4.5 Chainsaw milling in Ghana: context, drivers and impacts

EMMANUEL MARFO

Introduction

Chainsaws were introduced in Ghana in the 1960s and gradually replaced the use of manual saws for felling and cross-cutting trees. Chainsaw milling (CSM) became widespread in the early 1980s, when large-scale sawmill operations decreased along with a nationwide economic decline.

CSM has been outlawed in Ghana since 1998. The ban has failed to limit the activity, however; CSM is now one of the main forest governance problems in the country. Chainsawn 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 but a workable approach on to how to deal with it in policy and in practice has not yet emerged. A range of policies, laws and institutions has evolved to govern the practice and manage its consequences.

Export policies should be fully aligned with domestic market policies since both markets draw timber from the same resource.

The Voluntary Partnership Agreement (VPA) between the European Union (EU) and Ghana emphasizes the need to resolve the CSM issue. The question of legal timber — and how it can be addressed in the context of the domestic market — is central. Within the current regime of prohibition and ineffective enforcement, it is difficult to see how Ghana will be able to satisfy the legality assurance criterion of the VPA when its domestic market sells illegal chainsawn lumber.

Forests and the forestry sector

The total land area of Ghana is more than 23 million hectares (ha) (Table 1). Forest lands are owned by local communities and vested in “stools” (chiefs and families). The forest resources, however — whether in forest reserves or outside of them — are managed by the Forestry Commission (FC). Thus, even though traditional authorities are recognized as land-owners and receive benefits as such, they do not have any management rights over “their” forest.

Emmanuel Marfo works for CSIR-Forestry Research Institute of Ghana.

Ghana used to be rich in forest resources, and forests were an important part of the economy. There is a large local timber sector, which is predominantly export-oriented and unable to fulfill the demands of the less lucrative domestic markets. Today, the country's forest resources are highly degraded. Wildfires, agriculture and indiscriminate logging (including through CSM) have contributed to this problem.

Table 1. Key facts about forestry in Ghana

land area	238,500 km^2
population	22.5 million
estimated number employed by forest industry	100,000
forest area (forest reserves)	1.6 million ha (16,000 km^2)
off-reserve forest area	400,000 ha (4,000 km^2) over an area of 6 million ha
Annual Allowable Cut (AAC)	2 million m^3 per annum (1.5 million in off-reserve forests; 0.5 million m^3 in forest reserves)
installed processing capacity	5 million m^3 per annum
deforestation rate	65,000 ha/year
export value wood products	GHC 366 million (US$260 million)
contribution to GDP	6%

Institutional and legal framework

Chainsaw milling was a recognized enterprise before the 1980s, after which registration by District Assemblies became required. In 1991, direct controls were instituted; logging procedures and post-logging inspection measures were tightened. CSM continued in an excessive and uncontrollable way, and in 1998 the practice — including transportation and trade of its products — was completely prohibited by law. This ban has not ended the practice, however, and CSM continues to dominate supply to the domestic market.

CSM is mainly regulated through the *Timber Resource Management Act* and its legislative instruments. The Timber Resources Management Regulations of 1998 have specific provisions that criminalize chainsaw milling and operations for commercial purposes.

If the lumber is not meant for sale, exchange or for any commercial purpose, then CSM is permitted. The source of the timber — whether from forest reserves, farms within forest reserves or community forests — is not relevant. Although the law seems to allow CSM with a registered chainsaw for household purposes, it does not allow this lumber to be transported unless accompanied by a conveyance certificate. To address this contradiction, some District Managers of the Forestry Services have issued waybills to allow the transport of CSM lumber.

In November 2009 the first VPA between Ghana and the EU was signed and ratified on legal timber exports, including the domestic market.[1] Illegal chainsaw milling challenges Ghana's ambitions to develop a legal and sustainable forestry sector.

The chainsaw milling subsector

Chainsaw enterprises are generally small and loosely structured. CSM 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. Operations are mostly financed by dealers from urban centres who trade lumber in the timber markets, although some individual operators are reportedly self-financing.

Timber production and trade

Based on a nationwide survey (TIDD/FORIG 2009), 72 species were processed through CSM and processed into 112 product dimensions. About 84% of the lumber in the domestic markets studied was supplied by chainsaw operators; 16% came from sawmills (Marfo, Adam and Obiri 2009 and TIDD/FORIG 2009).

Chainsawn lumber is 12–74% cheaper than sawmilled lumber from the same tree species, quality and dimensions and the range of species and dimensions it offers is much larger. (Adam and Dua-Gyamfi 2009; Obiri and Damnyag 2009b).

Conversion efficiencies for CSM in Ghana range from 27–40%, averaging 30.3% (Marfo 2010). The annual harvest volume by chainsaw operators ranges from 2.2 to 2.9 million m^3; given an average tree volume of almost 3 m^3, this is equivalent to about 745,000 to 970,000 trees per year. If non-market direct consumption by households for building, roofing, etc. was included, the estimate would be even higher. This means that the harvested volume could be higher than Ghana's official AAC of 2 million m^3 per year, suggesting that CSM contributes substantially to the country's forest loss.

The profit from CSM over the value chain ranges from 15–22% of total production costs with an average profit of GHC 66.6/m^3 (Obiri and Damnyag 2009a.). The transporter and supplier of the machines, fuel and accessories each receive approximately 10% of the gross revenue;[2] the operator receives 19%; and labourers and production assistants, providing various services, jointly earn 25%. Lumber merchants receive the highest proportion of revenue (27%) from chainsawn lumber. The difference in gross margin between the operator and the lumber merchant's income is about 8%. As tends to be the case in many commodity chains, the sellers at the end of the chain make the most money.

Employment

Recent studies (Marfo and Acheampong 2009; Marfo 2010) estimate that more than 97,000 people could be participating in production, hauling, resawing and retailing in the domestic market alone (Table 2), almost as many as in the formal industry. Many other people indirectly derive income from services at the timber markets or depend on chainsawn wood for their work.

Table 2. Summary of CSM statistics

total annual gross revenue from CSM	GHC 279 million
annual gross revenue retained by chainsaw operators	GHC 52 million
total annual profit from CSM	GHC 37 million
net profit of CSM	GHC 66.6/m^3
volume of trees annually harvested by CSM	2.5 (2.2–2.9) million m^3
number of trees harvested	842,000 (745,000–970,000)
conversion efficiency of CSM, based on total usable tree volume	30.3%
number of species processed by CSM	72
dominant species supplied to market	mahogany, wawa, dahoma, ofram
volume of CSM lumber sold in the market	558,054 m^3
volume of chainsawn lumber consumed in Ghana from the domestic market	496,815 m^3
proportion of chainsawn lumber in the market	84%
number of people directly engaged by CSM	97,000
annual potential stumpage revenue lost by the FC	GHC 25 million
estimated annual value of informal payments	GHC 33.5 million

Source: Marfo 2010; at time of writing, US$1 = GHC 1.4

Drivers of chainsaw milling

Chainsaw milling has persisted in Ghana even though it is banned. In order to design effective policy responses, it is necessary to know the key factors that drive chainsaw milling. Marfo, Adam and Obiri (2009) distinguished the following drivers:

- corruption and weak institutional governance;
- a high level of rural unemployment;
- strong market demand for cheap lumber and an inability of formal sawmills to meet this demand;
- political interference in Forest Services Division (FSD) operations;
- lack of political will to enforce the ban and implement alternatives;
- an unclear legal framework and an inadequate policy response to the domestic timber demand;
- inadequate tenure arrangements and inequitable benefit sharing of forest resources; and
- strong support for CSM by local communities, particularly farmers.

Impacts of chainsaw milling

Socio-economic impacts

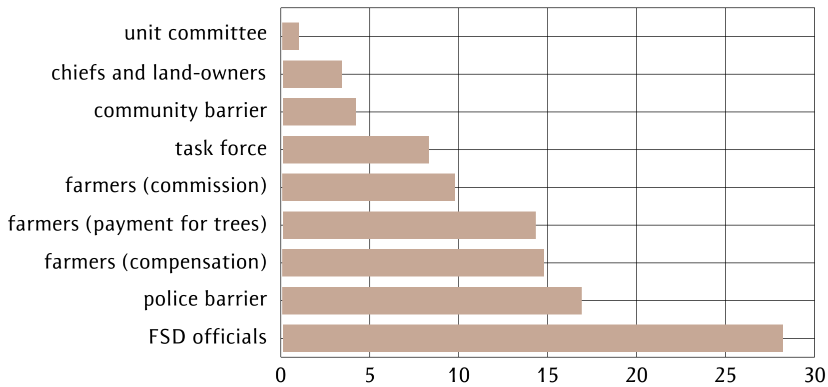
Chainsaw lumber production helps sustain rural economies and livelihoods in six ways: employment; community benefits such as provision of schools and wells; informal taxes collected by District Assemblies; supply of lumber; supply of firewood; and services such as transportation (Obiri and Damnyag 2009b).

The most important economic benefit to rural communities is the provision of jobs. The income earned from chainsaw operations is higher than that from alternative labour activities in the communities (Obiri and Damnyag 2009b). Operators working full time on chainsaw operations may earn as much as 24 times the income of alternative work such as subsistence farming.

Chainsaw operators do not pay a stumpage fee for trees they fell because of the absence of a legal framework, but they need to make substantive informal payments in order to keep their operations going. Based on the estimated CSM production, the stumpage revenue foregone by the state is more than GHC 25 million (US$18 million) per year. Informal payments accrue to a wide range of people; public officials (FSD, police and task force) directly involved in enforcing the ban capture at least 50% of these payments (Figure 1).

Figure 1. Informal payments (%) per single operation in eight study districts

Source: modified from Obiri and Damnyag 2009a; n = 120



Conflicts are part of the everyday struggle over commercial access to timber. Ongoing conflicts related to CSM involve operators and communities (farmers) and operators and forestry officials (including court cases). The two main causes of operator-community conflicts involve lack of consultation with farmers before logging and insufficient compensation for crop damages. Forestry officials face the possibility of violence when they have conflicts with illegal operators; violent clashes have been reported (Marfo and Nutakor 2009). Conflict is costly to the FC. Its officers report that they spend 25–75% of their time on chainsaw-related matters. If a conflict reaches court, an average of seven court appearances is needed to resolve the matter (Marfo and Nukator 2009).

Environmental impacts

The most pervasive argument against CSM is its negative environmental impact. Marfo, Adam and Obiri (2009) noted several negative environmental consequences compared to conventional logging:

- 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; and
- chainsaw operators have invaded ecologically sensitive sites such as Globally Significant Biodiversity Areas and convalescent areas of production forest reserves.

The problems related to CSM seem to stem from lack of technical skills and from the illegal framework within which it operates. A regularized environment could support administrative development and capacity building to address issues such as directional felling, logging intensity and choice of sites.

Conclusions

Ghana is in a dilemma as to how to deal with CSM in both policy and practice. A specific economic, social and political environment drives CSM. Most stakeholders recognize that it is important both as an employer of rural youth and a supplier of domestic timber. Regularization or eradication of CSM would adversely affect the rural economy and the enterprises that depend on it for lumber. It would also reduce employment and income-earning opportunities for rural people.

If the current level of exploitation continues, however, a serious shortage of merchantable trees is imminent. Ghana would lose much of its remaining forest and the services they provide. Based on the estimated CSM harvest of about 2.5 million m^3 and the AAC of 2 million m^3, the annual harvest can be estimated at about 4.5 million m^3. This is approximately four times the recommended allowable cut — a figure that is itself probably outdated.

The current regime of benefit sharing — which alienates communities — needs major restructuring in order to gain community support for the management of forest resources. Tenure reforms that recognize some ownership or management rights on the part of communities, especially outside forest reserves, are an important consideration.

The ratification of the EU-Ghana VPA in 2009 further emphasized the need to address the CSM issue. If Ghana is not able to assure the legality of the domestic market, including CSM, the country's export trade with the EU is likely to be affected. A strict implementation of the VPA — with its legal assurance systems and law enforcement — could spell the end of CSM, which provides a living for hundreds of thousands of people in Ghana. Bridging the numerous conflicting local and global interests that characterize CSM requires a meaningful and inclusive dialogue by all stakeholders.

Chainsaw operations need to be regulated, either through effective enforcement of the current ban or by being integrated into mainstream forest management and operations. Declaring that CSM is illegal without addressing the timber markets that sell its illegal products is not realistic or effective. Legalizing a practice that is clearly operating at unsustainable levels is also not an option.

The way forward

For any policy option to be effective, it must optimize the advantages of CSM while reducing adverse environmental and socio-economic effects. Policy should also address the factors that drive CSM. The domestic market demand for lumber has been identified as the major driver for illegal CSM in Ghana. Without addressing this issue within the context of the production and supply of legal timber, it may be impossible to develop and enforce an adequate CSM policy. Because of the significance of CSM, solutions must be discussed and agreed to by a wide range of actors. The illegal nature of the practice makes it difficult to formally engage chainsaw millers in dialogue, but this is necessary to build support for sustainable solutions.

Since 2007, a process of multi-stakeholder dialogue has involved both legal and illegal actors and aims to find a consensus on the CSM challenge.[3] The process aligns with the National Forest Forum and VPA implementation processes and so far has increased common understanding of the main issues and identified acceptable options to address CSM and domestic market supply.

Participants in the process agreed that, based on lessons learned from the CSM ban and experiences elsewhere in Africa, the transformation of CSM into regulated artisanal milling[4] is worth exploring. The way forward lies in reconciling the demand for adequate legal timber for the domestic market with the sustainable production capacity of the country's forest resources. Export policies should be fully aligned with domestic market policies since both markets draw timber from the same resource. Ultimately, supplies may have to come from plantations or imports. For now, the process considers three possible policy directions:

- Option 1: Sawmills alone to supply the domestic market with legal timber. This implies the maintenance and full enforcement of the CSM ban, and the development of a range of options to encourage sawmills to supply domestic markets.
- Option 2: Sawmills and artisanal millers to supply the domestic market with legal timber. This implies allocation of harvesting rights to artisanal millers and the logging industry. Options must be developed to create equitable conditions for sawmillers and other participants in the domestic market.
- Option 3: Artisanal millers alone supply the domestic market with legal timber. This implies allocation of harvesting rights to artisanal millers.

These options are being discussed within the forestry sector. Studies — including an economic analysis of the costs and benefits of these options for various stakeholders — are underway to help participants in the multi-stakeholder process to develop suitable ways forward.

Acknowledgements

The author is grateful for the EU funding that made this research possible under the framework of the EU-Tropenbos International chainsaw milling project, “Developing alternatives for illegal chainsaw milling in Ghana and Guyana through multi-stakeholder dialogue.” The project aims to find sustainable solutions to the problems associated with CSM. Many thanks to various scientists, notably Emmanuel Acheampong, Kwame Asamoah Adam, Beatrice Obiri, Lawrence Damnyag, Eric Nutakor, Francis Wilson Owusu, Kwame Appiah, Akwasi Dua-Gyamfi, Dominic Blay and Victor Agyeman, who were involved in the country case study. Thanks also to the project management team in Ghana for support and to Roderick Zagt and Marieke Wit for their inspiration in writing this paper.

Endnotes

1. VPAs between the EU and timber-exporting countries implement the EU Action Plan for Forest Law Enforcement Governance and Trade (FLEGT).
2. This is equivalent to total sales before production and transaction cost (informal payments) are deducted.
3. The “Developing alternatives for illegal chainsaw milling in Ghana and Guyana through multi-stakeholder dialogue” project aims to find sustainable solutions to the problems associated with the production of lumber for local timber markets by involving all stakeholders in dialogue, information gathering and the development of alternatives to unsustainable chainsaw milling practices. See www.chainsaw milling.org.
4. Artisanal millers are trained and organized chainsaw millers who use more efficient equipment, such as Logosol or Wood-Mizer.

References

Adam, K.A. and A. Dua-Gyamfi. 2009. A comparative analysis of chainsaw and sawmilled lumber production to the domestic market in Ghana. In E. Marfo, K.A. Adam and B.D. Obiri (eds.). *Ghana case study of illegal chainsaw milling: Developing alternatives to illegal chainsaw milling through multi-stakeholder dialogue in Ghana and Guyana project.* FORIG Research Report (CSIR-FORIG/TR/EM;KAA;BDO/2009/18).

Marfo, E. 2010. *Chainsaw milling in Ghana: Context, drivers and impacts.* Wageningen, the Netherlands: Tropenbos International, 76 pp.

Marfo, E. and E. Acheampong. 2009. Sustainability of jobs created by chainsaw activities in Ghana. In E. Marfo, K.A. Adam and B.D. Obiri (eds.). *Ghana case study of illegal chainsaw milling. Developing alternatives to illegal chainsaw milling through multi-stakeholder dialogue in Ghana and Guyana project.* FORIG Research Report (CSIR-FORIG/TR/EM;KAA;BDO/2009/18).

Marfo, E., K.A. Adam and B.D. Obiri (eds.). 2009. *Ghana case study of illegal chainsaw milling. Developing alternatives to illegal chainsaw milling through multi-stakeholder dialogue in Ghana and Guyana project.* FORIG Research Report (CSIR-FORIG/TR/EM; KAA; BDO/2009/18).

Marfo, E. and E. Nutakor. 2009. The social and political environment for the enforcement of the chainsaw milling ban. In E. Marfo, K.A. Adam and B.D. Obiri (eds.). *Ghana case study of illegal chainsaw milling: Developing alternatives to illegal chainsaw milling through multi-stakeholder dialogue in Ghana and Guyana project.* FORIG Research Report (CSIR-FORIG/TR/EM;KAA;BDO/2009/18).

Obiri, B.D. and L. Damnyag. 2009a. Economic impact on rural and national economies. In E. Marfo, K.A. Adam and B.D. Obiri (eds.). *Ghana case study of illegal chainsaw milling. Developing alternatives to illegal chainsaw milling through multi-stakeholder dialogue in Ghana and Guyana project.* FORIG Research Report (CSIR-FORIG/TR/EM;KAA;BDO/2009/18).

Obiri, B.D. and L. Damnyag. 2009b. Market and financial environment of chainsaw milling in Ghana. In E. Marfo, K.A. Adam and B.D. Obiri (eds.). *Ghana case study of illegal chainsaw milling. Developing alternatives to illegal chainsaw milling through multi-stakeholder dialogue in Ghana and Guyana project.* FORIG Research Report (CSIR-FORIG/TR/EM;KAA;BDO/2009/18).

TIDD/FORIG. 2009. *Ghana domestic timber market study.* Commissioned under Natural Resources and Environmental Governance Program. Timber Industry Development Division and Forestry Research Institute of Ghana, Final Report.