies;
- a high rate of rural unemployment;
- a lack of political will to enforce the ban;
- market demand (i.e. the relatively cheap price of chainsawn lumber); and
- political interference, particularly by chiefs and local politicians.

High transaction costs — in terms of FSD personnel's time in the courts — are a disincentive for prosecuting cases. FSD deals with a significant number of issues that do not lead to convictions or to the collection of fines.

Monitoring of chainsaw milling operations is problematic due to the operators' informal organization, their lack of record-keeping (in order to avoid paying taxes), and the clandestine nature of their activities.

With respect to monitoring, 98 percent of operators interviewed for the case study said they had been arrested. This suggests that monitoring activities have not been relaxed and that being arrested has not deterred these individuals. Almost all operators admitted that they were aware that their activities were illegal; ignorance of the law is not an issue.

Recommendations

Social and economic benefits

A specific economic, social and political environment drives chainsaw milling. Most stakeholders recognise that chainsaw milling is important both as an employer of rural youth and a supplier of domestic timber. Regularization or eradication of chainsaw milling could adversely affect the rural economy and would affect enterprises that depend on it for lumber. It could also reduce employment and income-earning opportunities for rural people who are directly involved in chainsaw operations.

Dwindling forest resources

If the estimated harvest by chainsaw operators of about 2.4 million cubic metres is added to the official allowable cut of 2 million cubic metres, this means an annual harvest level of about 4.4 million cubic meters. This is approximately four times the recommended allowable cut. If the current level of exploitation continues, a serious shortage of merchantable trees is imminent. Plantation development therefore seems to hold the key to the sustainability of both the formal industry and chainsaw milling enterprises.

Access

Tenure reforms that recognise some ownership or management right on the part of communities, especially outside forest reserves, are an important consideration. In practice, farmers already decide the fate of trees on their land. The current regime of benefit-sharing – which alienates communities — needs serious restructuring in order to gain community assistance in the management of forest resources. In effect, forest resources must be seen as economic resources that benefit communities.

Policy reform: lifting the ban?

Ghana's 1994 Forest and Wildlife policy can incorporate all the options suggested by stakeholders and experts in dealing with chainsaw milling. The legal framework criminalises the use of chainsaw milling and trading for commercial purposes, although its enforcement has been fraught with difficulties and inconsistencies. The law does not criminalise CSM for household use but the FSD's Manual of Operations does not provide straightforward procedures for domestic use permits to use chainsaw to mill timber for local consumption.

In spite of the ban on chainsaw milling in Ghana, the practice is highly accepted among the general public. It is also supported by some stakeholders, including more than half of FSD District Managers. The timber trade associations, especially the Ghana Timber Millers' Organization, oppose it, however.

Social, economic and environmental impact studies show that most of the negative impacts of chainsaw milling are the result of its being banned and of the attendant problems of ineffective monitoring, rather than of the practice itself. If the fundamental reason for the chainsaw ban was its adverse environmental impacts, the empirical observations in the study do not support this claim.

Chainsaw operations need to be regulated, either through effective enforcement of the ban or by being integrated into mainstream forest management and operations. Based on the information provided by the case study, the ban needs to be reviewed. Declaring chainsaw milling as illegal without addressing the timber markets that sell these "illegal" products is not realistic or effective.

Since chainsaw milling has high social acceptance and significant economic interests and it supplies a critical domestic market, maintaining a ban without effective enforcement capability may only enforce connivance and illegality.

Enforcing the ban will be very challenging unless three critical conditions are simultaneously met:

- the timber industry is prepared to supply wood to the domestic market;
- FSD procedures are streamlined to allow for the processing of timber for domestic use; and
- resource governance is significantly improved (particularly in terms of corruption within the FSD and law enforcement agencies) and genuine political will for addressing chainsaw milling is secured.



Since it is unlikely that these conditions can be met within the near future, and since chainsaw milling is increasing, some immediate interventions should be instituted.

Even though there is increasing pressure to lift the ban, the study suggests that this option should be approached with some caution. Several tenure, procedural and monitoring capacity issues still need to be resolved:

- How should policy initiatives address the issue of request for timber for domestic purposes by individuals?
- What specific provisions are needed in the procedure manual for harvesting timber outside reserves to address the domestic use of timber using registered chainsaws?
- What capacity in terms of personnel and logistics of the FSD is needed under a regularised chainsaw milling regime?
- What licensing mechanism is needed to integrate chainsaw operations?
- How does the government ensure equity in the payment of economic rent (or stumpage) for trees?
- What are the impacts, especially on the resource base and the domestic market, of an arrangement that regularizes chainsaw milling?
- How will the government pursue the legality assurance condition under the Voluntary Partnership Agreement with its EU trade partners without addressing legality of domestic timber supplies?

Domestic timber supply

Approaching the problem from the demand side is a more practical option. Without addressing the issue of domestic timber supply within the context of the production and supply of legal timber, it may almost be impossible to develop and enforce an adequate chainsaw milling policy. Chainsaw milling is increasing because the high local demand for lumber is not being met from sawmills and because it provides a wider range of species and dimensions. Supplying this demand with legal timber must be the basis of any policy option. This requires obtaining information on the exact size of the demand in the domestic market and assessing whether legal sawmills can meet this demand.

Distribution of benefits

Many people support the idea of paying financial benefits directly to farmers as a way to build a state-community partnership that can address illegal logging (Marfo 2004; Adam et al. 2007). It has been proposed that 40 percent of timber revenue collected by the FC from off-reserve areas be distributed to communities or farmers as a way to compensate them for tending and managing the trees on their lands and farms. This seems to be supported by economic analysis. Farmers already gain almost this much through direct payments from chainsaw operators. Chainsaw lumber production has become a key contributor to rural livelihoods. This fact — coupled with the apparent connivance of operators with FSD staff and traditional resource owners — suggests the difficulty that the country will face in enforcing regulations. The government may need to consider incentives to ensure that adequate benefits from tree resources are paid, especially to farmers and land-owners.



Multi-stakeholder dialogue

A process is needed to review the ban of CSM and design innovative policy options to address the issue of supplying the domestic timber market with legal timber. Stakeholders need to be engaged in this process as soon as possible. The multi-stakeholder dialogue approach is crucial; the drivers for CSM cut across social, political, environmental and economic realms and involve a range of stakeholders.

Several factors must be considered when beginning discussions to design innovative policy options:

- Policy discussions need to be approached with an open mind, because there is general social acceptance of CSM, and because most stakeholders are in favour of regulating the activity rather than maintaining a ban that cannot be enforced.
- In order to be effective, policies must have the participation of key stakeholders, including legal and illegal loggers.
- It is vitally important to deal with local elite interests.
- Dealing with sector corruption, particularly within the FSD district-level staff and the police, is a fundamental requirement.
- The applicable laws on CSM must remove the ambiguities often encountered by practitioners. It may be useful to subject this interpretation to further public and stakeholder discussion.
- The procedure manuals for harvesting timber need to be revised to accommodate a range of methods for accessing and processing timber for domestic use.
- Research should continue to be an important part of policy discussions. Stakeholders need relevant information when considering options and impacts.



Capacity building for stakeholders

Any effort to integrate chainsaw operators in mainstream forest operations should consider improved technology for and organization of operators; otherwise, monitoring will be difficult. In addition, the capacity of the FC and civil society groups needs to be increased to ensure that they can facilitate effective monitoring and ensure compliance.

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Endnotes

1. The author is a research scientist at the Forestry Research Institute of Ghana.
2. See Marfo, E., K. A. Adam and B. Darko-Obiri (eds.). 2009. *Ghana country case study report on chainsaw milling: Developing alternative to illegal chainsaw milling through multi-stakeholder dialogue in Ghana and Guyana*. Final Report. CSIR-Forestry Research Institute of Ghana/Tropenbos International, The Netherlands.
3. Adam and Gyamfi 2009.
4. Birikorang and Rhein, 2005.
5. The Forestry Commission's share of legal stumpage fees is 40%.
6. The comparison was based on data from a recent sawmill efficiency study commissioned by the Forestry Commission (Gyimah and Adu-Gyamfi 2009), a FORIG/ITTO project on processing of log residues using a Logosol portable sawmill, and field experiments carried out as part of the Ghana case study involving four species of trees and Stihl and Husqvarna chainsaws.

The EU-funded project “Developing alternatives for illegal chainsaw milling in Ghana and Guyana through multi-stakeholder dialogue” is being carried out by Tropenbos International in collaboration with the Forestry Research Institute of Ghana (FORIG) and the Forestry Commission (FC) in Ghana, and with Forestry Training Centre (FTCI) and Iwokrama in Guyana. The project aims to find sustainable solutions for the problems associated with the production of lumber for the local timber markets in Ghana and Guyana. It involves all stakeholders in dialogue, information gathering and the development of alternatives for unsustainable chainsaw milling practices. The overall objectives of the project are to reduce poverty and promote viable livelihood in forest-dependent communities; reduce the occurrence of illegal logging; and promote the conservation and sustainable management of tropical forest in developing countries.



This publication has been produced with the financial assistance of the European Commission: The Programme on Tropical Forests and other Forests in Developing Countries, and the Ministry of Foreign Affairs of The Netherlands.

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Published by: Tropenbos International, Wageningen, The Netherlands

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Citation: Marfo, Emmanuel. 2009. *Chainsaw Milling in Ghana: An overview of the issues.*

Editors: Emmanuel Marfo, Patricia Halladay, Roderick Zagt and Marieke Wit

Layout: Patricia Halladay Graphic Design

Photos: TBI and FORIG

Cover photo: James Parker Mckeown

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