



The domestic market for small-scale chainsaw milling in Cameroon

Present situation, opportunities and challenges

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Abbreviations

AHC	Annual Harvesting Certificate
CF	Community forest
FLEGT	Forest Law Enforcement, Governance and Trade
FMU	Forest Management Unit
FSC	Forest Stewardship Council
PR	Processing rate
NPFE	Non-Permanent Forest Estate
PFE	Permanent Forest Estate
RWE	Roundwood equivalent
SSV	Sale of standing volume, same as <i>VC</i> , <i>ventes de coupe</i>
TRP	Timber Recovery Permit
VPA	Voluntary Partnership Agreement

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The early results were conveyed to Cameroon's Ministry of Forests and Wildlife on several occasions, in particular at a national workshop held in Yaoundé, Cameroon, in January 2010, attended by about 40 representatives from several ministries, civil society and the scientific research community. After incorporating many of the remarks from the workshop, a preliminary version of this report was sent to the Ministry of Forests and Wildlife in May 2010.

Executive summary

In 1994, Cameroon adopted a new forest law that focussed on the export-oriented, large-scale industrial forestry sector. Timber produced through small-scale logging operations for the domestic market was neglected. Such timber remains unrecorded in official statistics and is generally produced without a valid permit. However, Cameroon recently signed a Voluntary Partnership Agreement (VPA) with the European Union under the Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan, promising to certify the legal origin of the entire national timber production.

This report presents a quantitative and qualitative evaluation of the country's domestic timber market. Our global estimates for Cameroon's chainsaw milling sector for the period June 2008 to July 2009 are presented in the following table.

Domestic production (m³)	Informal chainsaw milling operations		662 000
	Sawmill scrap		198 000
Exports (m³)	Informal chainsaw milling operations	Chad	41 000
		Nigeria	12 000
	Sawmill scrap	Chad	27 000

According to a survey in the cities of Yaoundé, Douala and Bertoua and the country's South-West Region, annual production from informal chainsaw milling operations had reached 715 000 m³ by 2009. By comparison, in 2009 the volume of sawnwood from the industrial sector in Cameroon amounted to 360 000 m³. Adding the small-scale production of sawnwood sold on the domestic market to the figure in national statistics results in a total national

production of about 4.3 million m³ per year (in Roundwood Equivalents)—or nearly double the official figure.

Domestic wood trade is a source of employment for a large number of Cameroonians. Chainsaw milling, for instance, provide 4000 direct, often permanent jobs in the cities, and close to 40 000 more or less permanent jobs in rural areas. Informal chainsaw milling is thus a fully fledged economic sector, as can be seen from the following estimates of sales and profits for 1 year.

		Annual total (in million F CFA ^a)	F CFA per m ³
Upstream in the sector (rural zone)	Sales	42 698	64 498
	Profits	6 310	9 531
Downstream in the sector (urban zone)	Sales	54 632	82 526
	Profits	9 297	14 042

a The Franc CFA is pegged to the Euro at the rate of 1 Euro for 655.957 CFA.

Local people who sell their trees according to customary law or who work in this sector make a good living. Nearly half the expenditure for logging in rural areas (about 32 000 F CFA/m³) is income for rural populations. Contrary to common belief, this activity contributes to poverty reduction in rural areas, at least in the short and medium term.

Chainsaw milling operations are also a major source of personal income for many government officials, who have created a huge, obligatory payment system to 'launder' the timber sold on local markets; this system brings in about 7 billion F CFA per annum.

Overall, the public authorities are the main losers in this sector, as very little of the revenue generated by chainsaw milling reaches state coffers. Four population groups share the profits from this business, as shown in the table below.

Chainsaw milling is often criticised for its negative impact on the environment. Our survey showed that nearly all the logging sites are located in government-designated Non-Permanent Forest Estate, less than 2 km from an access road and very often (65% of the time) in sites with major anthropic activity (secondary forest, cocoa plantations, fallows, fields). Furthermore, small-scale chainsaw millers look for only a few commercial species—the same ones as the industrial logging companies—and, wherever

possible, target large trees to maximise their output. Currently, this activity does not greatly threaten Cameroon's Permanent Forest Estate.

On the longer term, several technical options are available for improving and legalising the *modus operandi* of this activity, such as issuing an *ad hoc* professional accreditation for small-scale chainsaw millers, 're-decentralising' and improving of procedures for issuing felling permits and introducing innovative measures to make government services more responsible, whilst trying to reduce informal levies. However, none of these options will be very effective unless they are accompanied by determined efforts to fight the widespread, uncontrolled corruption throughout the sector.

Beneficiaries	Sources of revenue	Amount (in million F CFA/yr)
Rural populations	Wages Tree sales Profit from sale of sawnwood to urban traders	20 011
Urban populations	Wages Rent for outlets Profit from sale of wood to final consumer	11 545
Representatives of government or council authorities	Informal payments at council level, on the road and in urban markets	7 061
Council authorities	Final taxes (<i>Impôt libérateur</i>)	49

Foreword

Since early 2008, the Center for International Forestry Research (CIFOR) has been studying the domestic timber sector in Cameroon, Gabon (Libreville), Republic of Congo (Brazzaville, Pointe-Noire), Democratic Republic of Congo (Kinshasa) and Central African Republic (Bangui), together with partners based in these countries. Funding to conduct research at the sub-regional level was granted mainly by the Netherlands International Cooperation Agency, the European Union and the French Development Agency.

We decided to conduct parallel research on the domestic timber sector in several countries in the Congo Basin for several reasons. First, very little information is available on this sector, which is still largely informal, despite growing demand for its products in urban areas. In all the study countries, this sector accounts for a sizeable share of the timber production, sometimes even more than the official sector. Second, all 5 countries either have signed or are negotiating a Voluntary Partnership Agreement (VPA) under the Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan of the European Union. This should result, in the short- to medium-term, in all

countries to adopt a traceability system which will guarantee the legality of all products from forestry operations, whether sold on the national or international market. Last, these countries have similar forestry codes and policies, and the local populations use the lands and forest resources in a similar manner, thus giving relevance to comparisons of how chainsaw milling operates at the sub-regional level.

What is meant by ‘domestic timber sector’? This sector is often understood as the opposite of the industrial sector that fells trees and processes the timber for export. Although there exist instances where the dichotomy between domestic and industrial timber fades—some industrial scrap is sold on the national market and some timber produced by chainsaw millers is sold on the international market—the two sectors present clear boundaries which can be used to make a distinction between them (Table 1).

The whole domestic timber sector is marked by informal practices, from felling trees to selling sawnwood. Although informal methods do not quite respect all the national regulations, they do

Table 1. Distinguishing characteristics between domestic and industrial sectors

Characteristics	Domestic	Industrial
Felling permit	No (or very rarely)	Yes (concessions, council and community forests, timber recovery, etc.)
Felling and processing techniques	Chainsaw (sometimes mobile saw) for felling and processing in the forest; small number of trees per operation	Heavy machinery, often in the annual allocated areas (<i>assiettes annuelles de coupe</i>); large number of trees per operation; processing plant
Sales	Lower-quality sawnwood for national market and neighbouring countries	Logs, sawnwood, veneer, plywood, wooden floors, almost exclusively for export
Taxes and regulations	Largely informal	Largely formal

not necessarily break the law either. That is why we prefer the word 'informal' to 'illegal'. The activities of most of the chainsaw millers could be covered by a legal felling permit but, for various reasons that we will try to explain, the chainsaw millers do not ask for such permits and prefer to keep operating in the informal economy. The main purpose of this report, therefore, is to explain how the domestic timber sector functions in an effort to contribute to finding ways to make it legal and secure.

In response to this situation, CIFOR is publishing (2011) 5 reports describing the domestic timber sector in each of the 5 countries in the survey, plus a final report to compare the functioning and challenges of the domestic sawmill sector throughout the sub-region. We hope that this research will contribute to improving forest policies at national and sub-regional levels by giving this activity, undervalued and all too often criminalised, the position it deserves.

1

Introduction

Cameroon's timber production and exports have been well documented since the colonial era (e.g. Hédin 1930, Chambre d'Agriculture de l'Élevage et des Forêts du Cameroun 1959, MINFOF 2006). From independence (1960) until the second half of the 1990s, (Figure 1), timber production grew steadily and substantially for many reasons.

After independence and throughout the economic boom from 1970 to the end of the 1980s, national demand for timber for urban construction and infrastructure grew. The timber was produced by a small number of industrial forestry firms, mostly foreign owned (Eba'a Atyi 1998, Wunder 2003). Towards the end of the economic boom, exports, which had accounted for an average of 44% of total

production throughout this period, dropped to 26% (Figure 1).

Production grew at a slower pace during the following years, which were marked by an economic crisis and stagnation (late 1980s to 1994). These were times of crucial microeconomic and political change. At the end of the 1980s, the Cameroon government's forest policy drew on advice from the World Bank (Topa *et al.* 2009). The 1987 Tropical Forestry Action Plan provided for an agricultural (including forestry) review in 1989, along with several structural adjustment strategies that developed conditional loan programmes as of 1989 (Mikesell 1992, Essama-Nssah and Gockowski 2000). This was the backdrop for the government's decision to (1) devalue the F CFA by 50%, although

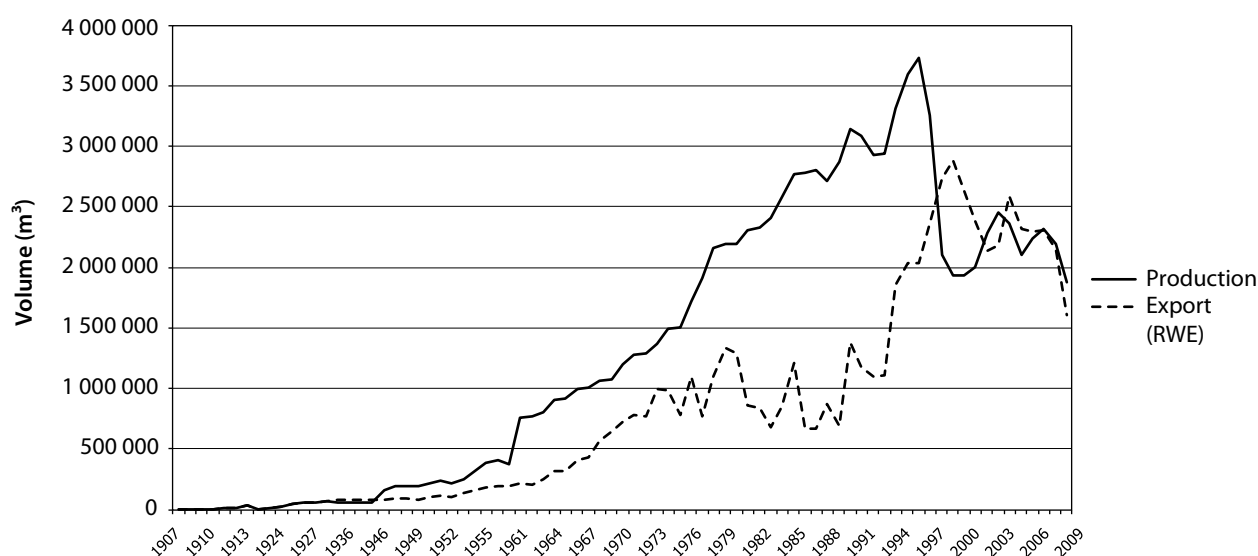


Figure 1. Official timber production and exports (1907–2009, Round Wood Equivalents -RWE)

salaries in the public service had been cut by nearly 50% in 1993, and (2) adopt a new forestry law that stressed sustainable forest management and a new tax regime (Brunner and Ekoko 2000, Carret 2000). These 2 measures, coupled with the negative effects of the economic crisis on purchasing power, contributed to (1) making industrial timber too expensive for the local population and (2) directing industrial production to the export market, because local logging costs were falling whilst international prices remained stable (Ndoye and Kaimowitz 2000).

At the end of the 1990s, timber production was officially estimated at about 2 million m³, about half as much as a few years earlier (Figure 1). There were many reasons for this decline; for example, permits granted before the new 1994 law were not renewed, and only a few new concessions, with restricted annual logging permits, were auctioned off in the second half of the 1990s. Furthermore, the Asian financial crisis in 1997 and a partial ban on exporting logs in 1999 depressed timber production. The new forestry regulations then shifted the statistics services into focussing on industrial production. Figures for timber exports between 1999 and 2009 were often higher than the formal production figures (Figure 1), because of illegal logging and because some production figures were not recorded (Cerutti and Tacconi 2008). During the second half of the 1990s, the economy gradually improved, especially in the big cities. This improvement encouraged many rural Cameroonians who had no other source of income

to become chainsaw millers. Their timber, which was sold on hundreds of urban markets, replaced the timber from industrial companies (Eba'a Atyi 1998, Plouvier *et al.* 2002, Akoa Akoa 2003) and was exported informally to neighbouring countries such as Chad and beyond (Koffi 2005). The general tendency of political decisions concerning the industrial timber sector was such that no global policy was adopted to regulate or guide the domestic timber sector, which continued to grow informally.

1.1 Chainsaw milling in forest policy

One of the main objectives of Cameroon's 1993 forest policy was to encourage the local population to participate in the forestry sector and to ensure they received part of the revenue generated by the sector. The 1994 forestry law reflects the 1993 policy by proposing a new framework for organising forest resources and their economic implications for Cameroonian people (Table 2).

The law offers several options for small-scale operators in the Non-Permanent Forest Estate (NPFE): (1) logging permits for up to 1 year and a volume of 500 m³; (2) personal logging permits for up to 3 months and a volume of 30 m³; and (3) user rights for people living in villages adjacent to forest zones (Republic of Cameroon 1994, 1995). Options (2) and (3) may not be used for commercial purposes.

Table 2. Legal framework for forestry operations

	Permanent Forest Estate		Non-Permanent Forest Estate		
Legal status	Private state estate (forest concession, protected areas etc.)	Private council estate	Community forest	Personal forest	Other forests in national estate
Application of customary rights	User rights (to satisfy strictly personal needs)				
Benefits for local populations	Annual area fees and technical specifications	Investment of profits from council forests in the council	Profits to benefit the community		
Potential for small-scale operations			Logging permits and personal logging authorisations		

As described in the law, the tax regime for these logging permits is rather vague. According to Article 66(2), the person who has a permit or a personal authorisation is supposed to pay the timber sale price to the owner of the trees; in theory, this is the state, but in practice, payments go to the customary owners, who negotiate the sale of 'their' trees at a price not stipulated in the regulations.

In 1999, the ministry decided to suspend the use and allocation of all small-scale permits, including personal authorisations and permits, on the grounds that they had become a major source of corruption and illegal logging. The suspension was maintained until 2006, although chainsaw milling never stopped (Cerutti and Tacconi 2008). Instead of reducing illegal logging operations, however, the suspension forced the whole sector to become informal, because legal logging permits were not available.

In 2006, when the suspension was lifted, the ministry tried to auction off nearly 50 permits and authorisations, but the chainsaw millers did not respond. There are several explanations for this failure. First, and contrary to the law, the logging permits were centralised by an interministerial commission in Yaoundé. As the informal sector had been operating satisfactorily for nearly 7 years, it was unrealistic to think that the operators would respect the administrative procedure and go to Yaoundé to participate in the call for tenders.

Second, the civil servants sent out from the ministry with delegated powers developed an extensive informal system to obtain payments from small-scale chainsaw millers. The chainsaw millers and the timber traders were in daily contact with the ministry officials. The central government's attempt to officially reinstate the small logging permits was received in the field as an attempt by the central powers to re-establish authority over small-scale forestry operations and, more importantly, over the informal payment system.

Available information on chainsaw milling, although sparse, confirmed the effects of

the suspension: it was received as merely an administrative decision. Estimates of timber sales, essentially on the domestic market, doubled from 250 000 m³ RWE (Roundwood Equivalents) in 1996 (Enviro-Protect 1997) to about 500 000 m³ in 2000 (MINFI 2000). Plouvier *et al.* (2002) analysed several markets in Yaoundé and Douala and estimated national production from small-scale sawmills at close to 1 million m³ (RWE), of which nearly 10% was exported through the port of Douala whilst the rest (900 000 m³ RWE, or about 300 000 m³ of sawnwood) was sold on the local markets.

The purpose of this report is to help explain the nature, scale and impact of the domestic timber market, with special emphasis on governance. The Cameroon case study has also a more general scope, because the country has long been at the centre of global concerns about illegal logging and Cameroon is 1 of the 3 countries that have signed a Voluntary Partnership Agreement (VPA) with the European Union. Like Ghana and the Republic of Congo (the other countries that signed VPAs), the government of Cameroon has decided to guarantee the legality of all its national timber production, including the timber harvested by small-scale chainsaw millers for sale on the domestic market.

It is essential, therefore, to understand why the current legal framework is not being applied, to adapt it in order to make up for the traditional neglect of timber produced and sold at the national and regional levels, and to recognise the social and institutional dynamics of timber production, including the vast network of personal interests that encourage corruption. The government of Cameroon and the European Union need to draw up a realistic agenda for revising the legal framework and effectively implementing the VPA.

The next section explains the methods used in researching this subject. This is followed by a presentation and discussion of the results in terms of the economic, social and environmental sustainability of small-scale chainsaw milling, along with suggestions for improving the regulations and securing the sector.

2

Survey and analytical methods

This survey analysed 3 aspects of Cameroon's domestic timber sector: production and processing in rural areas and forestlands, sales in the main cities of Cameroon and exports to neighbouring countries, mostly to Chad and Nigeria. A specific methodological approach (described below) was used for each aspect.

2.1 Production and processing

An upstream analysis of the sector was carried out on a sample group of councils and informal chainsaw millers. The analysis used 2 methods: information collection in urban markets and discussions with local actors. Both methods were used to identify which councils regularly supply substantial volumes of timber to these markets. The 44 councils in the study are located across several forest regions in Cameroon (Table 3).

A questionnaire was given to the leaders of each council concerned directly or indirectly with informal timber operations, amongst them the

mayor, the sub-prefect, representatives from the Ministry of Forestry and Wildlife (MINFOP) and the Ministry of Finance (MINFI) and village chiefs. The questionnaire examined the history of the area's informal timber sector, the people involved, the technical resources, the sector's benefits and problems and potential solutions.

In each of the councils, several informal chainsaw millers were interviewed according to a semi-structured interview grid that included questions on the sawyer's motivations, the targeted tree species, the use of the revenue earned from sawnwood, difficulties and potential solutions. Each chainsaw miller was asked to detail all the costs and profits from his latest chainsaw activities; 261 sawyers described 340 operations. Apart from some rare exceptions (which were removed from the database), the sawyers' estimates matched, which indicated reliability in the information collected.

The data from the councils and the chainsaw millers were processed using a database and a spreadsheet,

Table 3. Sample of councils in the survey

Region	Number of councils studied	Number of millers interviewed	Number of sawmill operations monitored
Centre	20	113	149
East	6	26	33
Littoral	4	25	31
South	8	74	107
South-West	6	23	20
Total	44	261	340

but were not extrapolated. The large sample size should make the results genuinely representative of the informal timber sector in Cameroon's southern forest zone.

2.2 Timber sales

The Cameroonian national timber market was studied in 3 major cities (Yaoundé, Douala and Bertoua) and in some smaller cities (e.g. Limbe and Kumba). Data collection for this study began in March 2008 and is ongoing.

2.2.1 Preliminary survey

A preliminary survey of the timber markets in the 3 major cities was carried out at the beginning of 2008. The list comprised 48 markets, each organised into small outlets, giving a total of more than 880 outlets. The bigger markets had about 130 outlets and the smallest had 1 or 2. The outlets were monitored regularly during the study period; by 2010, the number had risen to about 1220 (Table 4).

The number of markets changed very little during the study period, although in 2009 some large markets in the centre of Yaoundé and Bertoua were closed and rebuilt outside the city as part of urban planning.

After counting the markets and outlets, we held meetings with each market's *chef du marché*, who is the representative of the market and of the sellers. For markets without a representative, we held discussions with a group of sellers. The aims of the meetings were to (1) explain the objectives of the study and ask participants to cooperate; (2) obtain information on the size and organisational structure of the market (presence of official associations, relationships amongst people within the market, outlet logistics); and (3) help to select

groups of outlets that would agree to participate in data collection. This phase took several weeks because of the sensitivity of the subject. Guarantees were given that informers and sources of data collected would remain anonymous.

2.2.2 Samples and data collection

A sample group of outlets was formed in 36 of the 48 markets. Given the large number of markets and outlets, the budget and difficulties in finding outlet owners willing to be monitored over such a long period of time, we decided to construct the sample using 5 outlets for each market that had at least 50 outlets. In the biggest markets (4 had between 50 and 130 outlets), the sample was composed of 15–25 outlets. The study monitored 177 outlets (about 20% of the total number in 2008).

As the available data on market structure were generally insufficient, the first discussions with the market representative (*chef du marché*) were used to prepare a provisional stratified sample of the market outlets. The market representatives and the outlet owners were asked to classify the outlets (as best they could) into 3 groups—'large', 'medium' and 'small'—based on their annual sales volume. Stratification was not possible in 2 markets which had all outlets similar in size. There, outlets were randomly selected among sellers who agreed to participate in the collection of data.

After working regularly with our survey team for 1 or 2 months, depending on the situation, the people in charge of data collection started compiling the data. They collected data once a week, always on the same day, but, to avoid overestimating sales, they avoided the busiest days of the week (often Saturday and Monday). Apart from a very few exceptions, the day and the data compilation team did not change during the data collection period.

Table 4. Markets and outlets (2008 and 2010)

City	Total number of markets	Total number of outlets (2008)	Total number of outlets (2010)
Bertoua	2	47	82
Yaoundé	24	607	896
Douala	22	228	241
Total	48	882	1219

The following data were collected: number of employees (full time and part time), salary estimates, type of products sold, timber species, size of products, source of products (village, city, division, region), stocks, daily deliveries, number of pieces of wood (by product type and species) sold on that day and sales price.

When we had built more trust amongst people in the market (sellers, intermediaries, transporters and outlet owners not in the sample), we conducted about 200 non-structured interviews over a period of 1 year. The interviews asked general questions about how the market functioned and relationships between professional groups. Whenever deemed feasible, the interview ended with a discussion of the sector's informal payment systems.

2.2.3 Data analysis

Two hypotheses were used for estimating annual sales: (1) the data collection day was assumed to be representative of sales on the other days of the week and (2) the market was assumed to be open on 5 days a week in Douala and 6 days in the other cities, even though certain markets were open 7 days a week.

In the study, annual sales were calculated by adding together the weekly sales from July 2008 to June 2009. The average annual outlet sales for each group (i.e. 'large', 'medium' or 'small') were then multiplied by the number of outlets in that group within a given market, according to the previously established stratification. The same procedure was used to calculate the costs, benefits and payments within the markets.

2.3 Timber exports

The survey also covered timber exported through 2 other parts of the country—the South-West and

the Extreme North (Plouvier *et al.* 2002, Koffi 2005, Nicholas and Jenkins 2009). Such timber is not sold through market outlets as for this trade timber harvesters sell directly to timber merchants, who organise the transportation and the delivery to the final client in the country of destination.

From East Cameroon to the point of export, timber is transported by road and rail. The harvested timber is loaded onto trucks that head directly north along the only trafficable road out or to the closest railway station (Belabo), where it is loaded onto trains and transported to the station in Ngaoundéré, where it is repacked (if necessary) and sent by truck to its final destination. Timber from the South-West is usually transported along the vast Nigerian network of waterways for sale in Nigeria. To track and quantify the bulk of this timber, daily records of volumes transported by road, rail and river were collected in order to compile data on the origin and typology of the exported timber.

2.4 Production

We compared volumes of informally sawn timber with the official timber production and sales figures by converting them into Roundwood Equivalents (RWE). In our study, the processing rate (PR) for chainsaw milling operations was calculated for the species most frequently harvested for 30 randomly selected chainsaw felling operations in 13 locations with 17 teams of operators (Ondoua 2010). Our estimates gave an average PR of 33.7%, which is the figure we used to estimate the RWE. This figure corresponds to earlier estimations of PR using chainsaws, which were estimated within the range of 29.7% (Plouvier *et al.* 2002) to 32% (Rossi 2008). Auzel *et al.* (2001) showed that by choosing better lumber and species and training the sawyers, PR of 37% and 45%, respectively, could be achieved, but such conditions are optimal and do not represent the average chainsaw miller.

3

Results

3.1 Upstream operations: Production, processing and transport

3.1.1 Importance of small-scale chainsaw mills in the rural economy

In most of the councils studied, chainsaw milling can be traced back to the 1980s or earlier, although it was less developed and different in nature than at present. In rural areas, chainsaw milling exists because of long-standing local demand for timber to build houses and furniture, more recent demand from markets in nearby urban areas and markets in neighbouring countries, and the availability of trained chainsaw operators. Over time, this small-scale activity catering to the needs of rural households developed into an informal sector catering to growing urban demand.

In some councils, the establishment of a forest logging company was a major factor in the rise and consolidation of a chainsaw milling sector, as such companies attracted and trained professional workers, facilitated access to chainsaws and other equipment, and produced sawmill scrap that could be reused and repacked on site. However, despite this long history of both formal and informal sectors for small-scale logging and processing, there has been little study of these activities.

According to the small-scale chainsaw millers surveyed, the sector has grown substantially since the beginning of the 1990s, with growing numbers of millers joining the profession in most years since 1995, particularly in Cameroon's Centre Region (Robiglio 2009). Sales of chainsaws have also risen.

The growth of small-scale chainsaw milling at the end of the 1990s can be explained by a combination of factors. First, the magnitude of the economic crisis that hit Cameroon in the early 1990s had 2 simultaneous effects: (1) with less purchasing power, the urban population preferred to buy from small sawmills rather than from the larger, more expensive industrial ones (Plouvier *et al.* 2002) and (2) many young people returned to the rural areas, especially to revive food crop cultivation, which had experienced little effect of the drop in international prices and could offset the reduction in food imports (Pokam and Sunderlin 1999, Ndoye and Kaimowitz 2000). The development of small-scale chainsaw milling received a strong boost from the rapid expansion of farmlands, with large volumes of profitable commercial tree species available for harvesting, combined with the new farmers' considerable knowledge of urban markets in the cities where they used to live. This tendency was supported by the public forestry services, which issued a large number of professional accreditations during this period (Eba'a Atyi 1998). In 2001, more than 1000 operators had a professional accreditation (Auzel *et al.* 2001).

Small-scale chainsaw milling operations are now deeply woven into Cameroon's rural economic fabric, including in all 44 councils in the sample. However, intensity varies according to access to an urban market, wood resource availability and the presence (current or former) of a logging company. The environment in some councils is much more conducive for producing and commercialising sawnwood than that in others.

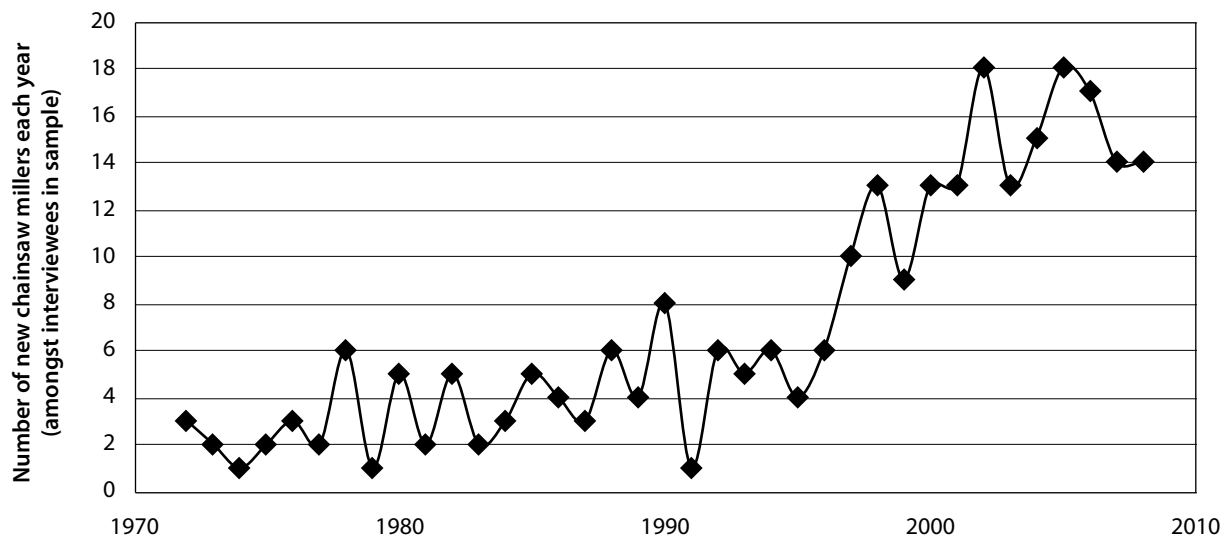


Figure 2. Number of chainsaw millers entering the informal sector each year (across whole sample)

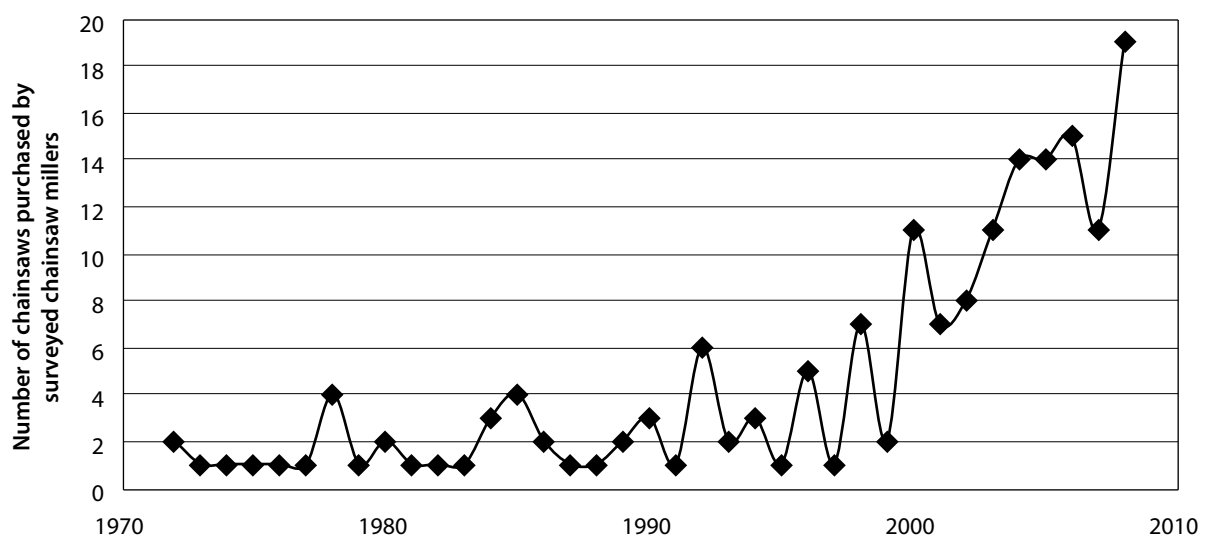


Figure 3. Number of total chainsaw purchases by surveyed chainsaw millers each year

The amount of equipment used for small-scale logging and processing varies greatly across councils (Table 5). Councils with highly enabling conditions had high indices for equipment such as chainsaws, mobile saws (Lucas Mill type) and other processing equipment (e.g. edgers, planing machines). These indices were lower in areas with less favourable professional conditions, although some councils with a low index for chainsaws—and thus, obviously, small tree stocks—invested in equipment for second-level processing to respond to nearby urban demand. This was the case, for instance, in Limbe, Idenau and Makak.

Small-scale timber operations generate both employment and profits for rural councils. Statistics on the number of people working in the small-scale sawmill sector are not available. However, we can arrive at a rough estimate using the number of chainsaws identified in our sample of councils, that is, an average of 40 chainsaws per council, with each chainsaw requiring a team of 4–5 people (1 chainsaw miller, 1 assistant, 2 or 3 carriers). In addition, estimates indicate that small-scale timber operations exist in nearly all the councils in Centre, East, Littoral, West, South and South-West Regions—a total of about 200 councils, excluding

Table 5. Availability of sawing equipment amongst surveyed councils

	Number and % of councils	Average number of chainsaws	Average number of portable saws	Average number of items of other equipment
Councils with minimally propitious conditions	10 (23%)	8.80	0.1	4.7
Councils with enabling conditions	20 (45%)	42.35	0.5	1.8
Councils with highly enabling conditions	14 (32%)	108.60	1.2	8.4

urban councils. By adding these assumptions, we estimate that at least 40 000 people make a living directly from small-scale chainsaw timber production, mainly in rural areas. This assessment of the number of illegal or informal chainsaw millers (*scieurs sauvages*) must also include chainsaw millers working with mobile saws and in secondary processing. Altogether, probably more 50 000 people in rural areas are engaged in small-scale logging and processing.

Many rural councils responded to the sector's substantial growth by levying an *ad hoc* tax that generates substantial revenue for councils and/or the municipal staff. Nearly two-thirds of the councils in our sample instituted flat-rate taxes of 2 types: a tax of somewhere between 5000 and 50 000 F CFA per trip for each truck loaded with about 15–20 m³ of timber from small-scale chainsaw operations and/or an annual fee of somewhere between 5000 and 100 000 F CFA for each chainsaw. In many councils, both fees were charged. Given that it is illegal to levy a tax on an illegal activity, these payments to the councils are seldom recorded in the accounts. Many mayors acknowledged the existence of this (sometimes quite substantial) source of revenue, and the fact that it was neither submitted to nor discussed by the municipal council. Members of each council's executive bureau made arbitrary, *a posteriori* decisions on the use of these funds. Law No. 2009/019 concerning the local tax systems partly clarifies and regulates this fiscal practice by imposing a 2000 F CFA/m³ tax on wood recovery products, which is less than the flat-rate tax that some councils had previously charged.

3.1.2 Main characteristics of Cameroonian chainsaw milling

Many of the small-scale sawyers in Cameroon's South Region are newcomers who entered the profession during the past few years. In addition to the growing demand for inexpensive forestry products, 3 main factors contributed to developing the profession and facilitated its uptake by a large number of rural inhabitants. The first was the greater availability of chainsaws, with many more being used during the past few years. Depending on make and model, prices for new or second-hand chainsaws range from 300 000 to 800 000 F CFA. Many households bought chainsaws to clear land for farming and to fell and cut trees either for home use or for sale. There is a huge market for second-hand chainsaws in all cities in Cameroon and an even bigger market for second-hand spare parts. Because this market also receives inexpensive, low-quality chainsaws from Nigeria, even people with a small budget can afford to buy a chainsaw; 66% of the 261 sawyers interviewed own their own chainsaw(s), as this is the only piece of equipment they need to become a chainsaw miller. The chainsaw is handled by the sawyer, who usually has 1 assistant and 2–3 (or at most 4) carriers, who are usually hired on site. Most of the sawing teams that we met were composed of 4 or 5 people and a chainsaw, often purchased second hand. The main difficulty in becoming a chainsaw miller, therefore, is gaining access to (buying or renting) a chainsaw, which is a relatively easy barrier to overcome to enter the profession.

The second factor is resources, even in a largely anthropic environment. The 1994 Zoning Plan for

Southern Cameroon leaves ample room for the NPFE, in which customary rights to clear forestland are recognised, but only to meet personal needs. Even in areas near the cities where the remaining forests are degraded, trees of more or less high sales value can be found in the farm and agroforestry lands such as cacao plantations. Most farmers have trees in their farm areas or family forests that they can easily sell on local markets. The availability of forest resources near almost all of the councils we visited explains sawyers' choice to work near their place of residence: 71% of the sawyers we interviewed were born in the division where they now work. The major advantage is the reduction in the cost of access to the trees, which are located either in areas owned by relatives who will negotiate an attractive price, or on the sawyer's own land. However, some sawyers chose to leave their traditional home area to work elsewhere, usually because of the scarcity of commercial tree species, insufficient equipment and labour and/or lack of thorough knowledge about and contacts with urban markets. These reasons apply for instance to many Eton from the Center Region, who continue their activities in the Ewondo lands and, more broadly, throughout South and East Regions.

The third factor that facilitates the extension of small-scale chainsaw milling in Cameroon is the absence of enforced regulations. The Forest

Code provides for small logging permits to meet national demand for sawn products, but in reality, millers earn good money from their work without the permit. Small-scale chainsaw operators very seldom apply for official permits for 2 reasons, one historical and the other structural. The first reason dates to 1999 when the Ministry of Forests suspended the small logging titles and many legal operators entered the informal sector overnight. Their operating costs and profit margins remained basically unaffected. The end of the suspension period, in 2006, did not stunt the growth of this informal sector.

The second reason is that the logging permits provided for in the Forest Code did not meet the chainsaw millers' needs and involved expensive procedures. In brief, chainsaw millers with permits faced stricter operating conditions and higher operating costs without enjoying any real economic benefits in return. Only 8% of the chainsaw millers of the 261 in the survey had ever had a legal logging permit. Not having a legal logging permit was experienced as a problem for only 10% of our sample group (Table 6) and was ranked 9th amongst the problems the chainsaw millers face in exercising their profession, coming far down the list after 'administrative hassles' and 'breach of trust' (i.e. with associates), as also reported by Akoa Akoa (2003).

Table 6. Chainsaw millers' perception of problems encountered in their work

Main problems encountered	Response rate (%)
Administrative hassles	71
Breach of trust (employer, client, worker)	41
Difficult relationship with customary owners (non-respect of commitments [on price of trees, wages, etc.], inter-community conflict, etc.)	22
Accidents and drudgery of work	19
Poor-quality equipment	13
Difficulties selling products	11
High cost of equipment and transport	11
Scarcity of resource	11
Difficulty in obtaining a felling permit	10
Lack of capital	7
Taxes	4
Uncertainty of profession	4

3.1.3 Economic profitability of chainsaw milling

The main appeal of the informal sawmill sector in rural areas is its economic profitability (Figure 4). Selling one's own trees or working as a small-scale chainsaw operator are sources of livelihood that did not exist a decade ago in most village economies in Cameroon (Lescuyer 2000, 2010). The accelerated development of this informal sector can undoubtedly be traced to the desire amongst local populations, especially their heirs, to benefit from this new boon by selling their trees, even at a low price, before the central government issues logging titles or authorisations to timber companies or the trees are plundered by other, competing customary owners. Customary heirs accelerate their tree sales essentially out of economic opportunism rather than as a way to recover traditional rights that the government has ignored for decades.

Our analysis of 340 sawmill operations highlights a gradient amongst the sawyers, with 2 identifiable extremes: 'professional' chainsaw millers and 'village' chainsaw millers (Akoa Akoa 2003, Djiré 2003, Djiongo 2005).

The professional chainsaw millers have regular, structured relationships with the markets; they start sawing when they receive an order and know to whom and at what price they will sell their products. Their equipment is usually of high quality.

Their clients or employers often provide protection against administrative hassles. Professional chainsaw millers carried out 65% of the sawnwood operations we monitored.

Village chainsaw millers have little contact with the market. They have trees in their home area, ready to be sold, and do not wait to receive purchase orders. Their system is to fell and process trees when they need money, and then take their sawnwood products to the market. They seldom have any external protection to limit their risks. Of the sawnwood operations we analysed, 35% were carried out under this system.

Professional chainsaw millers organise their work according to purchase orders, available means of transport and expected income. The combination of these 3 variables explains the extent of their activities in terms of time, space and logistics. In our case studies, an average chainsaw operation involved 3.88 trees, usually located close to each other. Most of these chainsaw operations were small-scale and short-lived: in 55% of the cases, no more than 3 trees were felled and the average operation lasted about 1 week (Figure 5). This preference for small operations can be explained by a shortage in transportation facilities for moving large volumes of sawnwood and probably also by the chainsaw millers' preference not to stay in the same place for any length of time, in

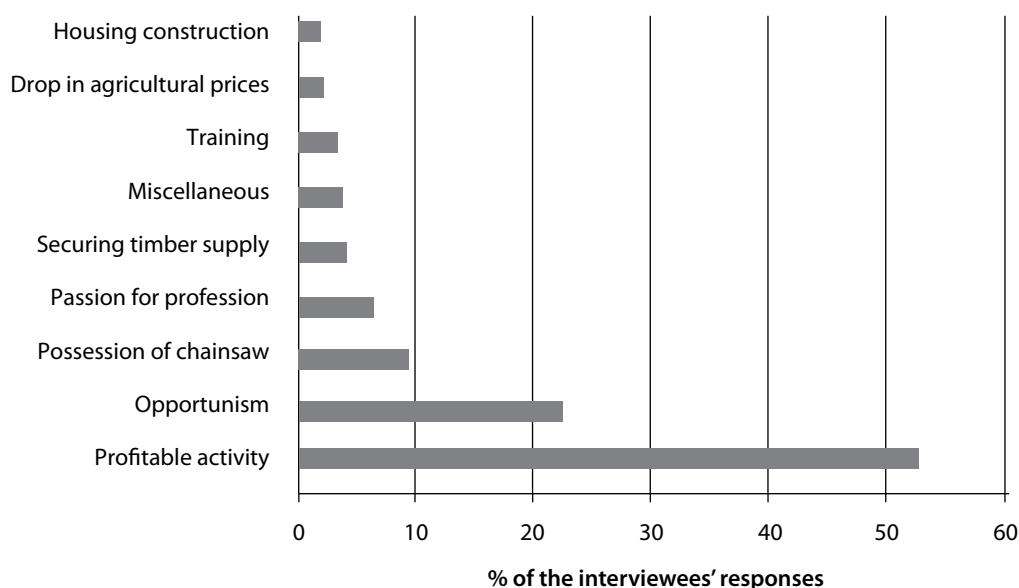


Figure 4. Main motivations for chainsaw millers

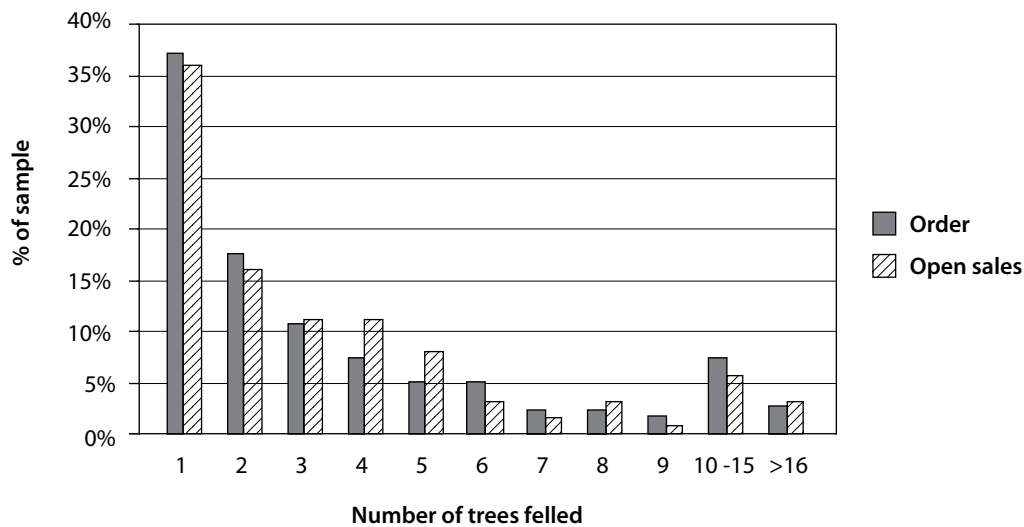


Figure 5. Number of trees felled per small-scale chainsaw operation

order to decrease the risk of being noticed by government officials.

On a site of the same size, professional chainsaw millers manage to produce more than village chainsaw millers by using a greater part of the felled trees; on average, they obtain 3.5 m³ of sawnwood ([0.33–9.23], standard deviation: 2.24) from a tree trunk whereas village chainsaw millers obtain only 3.18 m³ per tree ([0.44–8.80], standard deviation: 1.79). This processing rate matches other estimates of small-scale chainsaw operations (Ondoua 2010), and indicates that the trees were thoroughly exploited; large branches and the sapwood, for instance, are often used in chainsaw milling. This also seems to indicate a preference amongst chainsaw millers for more productive trees with wide diameters (Djiongo 2005).

The maximum yield for a chainsaw is estimated at 1–1.5 m³ of sawnwood per day for small-scale operations (Plouvier *et al.* 2002, Akoa Akoa 2003, Ondoua 2010). Producing 3.5 m³ takes slightly less than a week for a team composed of a sawyer, his assistant and 2 or 3 carriers.

Overall, chainsaw milling operations are carried out with limited technical and financial resources, using one or several chainsaws. After sawing the timber into pieces, chainsaw millers sell it either by the roadside or at the market. We identified and quantified all the costs and revenue from the 340

small-scale sawmill operations in the southern part of Cameroon. The results are presented in Table 7, with separate data for professional and village chainsaw millers.

The data in this table are instructive for many reasons. As can be seen, operating costs are the same for all types of chainsaw millers. The professional chainsaw millers' higher productivity does not significantly increase their costs; rather, in general, their greater professionalism enables them to reduce their intermediary costs (e.g. fuel, oil, spare parts). This indicates that village chainsaw millers could reduce their operating costs by changing their practices, and thus increase their profits.

Village chainsaw millers sell each cubic metre of sawnwood for 20% less than the professional sawyers. There are 2 explanations for this. First, because they do not have purchase orders for their products, village chainsaw millers usually accept a lower price at the marketplace. This is especially true for products that are not common to the market. For instance, professional and village chainsaw millers receive the same prices for ayous formwork or iroko planks, but professional chainsaw millers receive a considerably higher price than village chainsaw millers for moabi or bubinga planks, which are often made to order for the urban market. Another issue for village chainsaw millers is that police often confiscate their products, which

Table 7. Costs and profits for chainsaw operators in rural areas (F CFA/m³ of sawnwood)

Description	Average	Professional chainsaw millers	Village chainsaw millers
Local wages	28 224	29 392	25 428
Payments to owner	4 439	4 477	4 397
'Administrative' costs	6 079	5 291	8 063
Rent of equipment and transport	10 176	10 475	9 500
Fuel and oil	8 276	7 966	9 080
Spare parts	4 839	4 565	5 578
Miscellaneous	2 719	2 993	2 048
Total costs	64 752	65 159	64 094
Sale price	74 283	79 689	64 498
Profit	9 531	14 531	403

reduces their average unit sales price per cubic metre of sawnwood.

Profits differ greatly between the 2 types of chainsaw miller. Small-scale chainsaw production is very profitable for professional millers, who have structured relationships with the marketplace. Consider the average work site (3 trees felled with 3.5 m³ of sawn timber per tree): a professional chainsaw miller will make a profit of about 14 500 F CFA/m³, whereas a village chainsaw miller will make a profit, on average, of only about 400 F CFA/m³.

Chainsaw milling is economically rather risky for village chainsaw millers. Profitability depends on 2 factors that they cannot easily control: the final selling price and the parafiscal levies imposed by authorities along the transport chain. It is not unusual to meet a heavily indebted sawyer who has to work in the forest to pay off his debts, thus creating a vicious circle that could probably be broken if village chainsaw millers understood market needs better.

In most of the operations covered in the survey, the chainsaw millers (village millers and self-employed professional millers) received profits plus wages as a sawyer. Some professional chainsaw millers work for an urban employer that receives the profits and only pays the millers wages. Altogether, more than 60% of the surveyed

chainsaw millers reported earning enough to cover their everyday expenses (Figure 6), which indicates that their work has become a regular source of income. Furthermore, in the medium term, it opens the way for young workers to obtain the funds needed to build up their family life (e.g. dowry, buying land/house) or to make profitable medium-term investments.

Some case studies showed that another little-known benefit for chainsaw millers in rural areas was the development of salaried employment both for them and for their assistants and carriers in small-scale sawmills, where they are paid per piece of sawnwood (Lescuyer 2010). Most of these employees are farmers who continue to manage their fields whilst spending several days or weeks working in the forest, by hiring their 'village brothers' to work in the fields. During the past 10 years or so, in some landlocked areas, farmers have been able to boost their incomes from wages, informally paid but connected directly or indirectly to small-scale chainsaw milling.

Small-scale chainsaw operations have a direct impact on Cameroon's rural economies in other ways also. On average, 50% of the operating costs, or about 32 000 F CFA/m³, are spent in the villages where the trees are felled and the wood processed (these estimates were reported by Djiongo (2005) for East Region). Most of the payments are for the salaries of the local workforce (sawyers and their

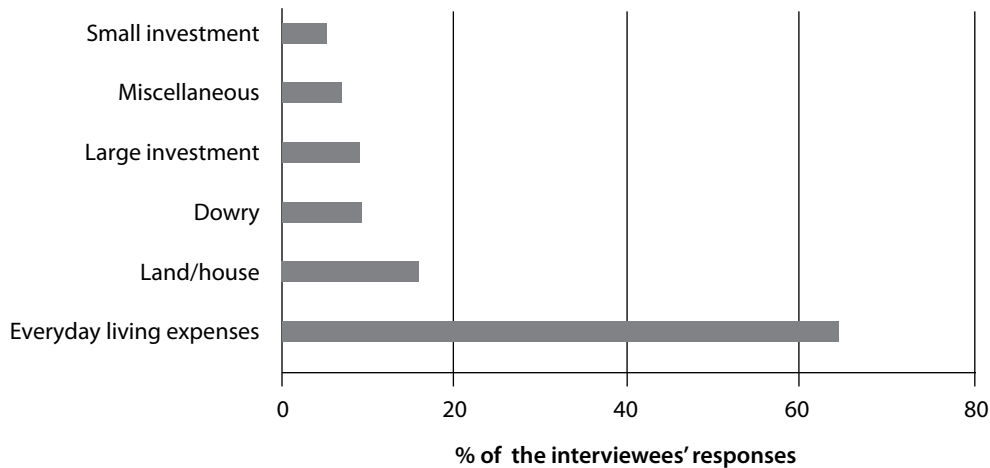


Figure 6. Use of income earned from chainsaw millers

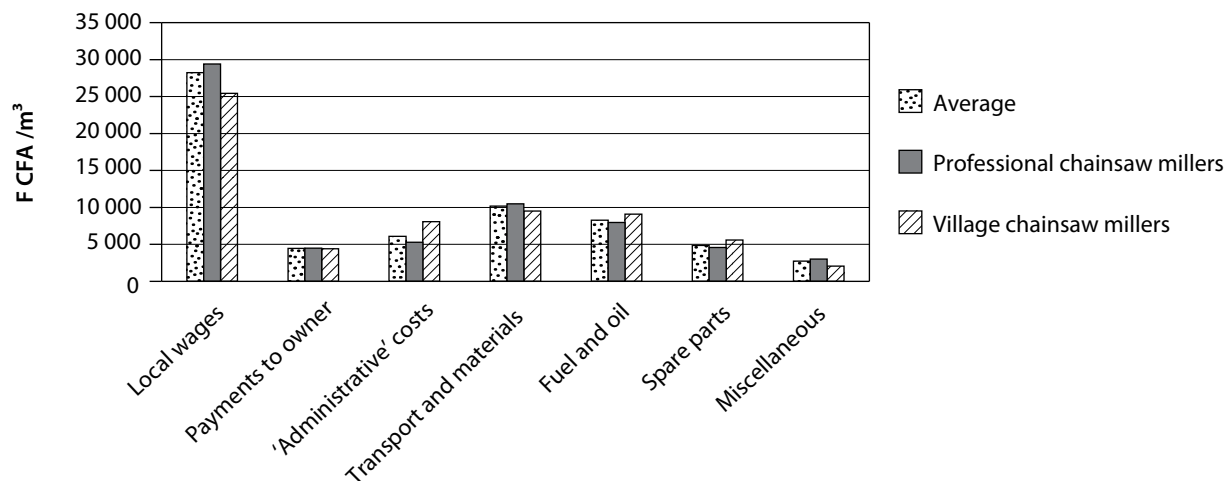


Figure 7. Breakdown of costs for chainsaw milling in rural areas

assistants and carriers) and for the customary owners who give permission to fell the trees. By extrapolating this average figure to all informally produced chainsaw timber sold on the Yaoundé, Douala and Bertoua markets, we see that this activity contributed about 21.1 billion F CFA to rural economies. By comparison, the Annual Forest Area Fee brought in 6 billion F CFA to the councils and communities in 2008, and much less in 2009. Local populations are not the only recipients of the considerable sums of money generated by chainsaw milling. Nearly 9% of the sawyers' costs comprise payments to various types of public authorities on the logging site or somewhere along the timber transport route. Koffi (2005) estimated informal taxes at 10% of the total production cost for an iroko plank. In addition to payments to

council representatives, chainsaw millers set aside money for 'wayside payments' that 'facilitate' the transport of chainsaw timber to the urban markets. Such payments are for the personal benefit of the government agents located at checkpoints along the road, rather than for any public fund, and must be made to all the government services that have such checkpoints.

These 'administrative costs', estimated at about 6000 F CFA/m³ of sawnwood, cost the timber transporters a total of more than 4 billion F CFA per year. This is an important source of revenue for many of the civil servants working in this field, who undoubtedly would not be enthusiastic about any attempts to regularise and legalise the sector.

3.1.4 Resource origin and management

The combination of rudimentary logging techniques and resource availability largely explains the chainsaw millers' choice of which trees to fell. Sawyers must work near trails and rivers, because sawn products are transported by carriers; very seldom are trees felled more than 2 km from an access route. The density of regional road networks varies, especially if comparing Centre Region with South and East Regions (Figure 8), which have few roads and therefore much less access to the trees than, for instance, the divisions around Yaoundé. Applying a buffer zone of 4 km around Cameroon's roads (using a map produced by Global Forest Watch and MINFOF 2007) and assuming current logging methods, we can say that chainsaw millers could exploit about 8 million ha of land in the NPFE. This zone is shown in yellow in Figure 8, with the PFE shown in green.

As small-scale chainsaw operations are usually carried out near access routes, it is not surprising

that this activity is more developed in anthropic environments (fallow, secondary forests, cacao plantations), that is, in areas that are exploited almost twice as much as the veritable forest ecosystems (Figure 9). In these anthropic zones, a clearer recognition of customary rights also limits conflicts over the ownership of standing timber and the related payments to customary heirs.

Most small-scale chainsaw milling takes place in zones with established agricultural cycles that schematically combine the swidden phases, fallows and then secondary forests that need to be cleared again. Chainsaw logging is a relatively recent activity for many farmers. Carrière (2003) showed that the Ntumu farmers in the southern part of Cameroon, for instance, even at the end of the 1990s did not consider combined tree–farm management methods as a way to generate profits.

The sites of most small-scale chainsaw milling, which have major human activity, are almost always

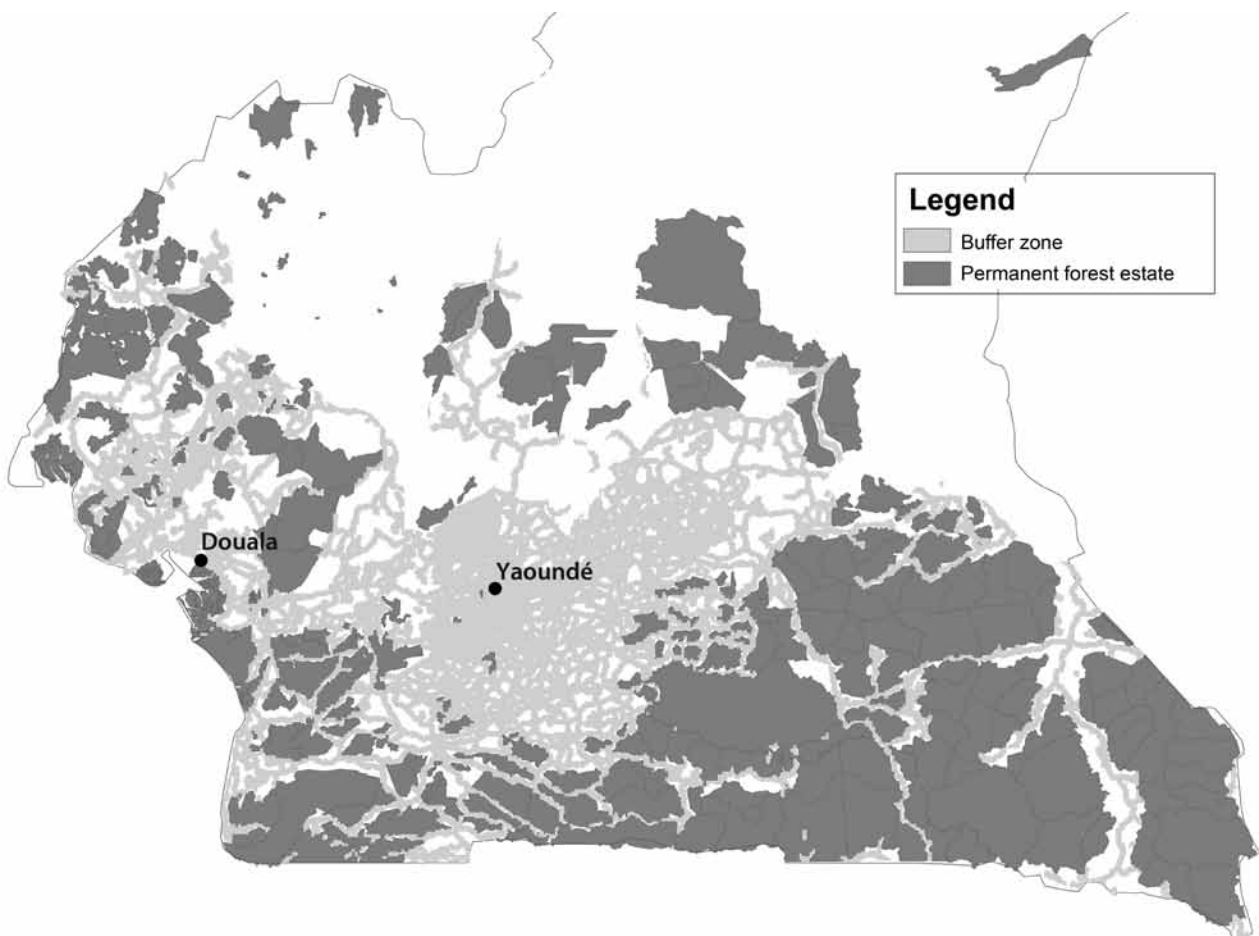


Figure 8. Potential exploitation zone for chainsaw operations

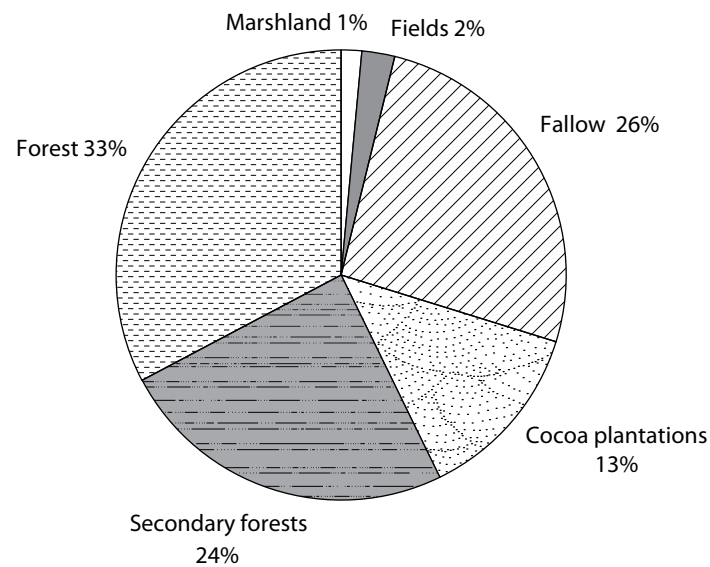


Figure 9. Main types of ecosystems targeted by chainsaw millers

in the NPFE, that is, in the buffer zone of about several kilometres (provided for in the Zoning Plan) around the PFE (Medjo 2000). Plouvier *et al.* (2002) and Djiongo (2005) made the same observation. This area is not intended to be forest in the future and, unless community forests are involved, the state has no specific management plans for it. The area is usually managed according to local customs, especially in relation to resource access and use. In the case of commercial timber species, the head of the family or household authorises felling at a flat rate (average of 5000 F CFA/m³ for sawnwood) that the chainsaw miller pays.

This combined tree-farm management method allows customary owners to make profits from the standing timber, but does little to encourage sustainable management of the timber resources, which could maintain profits over the long-term, although in some low-population areas, commercial species seem to be regenerating in combined agriculture/agroforestry plots (Semereab 2006). A study of 12 villages in Centre Region (Robiglio 2009) showed that very few of the farmers interviewed had planted trees in their cultivated

plots or cacao plantations with a view to securing the long-term existence of their commercial wood resources. However, 70% of these farmers said they protected these trees during the slash-and-burn cycle. Although some customary owners take small measures to manage high commercial value tree stocks, they seldom voluntarily take any initiatives to maintain or increase these stocks through replanting, assisted regeneration or planting new trees. There is no significant difference in the use of practices to protect cacao trees in areas where customary ownership rights are unambiguously recognised, and in farmlands where such rights are generally less clear. In other words, recognising and guaranteeing customary rights over resources and land have not proved sufficient to improve local resource management. Most of the people who sell their trees to chainsaw millers adopt a short-term strategy to obtain money, which leads to more or less rapid dilapidation of these resources. Plouvier *et al.* (2002) illustrate this race to sell trees in villages near Mbalmayo, where tree owners feel that ‘it is better to live well once’. This attitude can probably be extrapolated to other regions that supply the small-scale sawmills.

4

Downstream operations: Timber sales

4.1 Variability in timber sales

The quantities of sawnwood sold by the individual outlets vary considerably each month; there are also noticeable differences between sales in the big cities in the sample and among outlets of the same market.

Periodical variations in sales can be partly explained by seasonal variations, connected to the dry and rainy seasons, which affect access to the forests and the feasibility of chainsaw operations (Figure 10).

However, periodical variations in sales are influenced by more than just seasonal changes.

Several times during the survey period, special conditions affected sales in a marketplace or in a whole district of a city equipped with several markets. In 2009, for instance, the government imposed strict rules on timber traders in part of Bertoua. As sales dropped during this period, sawmill operators contacted buyers directly and offered timber from containers in other districts of the city, thus demonstrating the sector's great adaptability to outside pressures. By contrast, in Yaoundé, one market enjoyed a period of high sales when a large construction project was started in the neighbourhood, whereas 2 large markets elsewhere were closed and the outlets had to move to other districts of the city (July–August 2009).

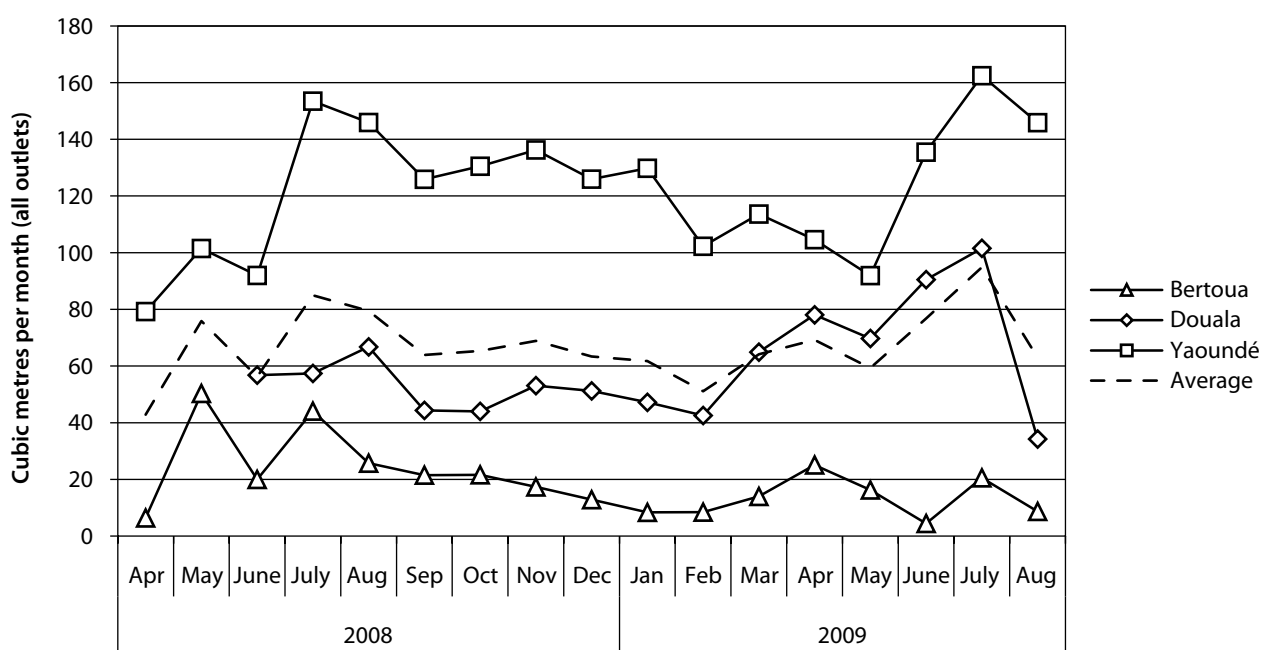


Figure 10. Average sales per month for all outlets

Other more routine measures of adaptation to informality exist. For example, night-time trading, which exists in all markets and depends on the location of the market—the greater the distance from the centre of the city, the greater the trade—and the activity level of local MINFOF staff—the lower the control level, the greater the trade.

4.2 Timber sales

According to our estimates, the average annual volume of sawnwood sold on Cameroon's domestic market between July 2008 and June 2009 was about 990 000 m³. We estimate total annual consumption to be about 860 000 m³, because about 130 000 m³ of the amount sold consists of inter-market sales before the timber reaches the end consumer.

Most of the timber sold on the market came from chainsaw operations in the forests; however, with some inter-city differences, nearly 27% of the products sold came from industrial sawmills. In Douala, where most of the industrial sawmills are located, for instance, about 60% of the total volume was derived from industrial scrap, whilst in Yaoundé, the corresponding figure was close to 14%, which also indicates where the operators have easier access to forests. These data confirm earlier estimates that between 10% and 40% of the timber sold in local markets comes from industrial sources (ONFI *et al.* 2002, Plouvier *et al.* 2002).

An estimated 662 000 m³ of timber sold on the market is sourced directly from sawmill operations in the NPFE. Although our survey methods are not fully comparable to those used in earlier studies (Enviro-Protect 1997, MINFI 2000, Plouvier *et al.* 2002), our estimates indicate that the volume of timber consumption on the domestic market has increased substantially since the 1990s.

Furthermore, the volume of domestic timber sales in the 3 major cities in the survey was higher than that of recent industrial sawnwood production and exports, which fell from 580 000 m³ in 2008 to 360 000 m³ in 2009 (MINFOF 2008, 2009). Between 2003 and 2009, average exports amounted to about 586 000 m³ per year.

4.3 Exports of informally produced timber

During the study period, data collected in the East Region indicate that a total of about 68 000 m³ of sawnwood was transported to northern Cameroon via approximately 500 railway carriages and 550 trucks (of various sizes). The destination most often mentioned was the Cameroon–Chad border, although several other destinations were also noted. These results match those obtained by Koffi (2005), who estimated annual informal exports at 40 000–60 000 m³ of sawnwood.

Wherever possible, the truck drivers were asked about the origin of the timber they were transporting. Their answers indicated that about 40% of the timber came from industrial scrap, suggesting that about 41 000 m³ was harvested in the forests of East Cameroon by small-scale chainsaw operators.

This is to be added to the approximately 12 000 m³ of informally produced timber for export from Cameroon's South-West Region to Nigeria.

Therefore, nearly 80 000 m³ of sawnwood, of which 53 000 m³ is produced by chainsaw, is exported each year, but is not recorded in official export statistics because the deliveries do not transit through Douala or Kribi.

4.4 Products, species and prices

Products used in construction, such as planks, formwork and beams, account for more than 90% of local timber sales. Planks alone account for nearly 41% of all the products from chainsaw operations and about 56% of all products from industrial scrap.

About 70% of total sales are of products made from 1 of the following 5 species: ayous (*Triplochiton scleroxylon*) (the most popular species, accounting for 35% of sales), movingui (*Distemonanthus benthamianus*), iroko (*Milicia excelsa*), sapelli (*Entandrophragma cylindricum*) and bilinga (*Nauclea diderrichii*). Most of the ayous and bilinga

is chainsaw-cut in the forest, whereas nearly 50% of the other species is recovered from industrial scrap.

The sales price varies according to timber quality, type, source and species. The average price per cubic metre across all species and products, expressed in Roundwood Equivalents (RWE), is about 27 000 F CFA, or 83 000 F CFA per cubic metre of sawnwood from the informal sector; note though, for instance, that planks and formwork of ayous (21% of total sales) are sold at 17 000 F CFA and 15 700 F CFA per m³ RWE, respectively—about 3 times the price of the same product made from industrial scrap (5200 F CFA; see Table 8).

As the domestic market requires products of sizes that chainsaw mills can supply but that industry cannot, it is understandable that prices are higher for chainsaw products than for products made from industrial scrap. Furthermore, company policy in many industrial firms is to sell industrial scrap to their employees at low prices. Several factors can explain why the price per cubic metre for tree species sold on the local market is, on average, 80% lower than the Cameroonian free on board (FOB) price for industrial timber (columns F and G, Table 8). First, the international market demands higher-quality products and imposes stricter specifications. Second, there is no tax on timber for the domestic market, and production costs

are lower than in the industrial sector. Another hypothesis is that competition is stronger on the national market than on the export market, thus pulling the price down. Furthermore, Cameroonian households, with their tight budgets, would probably not accept any rapid price increases.

Finally, the lack of information about the real economic value of standing timber in the rural zones severely depresses the price of trees sold by the local population. This flawed evaluation of resources is advantageous for chainsaw millers, who buy at very low prices, but probably means that the raw material is not used optimally. The widespread under-valuing of trees may also explain why relatively little attention is directed towards sustainable long-term resource management and planning, and why customary owners' tend to be uninterested in planting trees with higher commercial value.

4.5 Informal networks: Costs and profits

From our survey findings, we can assess both the costs and the profits of the upstream stages of the informal timber sector and final sales of its products on urban markets. During the period when small logging permits were suspended (1999

Table 8. Sale prices for products most in demand, by species

A. Source	B. Product	C. Species	D. Sales (%)	E. Sale price (F CFA/m ³ RWE)	F. Free on Board price (F CFA/m ³ RWE, Cameroon)	G. % of export price (E/F)
Chainsaw milling	Planks	Ayous/Obeche	4.7	17 000	92 000	18
		Iroko	4.0	33 500	145 000	23
	Formwork	Ayous/Obeche	16.3	15 700	92 000	17
		Fromager (kapok tree)/Ceiba	1.2	13 800	67 000	21
Industrial waste	Planks	Ayous/Obeche	8.0	5 200	92 000	6
		Movingui	5.8	7 900	109 000	7
	Laths	Sapelli	3.2	26 900	131 000	21
		Iroko	2.4	24 200	145 000	17

to 2006), small-scale operators developed strategies and expanded informal networks throughout the country to ensure their continued access to forest resources; they still apply these strategies today.

The most common procedure for legalising illegally cut timber is confiscation followed by auctioning. At auction, seized timber is officially hammer-marked and the buyer receives the official documents needed to transport and sell the products. Although auction procedures are detailed in official regulations (e.g. Decree no. 2001/1034/PM of 27 November 2001), these regulations are rarely followed. After being confiscated from government officials, the timber is nearly always automatically auctioned off to the operator who illegally cut and processed it, who pays an informal 'felling fee' to the same officials (Akoa Akoa 2003, Koffi 2005). No receipt is issued, as required in an official auction transaction, and the money seldom reaches state coffers. Ministry of Finance data on application of the informal confiscate-and-auction process since 2000 are instructive: in 2000, shortly after suspending all small-scale felling permits (1999), the ministry registered about 15 auctions of sized timber with payments totalling nearly 1.2 billion F CFA. By 2008, the number of auction sales had soared to about 275 whilst the total payments from these sales had dropped to about 120 million F CFA. It is worth noting that during that same period, the Ministry of Finance frequently complained that there were insufficient numbers of ministry staff at auction sites, in contravention of the regulations (PSRF 2008), which indicated that fewer auctions were registered than actually held.

This seize-and-sell method for informal auctions may be employed at the felling or timber loading site or along the road during transport, with prices varying depending on which government department (technical or law enforcement) is involved, or at the final market. The amount of these informal payments has been estimated for the upstream end of the sector. In urban markets, the outlet owners make these payments. In fact, ministry representatives confiscate the timber on its arrival at the market, regardless of whether informal payments have already been made. It is not unusual for truckloads of sawnwood to be

seized during transport on the road and then again upon arrival at the market.

The timber is not physically confiscated at the market, but is very often left in the outlet. A ministry official hammer-marks the timber with the 'wrong' side of the official hammer, indicating the territorial authority of the ministry representative, who thus displays his or her 'entitlement' to unofficial payments for the marked timber. When the unofficial payment has been made, the wood is hammer-marked with the 'right' side of the official hammer. Through this sequence, the timber is officially seized and auctioned off, in accordance with the law, after which the outlet owner is free to sell his or her 'legally laundered' timber.

Using the survey data, we can estimate the amounts of informal payments on timber sold in the markets. First, the market representatives and the ministry agent negotiate the product or species prices. Prices differ from one city to the next and possibly also from one market to the next, especially in Yaoundé. For the purposes of pricing, timber is divided into 3 main categories: white wood, red or hard wood and precious red wood. Although which species are considered precious red wood differs from one major city to the next, they usually include afromosia (*Pericopsis elata*), wenge (*Millettia laurentii*) and bubinga (*Guibourtia* spp.).

A fair estimate for the total informal payments is about 2.8 billion F CFA per year, assuming that flat-rate payments are not negotiated. Payments are often negotiated but vary greatly, depending on several factors; it is difficult to estimate the average discount rate for the informal sector. Our interviews indicated a very approximate average discount rate of about 40%. For total output, estimates of informal payments in the urban markets amount to about 1.7 billion F CFA per cubic metre of processed wood, excluding timber from industrial sawmills and resales, which are usually exempt from informal payments.

Outlet owners also have to pay official charges for: (1) the purchase of the wood itself (i.e. the timber from the chainsaw millers), totalling about 41 billion F CFA per year; (2) annual salaries

totalling 2 billion F CFA for the staff across all 1200 outlets, each of which has, on average, 1.7 full-time employees and 1.8 part-time employees; (3) rent (about 220 million F CFA) that outlet owners pay each year to the landowners in the marketplace (rents differ from market to market and are often a function of the sales volume, but on average, each outlet owner pays about 15 000 F CFA per month); (4) a final business tax (*impôt libératoire*) of about 49 million F CFA per year. This is the total amount of the official taxes that registered outlets (about 1200 in January 2010) pay to the municipal board in the council area where they are registered and located. All outlet owners are subject to this tax. Paying local taxes is especially important, not because of the amounts paid but because they are based on the assumption that the outlet owner's sales on the timber market are legal. By paying these taxes, selling the timber becomes officially authorised, although the source of the products is often dubious.

The outlet owner or manager is expected to cover all of these costs through sales. For our survey, the outlet owners provided information on the revenue obtained from the products (per species) for about 62% of the total number of sales recorded. We calculate the value of sales in the informal chainsaw timber sector—that is, excluding sawmill scrap—by multiplying the total volume sold in the markets of the survey cities (about 662 000 m³) by the average price for a cubic metre of sawnwood sold to the final customer (83 000 F CFA). Hence, the total value of sales in this informal sector is estimated at approximately 55 billion F CFA per year.

By subtracting from this sales revenue the total costs paid by outlet owners each year (about 45 billion F CFA), we calculate that total net profits from selling small-scale chainsaw milling-derived products exceed 9 billion F CFA per year (Table 9); this is equivalent to about 7.8 million F CFA per outlet or about 10 800 F CFA per cubic metre sold.

Table 9. Costs and profits of timber sales for outlet owners

Cost and profits	F CFA/yr (million)
Sales revenue	54 632
Costs	45 334
- Purchase price	41 313
- Wages	2 031
- Rent of market space	219
- Final taxes	48
- Informal payments (expected)	1 723
Profit (revenue – costs)	9 297

These calculations indicate that timber sales in urban markets are very profitable, even in the informal sector. It is noteworthy that during the 2 years of the survey, the number of outlets rose by 30% and the sector created about 4000 direct jobs in the timber markets covered by the survey. As Cameroon's national economy grows, the sector will very probably continue to grow, making greater use of the forest resources. This growth will have considerable economic, ecological and social impacts, which must be factored into new national policies on Cameroon's forests. We discuss this issue in the following section.

5

Discussion

5.1 Economic sustainability, profitability and jobs

For at least 15 years, Cameroon's forest policies have ignored small-scale chainsaw millers, who took actions to develop an informal sector that progressed without the attention recently bestowed by the government, funding agencies, timber companies, NGOs and even research centres. Chainsaw milling has become a big, efficient, economic sector, open to international business. It is a sector that has all the characteristics of a competitive market: atomised supply and demand, relatively accessible information on prices, few barriers to entry and exit, and relatively standard products.

In contrast to the industrial timber sector, the domestic sector caters to national demand by exploiting resources within the country. The whole sector, from production to consumption, operates mainly within national borders. It responds to urban demand for inexpensive sawnwood mainly for construction and furniture and, in so doing, generates substantial revenue for the rural economy.

According to our survey in the southern part of Cameroon, an estimated 44 000 people (40 000 in rural areas and 4000 in the urban markets) earn their livelihoods directly from chainsaw milling. Some people earn most or a significant part of their livelihood from this activity. Thousands of other parties also depend on this sector, such as artisans and carpenters, of whom there are nearly 5300 in Yaoundé alone (JMN Consultant 2005). Assuming

that each job supports 5 people, it can be estimated that, in the southern part of Cameroon, this sector supports about 250 000 individuals.

The breakdown of costs indicates where revenue from sales throughout the sector goes (Table 10, based on the estimates of costs and profits for village sawyers in both rural and urban areas; see column D, Table 7), where the final sales price per cubic metre of timber is close to the buying price set by traders.

Amongst the cost items factored into the final sales price for a cubic metre of sawnwood on the domestic market, wages account for the highest share (34%). Transport, profits, informal payments and consumables each account for about 15% (Table 11).

These data can be regrouped to quantify direct revenue generated by the sector for 4 types of actors, based on a consumption figure of 662 000 m³ of 'illegal sawnwood' in the markets (Table 12).

We could add other indirect economic benefits to this estimate of revenue produced by the informal chainsaw logging sector, such as the difference in price between timber from informal chainsaw operations and from the formal sector. Urban consumers, for instance, save considerable sums of money by buying from the informal sector rather than from industrial sawmills or even community forests. The informal sector thus has many economic spill-over effects on various activities,

Table 10. Breakdown of use of final sales revenue for a cubic metre of sawnwood

Description	Estimate (F CFA)
Wages in the village	25 428
Payments to customary heirs	4 397
Informal payments in rural areas	8 063
Transport and equipment	9 500
Fuel and oil	9 080
Spare parts	5 578
Miscellaneous	2 048
Profits in the bush	403
Informal payments in urban areas	2 603
Final taxes	74
Rent for outlet	331
Wages in urban areas	3 067
Profits in urban areas	14 042

Table 11. Aggregated components of sales price of sawnwood

Components of final sales price	Estimate (F CFA)	%
Wages (rural and urban areas)	28 495	34
Transport and equipment	15 078	18
Profit (rural and urban areas)	14 445	17
Consumables and misc. in rural areas	11 128	13
Informal payments (rural and urban areas)	10 666	13
Payments to customary heirs	4 397	5
Official taxes	74	0
Rent for outlet	331	0

Table 12. Beneficiaries

Beneficiaries	Sources of revenue	Amount (million F CFA/yr)
Rural populations	Wages Tree sales Profit on sale of sawnwood to urban traders	20 011
Urban populations	Wages Outlet rental Profit from sale of lumber to end user	11 545
Representatives of government or council authorities	Informal payments at council level, during transport and in urban markets	7 061
Council authorities	Final taxes	49

such as transport, artisanal crafts and the sale of sawing equipment—elements that are not taken into account in revenue estimates.

It appears, then, that the informal chainsaw milling sector generates considerable income, especially for rural populations, and considerable profits in both rural and urban areas. As the chainsaw millers in our survey said, this activity is very lucrative and hence continues to attract more and more people. As noted above, our survey data show that the number of outlets rose by nearly 30% between 2008 and 2010. However, the sector contributes very little by way of tax revenue or to fund public policies at the central or council level.

Given that the government has been the main loser in the dynamic growth of the chainsaw milling sector in Cameroon during the past 15 years, it is legitimate, at least for economic reasons, for the state to want to regulate and legalise this sector. However, the stakes are high. Any policy must serve to maintain the present level of job creation and revenue generated by the sector whilst at the same time encouraging (1) the economic actors to respect the technical, commercial and fiscal regulations, even though these will increase overall production costs, and (2) certain government agents to eliminate some major parafiscal networks. There is a great risk that imposing too many constraints and taxes on the sector, without strong

accompanying actions to improve governance, will put off most actors, who will probably devise new ways to maintain their informal status. In any case, a major increase in production costs—which would mean a significant drop in profits—could hardly be expected to convince these actors to continue their work within a formal, official framework. The economic profitability of the chainsaw milling sector, whether formal or informal, remains the key element in understanding how the sector works and how it may develop in the future.

5.2 Social and institutional sustainability

A favourable aspect in the growth of the small-scale chainsaw milling sector in Cameroon during the past decade is its social acceptance at village and individual levels, as well, to a certain extent, as the Cameroonian government level.

The move by customary owners to take over the areas and resources generally located near villages has increased opportunities for chainsaw millers to fell the trees. Although this move by customary owners is partly supported by the forestry law, which ratifies customary user rights, it does not comply with current regulations in at least 2 ways: on the one hand, the state is still the legal manager of the lands and its resources and, on the other, products derived from the exercise of traditional rights may not legally be sold. Hence, trees cannot legally be sold to chainsaw millers without permits, even though this activity seems legitimate within the community.

Indeed, in forest areas, especially in the NPFE, the resident population often manages the forestlands and resources, standing in for the decentralised state agents. This means that informal standards and practices rather than official regulations govern the daily use of the forest resources. By turning over their trees to the informal chainsaw millers, customary owners are implementing their traditional land and resource ownership rights. This enables them not only to consolidate their customary rights over these resources, but also to transform these rights into a source of revenue. Extending this idea, some authors, such as Oyono

(2004) and Bigombe Logo (2004), consider the community's decision to sell the trees as a way to assert rights over these resources—rights that were denied them first by colonial powers and then by Cameroon government. Although this view may appear exaggerated, especially given that it understates the desire for a quick income as the owners' main reason for selling the trees, it is true that the trees are almost always sold to informal chainsaw millers by individuals with customary rights.

This manipulation of customary rights, which are often collective rights, by some individuals for their own personal benefit sometimes creates serious conflicts within the community, especially when chainsaw millers are not from the same area. The chainsaw millers surveyed spoke of frequent problems arising because of tense or complex relationships with the customary owners. Customary rights over some forest resources are not clear because of the resources' location or status. Whereas an heir's customary property rights to trees growing in a cacao plantation or in newly cleared farmland are unambiguous, customary rights to old fallowlands or to collectively owned property may be unclear. This coexistence of individual and collective customary rights over a given land area (Lescuyer and Emerit 2005, Lescuyer 2006) tends to lead to conflicts when an individual sells, solely for his or her personal benefit, resources considered to belong to the family or community. Again, however, the urgent need for money pushes many village people to sell trees to which they do not have full customary ownership rights, even though they know they will have to settle a dispute with the 'village brothers' afterwards. Competition amongst customary heirs to supply trees and poor relationships with the market may explain why they receive low prices for standing trees. Better dissemination of information to the communities about the final prices for sawnwood should help push up the price, thus increasing prices paid to customary owners and encouraging chainsaw millers to do more to capitalise on this high-value commodity.

Many government agents and services have also accepted—even encouraged and facilitated—the existence and development of the informal

chainsaw timber sector. By the end of the 1990s, the chainsaw milling sector had already adopted many informal practices (e.g. Auzel *et al.* 2001) that thereafter became more pronounced and complex as a result of the suspension of the 'small titles' in 1999. By 2001, a well-tested system for 'laundering' informal chainsaw timber had been developed, at least in the Yaoundé urban markets (Akoa Akoa 2003). With dramatic growth in national demand for timber, the system continued to expand and become more complex. The system is still in place and provides a handsome income for many government officials, who, as noted above, accept and even encourage the informality of the domestic timber sector.

Before introducing reforms, it will be important to consider the role of this activity in Cameroonian society, both for resident populations and for the government. Formalising and regulating this sector will require well-designed targeted strategies.

5.3 Environmental sustainability: Prospects for the future

At the national and international levels, there are 2 lines of discourse on the environmental impacts of informal timber production in Cameroon and throughout the sub-region. On the one hand, a dominant discourse amongst environmental NGOs (e.g. Friends of the Earth 2008) and some central governmental services portrays the sector as characterised by unregulated practices that ignore standards designed to guarantee sustainable forest management. Such parties describe the informal activities as being the work of individuals who are only interested in making a quick profit and who will do anything to circumvent state services, thus accelerating the degradation of forest resources for the benefit of only a few unscrupulous profit-seekers.

Other analysts, however, offer a more optimistic view of the environmental impacts of chainsaw milling, suggesting that the informal methods make better use of ligneous resources (Fomete 1997), have less impact on the environment at the felling/processing sites, attract more involvement by local people (Auzel *et al.* 2001) and/or reduce pressure on the production forests (Plouvier *et al.* 2002).

Our research puts us in a midway position. Small-scale chainsaw millers usually remove trees from highly anthropic environments in the NPFE, which is not supposed to remain permanently as forest. The estimated 33.7% processing rate recorded in our survey indicates that chainsaw processing is at least as efficient as industrial sawmills during the first processing stage (ONFI *et al.* 2002). Small-scale chainsaw millers select trees with a large diameter, and usually exploit the lower branches also, in contrast to industrial timber companies, which leave these branches lying on the forest floor.

This type of selective logging is carried out particularly in the NPFE and so does not seem to lead to the significant deterioration of any contiguous Cameroonian forest areas that the law seeks to protect in the PFE. However, the environmental impacts of this informal production system may become more pronounced in the next few years, because of 2 main factors.

First, local populations have practically no management principles for commercial wood resources. Traditional owners invoke their customary ownership rights to sell 'their' trees to the chainsaw millers, but very few of these owners use these rights to effectively manage their forestry resources. As Robiglio (2009) indicated for Centre Region, customary owners are solicited to relinquish their property, not to manage it. Although cacao plantations represent the most successful form of customary property, which even the government would find difficult to challenge, very few farmers plant more commercial tree species, and most are quite willing to sell the trees already growing on their land. Even when customary rights are unquestionably established, there are very few personal initiatives to manage the forestry resources through, for instance, afforestation, reforestation or assisted natural regeneration. Unless the customary owners begin managing their lands and tree resources, there is a risk that all commercial tree species will be felled and become increasingly rare. This already seems to be the case in areas around Yaoundé, such as Lekie division, where red wood got scarce. By simplifying and decreasing the cost of the procedure to obtain land rights and establish private forests, the government could convince some customary

landowners to become legal owners, with a potential direct impact on the replanting of commercial tree species. This legal option, however, might well lead to serious conflict amongst heirs during the demarcation of private individual plots in areas that are now often collectively owned.

The second factor that could affect the environment is the amount of chainsaw timber required to meet the medium- and long-term urban demand. Eventually, to meet demand, the chainsaw millers will have to penetrate deeper into the forest and use more effective tools such as portable saws, which currently are used mainly to supply the legal export market. In some areas, it will be difficult to prevent chainsaw millers from entering the PFE, whether logging concessions, abandoned or not, or even protected areas, thus potentially destabilising Cameroon's whole forest policy. Given an estimated processing rate of 33.7% for estimated sales (662 000 m³) and exports to North Cameroon and Nigeria (53 000 m³), we calculate that the total volume of logs processed into informal chainsaw timber is approximately 2.1 million m³ RWE per year. Between 2004 and 2008, the average formal production from forest concessions in the PFE amounted to about 1.8 million m³. The official total national production figures—from concessions, *ventes de coupe* (VC) and timber recovery permits (TRP)—for the same period was close to 2.2 million m³ RWE. Adding annual production of small-scale chainsaw timber to the official figure for 2008 (2.2 million m³) puts the total output for Cameroon at about 4.3 million m³, of which only 9% comes from Forest Stewardship Council (FSC)-certified industrial forest concessions, and only 28% is harvested according to rules set out in management plans.

Since the adoption of the 1994 law, various forest policies have attempted to regulate the industrial sector. Although this focus was probably still justified in the 1990s, when small-scale timber production was less developed than it is today, the situation has changed, and public policies, both industrial and environmental, would become more effective if they considered national timber production as a whole. A recent government publication titled 'Strategic document for growth

and employment', which establishes the reference framework for government actions between 2010 and 2020 (Republic of Cameroon 2009), states that efforts in the forest sector for the next decade will be directed towards stabilising timber production at its current level (i.e. about 2 million m³). As detailed above, however, the real timber production figure is more than double that, and the extent of the production creates social, economic and environmental dynamics that are very different from the dynamics generated by the industrial timber sector. Hence, any government actions that neglect to consider local production by informal chainsaw millers may fail.

Furthermore, the optimal conditions for developing a national or regional timber market—an issue the ministry has been studying for at least a decade—cannot be assessed without adopting a global strategy and implementing services that pay due attention to the economic, environmental and social impacts of both the industrial sector and chainsaw production. In April 2010, the Ministry of Forests and the Ministry of Trade published a decree stating that the role of the domestic timber market should be, amongst others, (1) to promote the use of secondary species, (2) to promote equitable market conditions and (3) to keep timber producers and the traders informed about timber supply and demand (MINFOF-MINCOMMERCE 2010). Although these are generally legitimate objectives, the validity of their underlying hypotheses can be assessed only if the Cameroon's entire forestry sector—with data from both the industrial and the domestic sectors—is taken into account. Data for our survey, for instance, show that both sectors target the same species: about 60% and 80% of the total volume of ayous and iroko harvested, respectively. These species, which have long been the most widely harvested, are sourced mainly from the NPFE, rather than from the forest concessions (Figure 11). Hence, the use of these trees and timber produced from them are not declared or regulated, and no formal taxes are imposed. This lack of knowledge about how the informal sector operates hampers the design of policies that favour equitable market conditions and improve conditions for national timber supply and demand.

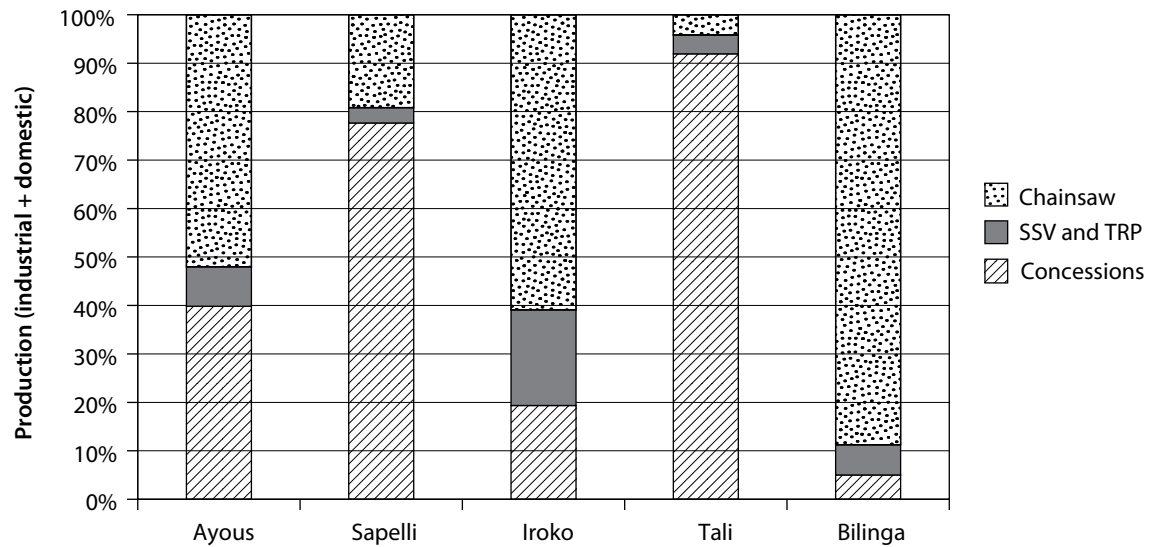


Figure 11. Felling methods for the most targeted species

Community forestry (CF) is often proposed as a strategy to ensure the long-term future of small-scale sawmills, with the idea the CF activities are limited to small-scale timber production, ostensibly for the local markets, and local populations are the direct beneficiaries. CF is hence often presented as an interesting opportunity for attracting and recruiting chainsaw millers legally. This strategy, however, has to overcome 2 major obstacles: (1) much higher production costs for CF timber than for informal timber production (Nzoyem *et al.* 2010), which explains the poor competitive position of CF products on the national market; and (2) the scarcity of CF timber on the markets because so few CFs are exploited. In 2009, for instance, only 73 community forests had received the Annual Harvesting Certificate (AHC) that allows them to exploit the forests. Assuming that the average annual output from a community forest

is about 200 m³ (Cuny *et al.* 2004), the domestic markets would receive no more than 15 000 m³ of sawnwood from this source. Furthermore, assuming that the number of operating community forests reaches 300 in the next 5 years, their production would level off at 60 000 m³ of legally sawnwood per year, or less than 10% of the volume currently produced by the informal sector for sale on the Yaoundé, Douala and Bertoua markets.

Of course, this does not change the need to improve the functioning of the community forests. The first steps in this improvement were the approval of a new procedures manual and an increase in the number of CFs. In particular, it is essential that the government revise the regulations on small logging permits and other *ad hoc* measures in order to improve the economic, environmental and social impacts of chainsaw milling.

6

Suggestions for regularising, securing and ensuring the sustainability of the chainsaw milling sector

6.1 Reform of permits and permit award system to better satisfy the needs of the small-scale chainsaw millers

The permits for chainsaw milling created under the forestry law have not been satisfactory: some do not allow sales and only cover small volumes (personal logging permit); others require formal recognition as a logger (timber exploitation permit for small-scale processing); and all of them entail cumbersome procedures. For example, since 2006, all permits have been centralised and are issued in Yaoundé.

For a small-scale chainsaw miller, the way towards legality is not impenetrable—but almost. Ill-adapted measures create illegal situations (Lescuyer 2007), either because legality is beyond the reach of most small-scale chainsaw millers, or because certain actors decide to reach an agreement with state agents in order to circumvent these regulations, thereby generating collusion and corruption. In 1999, the excessively large number of irregular small permits led to the MINFOF decision to suspend them all (until 2006). Our survey showed that very few chainsaw millers then bothered to obtain a legal permit; the permits increased the chainsaw millers' operating costs without offering any compensating benefits, because possession of a permit did not translate into significantly lower 'informal' payments. Many community forest managers feel the same way. Their secure waybills look no different from fake waybills, and they have

to pay the same parafiscal charges as the illegal chainsaw millers (Karsenty *et al.* 2010).

There is no quick solution for convincing the informal sector to regularise and formalise its logging activities. At present, the type of professional accreditation required (it is the same as for industrial activities), the type of permits created through the forestry law and the procedures for issuing these permits are major obstacles for nearly all chainsaw millers. Professional accreditation must be more customised, and contain special provisions, for instance, for small-scale logging. Plouvier *et al.* (2002) recommended that procedures for obtaining legal permits be simplified and volumes be adapted to the real capacities of the chainsaw millers. In addition to accreditations, permits for chainsawn products should be readily available by being issued at the administrative level closest to the applicant, even if this makes it more difficult for central MINFOF agencies to coordinate and track the permits. Measures could easily be taken to reduce this difficulty, such as allocating a quota and/or a number of permits per region, per year. Furthermore, signing the VPA-FLEGT should induce Cameroon to establish a traceability system that covers the whole national territory and should contribute to monitoring small permits.

Interviews with the chainsaw millers and responses to the survey questionnaire reveal 3 elements that characterise chainsaw millers' idea of 'an ideal permit'.

1. Geographical scope limited to the council or even the canton level because most chainsaw millers work in their area of residence.

Within this zone, it would no longer, *a priori*, be necessary to identify which trees can be cut down, but all trees felled must be located within the NPFE.

2. A large enough annual volume of wood to ensure a regular year-round income. For most chainsaw millers, the target volume is more than 30 m³ but much less than the 500 m³ provided for in the small-scale timber production permits. An average volume might be between 100 and 200 m³ per year, depending on the size of the NPFE and the density of commercial species growing in the zone.

3. One annual, flat-rate payment calculated according to the felling volume.

Even if small permits are adapted to small-scale chainsaw millers' needs, the millers will only apply for them if the costs are not significantly higher than the benefits. It will probably not be possible to convince chainsaw millers to regularise their situation if they do not gain any economic advantage. In tangible terms, this means that the price that the chainsaw millers are willing to pay for a legal logging permit has to be at least partly offset by lower informal payments—which chainsaw millers now have to pay throughout the entire production process. If a legal logging permit does not ensure lower para-fiscal charges, most chainsaw millers will probably choose to stay in the informal sector.

6.2 Reforming governance at the local level

As mentioned above, there are 3 levels of informal payment in the chainsaw milling sector: in the council, on the road and at the urban markets. Urban market controls are carried out by MINFOF services only, but upstream in the sector, several government services are involved, each taking 'their share'. Improving governance will require an intersectoral approach—if the aim really is to lower para-fiscal charges, which is a prerequisite for any regulation of the informal logging sector.

With several ministries represented in a council area, it may be possible to set up multipartite council commissions to deliver and control logging permits. If the small-scale timber production permits were delivered and auctioned by MINFOF agents operating locally, it may be possible to set up a council commission composed of the head of the local forest office and other forms of public authority (sub-prefecture, MINFI, gendarmerie, police, city hall), who may potentially be opposed to legalising the small-scale timber production sector. This type of commission already exists for the allocation of revenue from forest and wildlife resources. To recognise members' participation in awarding the permits, a substantial bonus could be paid to the commission each year on the basis of the number of permits delivered and their on-site use. The purpose of the bonus would be to enable all the public officials involved to benefit from the legalisation of the sector: the bonus should be high enough to partially compensate for the income lost by the elimination of the 'administrative hassle', which is currently an important source of personal revenue for a large number of civil servants.

If the incentive mechanism fails—in other words, if the para-fiscal payments continue—the chainsaw millers would be unlikely to apply for logging permits, which in turn would mean a lower bonus for the council commissions at the end of the first year. The challenge lies in replacing informal personal gains with official payments to the local government representatives so that, over time, they will come to support the legalisation of the small-scale timber production sector.

This approach is not free of risk. For example, permits could become concentrated in the hands of a few operators who have connections with the local administrative services, or other agents may find their way into the informal payments circuit to solicit this 'bonus' in exchange for support of the legalisation process. However, it seems logical that the members of the council commission would try to protect their own bonus by preventing outsiders from interfering with the newly established mechanism. The central government must also be involved in supporting the local mechanism for good governance, as the Minister of State

recently indicated in his presentation on the VPA to decentralised government agencies (Chi Elvido 2010).

6.3 Economic incentives rather than prohibitive regulations

As noted above, the main attraction of informal timber production is the revenue it generates for those working in the sector. The financial variables are therefore critical in changing these actors' behaviour. This situation suggests 2 approaches for the government.

Try to increase the costs of producing timber informally, thereby decreasing profits, which would persuade some chainsaw millers to shift to the legal sector where margins are protected, as well as improving the quality of the final product. However, this approach has 2 problems. First, the profit margin in the legal small-scale timber production sector is not known, because such activities are very rare. The few studies that exist on the profitability of community forests indicate that their profits are low—even negative—when measured against the number of households concerned (Akoa Akoa 2007, Rossi 2008, Beauchamp 2009). Therefore, even if operating costs are increased, there is no guarantee that informal small-scale timber production would become less profitable than the legal production of timber produced currently for the domestic market. The second problem with a voluntary increase in informal production costs is related to the behaviour of government agents in the field: rarely do agents actually confiscate timber—our survey recorded 9 cases out of 340 sawnwood operations—and corruption is rife. If there is no exponential increase in the amount of timber seized—a politically sensitive solution—levying more taxes on informal chainsaw millers may simply reinforce the present system, marked

as it is by poor governance; that is, it may lead to demands for higher para-fiscal payments.

Give chainsaw millers who commit to legality guarantees that their level of profitability will be at least equal to what they gain in the informal sector. Producing sawnwood legally should be financially as attractive as supplying the urban markets with sawnwood from the informal sector. This requires, first and foremost, easy access to auctions and to logging permits, which would mean lower informal payments. Furthermore, this would also require the creation of urban markets that specialise in the sale of legal timber at a higher sales price. It is not known whether this type of niche market potentially exists. After at least 10 years of informal production characterised by ongoing hassle from government services, the sector has little interest in the notion of the 'legal source of the timber', especially if it means higher prices. End consumers probably share this attitude, as they are anxious to buy sawnwood at a low price, even if the quality also is lower.

The state can give the sector new impetus by requiring all public markets to buy timber only from legal sources, as it has done indirectly by signing the VPA. Other initiatives, such as the creation of a 'wood cluster', i.e. a controlled place where all domestic timber sales should take place in large cities such as Yaoundé and Douala, could also create a demand for legal timber. Product standardisation, which MINFOF has already started to work on, will help define products better and make this market more fluid. The challenge lies in convincing the upper and middle social classes to pay a little more for legal, good-quality timber. Some carpenters in the city have already found a place in this 'luxury' market and are successfully exploiting it, but a specific market study would be needed to assess the potential scope of such a legal market for small-scale sawnwood products.

7

Conclusion

Chainsaw milling operations are vital to the well-being of tens of thousands of urban and rural Cameroonians. During the past few years, this sector has become at least as important as the industrial forestry sector, having produced some 2.1 million m³ of wood, created about 45 000 jobs (direct) and generated more than 20 billion F CFA. However, forest policies tend to ignore its existence, thus making the state the main loser in the growth of this almost totally informal sector, with no official data collected to assess the sector's economic, environmental and social impacts. Cameroon, upon entering into a Voluntary Partnership Agreement with the European Union, will have to trace the source of all lumber produced in the country. The government is making technical efforts to fulfil this obligation—for example, in April 2010 a comprehensive timber traceability project was launched—but such technical efforts are not enough. A new approach is needed to fully integrate small-scale sawmills into the national economy and to improve the governance of the sector. Achieving this will require winning over

several groups involved in the forestry sector whose interests will not be served by formalising the chainsaw milling sector. A key group is made up of Cameroonian government officials, who collect a total of more than 6 billion F CFA a year in informal payments. One of the challenges, therefore, is to create a mechanism that can 'convert' personal revenue received from illegal sawnwood into collective benefits via levies on an activity legally recognised by the state and its public services. This new approach should also introduce reforms that ensure the informal sector becomes legal, secure and sustainable. The legal framework should, for instance, allow for the issuance of felling permits that better meet the needs of the small-scale chainsaw millers. Rather than increasing repressive measures against the 'illegal' and/or informal chainsaw millers, we recommend that incentives, especially economic incentives, be devised in a framework that will gradually entice the chainsaw millers to take part in a legal activity that will be just as lucrative as their informal practices are today.

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In 1994 Cameroon adopted a new forest law that focussed on the large-scale, export-oriented industrial forest sector while timber produced through small-scale logging for the domestic market was ignored, even in official statistics, and is generally produced without a valid permit. As Cameroon prepares to implement the Voluntary Partnership Agreement (VPA) it recently signed with the European Union, promising a legal framework for all national timber production, this occasional paper presents a quantitative and qualitative evaluation of the country's domestic timber market. By adding our estimates for small-scale production of sawn wood sold on the domestic market to national statistics, total national production would amount to about 4.3 million cubic metres per year, in other words close to double the official figure for Cameroonian timber production. Our research also found that the domestic market is profitable for thousands of Cameroonians. Its informal structure, however, contributes to maintaining a huge, inescapable payment system run by State agents to launder the timber sold on local markets, informal transactions that are worth about 6 billion F CFA each year. The paper concludes with technical options to improve market operating conditions. These options may prove ineffective unless they are accompanied by determined efforts to fight the corruption that permeates the industry.

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