Description of the artisanal supplies of wooden products in Yaoundé, Douala and Kinshasa

for the project "Congo Basin Timber"

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Introduction

The project "Congo Basin timber" started with some delay in May 2015, due to the procedures to establish the Letter of Agreement between CIFOR and ATIBT. In July 2015, an inception and methodological report was written to introduce the framework of the project and the methods to be implemented in the sampled cities.

In this project, the CIFOR is in charge of:

1. WP1 - Reviewing existing literature on the current situation of the uses of sawn wood products in the domestic market of Cameroon and Democratic Republic of Congo (DRC).
2. WP3 - Estimating the current artisanal supply of wood products for outdoor public works and for housing fitting-out on the domestic market, i.e.
    a. Assess the current sales of wood products for outdoor public building and works and for housing fitting-out by the artisanal producers on the domestic market;
    b. Describe the technical, commercial, physical and status of the products that can be proposed by the artisanal sawn wood sellers and joiners.
3. WP4 - Estimating the urban private demands for wooden furniture, i.e.
    a. Assess the volume and type of imported wooden furniture through surveys in specialized shops and consultation of customs data;
    b. Describe the types and prices of wooden furniture sold to private consumers by local joiners, by market surveys.

The survey methods were tested in Cameroon and DRC in July. The complete campaigns of data collection started in August in Cameroon and in September in DRC. They ended in November and December respectively. This report presents an overall analysis of the current state and challenges of the production and trade of wooden furniture in Yaoundé, Douala and Kinshasa. These new data complement the information already published by CIFOR on the urban markets of sawn wood in the two countries.

Methods

CIFOR elaborated the questionnaires for all surveys to be conducted in the two countries. In Cameroon, the CIFOR team conducted the surveys, with the support of four MSc interns (from the University of Yaounde II). In Kinshasa, the national NGO CODELT was sub-contracted by CIFOR to do the field surveys, through a team of 12 investigators. One member of the CIFOR team spent one week in Kinshasa to calibrate the surveys and to supervise the starting of the surveys.
All survey protocols and documents were pre-tested during one week to be adjusted before being applied to the full range of joiners and furniture shops.

Three tasks had to be conducted by CIFOR in this project:

1. List and categorize the products sold in the urban markets.

In the cities selected for the project, CIFOR already featured the domestic markets of timber and sampled the urban sellers. CIFOR has a substantial database where timber sales were recorded for at least one year in each significant market. An exhaustive list of all timber products is established thanks to this database. To identify the use(s) of each of these products, individual interviews and focus group discussions were done with a sample of urban sellers.

2. Identify the joiners/carpenters workshops located in Kinshasa, Douala and Yaounde, and describe the technical, commercial, physical and status of the products they propose as furniture and housing fitting-outs.

In the three cities, a team screened each urban district to locate every workshop of joiners and carpenters. A standard questionnaire has been filled in by these actors to characterize their production. The final version of this questionnaire is provided in Annex I.
The pre-test phase for this questionnaire showed for instance that most joiners were not comfortable with estimating the timber volume used to manufacture every piece of furniture. Therefore this data was not included in the final questionnaire and had been collected in a separate survey phase where the enumerators assessed the average timber volume required by each category of furniture.

3. Assess the volume and type of imported wooden furniture through surveys in specialized shops and consultation of customs data.

In the three cities, at least one enumerator visited the formal shops of wooden furniture to identify and characterize the main products offered for sale. A standard questionnaire has been filled in by the managers to assess the volume and value of their sale of wooden furniture. In a minority of stores, managers did not collaborate and the only information gathered was through a detailed diagnosis of the furniture presented in the show room. The final version of this questionnaire is provided in Annex II.

The urban surveys started in August 2015 in the three sampled cities and ended in November in Cameroon and in December in DRC. The Table 1 synthesizes the number of shops and stores visited by the survey teams, for which data were analysed. Almost one thousand of joinery workshops were visited in the two countries. Due to the absence of official recordings of these two specific activities by the administrative services, we cannot provide the level of representativeness of our sample, but the large number of surveys guarantees that the main business trends were captured.
We interviewed around 120 managers or owners of a furniture shops in the three cities, with a focus on formal and well-established shops that are often specialised in selling imported wooden furniture. Here again, we are not able to assess the representativeness of our samples but all renowned shops based in the city centres were investigated, sometimes with little collaboration from the managers or the staff.

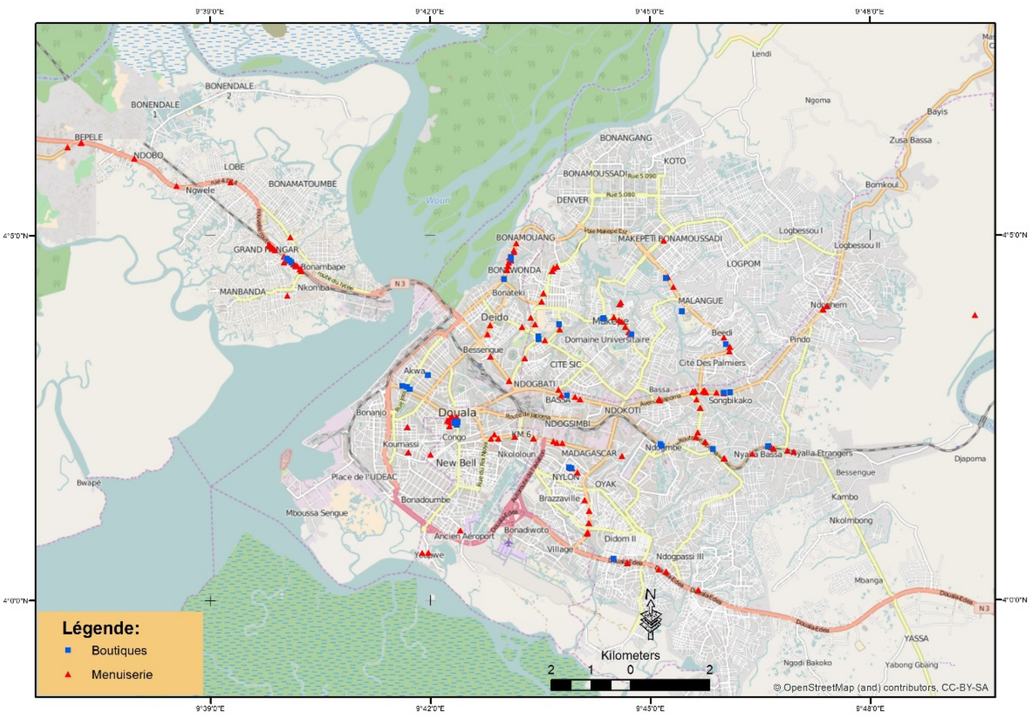
Table 1 – Sample of our surveys in the two countries

	Cameroon (Yaoundé & Douala)	DRC (Kinshasa)
Joiners-carpenters workshops	259 (115 Douala, 144 Yaoundé)	679
Furniture stores	89	23

Figure 1 and Figure 2 show the geographical distribution of the workshops and stores surveyed in Kinshasa and Douala.

Figure 1 - Indicative location of the surveyed workshops and stores in Kinshasa

Figure 2 - Locations of the surveyed workshops and stores in Douala



Literature review on the domestic markets of sawn wood in Cameroon and DRC (WP1)

Current state of the domestic demands of sawn wood in Cameroon

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. The law offers several options for small-scale operators in the Non-Permanent Forest Estate: (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. Options (2) and (3) may not be used for commercial purposes.

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. The initiative was repeated in 2013 and 2014, with the same mitigated result. There are several explanations for this failure. First, and contrary to the law, the logging permits were centralised by an inter-ministerial 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 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 (Roundwood Equivalents, RWE) in 1996 (Enviro-Protect 1997) to about 500 000 m3 in 2000 (MINEFI 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 sawn wood) was sold on the local markets. Cerutti and Lescuyer (2011) provided more recent estimates of the scope of the domestic market: between July 2008 and June 2009, the average annual volume of sawn wood sold on Cameroon's domestic market was about 860 000 m^3 with 662 000 m3 of timber sourced directly from informal chainsaw milling operations and 198 000 m^3 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.

In these domestic markets, 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 RWE, is about 27 000 F CFA, or 83 000 F CFA per cubic metre of sawn wood from the informal sector. 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 FOB price for industrial timber. 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.

On the basis of the total volume sold in the markets of the survey cities and the average price for a cubic metre of sawn wood sold to the final customer, the total value of sales in this informal sector is estimated at approximately 55 billion F.CFA per year. These calculations indicate that timber sales in urban markets are very profitable, even in the informal sector.

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 (Cerutti and Lescuyer 2011).

Constraints to source domestic markets with legal timber in Cameroon

The optimal conditions for developing a national or regional timber market 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. 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.

There is no quick solution for convincing the informal sector to regularise and formalize its logging activities. At present, the type of professional accreditation required, the type of permits created through the forestry law and the procedures for issuing these permits are major obstacles for nearly all chainsaw millers. 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 chain sawn products should be readily available by being issued at the administrative level closest to the applicant. Measures could easily be taken to reduce this difficulty, such as allocating a quota and/or a number of permits per region, per year.

According to Cerutti and Lescuyer (2011), two short-term measures are claimed by most chainsaw millers to ease access to legality. First, a reform of content and the procedure to grant small-scale logging permits is required, with three proposals: (1) geographical scope limited to the council or even the canton level because most chainsaw millers work in their area of residence; (2) a large enough annual volume of wood to ensure a regular year-round income; (3) one annual, flat-rate payment calculated according to the felling volume.
On the other hand, 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. 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 parafiscal charges, most chainsaw millers will probably choose to stay in the informal sector.
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 15 years of informal production, 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.

However, none of these options will be very effective unless they are accompanied by determined long-term efforts to fight the widespread, uncontrolled corruption throughout the sector.

Current state of the domestic demands of sawn wood in DRC

With an estimated 155 million hectares of forestland of which two-thirds are rainforest, DRC is home to close to half the tropical rainforests of Africa. Early in the 2000s, with a gradual return to peace, DRC undertook a vast political, economic and institutional reform programme that especially focused on the forestlands (Debroux *et al.* 2007). In response to pressure from certain international donors (Trefon 2006), a forest code was adopted through Law No. 11/2002 of 29 August 2002 to encourage sustainable resources management and increase the contributions of the forestlands to the country's economic, social and cultural progress. Most of the reforms and discussions on forest policy focus on the industrial sector, with less attention being given to the importance of the artisanal, often informal practices, because they were less well documented.
Several estimates were provided to assess the financial importance of small-scale logging in DRC. In the early 1990s, the study by Gerkens *et al.* (1991) showed that the production of timber in the informal sector (525 000 m^3/yr) was far greater than in the industrial sector (132 000 m^3/yr), but this study is more than 20 years old. More recently, Djiré (2003) studied 103 timber outlets in Kinshasa, Matadi and Boma and estimated the production from the informal sector at 1.5-2.4 million m^3 of chainsaw timber per annum. But the sample in their study was not large enough or long enough to produce a representative estimate of the national production from this sector. Many field studies were criticised for the same reason, especially in Orientale province (Nkoy Elela 2007, Abdala *et al.* 2010, Begaa Yendjogi 2012), where credible data were collected but over too small an area or for too short a period of time to be extrapolated.

Mbemba *et al.* (2009) focused on the Kinshasa market and estimated annual consumption of chainsaw timber in the capital at 68 000 m^3 but the survey protocol was incomplete.
More recently, Lescuyer *et al.* (2014) used two approaches to estimate domestic consumption of chainsaw timber in several of the most populated cities of DRC:

- for Kinshasa and Kisangani and for the cities in eastern DRC, urban consumption estimates were based on the difference between the chainsaw timber entering and leaving the cities:
- for Kinshasa and Kisangani, consumption was also based on the volumes sold in a sample selection of outlets located in various markets throughout the city. Double sales, i.e., inter-market sales, were deducted in estimating the chainsaw timber consumption of course.

These surveys were conducted for at least one year in all monitored sites. They estimate chainsaw timber production in DRC at more than one million of cubic meters per year (3.4 million m^3 RWE), i.e. 13 times more than all the timber produced in the formal sector. The volume of small-scale timber production is estimated to be twice as much as it was 20 years ago (Gerkens *et al.* 1991). The explanation can be traced to the urban population growth and the relative increase in the purchasing power of certain urban classes. Kinshasa is the biggest market for chainsaw timber, mainly because of the size of its population. A significant part of the chainsaw timber sold in Kinshasa comes from industrial scrap (61 000m^3) but almost 175 000 m^3 of chainsaw timber is consumed annually.
This sector is job-intensive in the city. The Kinshasa markets offer 2637 permanent jobs and 3868 temporary jobs and the Kisangani markets offer 220 permanent jobs and 2718 temporary jobs in timber sales and handling. The number of jobs created in the urban timber markets has not been expanded to include jobs connected to the sale of products made with chain sawn timber on the domestic market.

Constraints to source domestic markets with legal timber in DRC

Four strategies are often considered to improve regulations and ensure the sustainability of chainsaw milling in DRC. First of all, there is consensual agreement that the Congolese regulations on small-scale timber production are incomplete and often contradictory. Today, the granting procedure to small-sale logging permit remains complicated, sometimes confusing and quite costly for individual operators. Moreover, the provincial level, because of its size, is probably not the best level for organising the reception and processing of applications for small-scale chainsaw permits.
Relations between local populations and small-scale chainsaw millers often spark complaints on one side or the other (Nkoy Elela 2007, Benneker *et al.* 2012). Whether the felling operation is official and is based on a *cahier des charges* or whether it is informal with the transaction being negotiated by the artisanal operator and the single customary owner, the operator often has to cope with protests from the local populations. The creation of a model for the *cahier des charges,* as often suggested, (Nkoy Elela 2007, Muganguzi Lubala and Benneker 2012) might be an improvement.

Second, ways and means must be considered to improve the implementation of the regulations, starting with efforts in the medium-term to change the behaviour of the actors, especially the civil servants. The weak enforcement of the forest regulation is due more to a political-economic system in which politicians and civil servants receive unearned income, than to the culmination of abuses by unscrupulous agents who base their decisions on regulatory loopholes or rare audits (Ascher 1999, Cerutti *et al.* 2013), thus participating in the revival of the rentier state model instituted during the Mobutu era. For the forest law to be applied, the practices of the actors will need to be better understood so that solutions can be proposed that will change their behaviour.

Third, two financial incentives could be provided rapidly to the small-scale operators to improve their practices and their impact on the national economy: the simplification of the tax system and the introduction of financial incentives to 'go legal'.

Fourth, several longer term actions are considered to improve the commercialisation of legally produced timber on the domestic markets. Urban demand for chainsaw timber of legal origin would give the small-scale chainsaw millers the strongest incentive to seek legality. But after a decade or more of informality and continuous harassment from the public administration, the small-scale chainsaw millers are not very interested in the problem of the 'legal origin' of the wood, especially if the related costs are going up. This probably also holds true for final buyers who are looking for low cost sawn timber, even if the quality is less good.

There are at least two major obstacles to the development of urban demand and legally-produced timber supply. On the demand side, in the present situation there is no way to distinguish between chainsaw timber covered by a valid permit and chainsaw timber from the informal sector. On the offer side, the main obstacle is money, since sawn wood is sold on the domestic market at prices that are lower than the international prices, a situation that does not attract industrial operators to the domestic market. The situation in Kinshasa, where prices for chainsaw timber on the domestic markets are only 20% below standard international prices, may be ripe for an alternative approach. Reducing certain taxes on industrial timber would probably eliminate a major part of this price difference and encourage formal enterprises to sell on the domestic markets, without lowering their profit margins.

Assessment of demands for legal sawn wood in the domestic markets (WP3)

CIFOR systematically collected information on timber trade in a sample of urban markets in Yaoundé, Douala and Kinshasa over a minimum duration of one year (Cerutti and Lescuyer 2011, Lescuyer *et al.* 2014). On this basis, the Table 2 and Table 3 show the sawn wood products traded in these markets.

Table 2 – Trade of sawn wood in the Yaoundé and Douala markets

Type of product	Length (m)	Width (m)	Height (m)	Unit volume (m3)	Main species	% of total traded volume	Utilizations	From industrial sawmills
Beam	5	0,15	0,05	0,0375	Sapelli, Iroko	7%	Building	24%
Block	3	0,2	0,5	0,3	Sapelli, Iroko	17%	Craft activities, furniture	4%
Courson	1,5	0,3	0,15	0,0675	Iroko, Movingui	0%	Craft activities, housing fitting-out	79%
Formwork	5	0,3	0,03	0,045	Ayous, Frake	8%	Building	10%
Lath	5	0,08	0,04	0,016	Ayous, Sapelli	7%	Building	36%
Panelling	4	0,05	0,01	0,002	Bilinga, Iroko	0%	Housing fitting-out	10%
Plank	3	0,4	0,05	0,06	Sapelli, Iroko	52%	Furniture	14%
Plank (small)	2,2	0,2	0,05	0,022	Bilinga, Padouk	3%	Building	7%
Rafter	4	0,08	0,08	0,0256	Sapelli, Ayous	6%	Building, furniture, housing fitting-out	3%
Various small pieces				0,002 - 0,025	Iroko, Sapelli, Ayous	0%	Building, housing fitting-out	75-100%

Table 3 – Trade of sawn wood in the Kinshasa markets

Type of product	Length (m)	Width (m)	Height (m)	Unit volume (m3)	Main species	% of total traded volume	Utilization	From industrial sawmills
Beam	5	0,15	0,1	0,075	Fuma Niove Dabema	27%	Craft activities Building	24%
Board	5 5	0,4 0,5	0,05 0,02	0,1 0,05	Iroko Afromosia Limba	3%	Furniture Buildings Plank	0%
Block	3 4 5	0,15 0,2 0,5	0,15 0,15 0,2	0,0675 0,12 0,5	Afromosia Wengue	0	Bâtiments Meubles Planches	0%
Courson	2,8	0,05	0,02	0,0028	Iroko	0%	Housing fitting-out Furniture	40%
Formwork	5	0,5	0,05	0,125	Fuma	0%	Bricklaying Furniture	0%
Lath	5	0,08	0,04	0,016	Tshitola Iroko Olonvongo	3%	Furniture Building Housing fitting-out	47%
Plank	6	0,07	0,03	0,0126	Tola Iroko Wengue	34%	Furniture Buildings	45%
Plank (small)	5	0,22	0,03	0,033	Tiame Faro Olonvongo	1%	Building Furniture	74%
Rafter	2 2,5 3 3 5 6 7	0,05 0,05 0,05 0,07 0,07 0,07 0,07	0,05 0,05 0,05 0,07 0,07 0,07 0,07	0,005 0,00625 0,0075 0,0147 0,0245 0,0294 0,0343	Bosse Tiama Iroko Sapelli Bilinga Kossipo Tola	32%	Building Furniture Craft activities	0%
Stick	5	0,22	0,03	0,033	Faro	0%	Building	50%
Strip	5	0,05	0,01	0,0025	Tola	0%	Housing fitting-out Furniture	5%

Three lessons can be drawn from these data. First, in Cameroon and DRC, three types of sawn wood make the bulk of the traded volume: the plans and blocks in Cameroon, the planks, rafters and beams in Kinshasa. On the other hand, in both countries, about 20% of sawn wood sold on the domestic markets come from industrial sawmills, either as scraps or as small-
size products requiring sophisticated processing. Presumably, these products have a legal origin. Lastly, the surveys conducted with timber sellers indicate that there is currently no - even occasional - demand for sawn wood of legal origin, regardless of the product, the timber species or the use made of it. In several markets, there are cases where individuals asked about the legal origin of sawn wood before buying it, but these initiatives remain anecdotal in terms of daily activity.

Assessment of demands for legal sawn wood in the joinery workshops in Yaounde and Douala (WP3)

This analysis is based on data collected in 259 joiner workshops visited in Yaounde and Douala between August and November 2015.

Main characteristics of the joinery workshops

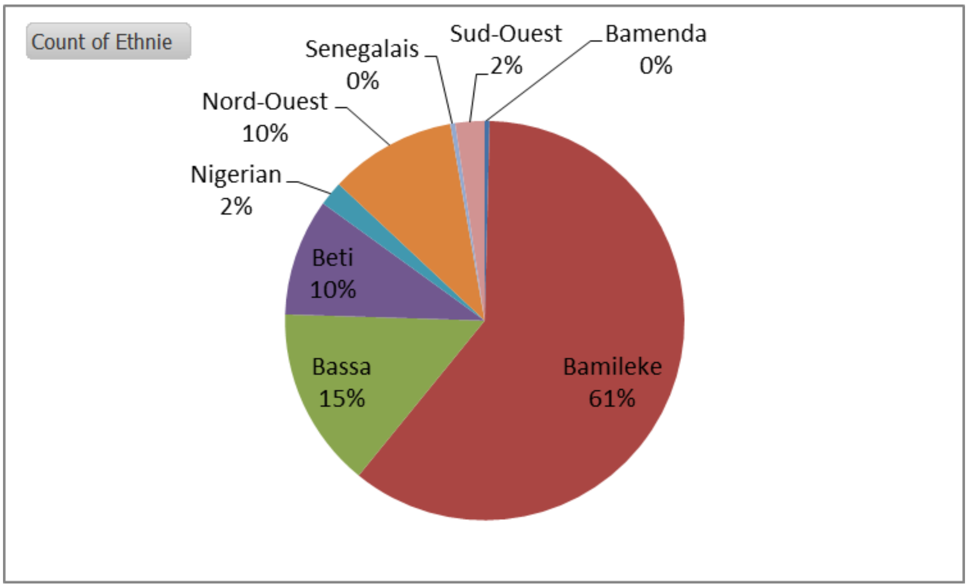
The artisanal production of wooden furniture is not a recent activity, as evidenced by the average duration of life of the workshops sampled, which is estimated 9 years. Most workshops were created between 2005 and 2008, and the ethnicity of the joiners does not influence this duration (Table 4).

Table 4 - Average date of the creation of the joiner workshops, ranked according to ethnic groups

Bamenda	2 006
Bamileke	2 006
Bassa	2 007
Beti	2 005
Nigerian	2 008
Nord-Ouest	2 006
Senegalais	2 013
Sud-Ouest	2 008

All holders of a joinery workshop are men and most of them are aged between 28 and 43 years old. Most of them belong to the Bamileke group (from the West region of Cameroon), although Bassa and Beti also constitute significant minor groups (Figure 3).

Figure 3 - Ethnic group of the holders of a joiner workshop



The average area of the sampled workshops is $51m^2$ but this surface is higher for the Beti joiners in Yaounde and for the South-West joiners in Douala.

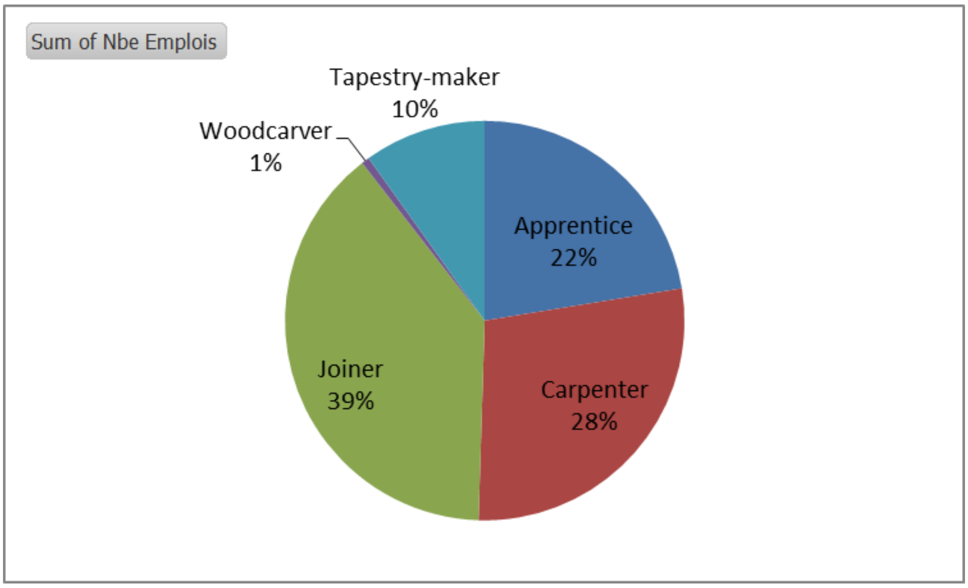
Table 5 – Average surface of the joiner workshops, ranked according to ethnic groups

Bamileke	50
Bassa	44
Beti	81
Nigerian	15
Nord-Ouest	34
Sud-Ouest	73

A large majority (78%) of the workshops is primarily oriented to the manufacture of furniture, with 19% making only furniture and 59% making mainly furniture. Other specializations are housing fitting out (12%), building and public works (6%), and tapestry work (3%).
Only 27% of the sampled workshops belong to a professional association or union.

The sampled 259 workshops generate 1044 full time permanent jobs and 50 temporary jobs, i.e. 4 permanent and 0.2 temporary full-time jobs per workshop. These jobs are divided in five categories, with joiners being the major group (Figure 4).

Figure 4 – Importance of the various crafts observed in the sampled workshops



82% of these employees are paid as a percentage of sales. This percentage varies by 4% and 30% of the selling price of the product, on the basis of the work done. Moreover, 12% of the employees are randomly paid, according to the opinion of the boss. Only 6% of the workshops staff receive a fixed salary.

Cameroonian joinery mainly utilise hand tools. The most used electric instruments are the drill, the sander, the planing machine, the jigsaw and the spindle moulding-machine. They are used by 60% of the sampled joiners.

Manufactured and traded furniture in Cameroon

In August and September 2015, the sampled 259 workshops have produced 9383 wooden objects, with a volume of 1596m^3 and a turnover of 453 million F.CFA. Beds, cupboard, and living-room suites are the most important furniture in both financial and volumetric terms (Figure 5, Figure 6). 87% of the wooden furniture is sold to end-consumers, while 10% is sold to furniture dealers.

Figure 5 – Turnover of the sampled joiner workshops in August and September 2015 (in F.CFA)

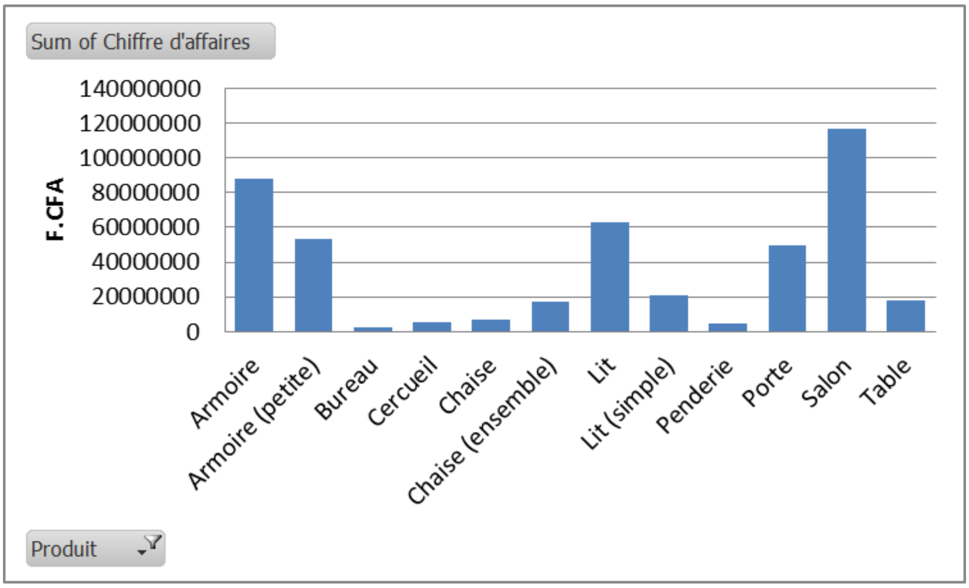
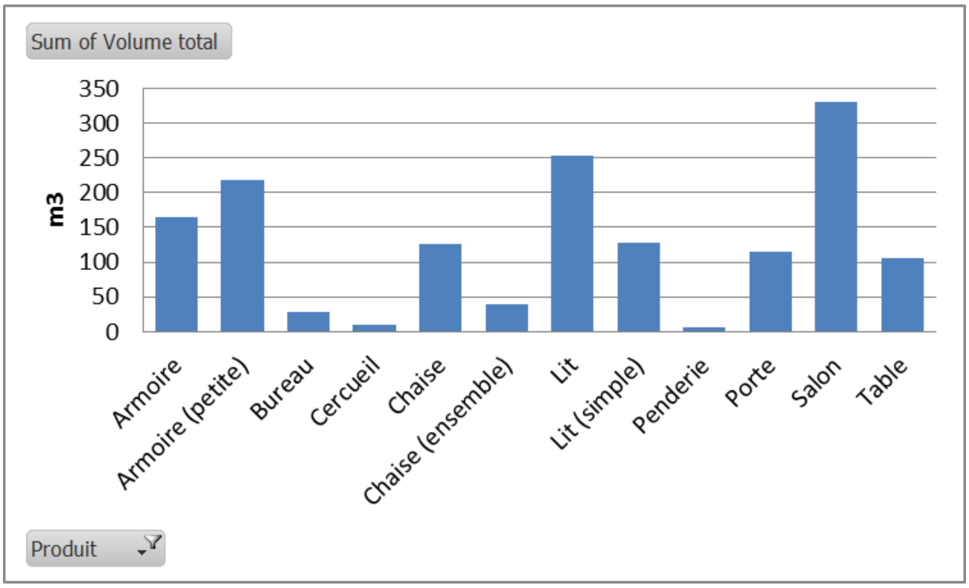


Figure 6 – Volume of wooden furniture sold in the sampled joiner workshops in August and September 2015 (in m^3)



Sapele is the timber species most used by the joiners (Figure 7). 85% of the timber used by joiners comes from urban markets, where it is bought mainly in the form of planks (Figure 8). Premium wood (never used before, nor an industrial sawmill waste) accounts for 54% of purchases of the sampled joiners and carpenters (Figure 9). Scraps of industrial samwills constitute a minor source of materials for artisanal joiners, except for a few products that require parts of small thickness.

Figure 7 – Timber species used in the sampled joiner workshops

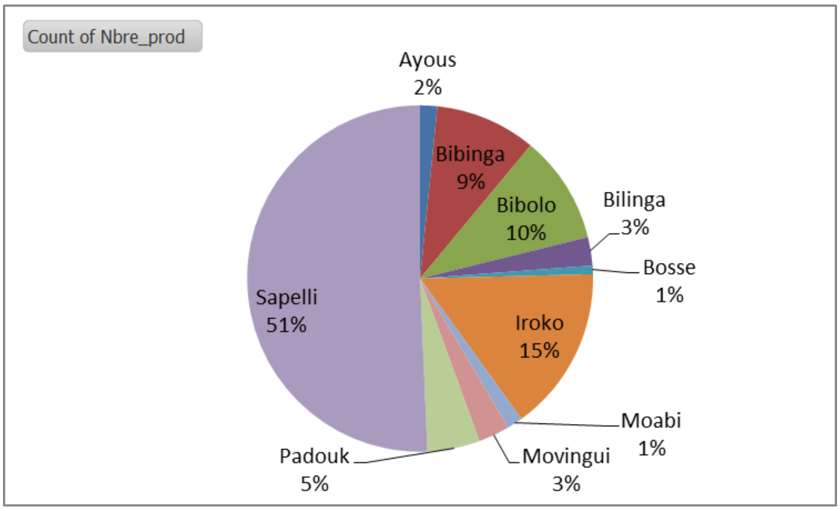


Figure 8 – Types of timber materials purchased by the sampled joiners

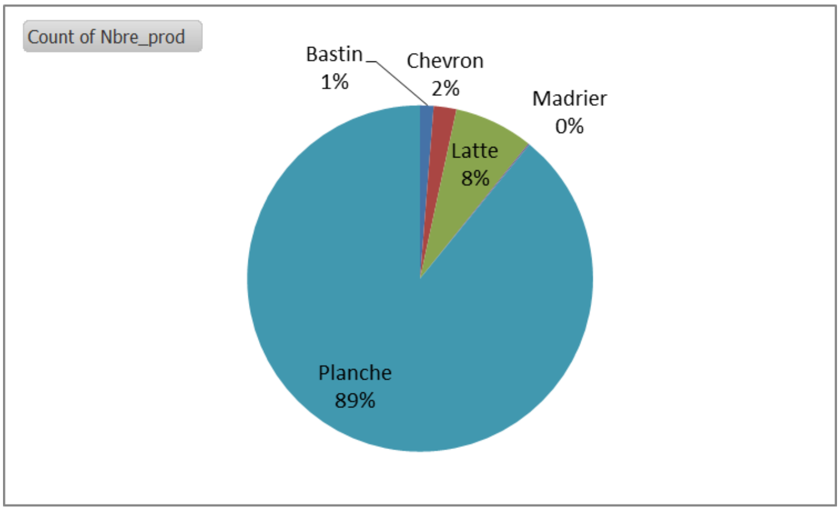
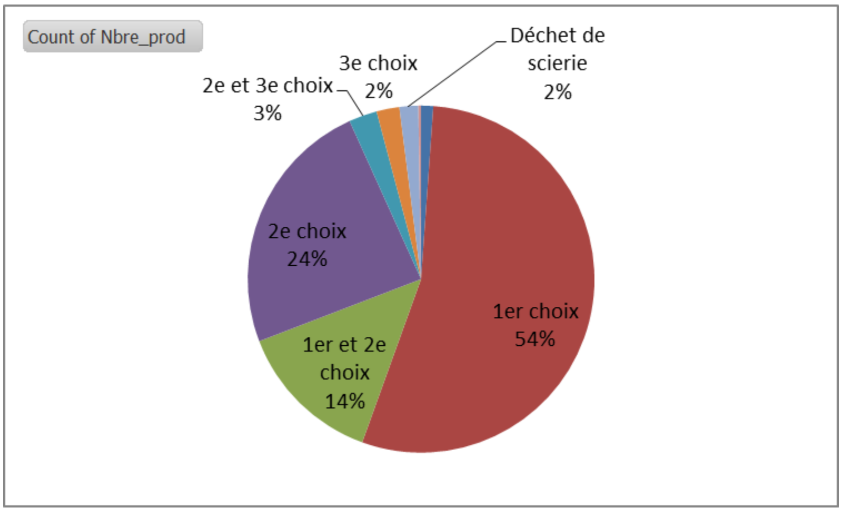


Figure 9 – Quality of the timber materials purchased by the sampled joiners



Demand for products made with legally-sourced sawn wood

Only 13 (5%) of the 259 sampled workshops had to respond at least once to requests for furniture made with sawn wood legally sourced in 2014 and 2015. In 2015, only 58 furniture were sold to individual consumers who wanted to be sure of the legal origin of timber: 52 doors, 2 cupboards, 2 wardrobe, 2 living-room suites. This volume amounts to 7 m^3, i.e. a trivial percentage of the volume of furniture sold in 2014 and 2015 in these two cities.
For these 58 cases, the evidence of legality is demonstrated through using scraps from industrial sawmills (for 25 doors), harvesting timber in the plot of land of the consumer (1 cupboard), buying timber directly to the port of Douala (2 doors), sourcing timber stamped by the administration in urban markets (for 27 doors, 1 cupboard, 2 wardrobes, 2 living-room suites).
Looking for wood quality is almost the only reason why consumers ask legally-sourced furniture.
The interviews done with joiners indicate a general lack of requests for legally sourced timber. Apart from very uncommon requests, the vast majority of buyers look primarily for wood at a competitive price without any consideration for its origin. According to respondents, providing legally-sourced wooden furniture would not be difficult, but it would require that consumers are willing to pay more.

Prospects

The managers of joinery workshops were asked to give their opinion about the likely evolution of the sector (Table 6) as well as some solutions to ease their business (Table 7).

Table 6 – Joiners' perceptions of the evolution of the joinery sector over medium term

Opinion of the joiners	% of answers
Decreasing (no reason given)	20%
Decreasing due to hard competition between joiners workshops	13%
Decreasing as timber gets expensive and some species become rare	10%
Decreasing due to lack of training	8%
Decreasing due to lack of political support	5%
Decreasing due to competition of imported furniture or of substituting materials	5%
Decreasing due to lack of funding	2%
Increasing due to better equipment	17%
Increasing (no reason given)	11%
Increasing due to better human skills	10%
Stable	1%

Table 7 – Joiners' perceptions of solutions to ease their business

Joiners' opinion	% of answers
Reduce tax pressure	41%
Need to develop adequate and official locations for joiners	21%
Public policy dedicated to support the artisanal sector	13%
Subsidizes	8%
Ensure the access to timber resources for a limited cost	6%
Strengthen training	6%
Improve the governance of this commodity chain	5%

Two thirds of respondents have a pessimistic view of change in their sector, without one main reason to justify this perception. They complain about the general lack of policy and financial support to this sector. The improvement of technical equipment appears as the main factor of growth of this activity in the coming years. At no time, timber legality appears as a constraint or a factor to sustainable growth.

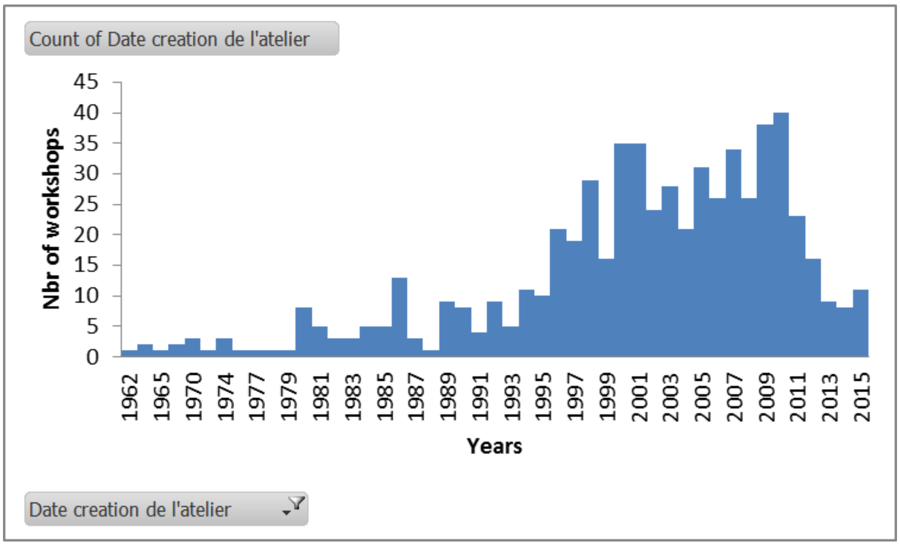
Assessment of demands for legal sawn wood in the joinery workshops in Kinshasa (WP3)

This analysis is based on data collected in 679 joinery workshops visited in Kinshasa.

Main characteristics of the joinery workshops

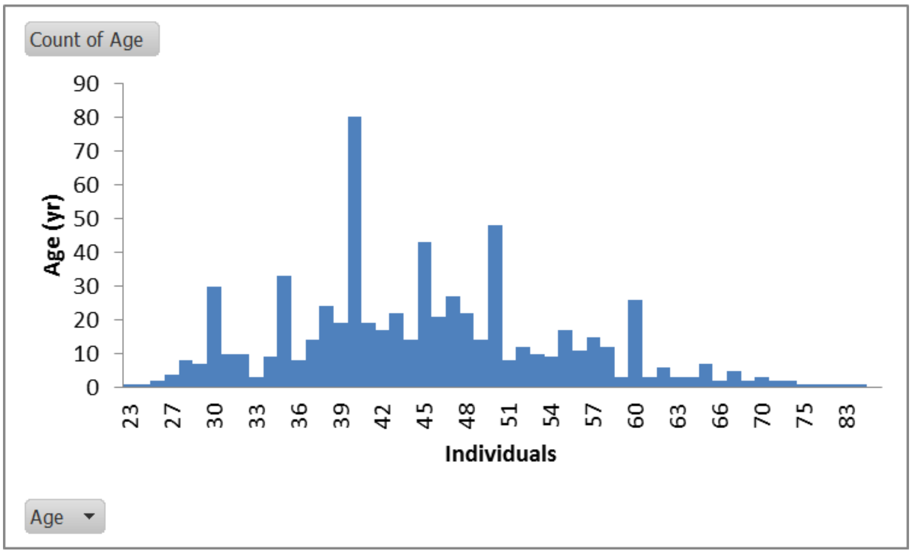
The artisanal production of wooden furniture is not a recent activity, as evidenced by the average duration of life of the sampled workshops, which is estimated 14 years. Most workshops were created during the decade 2000s (Figure 10).

Figure 10 – Date of creation of the sampled joinery workshops in Kinshasa



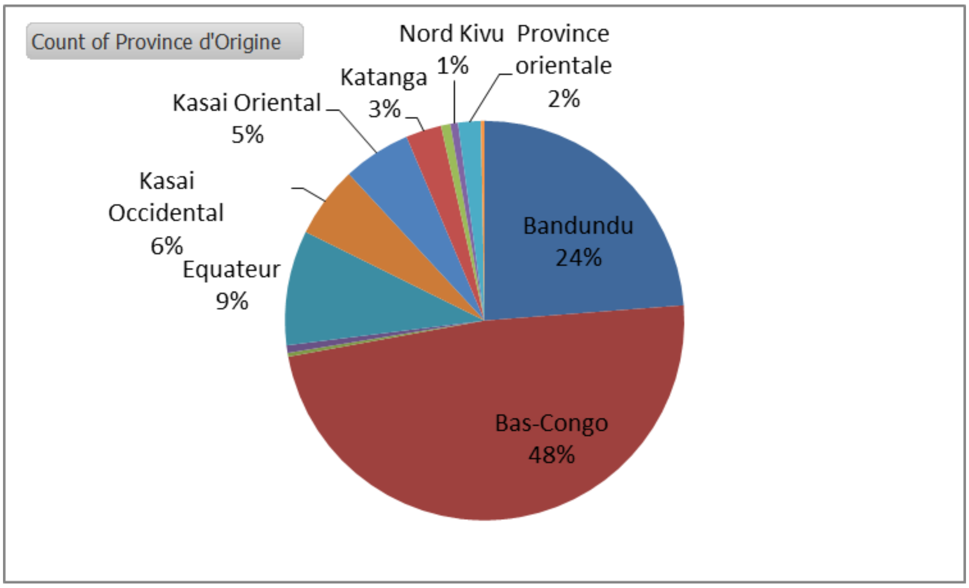
The average age of managers of these workshops is estimated at 45 years (Figure 11) and shows a similar trend: unlike in Cameroon, there are relatively few young bosses in this activity.

Figure 11 - Age of the joinery workshops' managers in Kinshasa



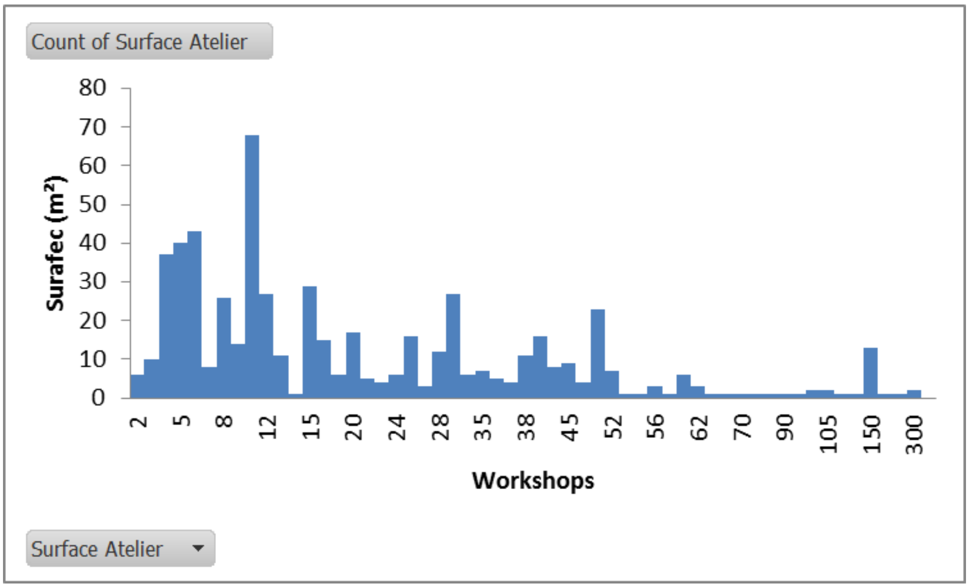
Most shop owners are not native of Kinshasa, but the neighboring regions of Bas Congo and Bandundu where forests still remain (Figure 12).

Figure 12 – Origin of the holders of a joinery workshop



Managers from Bas Congo and Bandundu have smaller surface workshops that the average, estimated at about 25m2. It is in these ethnic groups that the greatest number of workshops smaller than 10m2 is found (Figure 13).

Figure 13 – Distribution of the surfaces of the joinery workshops in Kinshasa

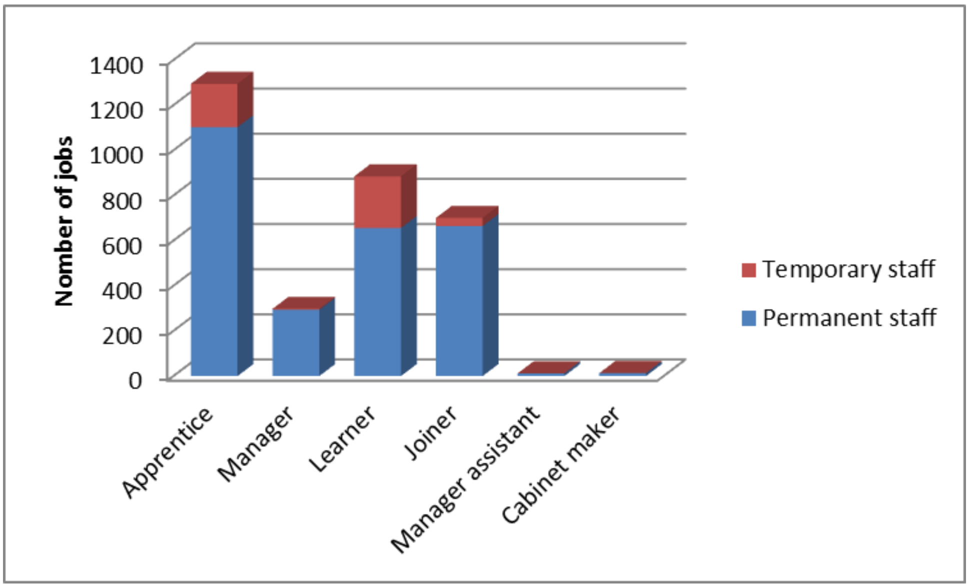


45% of workshops are oriented to the manufacture of furniture and of housing fitting, while 39% are only specialised in the making of wooden furniture. A minor part of the sampled workshops are specialized in providing the building and works sector, or in making coffins.

Like in Cameroon, only 18% of these workshops belong to local professional unions.

More than 3220 jobs have been declared in the sampled workshops. On average, a joinery workshop generates almost 5 full-time jobs, 85% being declared permanent by the respondents. Extra temporary staff is recruited to answer a substantial order in a short period of time. Most employees are apprentices and “learners” who work under the supervision of around 900 managers and joiners (Figure 14).

Figure 14 – Types of job provided by the joinery sector in Kinshasa



63% of these employees are paid as a percentage of sales while 27% of the staff works for a flat rate (Table 8). 8% of the workshops employees are paid on piecework and around 3% of the workers are paid on a random basis or not paid at all.

Table 8 – Modes of payment in the joinery workshops in Kinshasa

Row Labels	% sur la vente	Forfait	Salaire mensuel	Motivation	par pièce	Sans salaire
Apprenti	72	92	1	2	1	
Chef d'atelier	200	8	2		6	
Chef d'atelier adjoint	4					
Ebéniste	5	2			1	
Elève	81	55		4	8	12
Menuisier	175	76		2	48	1
Grand Total	**537**	**233**	**3**	**8**	**64**	**13**

Most of the manufacturing work is hand-made: 2308 tools were cited and only 12% is electric equipment. The most common tools are the wood saw (25% of answers), the hammer (23%) and the manual plane (19%). Most of them are made in China. The most used electric instruments are the sewing, the planing and the sander machines. Most of this electric equipment is made in Europe. 80% of the manual and electric tools have been bought during the latest five years.

Manufactured and sold products

In August and September 2015, the sampled 679 workshops have produced 7650 wooden objects, with a turnover of 1,73 million USD. The doors, the benches and the beds give the highest number of pieces sold during this period (Figure 15). However in financial terms, the living-room suites, the doors, the wardrobes and the cupboards have the most important turnovers (Figure 16).

Figure 15 – Number of furniture sold by the joinery workshops in August and September 2015 in Kinshasa

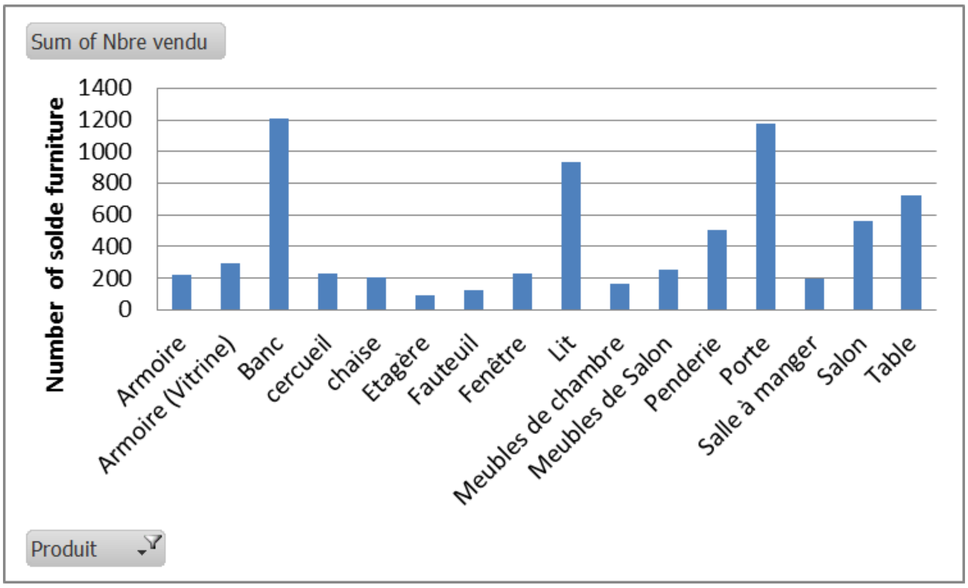
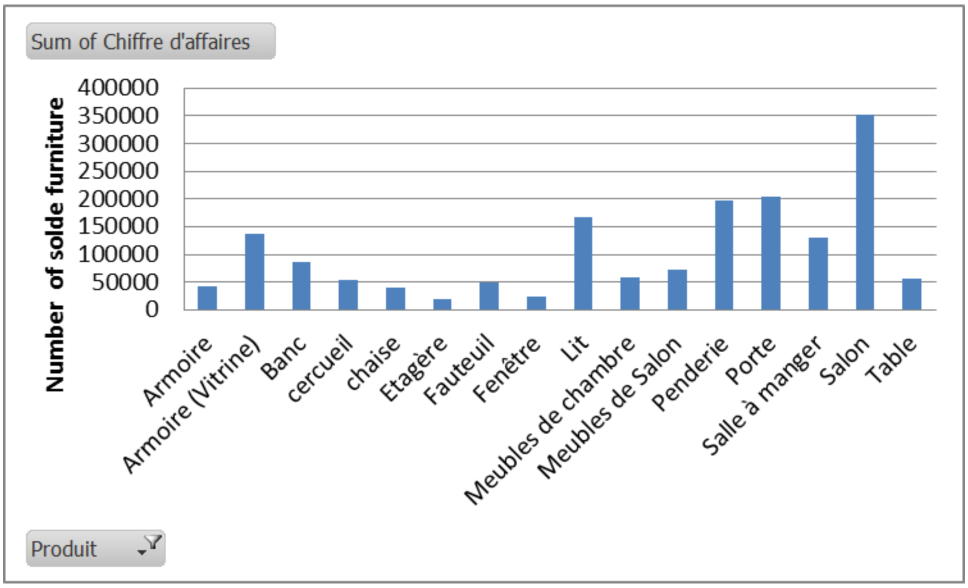


Figure 16 - Turnover of the sampled joiner workshops in August and September 2015 in Kinshasa (in USD)



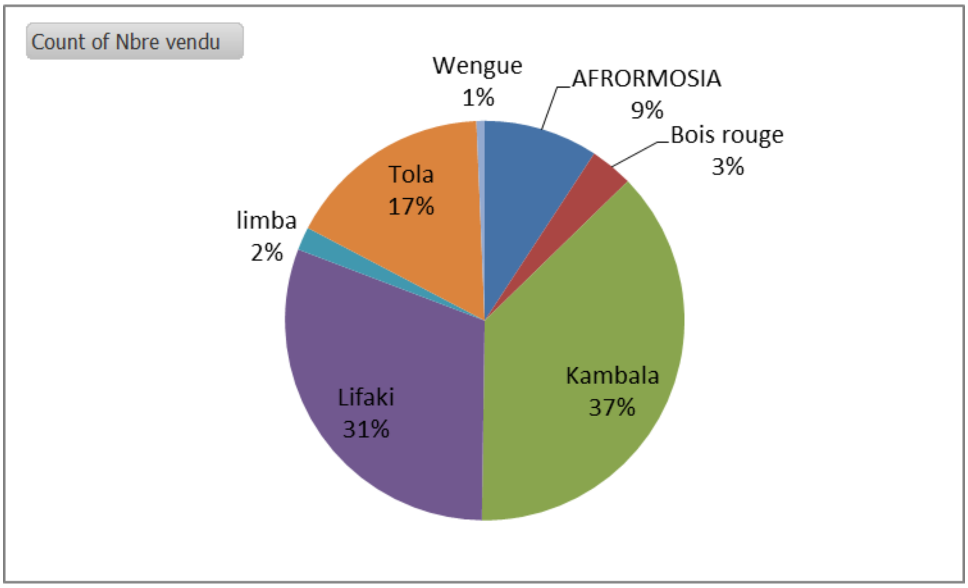
79% of the wooden furniture is sold to private end-consumers, but the schools and churches have substantial purchase of benches and tables (Table 9).

Table 9 – Main buyer groups of wooden furniture in August and September 2015 in Kinshasa

Row Labels	Ecole	Eglise	Entreprise	particulier
Armoire			12	206
Armoire (Vitrine)				297
Banc	649	326	130	103
cercueil				231
chaise	13			190
Etagère			7	83
Fauteuil				124
Fenêtre	22			209
Lit				932
Meubles de chambre			27	124
Meubles de Salon			8	249
Penderie				503
Porte			10	1150
Salle à manger				194
Salon			4	557
Table	253		27	445
Grand Total	**937**	**326**	**225**	**5597**

Iroko (kambala) and sapele (lifaki) are the two timber species most used by joiners (Figure 17) but tola and afrormosia are also appreciated species. Likewise in Cameroon, artisanal joiners use the same species as the ones exploited by industrial companies.

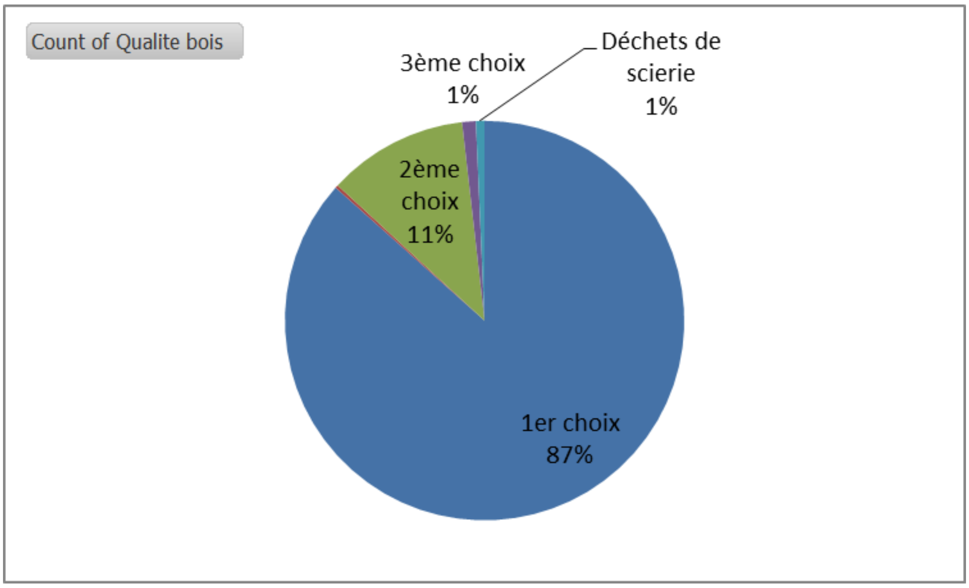
Figure 17 - Timber species used in the sampled joiner workshops in Kinshasa



80% of the timber used by joiners comes from urban markets. 15% originate from the harvesting sites (in Bandundu, Bas Congo and Equateur) and only 5% is purchased in sawmills located in Kinshasa.

Premium wood (never used before, nor an industrial sawmill waste) accounts for 87% of purchases of the sampled joiners and carpenters (Figure 18). Scraps of industrial sawmills constitute a very minor source of materials for artisanal joiners.

Figure 18 - Quality of the timber materials purchased by the sampled joiners in Kinshasa



Demand for products made with legally-sourced sawn wood

Only two of the sampled workshops responded to requests for furniture made with sawn wood legally sourced in 2015: 6 beds ordered by a student of the University of Kinshasa, and 20 doors bought by a hotel. In the first case, the customer wanted to promote sustainable production of timber, whereas the hotel aimed at ensuring the quality of the purchased doors. In the two cases, the evidence of legality was given by the joiners through using scraps from industrial sawmills.

Interviews done with the artisanal joiners indicate that 58% of them do not meet any constraint to find legally-sourced timber. But 24% of the respondents complain that most high-quality (and possibly legal) timber is monopolized by large industrial companies for exports.

Overall, the interviews done with joiners indicate a lack of requests by the consumers of Kinshasa for legally sourced timber due to (1) insensitivity of customers to the legal (and sustainable) source of timber and (2) the higher price of legally-produced timber. Like in Cameroon, the vast majority of the buyers in Kinshasa look primarily for wood at a competitive price without any consideration for its origin.

Prospects

The managers of joinery workshops were asked to give their opinion about the likely evolution of the sector over medium term (Table 10) as well as some solutions to ease their business (Table 11).

Table 10 - Joiners' perceptions of the evolution of the joinery sector over medium term in Kinshasa

Joiners' opinion	% of answers
Decreasing due to competition of imported furniture	37%
Decreasing (no reason given)	33%
Decreasing due to hard competition between joiners workshops	5%
Decreasing due to lack of political support	4%
Decreasing due to lack of funding	3%
Decreasing due to lack of training	2%
Decreasing as timber gets expensive and rare	0%
Increasing (no reason given)	10%
Increasing due to better equipment	3%
Increasing due to better human skills	2%
Stable	2%

83% of respondents have a pessimistic view of change in their sector, mainly due to the competition of imported wooden furniture by Asian companies over the latest five years. Besides, they complain about the general lack of political, technical and financial support to this sector. Contrary to Cameroon, the risk of depleting timber resources is almost non-existent in the joiners' perceptions.

Table 11 - Joiners' perceptions of solutions to ease their business in Kinshasa

Joiners' opinion	% of answers
Public policy to support the sector	52%
Strengthen training and access to equipment	14%
Subsidies and financial support	11%
Better organization and status for joiners	9%
Campaign to promote home-made wooden furniture	6%
Improve the governance of this commodity chain	4%
Reduce tax pressure	2%
Ensure the access to timber resources for a limited cost	2%

A majority of joiners claims for strong measures by the State to avert the unfair competition by Asian importers of furniture. Such a public policy would benefit from being associated with a better internal organisation of the joinery sector and with a consumer campaign to promote home-made furniture in DRC.

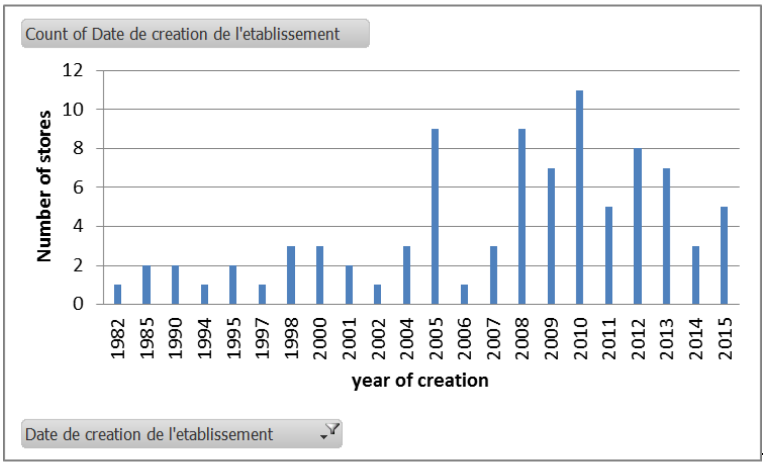
Assessments of demands for legal sawn wood in the furniture stores in Cameroon (WP 4)

This analysis is based on data collected in 89 furniture stores visited in Yaoundé and Douala.

Main characteristics of the furniture stores in Douala and Yaoundé

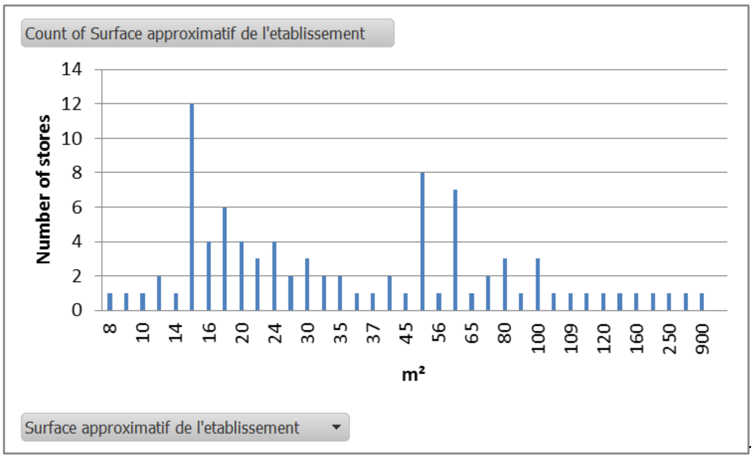
The sale of furniture is not a recent activity in Cameroon, either it is done in well-established shops or through stalls installed directly on the road. The average duration of the sampled stores is 7 years, with many stores created between 2008 and 2012 (Figure 19).

Figure 19 - Date of creation of the sampled furniture stores in Cameroon



The curve of distribution of shop surfaces shows two groups with roughly equal numbers of shops (Figure 20). On the one hand, the shops with an area less than 35m^2 are often lightweight structures without perennial implantation, whose activity can be fleeting in time and in space. The main tax they pay regards their "temporary occupation of the public highway". Their average turnover is around 2,9 million F.CFA per year. On the other hand, the well-established shops hold an area larger than 35m^2 and are usually located in "hard" buildings. Their average turnover amounts to 4.2 million F.CFA/yr.
But whatever their size and their legal status, all furniture shops pay the council tax.

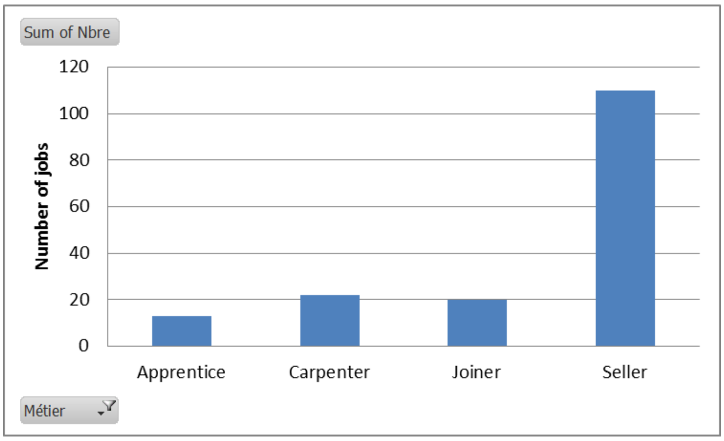
Figure 20 - Distribution of the surfaces of the furniture stores in Cameroon



64% of these shops are specialized only in the sale of furniture and are not involved in their manufacturing. Conversely, 17% of stores in our sample are held by joiners, whose sale to final consumers is a secondary activity in terms of working time.

On average, each store generates 1.85 jobs, 91% of which are permanent full-time positions, on the basis of the interviews. Selling is the major remunerated occupation (Figure 21). Half of the employees receives a fixed salary averaging 55 000 F.CFA while the payment of the other half of the staff is based on the turnover of the shop.

Figure 21 - Types of job provided by the furniture shops in Cameroon



Manufactured and sold products

Fifteen types of products are sold by the furniture stores of Yaounde and Douala. Between January and August 2015, furniture sales accounted for a volume of 1820 m^3 of wood in the sampled stores, for a total turnover slightly above 500 million F.CFA. In terms of volume of wood, the best-selling products are, in descending order, beds, chairs, cupboards, tables and living room suites (Figure 22). If using the criterion of turnover, the order of importance is: beds (single + double), wardrobes, living room suites, tables and coffins (Figure 23).

Figure 22 - Volume of wooden furniture sold in the sampled furniture shops in 2015 in Cameroon (in m^3)

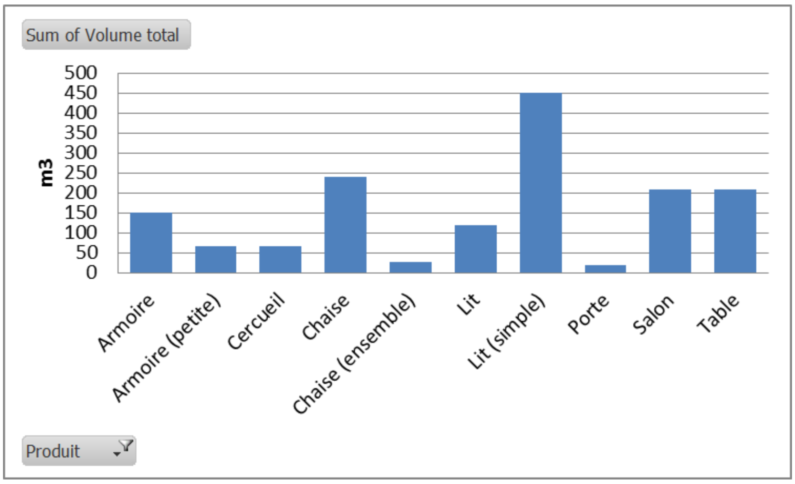
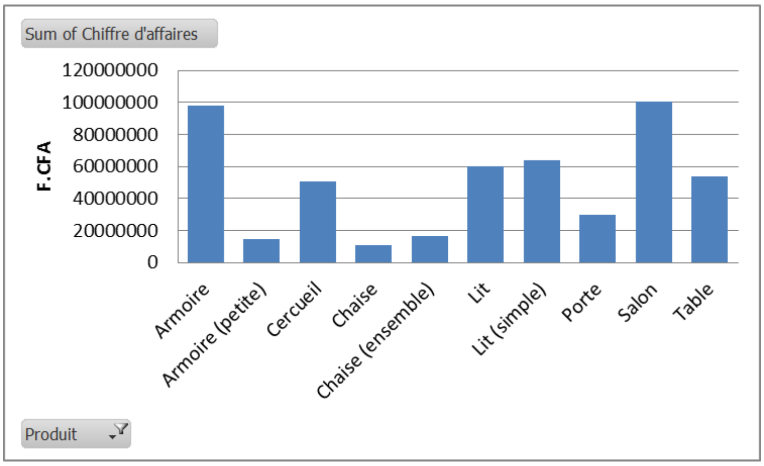
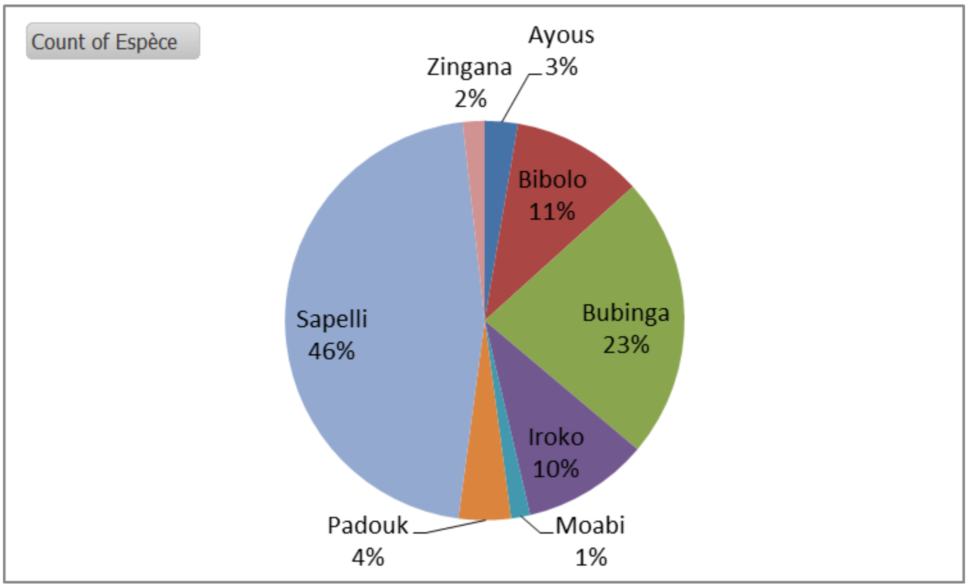


Figure 23 – Turnover of the sampled furniture shops in 2015 ranked by categories of furniture (in F.CFA)



Most furniture traded by the specialized shops is bought in the joinery workshops of the same city, hence a similar use of the same timber species (Figure 24). As a reminder, while the harvest of the bubinga species was suspended in 2012 by the forestry administration, the species remains often used to make furniture that is officially traded in most specialized shops in Yaounde and Douala.

Figure 24 - Timber species of wooden furniture sold in the sampled shops in Cameroon



Demand for products made with legally-sourced sawn wood

The legality of the materials used in furniture manufacturing and trade remains a very minor concern for buyers. Overall, 89% of products sold in stores in our sample are not made from materials proving their legal origin. Moreover, 9% of materials are presumed to be legal because they were stamped by the administration, which is often insufficient evidence of legality (Cerutti *et al.* 2013).

In 2015, only 3 cases of demand for legally-sourced timber have been recorded in the sample of furniture stores. In the first case, it was a company that wanted to secure the quality of the wood used for manufacturing 50 tables. In the other two cases, it was individuals who wanted to ensure the quality of timber (for 10 tables) or to avoid any trouble with the administration (for 5 tables).

For most interviewed managers (85%), it is possible to substitute imported furniture by furniture produced locally, since the raw material is abundant in Cameroon but provided that the quality of the equipment is improved. According to the respondents, the imported wooden furniture is of very poor quality but its low price may attract many urban consumers. It is the State' responsibility to care for the local sector of furniture manufacture and trade, through technical, financial and marketing supports.

Assessments of demands for legal sawn wood in the furniture stores in Kinshasa, DRC (WP 4)

This analysis is based on data collected in 23 furniture stores visited in Kinshasa between September and December 2015.

Main characteristics of the furniture stores in Kinshasa

Unlike Cameroon, surveys conducted in Kinshasa focused on well-established stores, mainly settled in the affluent neighborhoods of the capital. Our sample consists of three classes of shop:
- 3 small-size shops (≤25m^2), which mainly supplies from local joiners, as the common model studied in Cameroon;
- 16 medium-sized shops (100-800m^2), among which 13 are specialized in the sale of furniture;
- 4 large shops (area greater than 2000m^2), including one shop for which selling furniture is not the main activity.

Most of these stores pay around ten formal taxes, except the 3 small-size shops that only pays a license and a local tax. They are intended primarily for upper class residents of Kinshasa. This sector seems attractive since 55% of the sampled shops have been created since 2011, 27% between 2001 and 2010, and only 18% before 2000.

The average number of employees per store was 8.2 people, but this variable is positively correlated with the size of the store. Almost all of these jobs are permanent, full-time and registered with the administration. Three quarters of these jobs are occupied by salesclerks. The monthly salaries range between $ 120 for marketing (wo)men and salesclerks up to $ 700 for managers. However, most of the staff is paid less than $ 250 per month.

Manufactured and traded furniture in Kinshasa

Kinshasa found the same types of furniture than those sold in Cameroon but, this time, the living room suites and the beds were the most traded products between September and November 2015, both in terms of volume and turnover (Figure 25, Figure 26).

Figure 25 - Volume of wooden furniture sold in the sampled shops between September and November 2015 in Kinshasa (in m^3)

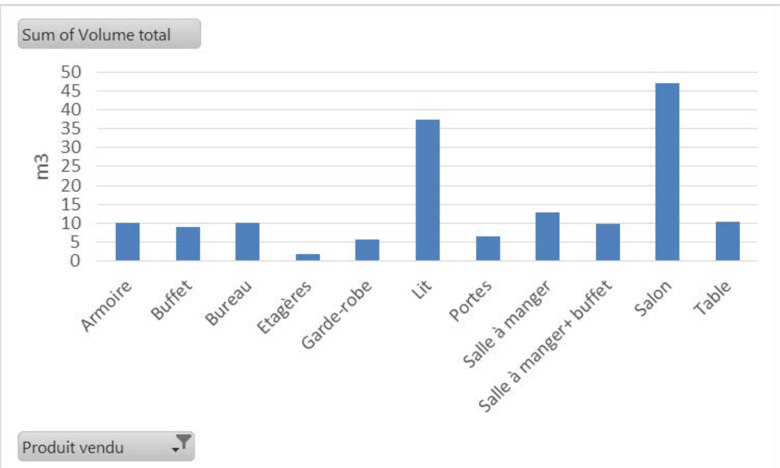
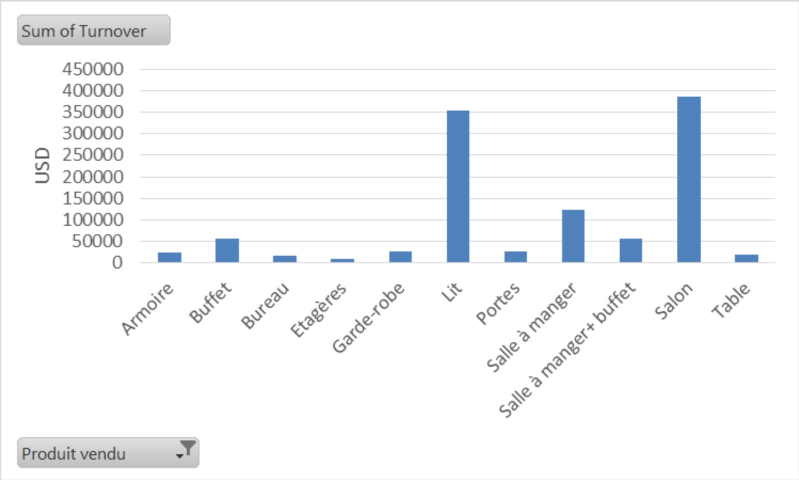


Figure 26 - Value of wooden furniture sold in the sampled shops between September and November 2015 in Kinshasa (in USD)



In total, between September and November 2015, around 161m3 of wood were sold as furniture by the sampled shops, for a total turnover of 1.1 million USD. The price of wooden furniture proves to be much higher in Kinshasa than those practiced in the sampled shops in Cameroon. This indicates that, for this sample of shops in Kinshasa, purchases focus on luxury goods that are either imported or made from precious wood from the DRC, as afrormosia or sapele. As an evidence, 23% of our sample of shops sells only imported furniture.

Individuals bought about 75% of the wood volume used to make these furniture. Their importance, however, falls to 47% of the turnover generated by these shops, almost as much as the companies that make up 44% of turnover.

The comparison between the estimates in volume and in value is also interesting to analyze the wood species used to build furniture. On the one hand, the estimated volume (Figure 27) shows that traded furniture are first made of chipboard and, secondly, of solid wood but of unknown species, that is to say by imports. The order of importance is reversed when using the criterion of turnover associated with the sale of the furniture (Figure 28): imported solid wood furniture stand for almost half the turnover of these stores because unit prices of solid wood is much higher than that of chipboard.

Figure 27 - Importance of timber species in the volume of wooden furniture sold in the sampled shops in Kinshasa

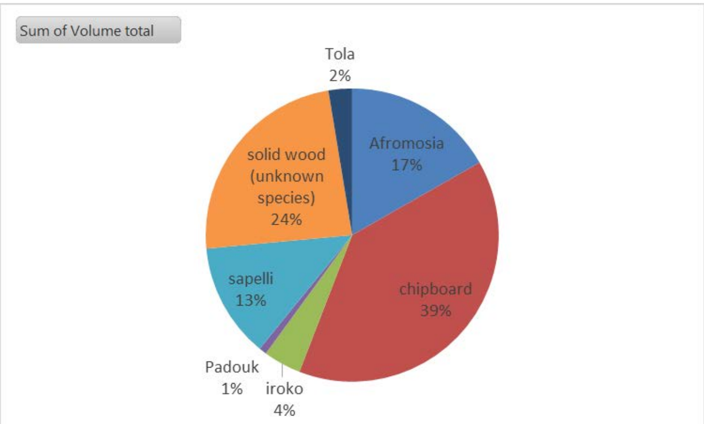
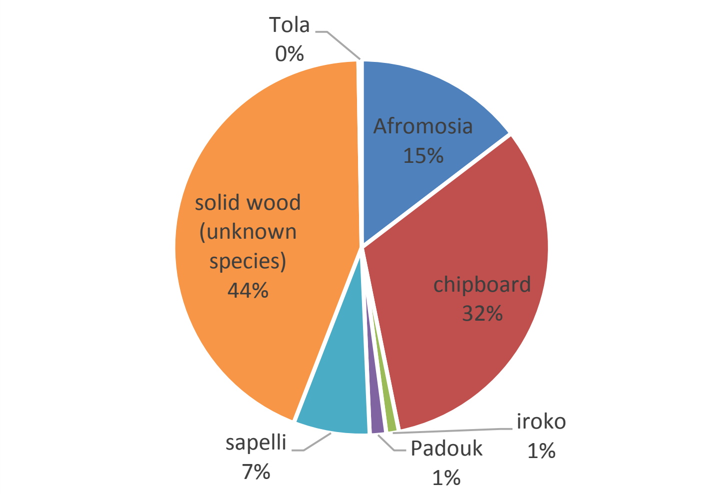
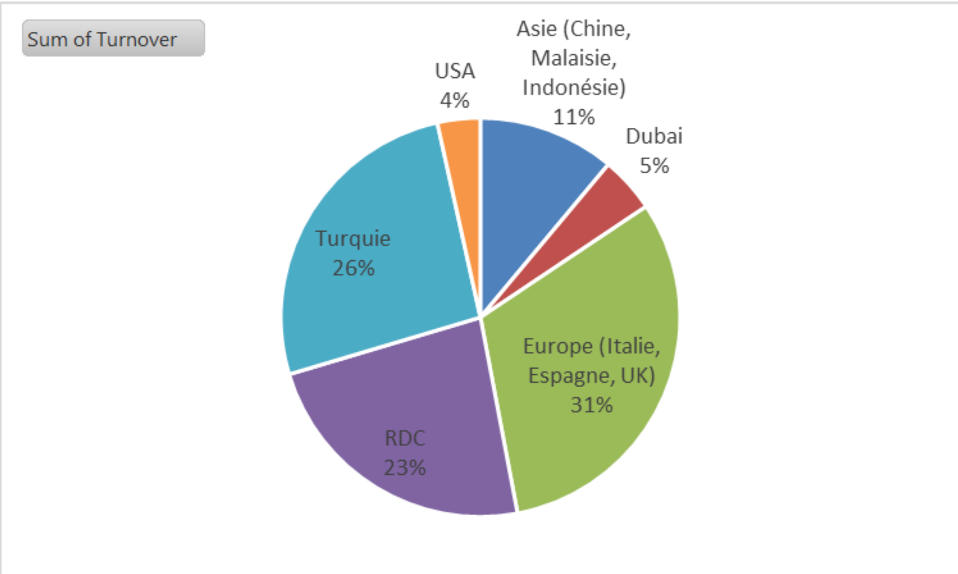


Figure 28 - Importance of timber species in the value of wooden furniture sold in the sampled shops in Kinshasa



Many joiners we interviewed in Kinshasa complained about the imports of "Chinese" low-quality furniture that compete with their products. In reality, the Far East countries cover only a minor amount of chipboard furniture that are sold in these shops. Europe, Turkey and the United Arab Emirates (Dubai) also export such products to the DRC, in addition to the export of solid wood furniture (Figure 29). But it remains primarily the sale of solid wood furniture that makes up most of the turnover of these shops and explaining the ranks of Europe, Turkey and the domestic producers.

Figure 29 – Geographical origins of furniture (based on turnover)



This observation tempers the negative judgments made by many joiners over the invasion of Kinshasa by Asian furniture: either joiners too easily consider chipboard furniture as "made in China" products, or the "Chinese" furniture are sold in more informal outlets that were little represented in our sample.

Demand for products made with legally-sourced sawn wood in Kinshasa

The vast majority of customers is not explicitly interested in the legality of furniture bought in these shops. However, according to the managers of these stores, the legality of the furniture offered for sale is assured since they are either imported (and therefore subject to control procedures) or come (at least partly) from industrial sawmills located in Kinshasa. So far no customer has ever required that these furniture guarantee the sustainable management of forests.

The two main criteria guiding the choice of customers in these shops are the aesthetics of the product and its price. As described above, the solid wood furniture remain most purchased, if we retain the criterion of turnover. But it is surprising to see that these stores sell more solid wooden furniture imported from Europe and Turkey than locally-made. For a certain level of quality, imported furniture is more competitive than local furniture, although the import procedures are considered lengthy and costly by the stores managers. A small majority (62) of respondents believe that domestic producers will get the necessary know-how (adequate equipment and trained labor) to catch up in the next five years.

Conclusion

The diagnosis of the sector of furniture manufacturing and sale in the three selected cities turns out to be mixed. On the one hand, it offers a wide variety of cheap products adapted to the means and tastes of urban consumers, it generates an annual turnover of at least USD 20 million and contributes to the employment of at least 5 000 people in the three cities.
But, on the other hand, joinery workshops and furniture stores show significant weaknesses: (1) the equipment used in joinery workshops remains unsophisticated; (2) they employ mostly unskilled labor, often paid irregularly or informally ; (3) they buy most sawn wood in the urban markets, where a majority of timber comes from informal sources ; (4) joiners use the same few tree species than the industrial sector, mainly because the latter are well known and requested by consumers; and (5) overall, they do not seem to have the means to adapt to face competition of imports from Asia and Europe. This sector therefore seems little innovative, and even ageing in Kinshasa.

Whatever chain segment (timber market, joinery workshop, furniture store), requests for sawn wood of legal origin remain anecdotal today. In the three cities, we have identified less than 200 pieces of furniture for 2015 (mainly doors and tables) that were sold to customers who asked for an evidence of legal source. Moreover, most of the requirements were related to the search of timber quality by consumers.
Given this infinitesimal volume of transaction of legally-sourced furniture, no correlation between such demands and specific timber species, products or furniture can be observed. It does not seem to exist even one market niche for legally-sourced timber. But in a context where the supply of timber and of wooden furniture does not have strong constraints to comply with regulations, the most promising leverage for legality is probably to raise the awareness of the individual and corporate customers.

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Annex I – Questionnaire for joiners and carpenters

Enquêteur : Date :

Fiche d'activité des menuisiers et charpentiers

Ville : Arrondissement : Quartier :

Localisation GPS :

Nom du patron :

Âge du patron : Ethnie :

Date de création de l'atelier : Surface de l'atelier:
Jours et heures d'ouverture:

Appartenance à une association professionnelle (formelle ou informelle) :

- Employés actifs dans l'atelier

Type de travail	Nombre	Permanent / Temporaire	Temps plein / partiel	Mode de rémunération

- Quelles sont les spécialités de votre production et leurs pourcentages dans votre activité:

☐ Ameublement
☐ Bâtiments et travaux publics (charpente, échafaudage, palissade,…)
☐ Huisseries (portes, fenêtres, moulures, chambranles…)
☐ Autres (à préciser) :

- Quelles sont les étapes de transformation du bois qui sont réalisées hors de votre atelier ?

- Principaux équipements utilisés dans l'atelier

Equipement	Date d'achat	Origine	Produits

Quels sont les produits fabriqués et vendus par l'atelier en août et septembre 2015?

Produit	Matériau bois utilisé	Qualité du matériau bois	Source du matériau bois	Espèce	Nbe de produits vendus	Prix du produit	Principaux acheteurs

- Existe-t-il des demandes de produits provenant de sources légales ?

Produit	Type d'acheteur	Motivations de l'acheteur	Nbe de produits vendus en 2015	Source du matériau bois

- Comment expliquer l'état actuel de la demande de produits légaux ?
- Quelle sont les contraintes pour accéder à des matériaux légaux ?
- Evolution de l'activité du secteur dans les 5 prochaines années
- Evolution de l'activité de l'atelier dans les 5 prochaines années
- Dernier commentaire ?

Annex II – Questionnaire for furniture stores

Enquêteur : Date(s) :

Fiche d'activité des boutiques de meubles

Ville: Arrondissement : Quartier :
Localisation GPS :
Nom de l'établissement:
Nom et fonction de la personne rencontrée:
Nom du propriétaire (ou gérant) de l'établissement:

Date de création de l'établissement:
Vocation principale de l'établissement:
Principales taxes payées par l'établissement :
Surface approximative de l'établissement :
Jours et heures d'ouverture :
Employés actifs dans l'établissement, liés à la vente des meubles

Type de travail	Nombre	Permanent / Temporaire	Temps plein / partiel	Salaire mensuel

Chiffre d'affaires de 2014 lié à la vente des meubles :
Proportion du chiffre d'affaires total de la boutique :

Quels sont les meubles exposés en boutique ?

Produit	Espèce(s) de bois	Origine(s) géographique(s)	Origine légale	Nbe de produits vendus en 2015	Prix du produit	Principaux acheteurs

Quels sont les meubles qui ne sont pas exposés en boutique mais qu'on peut commander dans cette boutique ?

Produit	Espèce(s) de bois	Origine(s) géographique(s)	Origine légale	Nbe de produits vendus en 2015	Prix du produit	Principaux acheteurs

Existe-t-il des demandes pour des meubles provenant de production durable avérée ?

Meuble	Type d'acheteur	Motivations de l'acheteur	Nbe de meubles vendus en 2015	Quelle preuve de durabilité ?

Comment expliquer l'état actuel de la demande de produits légaux et/ou d'origine durable?

Répondez-vous à des appels d'offres pour la fourniture de meubles ?

Date	Client	Types de meuble	Nombre ou volume	Valeur	Qui a remporté l'AO ?

Les procédures d'importation de meubles rencontrent-elles des difficultés particulières ?
Certains meubles importés pourraient-ils être remplacés par des meubles fabriqués nationalement ?
Quelle sera l'évolution de l'activité du secteur dans les 5 prochaines années ?

Dernier commentaire ?