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Report No: ACS18156 | June 2016 | AFRICA

CENTRAL AFRICA CONGO BASIN TIMBER

Case studies of urban wood products markets in the Democratic Republic of Congo and Cameroon

Suggested Citation:

Cerbu, Gillian (Ed.). 2016. *Central Africa Congo Basin Timber.* PROFOR, Washington D.C.

ISBN 978-0-9910407-5-9

Cover Photo by Emmanuel Groutel/ATIBT

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Acknowledgements

Funding for this study has been generously provided by the Program on Forests (PROFOR).

The concept for this study has been developed jointly by the World Bank team in cooperation with ATIBT and CIFOR, under the guidance of the Country Management Unit.

This report builds on the results and analysis of the PROFOR supported study by Megevand et al. (2013), 'Deforestation Trends in the Congo Basin: Reconciling Economic Growth and Forest Protection' as well as the World Bank study by Lee (ed.)'s 'Managing a valuable resource: Policy notes on increasing the sustainability of the DRC's forest production.' The recommendations and conclusions of these reports remain valid.

This report has been prepared under the guidance of the World Bank Country Management Units for DRC and Cameroon, and Benoît Bosquet, Practice Manager for the World Bank's Environment and Natural Resources Global Practice. The team is grateful for the guidance in designing and structuring this study provided by Ralph Ridder, Steven Johnson (General Coordinator, ITTO), Paolo Cerutti (Senior Scientist, CIFOR), Guillaume Lescuyer (Senior Scientist, CIFOR-CIRAD), Timothy H. Brown (Sr. Natural Resources Management. Specialist, World Bank), Emeran Serge M. Menang Evouna (Sr. Environmental Specialist, World Bank), Diji Chandrasekharan Behr (Sr. Natural Resources Economist, World Bank), Julian Lee (Environmental Specialist, World Bank) and Steven Paul Gretzinger (IFC), with additional comments provided by Julian Lee (Environmental Specialist, World Bank), and Andrew M. Mitchell (Sr. Forestry Specialist, World Bank)

The report was written by Clément Chevignon (Acting Project manager, ATIBT), Emmanuel Groutel (Executive Officer, ATIBT), Guillaume Lescuyer (Senior Scientist, CIFOR/CIRAD), Edouard Essiane Mendoula (CIFOR), Raphael Tsanga (CIFOR), Emilien Dubiez, Adrien Péroches (ONFC), and Gillian Cerbu (World Bank, Task Team Leader, Natural Resources Management Specialist), with editing provided by Nina Rinnerberger (World Bank, Natural Resources Management Specialist). It is based on a review of various documents and reports, as well as data provided from various sources. The report relied on quantitative data collected around three urban wood products markets: Yaoundé, Douala and Kinshasa, collected by CODELT (in DRC), and Obed Fung, Yves Ngono, Barthélémy Embolo Ahanda, Faith Ndoh, (M.Sc. students, University of Yaoundé II) and ONFC (in Cameroon).

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ABBREVIATIONS AND ACRONYMS

ATIBT	*Association Technique Internationale des Bois Tropicaux,* International Technical Association of Tropical Wood
CIFOR	Center for International Forestry Research
FCFA	*Franc de la Coopération Financière en Afrique Centrale,* Central African Franc
FLEGT	Forest Law Enforcement, Governance and Trade
DRC	Democratic Republic of the Congo
EU	European Union
FIB	*Fédération des Industriels du Bois,* Federation of Wood Industries
GDP	Gross domestic product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
ITC	Information, technology and communication
MECNDD	*Ministère de l'environnement, conservation de la nature et du développement durable, RDC,* Ministry of Environment, Nature Conservation and Sustainable Development, DRC
MINEFI	*Ministère de l'Économie et des Finances,* Ministry of the Environment and Finance, Cameroon
MINFOF	*Ministère des Forêts et de la Faune,* Ministry of Forests and Wildlife
NTFP	Non-timber forest products
PCA	*Permis de coupe artisanale,* artisanal felling permit
RWE	Round wood-equivalent
USD	United States dollar
VPA	Voluntary Partnership Agreement

EXECUTIVE SUMMARY

In the Congo Basin, some estimates state that one-third of the total wood market (not including fuelwood) is sourced from traditional (or artisanal) woodcutting, with these products primarily destined for domestic markets (Lescuyer et al. 2012). On the supply side there are barriers to entry into the formal sector and inherent difficulties in harvesting trees legally and sustainably. Due to the informal nature of much of the domestic value-added wood product market, the sector's real contribution to GDP and to local livelihoods is challenging to measure. Official estimates place the contribution of forests to GDP at less than 1% (in 2010) (Lee et al. 2015), while in a prior World Bank study, in DRC, the estimate is much higher at 8.3% (Lee et al. 2015).[1] Although it is viewed as a promising contributor to local livelihoods and employment, and supplies other sectors with much needed materials, there is a dearth of data on the wood processing sectors in this region. Due to the informal nature of much of the domestic value-added forest product market, the sector's real contribution to GDP and to local livelihoods is more challenging to measure. Most of the forest sector's benefits are informal and not fully captured by public accounting. This lack of information on the current economic contributions of the wood processing sector to the economies of the region, combined with Governments' perception that the sector is of little importance, are further barriers to the sector realizing its full potential.

The objective of this study is to improve knowledge and prioritize options for policies and targeted investments for improved domestic timber utilization in Cameroon and the Democratic Republic of Congo (DRC). Specifically, the study aims to build on prior knowledge to better understand the solutions needed to overcome barriers to expanding the market for legal (and possibly sustainable) timber and processed wood products used in the domestic furniture and construction markets in the two countries.

Boosting the share of locally-processed wood used in domestic construction and furniture-making could represent a significant business opportunity for small, medium and large-sized enterprises in wood fiber-based value chains: smallholders, community forest holders, forest concessionaires, as well as SMEs and larger companies involved in transportation logistics, wood processing industries (large or small), wood workers, builders, and even designers, with the right policy incentives and enabling environment. This also has the potential to make value-addition through furniture-making and construction relatively more attractive, as there is higher potential for job creation than other wood uses, e.g., for energy. Quality wood is, however, currently almost entirely diverted to the export market (ATIBT, FAO and OIMT, 2013).

Domestic processing capacities are low, almost entirely limited to primary processing: sawnwood, peeling and slicing for plywood, and veneer production. In both the informal and formal processing sectors, there are great opportunities to improve competitiveness and reduce waste. Less than 3 percent of the global production of tropical round wood destined for export originates in Central Africa, far behind the other two major tropical forest regions, with their contribution to the trade in processed timber even smaller (OFAC 2011). As a renewable, locally-sourced resource (when properly managed), the share of processed industrial wood and legal artisanal wood used in furniture-making and construction has the potential to increase the sector's contribution to the economy, jobs, and livelihoods of forest-dependent communities.

Industrial and semi-industrial wood transformation enterprises are well-equipped but have difficulties competing on the domestic market as they are subject to higher taxes than smaller enterprises, operating informally. In addition, semi-industrial operators may need support to industrialize their processing lines so that they are able to produce lower-cost, good-quality products like structural panels for housing. Over the medium term they may need support to identify market niches where they can sell their higher quality/legal products on the domestic market.

Based on this study's findings, the urban timber markets of Yaoundé, Douala, and Kinshasa generate an annual turnover of at least USD 15 million and contribute to the employment of at least 5000 individuals in these three cities (not counting those employed on a part-time/seasonal basis). They also furnish local markets with a wide variety of cheap products adapted to the means and tastes of urban consumers.

Based on prior work in this area and our study's findings, the necessary steps to develop the value-added wood processing industry in Cameroon and DRC can be divided into the following main priorities:

1. In this study on DRC's forest sector, formal wood production (industrial + artisanal) was estimated to account for around 0.37% of GDP in 2010 (US$ 80 million), of which 0.33% and 0.04% are from industrial concessions and artisanal permits, respectively. Informal wood production (including wood fuels) was valued at US$ 1,687 million and represents 95.5% of total sector value.

i. Government promotion and creation of an attractive investment market for industrial, small- and medium-sized enterprises (SMEs) and individuals, including easing access to credit (further discussed in Tables 8 and 9 below);
ii. Facilitated legal access to the raw materials (ensuring sustainable and sustained supply), trained workers (capacity building) and facilities needed for transformation;
iii. Creation of a structured market chain for the goods produced with appropriate standards (technical, environmental and social);
iv. Marketing and sensitization targeted at promoting wood as an aspirational (instead of a poor man's) building material;
v. Supporting the development of progressive, locally-adapted, sustainable public procurement policies similar to legislation on public sourcing in other countries in order to increase public demand of legal and/or sustainable products (e.g., the UK's procurement legislation originally passed in 2000, revised June 2013) (ATIBT, FAO and ITTO, 2013).).

The transition to legality is possible for chainsaw millers through the implementation of the following short-term measures (Cerutti and Lescuyer 2011; Lescuyer et al. 2014):

vi. A reform of the requirements and procedures to grant small-scale logging permits is required, which could be approached as follows:
    a. The council (Cameroon)/district (DRC) authorities should be in charge of granting small-scale logging titles as well as monitoring their application in the field, as most chainsaw millers work in their area of residence[2];
    b. Sufficient annual volume of wood should be allotted for each chainsaw miller to ensure a regular year-round income, with some constraints to sustainably manage timber resources when the annual volume is above a determined threshold (in the context of ongoing debate on logging concessions for communities);
    c. Annual, flat rate payment should be calculated according to the felling volume.

vii. A reduction of the formal costs to apply for a small-scale permit, otherwise most chainsaw millers will likely opt to remain in the informal sector. For both Cameroon and DRC, a reduction in the fees for permits and simplification of the permit acquisition process is needed; these permits should reflect the fair economic value of the product and not be too low in order to ensure that operations remain efficient nor too high to avoid illegality and encourage compliance. Fee collection will require improved monitoring and reducing corruption. In DRC, most actors are operating in an informal space due to legal shortcomings and widespread irregularities in the issuing of permits (Lescuyer et al. 2014). For example, in Bandundu Province, DRC despite the issuance of 221 permits to 106 permit holders from 2010-2012, widespread abuse of the permitting system has been documented (REM 2013; Global Witness 2012; Greenpeace Africa 2013).

viii. Support for the creation of urban markets that sell legal timber at higher prices (in recognition of the higher quality product produced) in addition to support for training and provision of equipment to allow local artisans to compete with cheaper furniture imports, including techniques to maximize the wood used and reduce waste. End consumers are keen to buy sawnwood at a low price, even if the quality is lower.

Alongside these measures, consumer education and awareness is paramount—especially for the growing middle-class: consumers need to be made aware of the true value of domestic wood products in supporting the local economy, as well as the importance of supporting the transformation of legally-sourced wood products. The government could play a strong role in promoting the benefits of local and legal wood through various incentives, along with their procurement, tax, and trade policies. Additional outreach to local thought leaders and influencers, like religious leaders, community groups and teachers, and through teaching materials and social media could support this sensitization process.

However, none of these measures alone or in combination will be very effective unless they are accompanied by determined long-term efforts to fight the widespread, uncontrolled corruption throughout the sector. In Lescuyer et al. 2014, the authors suggest that a potential pathway could be the combination of short-term technical measures with support for long-term improvements to governance in the sector. In addition, as part of this technical support, a potential approach could be the development of an information system or tool that could facilitate the monitoring of permit allocation, declaration of volumes and deliveries, as well as track tax payments. With the integration of all of these elements into a unified forest monitoring and information system, and the obligation of all payments to be processed within this system, it will become increasingly difficult and cumbersome for officials to accept payments outside the system. Similarly, new information, technology and communication (ITC) approaches, such as using smartphones for declaring goods, making payments, scanning codes, and tracking source of origin could be used. All of these approaches would simplify transactions, the declaration of goods, and act as a deterrent for additional payments outside of the system.

An extensive list of challenges faced by Cameroon and DRC, opportunities and recommendations for developing the processed wood sector are listed by level of priority in Table 1 below.

2. In the case of the decentralization of title-giving authority, independent monitoring of the allocation of these permits should be conducted by a separate body.

Table 1. Opportunities, challenges and recommendations for local wood product markets in Cameroon and DRC

Opportunities	Challenges
• Population growth in the region concentrated in urban areas; • GDP growth; • Growing domestic timber market; • Ongoing VPAs (FLEGT); • Growth of middle class (with greater disposable income); • High potential for domestic demand; • Prices for lesser-known species remain low.	• Complex administrative registration requirements (permits, etc.); • Low visibility of existing SMEs supplying the domestic market with wood products; • Almost non-existent formal domestic wood market; • Same species used by artisanal and semi-industrial wood processors (and exporters), thus leading to competition; • Taxes and fiscal rules not yet supporting the still nascent development of the local artisanal joiners and semi-industrial processors; • Consumers accustomed to only having access to low quality wood on the domestic market; • Low levels of education and training among artisanal joiners; • No access to bank loans to expand or develop artisanal activities; • Lack of access to technology for production (currently primarily use hand tools and wood is not dried); • Most consumers currently unable to pay a premium for quality and legally-sourced wood products; • Lack of formal associations of SMEs and/or artisans in the sector; • Consumers accustomed to cheap import products (even if quality is compromised), making it difficult for local producers to sell their wares at a premium.
Timeframe	**Recommendations**
Short-term	1. Support investment in tools and material to produce better quality products (through drying, processing)(See Tables 8 & 9); 2. Support the increased visibility[3] of the artisanal wood products sector, perhaps through the creation of cooperatives to federate artisanal operators to facilitate increased promotion of the sector (cf. current experiences in Cameroon with timber traders, and with associations of artisanal producers based in and around Kisangani – cluster model)[4]; 3. Create a model for social responsibility specifications (cahier des charges) to improve monitoring and thus the eventual availability of legal, locally-sourced wood for small-scale processors (cf. current debate in DRC about Simple Management Plans for community concessions); 4. Enforce regulations through effective sanctions and financial incentives; 5. Promote species substitution (with lesser known species); 6. Develop skills related to the use of lesser known tree species.
Medium-term	7. Provide training to operators and artisans to minimize waste and maximize the use and valuation of raw wood material; 8. Promote local wood as an aspirational good with examples of modern buildings and furniture to attract consumers and break the "wood is for the villagers" paradigm and target the growing urban middle class in the region[5]; 9. Promote innovation in wood-building design through showcasing African designers and architects from across the continent; 10. Promote and sponsor the use of local and legally-sourced wood for the creation of hotels, lodges, base camps and other tourism infrastructure; 11. Develop and promote use of an integrated information system or tool that could facilitate the monitoring of permit allocation, declaration of volumes and deliveries, as well as track tax payments.
Medium- to long-term	12. Respond to the local demand for lower-priced wood products through manufacturing low-cost (but quality) products by training artisanal suppliers.

3. Currently these artisanal wood processors operate in a grey or black market visible to their client, and not visible to policy makers/ the government. In order to create a supportive enabling environment for the artisanal sector, their activities need to be visible to the state.
4. The facilitation of cooperatives could be done through investments in physical infrastructure: potentially developing several wood processing clusters (similar to the manufacturing sector cluster developed in Nkok, Gabon).
5. Efforts to promote wood as an aspirational material have been undertaken by ATIBT and the Ministry of Forestry in DRC with thus far limited impact. These efforts may need to be expanded and more carefully targeted to reach specific audiences.

INTRODUCTION AND CONTEXT: THE CONGO BASIN'S DOMESTIC MARKETS FOR PROCESSED WOOD

The objective of this study is to improve knowledge and prioritize options for policies and targeted investments for improved domestic timber utilization in Cameroon and the Democratic Republic of Congo (DRC). This study aims to build on prior knowledge to better understand the solutions needed to overcome barriers to expanding the market for legal (and sustainable) timber and processed wood products used in the domestic furniture and construction markets in Cameroon and DRC. This work follows on World Bank-supported technical assistance in the region, including Megevand et al.'s (2013) Deforestation Trends in the Congo Basin: Reconciling Economic Growth and Forest Protection, and Lee (ed.)'s Managing a valuable resource: Policy notes on increasing the sustainability of the DRC's forest production (2015). In these prior studies, the economic, social, political and environmental context are outlined in depth. Particularly relevant and complementary to this study's findings, Lee (2015) presents options for improving regulation upstream in the informal and semi-formal logging sector and developing cost-effective avenues for increasing the legality of wood production in DRC. Much work has been carried out on the informal and formal logging sector in the region; this study focuses on wood transformation and examining local demand for processed wood products. Following on prior studies' typologies of timber processors (Lescuyer et al. 2014), this report distinguishes between the industrial (with heavy logging and processing equipment, timber harvested in logging concessions), the semi-industrial (with portable saws for processing in the forest, with or without legal permits) and artisanal (usually with chainsaws for felling and processing in the forest, often without adequate authorisations) operators and provides specific recommendations for each type of entrepreneur class.

In order to guide this study, a literature review, combined with surveys and interviews[6], was carried out in an attempt to answer the following questions:

i. To what degree is there domestic demand for legally-sourced artisanal wood products for furniture, house fit-out[7] , or public works?
ii. Is it possible to substitute imported wooden furniture with locally-made furniture (from industrial and artisanal sources)?
iii. What are the possibilities for the domestic supply of wooden houses and for wooden housing fitting-out materials to satisfy current and future private and public demand?

This study was divided into the following sub-components:

iv. Understanding domestic supply and demand for locally sourced wood products: a stocktaking.
v. Review of the current and potential industrial supply of wood products for the domestic market: A synthesis of findings are presented based on a compilation of survey responses from prior studies conducted on industrial wood processors. These wood processors operate in the formal market and usually conform to national legislation. These studies do not cover small, artisanal processors operating in the informal market (which are covered under the following chapter (III)).
vi. Estimate of the current artisanal supply of wood products for the domestic market: A synthesis of existing information on timber trade information collected in a sample of urban markets in Yaoundé, Douala (in Cameroon) and Kinshasa (in DRC) over a minimum duration of one year is presented (based on a synthesis of work done by Cerutti & Lescuyer 2011 and Lescuyer et al. 2014), followed by new survey data collected in August and September 2015, financed through this study.
vii. Urban private demand for local and legally-sourced wooden furniture: Study results are presented based on timber trade information collected in a sample of urban markets in Yaoundé, Douala, and Kinshasa over a minimum duration of one year.
viii. Estimate of national demand for wooden housing and for wooden housing fitting-out: Review of the state of the art and existing studies.
ix. Prospects of boosting legal timber sales on domestic markets: Synthesis and recommendations based on the study findings.

Based on the information gathered under these sub-components, an evaluation of the current and future market demand for wood-based construction material and the furniture industry was performed. Subsequently, opportunities, challenges and recommendations for increasing the proportion of locally- and legally-sourced wood used in construction and furniture are outlined.

6. Presented in Annex I – Questionnaire for joiners and carpenters.
7. Fit-out or fitting-out refers to the act of providing necessary equipment for a house or apartment, especially the door and window frames, and/or the final decoration.

The forest sector in Cameroon and the Democratic Republic of Congo

Congo Basin[8] forests contribute to local livelihoods of forest-dependent populations, society's well-being and the national economies, as well as provide the region with important ecosystem goods and services. The forest sector encompasses a range of activities, including: (i) activities associated with forest management (silviculture); (ii) formal and informal timber harvesting; (iii) wood processing; (iv) non-timber forest product (NTFP) collection and associated marketing of these products; (v) the livelihoods and benefits provided to local populations; (vi) and the sectors that make use of these processed forest products. Aside from these direct use values, the forest also provides ecosystem services such as water, carbon, and biodiversity conservation, as well as spiritual, scenic, touristic and other values.

Processed wood sold on the domestic markets

Africa-wide, annual consumption of wood is projected to grow by over 40% by 2030, and the region as a whole is slated to become a net importer of wood products for fuel and construction (Global Environmental Fund 2013). In the Congo Basin, some estimates state that one-third of the total wood market[9] is sourced from traditional (or artisanal) woodcutting (completely in the informal sector), and this segment is primarily destined for the domestic and regional markets (Lescuyer et al. 2012). Domestic demand for timber in this region is growing and is almost entirely supplied by the largely unregulated, inefficient and unsustainable[10] informal sector (primarily from artisanal and SMEs, with some semi-industrial actors). On the supply side there are barriers to entry into the formal sector and inherent difficulties in harvesting trees legally and sustainably. Due to the informal nature of much of the domestic value-added forest product market, the sector's real contribution to GDP and to local livelihoods is more challenging to measure.[11,12] This lack of information on the current economic contributions of the wood processing sector to the economies of the region is a further barrier to the sector realizing its full potential.

Enabling environment for investment in domestic wood processing

In countries that are so rich in wood resources, it is remarkable that industrially produced timber continues to be almost entirely exported while the domestic market for construction and furniture-making is almost entirely supplied by small-scale, artisanal and informal timber production. Meanwhile, in both the informal and formal processing sectors, there are great opportunities to improve competitiveness and reduce waste. Less than 3 percent of the global production of tropical round wood destined for export originates in Central Africa, far behind the other two major tropical forest regions, with these countries' contribution to the trade in processed timber even smaller (OFAC 2011). Domestic processing capacities are low, almost entirely limited to primary processing: sawnwood, peeling and slicing for plywood, and veneer production. As a renewable, locally-sourced resource (when properly managed), the share of processed industrial wood and legal artisanal wood used in furniture-making and construction has the potential to increase the sector's contribution to the economy, jobs, and livelihoods of forest-dependent communities.

Investors in this sector face a multitude of risks, including: market volatility, government and policy instability, and uncertain often overlapping land tenure/allocation (e.g.: mining projects overlapping forest concession areas). The greatest risk faced by potential investors is regulatory uncertainty (including sometimes rapidly changing policies) and lack of enforcement capacity, despite what are often strong written regulations, national laws, and international agreements like the Voluntary Partnership Agreements under the EU Forest Law Enforcement, Governance and Trade Action Plan (FLEG-T). Under the FLEGT Action Plan, the government of Cameroon signed a Voluntary Partnership Agreement (VPA) with the European Union in May 2010. It pledged that by 2012 all timber harvested in the country would be of legal origin – both for export timber and for timber traded nationally (VPA 2010). Cameroon committed itself to trace the source of all timber produced in the country within the framework of a

8. The Congo Basin spans six countries: Cameroon, the Central African Republic, the Democratic Republic of Congo, the Republic of Congo, Equatorial Guinea, and Gabon. It contains about 70 percent of Africa's forest cover: Of the Congo Basin's 530 million hectares of land, 300 million are covered by forest.
9. This figure excludes energy wood.
10. By sustainable here we refer to harvesting in the region being performed in the absence of forest management plans. Although the sustainability of supply of timber is an important issue, it is does not fall within the scope of this study.
11. In a parallel World Bank-funded study on DRC's forest sector, formal wood production (industrial + artisanal) was estimated to account for around 0.37% of GDP in 2010 (US$ 80 million), of which 0.33% and 0.04% are from industrial concessions and artisanal permits, respectively. Informal wood production (including wood fuels) was valued at US$ 1,687 million and represents 95.5% of total sector value.
12. In prior studies, the approximate annual financial benefits of chainsaw milling for rural population in the two countries were estimated to be: 34 million USD in Cameroon (Cerutti & Lescuyer 2011) and 47 million USD in DRC (Lescuyer et al. 2014). Meanwhile, the added value of chainsaw milling to the overall wood processing sector in Cameroon was valued at around 70 million USD (Lescuyer, Cerutti and Tsanga, 2015).

Legality Assurance System (LAS). Meanwhile, in DRC, under FLEGT, in October 2010, the DRC and EU's VPA negotiated agreement was decided to cover the industrial and artisanal timber production, as well as timber for the domestic market (Lescuyer et al. 2014).

The Cameroonian government is making technical efforts to fulfill its VPA obligations; however, to ensure the legal production of timber a new approach will be needed to fully integrate small-scale informal logging into the national economy and to improve the governance of the sector. To overcome the lack of political will and capacity to implement existing laws, regulations and agreements due to poor governance and widespread corruption, an increased effort to fully develop the Legality Assurance System (LAS) is needed. A web tool could have the potential to assist in monitoring and streamlining permit information, allocation and the declaration of harvest and tax payments. Ideally, all transactions should be performed electronically through this platform (building on experience with existing wood auctioning systems in other countries such as the United Kingdom) to reduce or even eliminate the opportunity for officials to claim additional payments.

In Cameroon currently there is a project focused on developing an online monitoring system (platform) for domestic wood products, and in DRC there has been increasing discussions on the potential to support the creation of community forests. However, it is too early to draw lessons learned from these experiences. Here we suggest a stepwise approach, beginning with technical measures over the short term, incentives over the medium term and improving governance over the long term.

Boosting the share of locally-processed wood used in domestic construction and furniture-making represents a significant business opportunity for small, medium and large-sized enterprises in wood fiber-based value chains: smallholders, community forest holders, forest concessionaires, as well as SMEs and larger companies involved in transportation logistics, wood processing industries (large or small), wood workers, builders, and even designers, with an appropriate mix of policy incentives to support the creation of an enabling environment. This also has the potential to make value-addition through furniture-making and construction relatively more attractive, as there is higher potential for job creation than other wood uses, e.g., for energy. Quality wood is, however, currently almost entirely diverted to the export market (ATIBT, FAO and OIMT, 2013).

I. UNDERSTANDING THE DOMESTIC MARKET: SUPPLY AND DEMAND FOR LOCALLY SOURCED WOOD PRODUCTS

Domestic demand for sawnwood in Cameroon

One of the major objectives of Cameroon's forest policy since 1993 has been to encourage the local population to participate in the forest sector and ensure that they receive a portion of the revenue generated by the sector. The 1994 forestry law reflects the 1993 policy by proposing a new framework for organizing forest resources and its economic implications for Cameroonians. The law offers several options for small-scale operators[13] in the Non-Permanent Forest Estate:

x. Logging permits for up to 1 year and a volume of 500 m^3;
xi. Personal logging permits for up to 3 months and a volume of 30 m^3; and
xii. Use rights for the population living in villages adjacent to forest zones.

Options (2) and (3) may not be used for commercial purposes.

In 1999, the Ministry of Forests and Wildlife (MINFOF) decided to suspend the use and allocation of all small-scale permits, including personal authorizations and permits on the grounds that they had become a major source of corruption and illegal logging. This suspension was maintained until 2006, although chainsaw milling continued over this period (Cerutti and Tacconi 2008). Instead of reducing illegal logging operations, the suspension forced additional actors into the informal sector; some operators were already active in the black market, while this forced others to enter the grey market, operating legally in some cases and illegally in others.

In 2006, when the suspension was lifted, MINFOF attempted to auction off nearly 50 permits and authorizations; however, the chainsaw millers did not participate. The initiative was repeated in 2013 and 2014, with the same lackluster result. The Government's attempt to officially reinstate the pre-1999 system of small logging permit allocation was received in the field as an attempt by the central powers to re-establish authority over small-scale forestry operations and over the informal payment system (Cerutti et al. 2013). There are various potential explanations for the failure of these recent attempts, including:

- Since 1999, an inter-ministerial commission in Yaoundé centralized logging permits with the unrealistic expectation that all operators would travel from their respective regions to Yaoundé to participate in the call for tenders.
- Civil servants with delegated powers and numerous mayors developed an extensive informal system to obtain payments from small-scale chainsaw millers.

Prior estimates of timber sales on the domestic market more than doubled from 300 000 m^3 of sawnwood in 2000.[14] Further, Plouvier et al. (2002) analyzed several markets in Yaoundé and Douala and estimated national production from small-scale sawmills at close to 1 million m^3 (RWE), of which nearly 10% was exported through the port of Douala whilst the rest (900 000 m^3 RWE, or about 300 000 m^3 of sawnwood) was sold on the local market. More recent estimates of Cameroon's domestic market's size reached 860 000 m^3 in 2009, with 662 000 m^3 of timber sourced directly from informal chainsaw milling operations and 198 000 m^3 from industrial sawmills (Cerutti and Lescuyer 2011).

In Douala, where most of the industrial sawmills are located, about 60% of the total volume sold in local markets was derived from industrial scrap, whilst in Yaoundé, with closer proximity to forested zones, the corresponding figure was closer to 14%, indicating that most domestically sold wood is sourced directly from the forest. In these informal domestic markets, the average price per cubic meter across all species and products, expressed in RWE, is about 27 000 FCFA, or 83 000 FCFA per cubic meter of sawn wood. The sales price varies according to timber quality, type, source and species. Data gathered as part of this study on volumes of processed furniture in urban markets is presented in Section III to follow.

Domestic market pricing is, on average, 80% lower than the Free on Board (FOB) price for industrial timber destined for exports, due to the following factors:

i. The export market demands higher-quality products;
ii. The export market imposes stricter product specifications/standardization;
iii. Timber destined for the domestic market is tax-exempt;
iv. Production costs in the artisanal sector are lower than in the industrial sector;
v. Competition is stronger on the national market than on the export market;
vi. Lack of information about the real economic value of standing timber in rural areas severely depresses the price of trees sold by the local population.

The total value of sales in the informal sector is estimated at 55 billion FCFA (~ 91.8 million USD) per year, based

13. Small-scale chainsaw operators (sawmills or millers) are those that produce wood products primarily by hand, operate in the informal ('artisanal') sector and often rely on temporary, mobile and/or hand-operated machinery to process wood and produce wood products. Most of the wood products produced by small-scale operators are sold on the local or domestic markets.10. By sustainable here we refer to harvesting in the region being performed in the absence of forest management plans. Although the sustainability of supply of timber is an important issue, it is does not fall within the scope of this study.
14. CIFOR researchers monitored domestic timber markets until 2013, observing similar trends.

on a prior study's extrapolation of the total volume sold in the three surveyed cities' markets and the average price of a cubic meter of sawnwood sold to the final customer (Cerutti & Lescuyer 2011). These numbers indicate that timber sales in urban markets have the potential to be profitable, even in the informal sector. However, further studies on the total costs of production throughout the supply chain from the forest to the end product are needed.

In prior assessments, chainsaw milling was recorded as providing 4000 direct, permanent jobs in urban areas (mainly traders and intermediaries), and nearly 40 000 jobs in rural areas, without considering indirect employment—which has proven difficult to estimate accurately (Cerutti and Lescuyer 2011). Conversely, the formal logging industry provides around 22 000 permanent jobs (Eba'a Atyi et al. 2013). Our study results provide new estimates based on the urban markets of Yaoundé, Douala and Kinshasa (in the sub-sections to follow).

Promoting the use of legal timber in Cameroon's domestic markets

A national or regional timber market strategy will only be sustainable if it pays due attention to the economic, environmental and social impacts of both the large-scale industrial sector and smaller-scale chainsaw production. In April 2010, MINFOF and the Ministry of Trade published a decree mandating that the domestic timber sector should have the following tasks (amongst others)[15]:

i. To promote the use of lesser known species;
ii. To promote equitable market conditions;
iii. To keep wood product producers and traders informed about timber supply and demand.

Although these are generally legitimate objectives, the validity of their underlying hypothesis can only be properly assessed if Cameroon's entire forest sector—with data from both the industrial and the domestic sectors—is taken into account. Additional data could help those employed in the domestic timber sector increase the use of a wider variety of species, thereby increasing their access to raw material for their products. Data on the specific attributes of products demanded by consumers would also increase their understanding of consumer demand in local urban markets and in the region.

There is no easy solution to convincing actors in the informal sector to formalize their logging and transformation activities. The constraints of professional accreditation, the permit types and format, and their transmission and approval procedure are major obstacles for almost all chainsaw millers. Measures could easily be taken to reduce this difficulty, such as allocating a quota and/or a number of permits per region, per year.[16] Plouvier et al. (2002) recommended that procedures for obtaining legal permits be simplified and volumes adapted to the real capacities of the chainsaw millers. In addition, permits for chainsaw-milled products should be issued at the closest administrative level to the applicant.

The transition to legality is possible for chainsaw millers through the implementation of the following short-term measures (Cerutti and Lescuyer 2011):

i. A reform of the requirements and procedures to grant small-scale logging permits is required, which could be approached as follows:
    a. Geographical scope should be limited to the council (or even canton) (Cameroon) level as most chainsaw millers work in their area of residence;
    b. A sufficient annual volume of wood should be allotted for each chainsaw miller to ensure a regular year-round income;
    c. An annual, flat rate payment (harvest fee) should be calculated according to the felling volume.

ii. A reduction in the fees for permits and simplification of the permit acquisition process (as applicable and reasonable in order to not create perverse incentives for unsustainable management of the forest resource). Millers will only apply for permits if the costs are not higher than the perceived benefits; the costs of the official payments need to be matched by a reduction in informal payments (ensuring issues of corruption will be addressed all along the supply chain). If a legal permit does not ensure a reduction in informal payments, chainsaw millers will be unlikely to move out of the informal sector.

iii. Support for the creation of urban markets that sell legal timber at higher prices (in recognition of the higher quality product produced[17]) and/or fiscal policy support to allow local artisans to compete with cheaper furniture imports. End consumers are likely to buy sawnwood at a low price,

15. However, in the absence of a marketing board, currently sellers are the primary interface and source of information on species and product attributes for consumers.
16. Although not explicitly addressed in this study, permit allocation decisions needs to be fully embedded in a policy framework which ensures that permits granted are for permanent forest areas in concessions where forest management is performed in a sustainable fashion, and ensuring that checks and balances are in place such as through third-party auditing. In Cameroon, small-scale permits are granted in non-permanent forest domain, with the assumption that local people will have a vested interest in maintaining a certain level of forest cover on their customary lands.
17. Quality of products produced is also variable, and it is crucial that the necessary training and infrastructure are provided to allow the production of lower cost, good quality products for sale on the local market.

even if the quality is lower. MINFOF would like to support the creation of urban markets for legal timber; however, these may have difficulty competing with existing markets. A more promising option would be to promote legal timber to increase demand for these products.

However, none of these measures alone or in combination will be very effective unless they are accompanied by determined long-term efforts to fight the widespread, uncontrolled corruption throughout the sector; as iterated above, a stepwise approach would be recommended.

Domestic demand for sawnwood in DRC

DRC is host to almost half of the tropical rainforests of Africa, with an estimated 148 million hectares of forestland (Kim, Sexton & Townshend 2015), of which two-thirds are rainforest. Early in the 2000s, with a gradual return to peace, DRC undertook a vast political, economic and institutional reform program that had a particular emphasis on forested lands (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 resource management and increase the contributions of forests 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, as they have been less documented.

The majority of timber originating in DRC is consumed on the domestic market as wood fuel (28 million m^3, or 84% of total consumption) or sawnwood (4.8 million m^3, or 18%) (Lee et al. 2015). Only a very small fraction is formally exported as round wood (0.1 million m^3) or sawn wood (0.09 million m^3), representing a total of 0.7% of total production (Lee et al. 2015). Since the early 1990s, estimates have shown 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.) (Gerkens et al. 1991).

Lescuyer et al. (2014) used two approaches to estimate domestic consumption of chainsaw timber in several of the most populated cities of DRC:

i. For Kinshasa and Kisangani and the cities in eastern DRC, urban consumption estimates were approximated based on the difference between the chainsaw timber entering and leaving the cities.
ii. 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. In order to ensure that there was no double counting, inter-market sales, were deducted when estimating chainsaw timber consumption.

These surveys were conducted for a minimum of one year at all monitored sites. The survey estimates place chainsaw timber production volume in DRC at more than one million 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 urban population growth and the relative increase in the purchasing power of certain urban classes. Kinshasa is the largest market for chainsaw timber, mainly due to the size of its population. A significant portion of the chainsaw timber sold in Kinshasa comes from industrial waste (61 000m^3), while almost 175 000 m^3 of chainsaw timber is consumed annually.

Based on data collected as part of this study in 679 joinery workshops visited in DRC, the Kinshasa markets provide 2637 permanent jobs and 3868 temporary jobs, and Kisangani markets provide 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 the downstream value chain.

Promoting the use of legal timber in DRC's domestic markets

There are several major obstacles to the development of a domestic timber market for legal and locally-produced timber. There is no way to distinguish between chainsaw timber covered by a valid permit and chainsaw timber from the informal sector. Following, a major obstacle to distinguishing between industrial and artisanal timber sold is pricing. 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. In cases where the cost of reaching Kinshasa becomes higher than the cost of exporting to neighboring countries, this is already happening.

The process of issuing permits to small-scale timber millers is in need of reform. Despite the issuance of 221 permits to 106 permit holders from 2010-2012, widespread abuse of the permitting system has been documented (REM 2013; Global Witness 2012; Greenpeace Africa 2013). In DRC, most actors operate in an informal space due to legal shortcomings and due to large irregularities in the issuing of permits (Lescuyer et al. 2014).

A consumer awareness campaign targeted at both private and public sector consumers in urban areas is necessary in order to highlight the benefits of supporting the local legal timber economy, to complement these measures. Public procurement policies promoting the use of legal timber products would also contribute to a positive outcome for this industry.

Multiple strategies could be considered to improve regulations and ensure the sustainability of chainsaw milling in DRC. The creation of a specific model for the specifications of chainsaw milling has the potential to reduce conflicts between artisanal operators and communities (Nkoy Elela 2007, Muganguzi Lubala and Benneker 2012). Currently, Congolese regulations on small-scale timber production are incomplete and often contradictory. The small-scale logging permit granting procedure is complicated, and often quite confusing and costly for individual operators. Further compounding this confusion in permit allocations, and as a result of the lack of clarity around allocations, relations between forest adjacent populations and small-scale chainsaw millers often spark complaints.

Further, the enforcement of regulations can be improved, by ensuring that civil servants receive a living wage, combined with effective sanctions for those who bribe forest officials. To tackle this issue, innovative financial incentives will need to be created in order to enforce the laws, especially for civil servants based in the various regions. The weak enforcement of forest regulations is a product of civil servants receiving unearned income from the informal market, and not a product of unscrupulous agents basing their decisions on regulatory loopholes or rare audits (Ascher 1999, Cerutti et al. 2013).

The rapid provision of financial incentives could incentivize small-scale operators to improve their practices ('go legal') and their impact on the national economy:

a. Simplification of the tax system to avoid the multiplication of false taxes[18] and to promote a one-stop-shop payment of taxes[19];
b. Introduction of financial incentives for the decentralized civil servants to enforce and monitor legality.

A reduction in the fees for permits and simplification of the permit acquisition process is required, otherwise most chainsaw millers will likely opt to remain in the informal sector.[20] Geographical scope should be limited to the district level as most chainsaw millers work in their area of residence, and a sufficient annual volume of wood should be allotted for each chainsaw miller to ensure a regular year-round income. An annual, flat rate payment (permit fee) should be calculated according to the felling volume. A single permit fee would cover the access to a logging area (like a stumpage fee) but may vary according to the number of trees that will be harvested. Millers will only apply for permits if the costs are not higher than the perceived benefits; the costs of the official payments need to be matched by a reduction in informal payments (ensuring issues of corruption to be addressed all along the supply chain). If a legal permit does not result in a reduction in informal payments, chainsaw millers will be unlikely to move out of the informal sector.

Sustained urban demand for chainsaw timber from legal origin would provide small-scale chainsaw millers the strongest incentive to seek legality. Longer-term actions to convince urban consumers to buy legally-produced timber have the potential to improve their commercialization on the domestic market. This can be done through targeted advertising campaigns, once sensitive market niches are identified. Complementing this, public procurement policies emphasizing procurement of legal timber could act to further promote these products.

However, none of these measures alone or in combination will be very effective unless they are accompanied by determined long-term efforts to fight the widespread, uncontrolled corruption throughout the sector; as iterated above, a stepwise approach would be recommended.

18. False taxes are taxes that are either invented by civil servants in order for them to capture additional rent through bribes, or misinterpretations of the forest code resulting in additional taxation.
19. This unified tax would be apart from a VAT, and would not include the permit fee.
20. This fee should be set at a level that is commensurate with the volume harvested and true value of the species harvested in order to not create perverse incentives for unsustainable management of the forest resource.

Table 2. Challenges and opportunities for local legally–sourced timber market promotion[21]

	Opportunities	Challenges
Cameroon	• 4000 direct jobs in town that can easily be targeted to increase skills • 40,000 fewer permanent jobs in rural areas that may be formalized and boost the formal contribution of the forest sector to GDP	• Uncontrolled corruption; • Pricing for timber is 80% cheaper than FOB price[22]; • Low visibility of existing small producers; • Taxes and fiscal policies hindering the development of the artisanal and semi industrial organizations
DRC	• 20% cheaper than timber sold on the export market	• Rampant corruption; • Incomplete and contradictory laws; • Taxes and fiscal rules hindering the development of the artisanal and semi-industrial operators; • Impossible to distinguish legal from illegal chainsaw lumber; • Dearth of legally sourced timber supply
Recommendations		
Short term recommendation	1. Reducing taxes on industrial timber in DRC would likely eliminate a major part of this price difference and encourage formal enterprises to sell on the domestic markets, without lowering their profit margins. 2. The creation of a model for the guidelines for small-scale forest management ('cahier des charges' for artisanal loggers and negotiated with communities), to facilitate the allocation of permits and the participation of local populations. 3. Financial incentives could be provided rapidly to the small-scale operators to improve their practices and their impact on the national economy through the simplification of the tax system, paying officials a living wage, and making it easier for them to 'go legal'.	
Long term recommendations	1. Revise and streamline existing regulations for small- and medium-sized wood product manufacturers. 2. Improve the enforcement of existing regulations, by simplifying regulations, effectively sanctioning those engaging in bribes and corrupted agents, establish monitoring systems, and introducing mechanisms to inspire behavior change amongst civil servants through ensuring that they are paid a living wage, along with training and monitoring mechanisms to combat corruption coupled with financial incentives at the decentralized level. 3. Improve the commercialization of legally produced timber on the domestic markets using specialized shops promoting the sale of legal wood, initially established with state support to showcase legally-sourced domestic wood products until they are able to be self-sufficient.	

21. The OCR Matrix is based on the matrix developed by E. Groutel for FAO (2014).
22. This much larger gap between FOB and the domestic market price can be explained by the production costs, which are much cheaper in urban markets in Cameroon than in Kinshasa.

II. REVIEW OF THE CURRENT AND POTENTIAL INDUSTRIAL SUPPLY OF WOOD PRODUCTS FOR THE DOMESTIC MARKET

Industrial timber suppliers and wood processing in Cameroon

In prior studies, semi-industrial loggers interviewed indicated that approximately 5% of their annual volumes were sold on the domestic market. Similar to the DRC, the timber sold is the lowest quality lumber not attractive for export. Products sold on the domestic market are pieces of wooden furniture made of light-weight wood species and/or low quality wood. In prior studies conducted in Cameroon, as in DRC, some semi-industrial companies reported selling their products in both industrial and artisanal markets.

Quality boards, flooring and other highly processed products are sold on the export market for two reasons: i) Cameroonian consumers are not interested in the higher-priced products produced by semi-industrial providers and ii) As these products fetch a high price on export markets, domestic consumers are priced out of the market. In addition, aside from being more expensive, often these products are only partially finished, and there is no interest from the informal domestic market to finish these products, as the profit margin would be too low at the finishing stage.

Industrial timber suppliers and wood processing in DRC

In 2014, the domestic portion of timber sourced from industrial logging was around 26% of the total annual sawn timber sold - or 61 353 m^3 - across the entire city of Kinshasa (Lescuyer et al., 2014). Most of this volume is not tracked by the logging companies as it is considered to be industrial scrap. In Kinshasa, industrial companies stated that they formally sold only about 8000 m^3 of lumber on the domestic market last year.[23] Compared to the total volume sold in Kisangani every year (58 207 m^3/y, Lescuyer et al., 2014), the portion from industrial companies is negligible (less than 1% of the total consumption of the city). The timber products traded are usually industrial scrap (by-product) or low quality timber ineligible for export.

The industrial forestry market is confronted with various constraints that drive up prices compared to the lower timber selling cost of artisanal chainsaw-milled wood: i) isolated areas and logistical constraints that result in high transportation costs, ii) weak governance capacity in decentralized administrations[24], iii) high taxation levels and incidental taxation[25], iv) limited forest productivity (production of 2 to 4 m^3/ha in DRC in comparison to 5 to 15 m^3/ha in other Central African countries), and v) unequal playing field or competition from the informal market, generally operating illegally, creating an uneven playing field.

Based on a synthesis of results from earlier surveys conducted with industrial chainsaw millers (2011-2014), this market structure in urban markets in both countries can be explained by the following:

i. Industrial companies target and tailor their products to export markets as these companies do not see the benefits of diversifying their products to better integrate them into the domestic market;
ii. Products on the artisanal market are cheaper;
iii. Timber legality is not a priority for the domestic market;
iv. Pricing is the main criterion for consumers—not quality—domestic market lumber is primarily based on poor quality products;
v. Consumers in DRC and Cameroon have a negative perception of wood;
vi. Sometimes imported wood products (mostly those made of plywood) are cheaper than those that are locally produced, creating competition.[26]

Due to a lack of incentives and enabling conditions to tailor their products to the demands of domestic consumers, industrial companies at the moment focus their production on export markets.

23. All the companies interviewed are active on the domestic market.
24. Increasing local government capacities is a priority area; ideally, elected and administrative staff of local authorities will have differentiate roles in administering and controlling small-scale permits within a robust incentive framework. This approach is currently being discussed within the current dialogue on the development of community forestry.
25. This 'incidental taxation' is mostly due to lack of training and due diligence among the customs staff.
26. As the sector matures, domestic plywood mills as well as other board manufacturing could be stablished. This would in turn then create more demand for wood waste and increase pressure on the domestic timber supply.

Table 3. Potential to improve and support the industrial and semi–industrial wood transformation sector (including SMEs)[27]

	Opportunities	Challenges
Cameroon	• Semi-industrial operators are present in the domestic market • Existing market for softwood furniture	• Most of the products sold domestically are of low quality and made from scrap wood—a concern in instances when these products should conform to certain quality standards; • Cameroonian consumers are not interested in paying a premium for products from semi-industrial suppliers; • Quality boards, flooring and other highly processed products are sold on export markets as there is no local market for products sold at these prices.
DRC	• Industrial companies are present on the domestic market • The industrial and semi-industrial sector supplies some legally sourced products • Existing market for softwood furniture	• Most of the products are of low quality, produced from scrap wood; • Competition from imported products; • Informal sector products are much cheaper
Recommendations		
Short term recommendations	1. Create the enabling environment for industrial operators to be able to sell higher grade at low cost (through encouraging the use of lesser-known species, supporting the creation of manufacturing/processing hubs alongside other measures). 2. Support the development of policies that create a fair operating environment for all segments of the wood processing sector in these countries: industrial, semi-industrial, and small- and medium-sized operators. These would include policies that promotes fair business, motivate informal entrepreneurs to come into the regulatory market, and ease the registration process to ensure that new entrepreneurs can get in through a straight forward approach. 3. Support SMEs with training[28] and the provision of necessary machinery to produce standardized high-quality products for the domestic market, such as structural panels for house construction. Currently, the equipment required is not affordable for SMEs.	

27. The OCR Matrix is based on the matrix developed by E. Groutel for FAO (2014).
28. There are now two new schools to train joiners, process, cut and manage timber: Mbandaka and Kisangani (in DRC).

III. ESTIMATE OF THE CURRENT ARTISANAL SUPPLY OF WOOD PRODUCTS ON THE DOMESTIC MARKET

Based on timber trade information collected in a sample of urban markets in Yaoundé, Douala and Kinshasa by CIFOR over a minimum duration of one year (Cerutti and Lescuyer 2011, Lescuyer et al. 2014), three major patterns emerge:

i. The following types of sawnwood make up the bulk of the traded volume: planks and blocks in Cameroon, and planks, rafters and beams in Kinshasa.

In both countries, about 20% of sawnwood sold on the domestic market comes from industrial sawmills, either as scrap or as small-size products requiring sophisticated processing (i.e., processing performed using industrial equipment), as shown in Table 4 and Table 5. Given their industrial origins these products are more likely to stem from a legal origin.

There are currently no orders for specifically legally-sourced sawnwood regardless of the product, the timber species, or their end use.[29]

Table 4 . Trade of sawnwood in the Yaoundé and Douala markets

Type of product	Length (m)	Width (m)	Height (m)	Unit volume (m^3)	Main species	% of total traded volume	Utilization	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%
Short Length of Sawn Timber – 1.5 – 2.5m length ("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%

29. In several markets there were recorded cases where individuals asked about the legal origin of sawn wood prior to purchase; however, these inquiries remain anecdotal in comparison to overall daily volume sold. Legally-sourced wood is often viewed as being of better quality as it could be processed industrially.

Table 5. Trade of sawnwood in the Kinshasa markets

Type of product	Length (m)	Width (m)	Height (m)	Unit volume (m^3)	Main species	% of total traded volume	Utilization	From industrial sawmills
Beam	5	0,15	0,1	0,075	Fuma	27%	Craft activities	24%
					Niove		Building	
					Dabema			
Board	5	0,4	0,05	0,1	Iroko	3%	Furniture	0%
	5	0,5	0,02	0,05	Afromosia		Buildings	
					Limba		Plank	
Block	3	0,15	0,15	0,0675	Afromosia	0	Building materials	0%
	4	0,2	0,15	0,12	Wengue		Furniture	
	5	0,5	0,2	0,5			Planks	
Short Length of Sawn Timber – 1.5 – 2.5m length ("Courson")	2,8	0,05	0,02	0,0028	Iroko	0%	Housing fitting-out	40%
							Furniture	
Formwork	5	0,5	0,05	0,125	Fuma	0%	Bricklaying	0%
							Furniture	
Lath	5	0,08	0,04	0,016	Tshitola	3%	Furniture	47%
					Iroko		Building	
					Olonvongo		Housing fitting-out	
Plank	6	0,07	0,03	0,0126	Tola	34%	Furniture	45%
					Iroko		Buildings	
					Wengue			
Plank (small)	5	0,22	0,03	0,033	Tiame	1%	Building	74%
					Faro		Furniture	
					Olonvongo			
Rafter	2	0,05	0,05	0,005	Bosse	32%	Building	0%
	2,5	0,05	0,05	0,00625	Tiama		Furniture	
	3	0,05	0,05	0,0075	Iroko		Craft activities	
	3	0,07	0,07	0,0147	Sapelli			
	5	0,07	0,07	0,0245	Bilinga			
	6	0,07	0,07	0,0294	Kossipo			
	7	0,07	0,07	0,0343	Tola			
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	5%

The urban timber markets[30] of Yaoundé, Douala, and Kinshasa generate an annual turnover of at least USD 15 million and contribute to the employment of at least 5000 individuals in these three cities (not counting those employed on a part-time/seasonal basis). They also furnish local markets with a wide variety of cheap products adapted to the means and tastes of urban consumers.

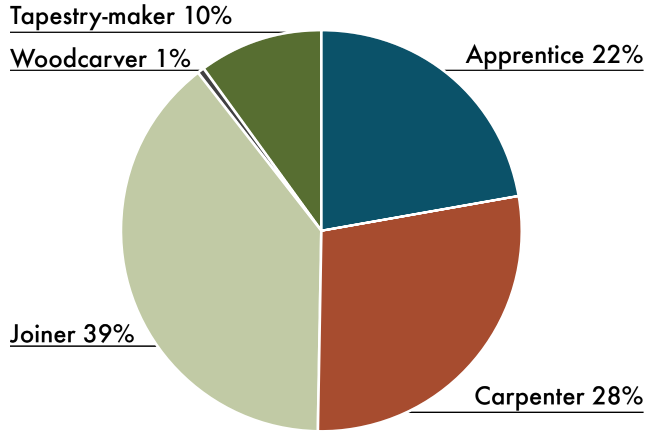
However, the current management of joinery workshops and furniture stores possesses significant weaknesses: (1) the equipment used in joinery workshops remains unsophisticated; (2) they employ mostly unskilled labor, often paid irregularly or informally; (3) they purchase most of their sawnwood in the urban markets, where a majority of timber comes from informal sources; (4) joiners use the same limited number of tree species as the industrial sector, mainly since they are well known and requested by consumers; and (5) overall, joiners do not seem to have the means to adapt to increasing competition, including furniture imported from Asia.[31] **This sector is in need of innovation and revitalization, especially in Kinshasa.**

Demand for legally sourced sawnwood is currently insignificant, regardless of the production chain segment or product (timber market, joinery workshop, furniture store). Based on this study's survey results, we have identified fewer than 200 pieces of furniture for 2015 (mainly doors and tables) that were sold to customers who asked for evidence of legal source[32], i.e., around 0.5% of the traded volume in the sampled workshops and stores. Moreover, most orders placed requesting legally-sourced timber used this as a proxy to ensure that they would be purchasing higher quality wood products. In this context, where there is an abundant supply of timber and wooden furniture, and little to no incentive to comply with regulations, the most promising leverage for legality lies in the awareness raising of local consumers.

The domestic timber market in Cameroon: summary of joinery workshop survey results in Yaoundé and Douala

Workshops in Yaoundé and Douala generate 1044 full-time jobs and 50 temporary jobs (or approximately 4 permanent and 0.2 temporary full-time jobs per workshop based on data collected on 259 joiner workshops visited in Yaoundé and Douala between August and November 2015). These jobs are divided into five categories, with joiners being the largest group (Figure 1). The average lifespan of workshops sampled is 9 years, with most employees ranging between 28 to 43 years of age.

Figure 1. Types of employment in sampled workshops in Yaoundé and Douala.



Most artisanal workshops sampled (78%) as part of this study were primarily oriented towards furniture manufacturing, with 19% solely producing furniture, and 59% primarily producing furniture. Additional specializations include housing fitting out (12%), building and public works (6%), and tapestry work (3%). Of the sampled workshops, 27% belong to a professional association or union, a good starting base to facilitate training, improve marketing and increase access to capital.

Of the employees in surveyed workshops, only 6% receive a fixed salary. The majority (82%) of employees are paid as a percentage of sales; this percentage ranges from 4% to 30% of the selling price of the product, on the basis of work performed.

Cameroonian joiners primarily use hand tools to produce the products sold at their workshops. The most-often used electric instruments include: drills, sanders, planer, jigsaw and spindle molding machine. These tools are used by 60% of sampled joiners.

The 259 sampled workshops as part of this study produced 9383 wooden objects with a volume of 1596m^3 (Figure 2.) and a reported turnover of 453 million F.CFA (~0.77 million USD). In both financial and volumetric terms, beds, cupboards and living-room furniture sets are the most important furniture items (Figure 3).

30. These include furniture shops, workshops and wood products sold in markets.
31. Timber trade in domestic markets remains efficient and adaptive, but this is less the case of the joiner/furniture sector that competes directly with imports of wooden furniture.
32. As this was industrial timber, it was assumed to be of legal origin.

Figure 2. Furniture types recorded as sold in sampled joiner workshops over the period of August and September 2015 (in USD).

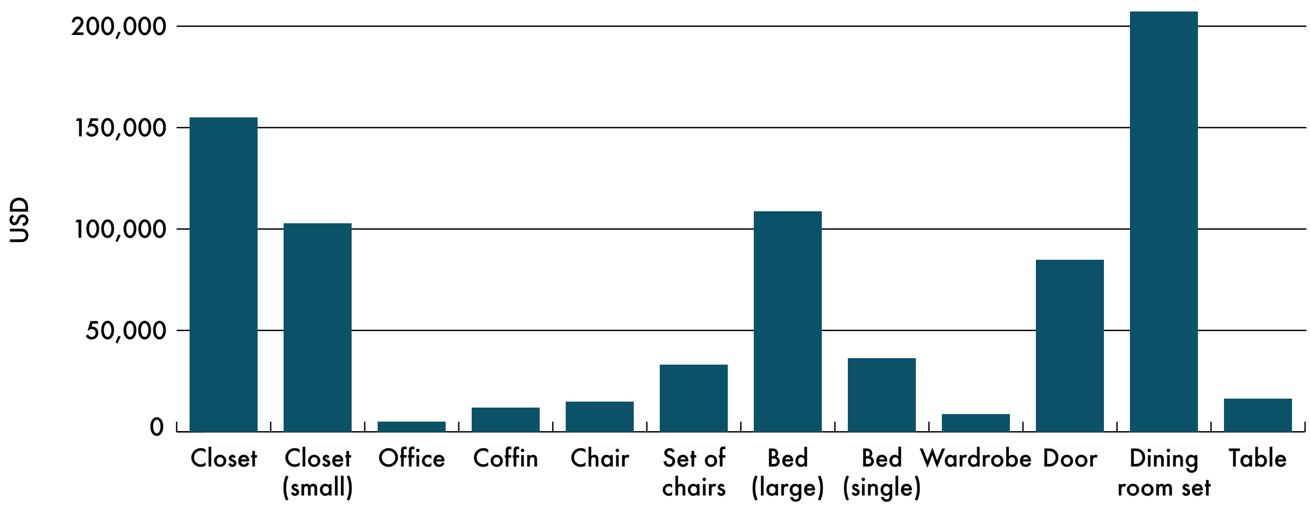


Figure 3. Volume of furniture types recorded as sold in sampled joiner workshops over the period of August and September 2015 (in m³).

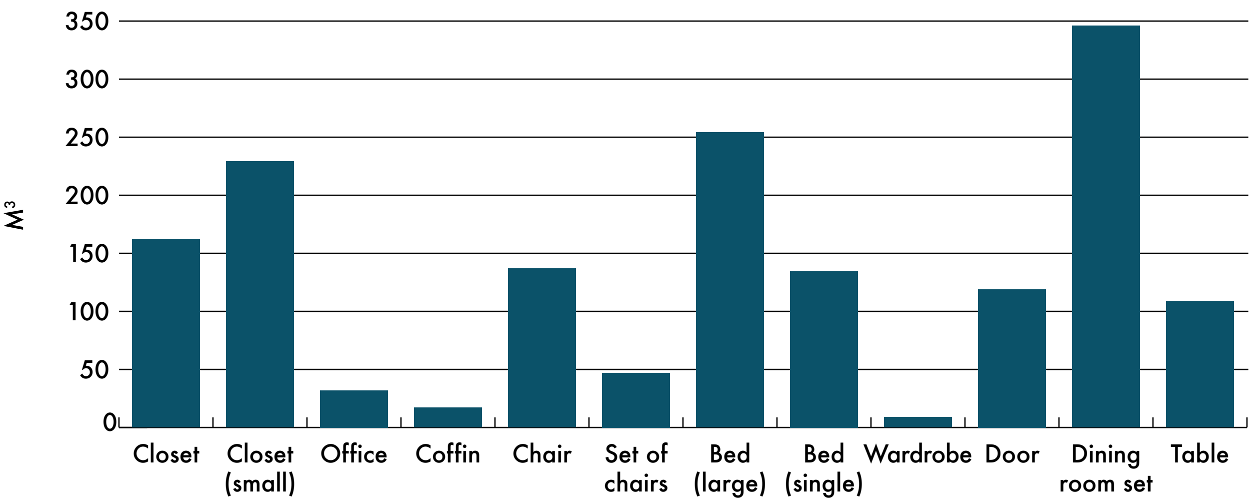


Figure 4. Timber species used in sampled joiner workshops (%)

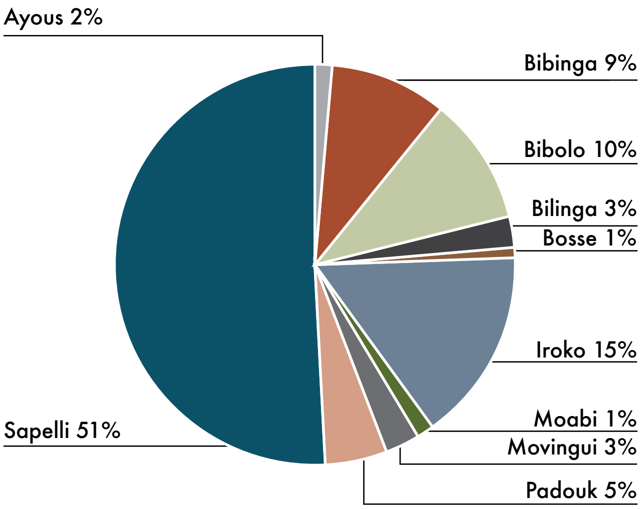
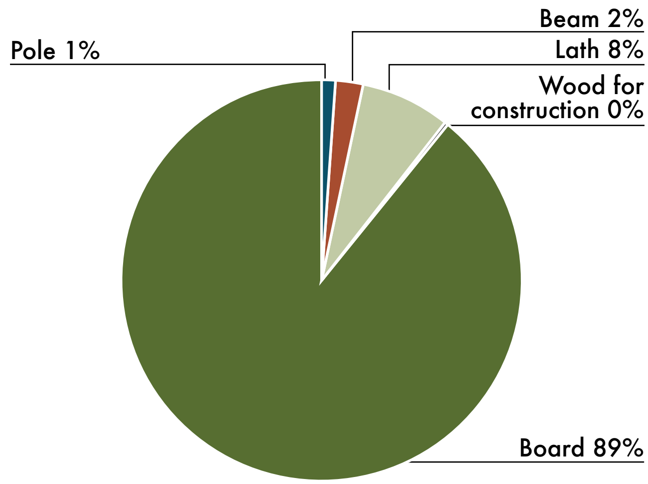


Figure 5. Types of timber materials purchased by the sampled joiners



The timber species most used by joiners is Sapele (sapelli), or 51% of total timber reported used (Figure 4) according to survey results. Most timber used by joiners (85%) is sourced in urban markets, where it is bought mainly in the form of planks (Figure 5). Premium wood (wood which has not been repurposed and is not sourced from industrial sawmill waste) accounts for 54% of purchases of the sampled joiners and carpenters. Waste from industrial sawmills constitutes a minor source of materials for artisanal joiners, except for a select number of products that require thin parts.

The domestic timber processing sector in DRC: summary of joinery workshop survey results in Kinshasa

In Kinshasa, joinery workshops generate 3220 jobs, of which 85% are considered permanent jobs (or approximately 5 full-time jobs per workshop) based on data collected on 679 joinery workshops visited in Kinshasa between August and November 2015; additional temporary staff are recruited when large orders are placed in a short time window. Most employees are apprentices and students working under the supervision of 900 managers and joiners. The average lifespan of workshops sampled is 14 years, while the average age of workshop managers is 45, unlike in Cameroon there are few young bosses in this sector in Kinshasa. Interestingly, in Kinshasa, most shop owners are from the forested provinces of the country, Bas Congo and Bandundu.

Workshops in Kinshasa are almost evenly divided between those specialized in furniture production (39%) and those that manufacture both furniture and housing fit-out (45%). Very few of the sampled workshops specialize in supplying the building and works sector, or in making coffins. As in Cameroon, only 18% of these workshops belong to local professional unions. Most employees (63%) are paid as a percentage of sales while 27% of staff are paid a flat rate salary; 8% of the workshops' employees are paid on a piecework basis and around 3% are paid irregularly or not paid at all.

Most products are handmade: 2308 tools were mentioned as being used and only 12% of these included electric equipment. The most common tools used are the wood saw (25% of answers), hammer (23%), followed by the manual plane (19%). Most of these tools are manufactured in China. The most-used electric instruments are sawing, planing and sanding machines; most of this electric equipment is made in Europe. Most (80%) of the manual and electric tools has been purchased over the latest five years.

The 279 sampled workshops produced 7650 wooden objects with a reported turnover of 1.73 million USD (Figure 2.; Figure 7). Unlike in Cameroon, it was difficult for survey respondents to estimate the furniture items sold in volumetric terms. The most-often sold items over this period were: doors, benches and beds (Figure 2.). However, in financial terms, the living-room suites, doors, wardrobes and cupboards were the most significant contributors to workshop earnings (Figure 7).

Figure 6. Furniture types recorded as sold in sampled joiner workshops over the period of August and September 2015 in Kinshasa (#).

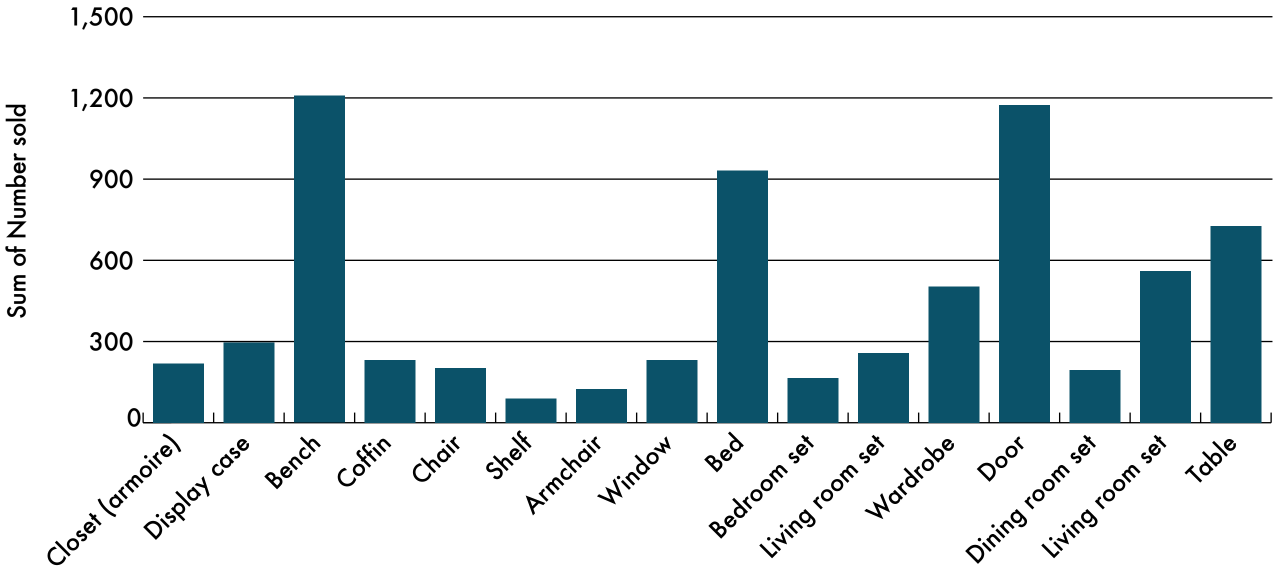
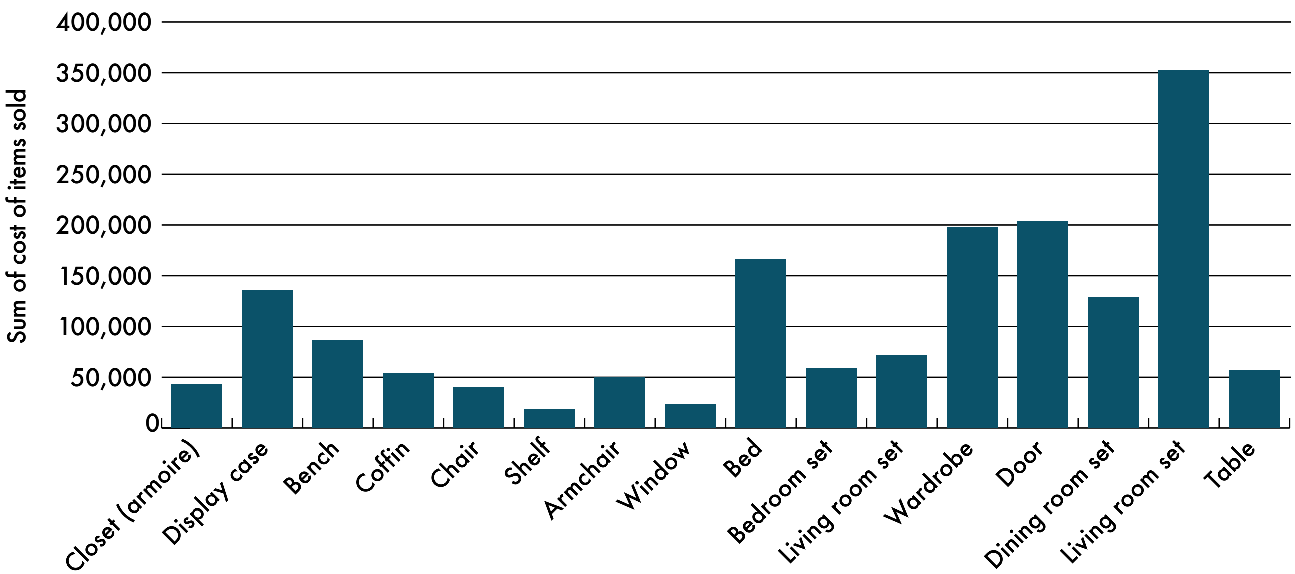
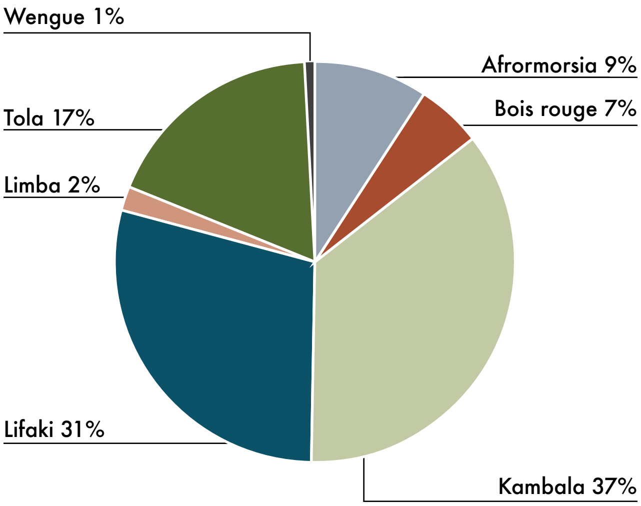


Figure 7. Furniture types recorded as sold in sampled joiner workshops over the period of August and September 2015 (in USD).



In Kinshasa, the timber species most used by joiners are sapele (lifaki) and iroko (kambala), according to survey results (Figure 8); while tola and afrormosia are also species that are often used. As in Cameroon, artisanal joiners tend to use the same species as those preferred by industrial companies. Most (80%) of the timber used by joiners comes from urban markets, with 15% originate from the harvesting sites (in Bandundu, Bas Congo and Equateur) and only 5% purchased in sawmills located in Kinshasa. Premium wood (no prior use, nor a product of industrial sawmill waste) accounts for 87% of purchases of the sampled joiners and carpenters. Scraps of industrial sawmills constitute a very minor source of materials for artisanal joiners (1%).

Figure 8. Timber species used in the sampled joiner workshops in Kinshasa (%).



The domestic timber market in DRC and Cameroon

The vast majority of consumers look primarily for wood at a competitive price without any consideration for its origin, in both Cameroon and DRC. Overall, interviews with joiners indicate little demand for legally-sourced timber on the part of Kinshasa's wood product consumers due to (1) lack of knowledge among consumers related to legal (and sustainable) sourcing of timber and (2) a higher price for legally-produced timber. Consumers in the urban markets surveyed were said to demand legally-sourced furniture solely due to the perception of it's being of higher quality. According to respondents, providing legally-sourced wooden furniture would not be difficult, but it would require consumers to be willing to pay a higher price. Interviews with artisanal joiners in these urban markets indicate that 58% of them do not face any constraints to sourcing legal timber as they are able to purchase timber from industrial logging companies. However, 24% of respondents claim that large industrial companies monopolize high-quality timber for export.

The majority (83%) of employees and managers of joinery workshops and furniture stores do not anticipate great positive change in the local wood processing sector in the near future, mainly as a result of the increased competition from imported wooden furniture from Asian companies over the last five years. In Kinshasa, their primary complaints revolve around a general lack of political, technical and financial support to their sector. In Kinshasa, in contrast to respondents from Cameroon, joiners perceive little risk of depleting timber resources (Table 6). In Cameroon, managers of joinery workshops in Douala and Yaoundé provided opinions on the likely evolution of the sector presented in Table 7 as well as some solutions to improving their ease of doing business (Table 8). Two thirds of respondents have a pessimistic view of change in their sector, without a principle reason to justify this negative perception. Their chief complaints are focused on the general lack of policy and financial support to this sector. The improvement of technical equipment was highlighted as the main factor of growth of this activity in the coming years. At no time is timber legality mentioned as a constraint to the sustainable growth of this sector.

Table 6. Joiners' perceptions of the development of the joinery sector over the medium term (5 years) in Kinshasa (DRC)

Joiners' opinion[33]	% of answers
Decreasing due to competition from imported furniture	37%
Decreasing (no reason given)	33%
Decreasing due to 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 becomes expensive and rare	0%
Increasing (no reason given)	10%
Increasing due to better equipment	3%
Increasing due to improved processing	2%
Stable	2%

Table 7. Joiners' perceptions of the evolution of the joinery sector over the medium term (5 years) in Yaoundé and Douala (Cameroon)

Opinion of the joiners	% of answers
Decreasing (no reason given)	20%
Decreasing due to hard competition between joiner workshops	13%
Decreasing as timber becomes 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 from imported furniture or substitute materials	5%
Decreasing due to lack of funding	2%
Increasing due to better equipment	17%
Increasing (no reason given)	11%
Increasing due to improved processing	10%
Stable	1%

33. Joiners were able to provide their first choice as an answer.

The majority of joiners in both countries desire stronger state intervention to reduce what is perceived as "unfair" competition by Asian importers of cheap furniture. This type of public policy would benefit from being associated with an improved internal organisation of the joinery sector and with a consumer campaign to promote locally produced furniture in DRC and Cameroon.

The promotion of local wood as an aspirational good would also help to improve the potential for the local wood production industry to develop. This could be done through the construction of best practice examples of modern buildings and furniture to attract consumers and break down the "wood is for the villagers" paradigm. Wood building best practice examples could showcase designers from across the continent and abroad. Additionally, local and legally-sourced wood could be used in the building of hotels, lodges, base camps and other tourism infrastructure. A promotional campaign accompanied by demonstration examples of modern wooden structures would facilitate a shift in perception of wood from being a primitive to a modern aspirational good. This could build on existing projects and structures in these countries including the GIZ-financed modern-wooden building housing the MINFOF regional office in Bertoua, Cameroon.

Table 8. Joiners' suggestions to improve the ease of doing business for small–scale furniture manufacturing in Yaoundé and Douala (Cameroon)

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

Table 9. Joiners' suggestions to improve the ease of doing business for small–scale furniture manufacturing in Kinshasa (DRC)

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 hand-made wooden furniture	6%
Improve the governance of this commodity chain	4%
Reduce tax pressure	2%
Ensure access to timber resources for a limited cost	2%

Table 10. Potential to improve and support the artisanal wood transformation sector[34]

	Opportunities	Challenges
Cameroon	• Using existing supply chains to add value to scrap wood from legal origin.	• Price competitiveness primary factor affecting consumer choice; • No (or little) consideration for legality; • Competition from imported wooden furniture from Asian and European sources
DRC	• Using existing supply chain to add value to scrap wood from legal origin • Small market niche for high-value furniture made with precious timber species from DRC (afrormosia and sapele)	• Price competitiveness primary factor affecting consumer choice; • Lack of consumer awareness of issue of legal (and sustainable) sources of timber; • Competition from imported wooden furniture from Asian and European sources
Recommendations		
Short-term recommendations	1. Campaign to promote local furniture and artisans (improve the perception of these materials; make them aspirational, and support the move towards formalizing the sector). 2. State support for the creation of an enabling environment that supports local wood products producers (to improve their skills and access to better equipment). 3. Better internal organization of the joinery sector, notably to better understand the growing demand from local consumers for furniture.	

34.The OCR Matrix is based on the matrix developed by E. Groutel for FAO (2014).

IV. URBAN PRIVATE DEMAND FOR LOCAL AND LEGALLY–SOURCED WOODEN FURNITURE

Both source and legality verification of wood products are very difficult to obtain in the markets studied. Overall, 89% of products sold in stores in the workshops and furniture stores sampled as part of this study are not made from materials with proof of legal origin. An additional 9% of products are presumed to be legal because they were stamped by the administration, which is often insufficient evidence of legality (Cerutti et al. 2013).

In Cameroon, a limited number of workshops were requested to fill orders specifically requiring that furniture be made from legally-sourced sawn wood: 13 of the 259 sampled workshops (5%) in 2014 and 2015 based on survey results. In 2015, only 58 pieces of furniture were sold to individual consumers who wanted to be sure of the legal origin of timber: 52 doors, 2 cupboards, 2 wardrobe, and 2 living-room suites amounting to 7 m^3—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 at 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).

In DRC, only two of the sampled workshops responded to requests for furniture made from legally sourced sawnwood 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 with artisanal joiners indicated that 58% of them do not face constraints in sourcing legal timber. However, 24% of the respondents complained that most high-quality (and possibly legal) timber is monopolized by large industrial companies and intended for the export market.

Overall, interviews with joiners indicate a lack of demand on the part of Kinshasa's wood product consumers 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. As in Cameroon, the vast majority of the buyers in Kinshasa look primarily for wood at a competitive price without any concern for its origin.

Most of the wooden furniture (79%) originating in the Kinshasa workshops is sold to private end-consumers; however, schools and churches purchase substantial quantities of benches and tables (Table 11).

Table 11. Types of wooden furniture purchased by consumer type in August and September 2015 in Kinshasa

Product type	School	Church	Private enterprise	Individual consumer
Closet (armoire)			12	206
Display case				297
Bench	649	326	130	103
Coffin				231
Chair	13			190
Shelf			7	83
Armchair				124
Window	22			209
Bed				932
Bedroom furniture set			27	124
Living room set			8	249
Wardrobe				503
Door			10	1150
Dining room set				194
Living room set			4	557
Table	253		27	445
Grand Total	937	326	225	5597

Most interviewed workshop managers (85%) in both countries felt it was possible to substitute imported furniture with locally produced furniture, since the raw material is abundant in the region. However, additional and higher quality equipment, as well as infrastructure for drying, storage, handling, would be required to create these products (in addition to marketing and product design). They also highlighted that the imported wooden furniture is generally of very poor quality; however, its low price attracts many urban consumers. Further, they believe that it is the State's responsibility to support and promote the local furniture manufacture and trade sector through policy, technical, financial and commercial support. Given the diversity of the timber sector and domestic market, establishing criteria for State support will require future analysis. As noted in Section III's recommendations, in parallel, further work is also required to understand local consumer preferences for wood furniture.

Table 12. Opportunities for influencing urban demand for local and legally–sourced wooden furniture[35]

	Opportunities	Challenges
Cameroon	• Lower taxes (specifically those related to the levels of site production and transportation roads) for small stores; • Urban workshops/stores employ nearly 2 permanent staff; half of the reported employees receive a fixed salary; • Large diversity in products sold; • When legal wood is requested, it is viewed as a proxy for better quality—which could be capitalized upon/used for marketing.	• Numerous temporary stores producing furniture (difficult to organize, standardize product offer, monitor and track); • Some stores rely on temporary jobs without fixed salaries; • Consumer education is needed on legal wood: it is currently viewed as a proxy for quality (not one and the same).
DRC	• Existing supply chains to add value to scrap wood from legal origin; • There are possibilities to substitute imported furniture with locally-produced furniture	• Consumers are primarily focused on finding the lowest cost wood products; • Consumers are not aware of (nor potentially concerned by) whether timber is sourced legally and/or sustainably; • Local producers face heavy competition from imported wood furniture from Asia.
Recommendations		
Short-term recommendations	1. Promote local and legally-sourced timber and wood products in local markets; 2. Promote lesser known species (with known specifications) to lower the pressure on intact forests and lower the price for locally-made products; 3. Create an enabling environment for local businesses to thrive where they can compete on a level playing field: through modifications to import taxes and/or duties; 4. Incentivize the production and distribution of locally-made products at low cost through support for capacity building in wood furniture making and purchase of processing equipment.[36]	

35. The OCR Matrix is based on the matrix developed by E. Groutel for FAO (2014).

36. This recommendation is fully in line with the World Bank-financed Cameroon - Competitive Value Chains (P112975) Project's component on Sustainable Wood Processing. Specifically, wood processing equipment in the amount of US$4.5 million was financed by the project and are expected to be delivered for shared use by beneficiaries by the third quarter of 2016. Further, the project will then shift its focus towards: (i) supporting the implementation of the Governance framework of the equipment in accordance with good practices, which are highlighted in legal documents prepared by the Ministry of Economy and Ministry of Forestry with support from a consultant financed by the project; (ii) contributing to the control of the use of legal wood by beneficiaries in accordance with the legal documents, and (iii) facilitating dialogue and adoption of policy reforms for both the wood and tourism industries (except regulatory reforms that promote industrial-scale logging).

V. URBAN DEMAND FOR WOODEN HOUSING AND FOR WOODEN HOUSING FIT–OUT

Due to the high price of timber, the cost of a wooden house is approximately the same as the cost of a standard build concrete house. In addition, according to survey respondents from industrial, semi-industrial, and wood housing production companies, in a prior study respondents indicated that, using wood has the potential to complicate the maintenance of the building due to: the often high levels of precipitation and humidity in central African cities, lack of adequate drying and treating facilities and lack of capacity and knowledge on maintaining these structures. However, with investments in improved infrastructure for drying and treating wood, these problems can be easily overcome. According to interview results, in Cameroon, international companies which have built wooden offices are generally satisfied with their investments.

In Cameroon as in DRC[37], timber is viewed as a 'poor' material in multiple senses of the term: both as a default housing option for the rural poor, associated with the "village lifestyle", and as a low quality material. In order to promote the sustainable use of forest resources, the region is in need of policies and information campaigns that promote timber as an aspirational renewable building material which contributes to the national economy.

Table 13. Opportunities for increasing the share of local, legal wood in wooden housing

	Opportunities	Challenges
Cameroon	• No building permit requirements; • Quick to construct, modular, movable; • Considered aesthetically pleasing; • Promotes sustainable use of forest products.	• Not cheaper than standard concrete house build; • Difficulties in finding electricians and plumbers to install needed infrastructure in these houses; • Poor perception among the local population of wood as a building material; • Difficulties in finding reliable timber suppliers; • Difficulties in maintaining these houses in a humid climate
DRC	• Quick to construct, modular, movable; • Has the potential to fit the needs of quickly evolving and growing cities	• Difficulties in finding reliable timber suppliers in DRC • Poor perception among the local population of wood as a building material; • Difficulties in finding reliable timber suppliers; • Lack of knowledge on how to maintain these houses in a humid climate
Recommendations		
Short term recommendations	1. Promotion by public sector of wood construction, such as in public contracts; 2. Promotion of timber as a sustainable and aspirational material and solutions for maintaining wooden structures in a humid environment; 3. Support for improved wood drying and treatment; 4. Support for improved carpentry training.	

37. In the DRC, the current forestry system is, however, not being managed in a sustainable manner, thus, requiring additional enforcement measures upstream.

VI. PROSPECTS OF BOOSTING LEGAL TIMBER SALES ON DOMESTIC MARKETS

Priority recommendations all relate to three domains of equal importance:

i. **Marketing and communication to educate domestic consumers and producers:**
    a. For consumers to increase the appreciation for the value of locally-produced wood;
    b. For producers to promote training opportunities, increase professionalism, and stimulate the local market.

ii. **Appropriate policies and regulations to create an enabling environment that promotes local wood producers:**
    a. Procurement policies that promote the use of legal wood in furniture and public building construction.

iii. **Support to the wood products sector through:**
    a. Support to the diversification of wood products destined for the local market through the promotion and use of lesser known species;
    b. Improving the skills and competencies of local artisans through professional courses, apprenticeship initiatives, study exchanges;
    c. Development of a locally-appropriate legality control system based on third party verification/ independent certification (traceability);
    d. Simplification of permits and taxes for small-scale wood processors.

The following table provides recommendations for the development of the local wood product markets for both Cameroon and Democratic Republic of Congo:

Table 14. Opportunities, Challenges and Recommendations for local wood product markets in Cameroon and DRC[38,39]

Opportunities	Challenges
• Population growth in the region concentrated in urban areas; • GDP growth; • Growing domestic timber market; • Ongoing VPAs (FLEGT); • Growth of middle class (with greater disposable income); • High potential for domestic demand; • Prices for lesser-known species remain low.	• Complex administrative registration requirements (permits, etc.); • Low visibility of existing SMEs supplying the domestic market with wood products; • Almost non-existent formal domestic wood market; • Same species used by artisanal and semi-industrial wood processors (and exporters), thus leading to competition; • Taxes and fiscal rules not yet supporting the still nascent development of the local artisanal joiners and semi-industrial processors; • Consumers accustomed to only having access to low quality wood on the domestic market; • Low levels of education and training among artisanal joiners; • No access to bank loans to expand or develop artisanal activities; • Lack of access to technology for production (currently primarily use hand tools and wood is not dried); • Most consumers currently unable to pay a premium for quality and legally-sourced wood products; • Lack of formal associations of SMEs and/or artisans in the sector; • Consumers accustomed to cheap import products (even if quality is compromised), making it difficult for local producers to sell their wares at a premium.
Timeframe	**Recommendations**
Short-term	1. Support investment in tools and material to produce better quality products (through drying, processing)(See Tables 8 & 9); 2. Support the increased visibility[40] of the artisanal wood products sector, perhaps through the creation of cooperatives to federate artisanal operators to facilitate increased promotion of the sector (cf. current experiences in Cameroon with timber traders, and with associations of artisanal producers based in and around Kisangani – cluster model)[41]; 3. Create a model for a social responsibility specifications (*cahier des charges*)to improve monitoring and thus the eventual availability of legal, locally-sourced wood for small-scale processors (cf. current debate in DRC about Simple Management Plans for community concessions); 4. Enforce regulations through effective sanctions and financial incentives; 5. Promote species substitution (with lesser known species); 6. Develop skills related to the use of lesser known tree species.
Medium-term	1. Provide training to operators and artisans to minimize waste and maximize the use and valuation of raw wood material; 2. Promote local wood as an aspirational good with examples of modern buildings and furniture to attract consumers and break the "wood is for the villagers" paradigm and target the growing urban middle class in the region[42]; 3. Promote innovation in wood-building design through showcasing African designers and architects from across the continent; 4. Promote and sponsor the use of local and legally-sourced wood for the creation of hotels, lodges, base camps and other tourism infrastructure; 5. Develop and promote use of an integrated information system or tool that could facilitate the monitoring of permit allocation, declaration of volumes and deliveries, as well as track tax payments.
Medium- to long-term	1. Respond to the local demand for lower-priced wood products through manufacturing low-cost (but quality) products by training artisanal suppliers.

38.The OCR Matrix is based on the matrix developed by E. Groutel for FAO (2014).
39. This table addresses the common market shared by artisanal, semi-industrial and industrial wood processors.
40. Currently these artisanal wood processors operate in a grey or black market visible to their client, and not visible to policy makers/ the government. In order to create a supportive enabling environment for the artisanal sector, their activities need to be visible to the state.
41. The facilitation of cooperatives could be done through investments in physical infrastructure: potentially developing several wood processing clusters (similar to the manufacturing sector cluster developed in Nkok, Gabon).
42. Efforts to promote wood as an aspirational material have been undertaken by ATIBT and the Ministry of Forestry in DRC with thus far limited impact. These efforts may need to be expanded and more carefully targeted to reach specific audiences

CONCLUSIONS AND RECOMMENDATIONS

With a burgeoning population, the DRC and Cameroon face a great challenge in terms of supplying their populations with adequate volumes of locally-produced and legal wood products along with public perception of these products. There may be an opportunity to encourage a shift in local perceptions, use and consumption of wood products. One such opportunity is the current round of EU's Forest Law Enforcement, Governance and Trade (FLEGT)[43] Voluntary Partnership Agreement[44] negotiations with the DRC and Cameroon requiring all wood sold (including on domestic markets) to be verified as being of legal origin. The VPA process of associated policy support and discussions have highlighted the inequities between the industrial and artisanal wood transformation sectors. In both countries, efforts that are being made to promote legality for export timber products are also bringing their added value to the domestic wood processing sectors.

Both industrial and small-scale operators in the sector face numerous challenges scaling up their businesses and matching their product offer to consumer preferences and demands. On the one hand, smaller-scale wood processers work hard to evolve, utilizing timber supplies as they become available and follow the new demands of customers but are increasingly in competition with imported furniture. Meanwhile, industrial processors operating within the formal sector struggle with administrative red tape and are heavily impacted by taxes all along the value chain. These industrial actors often have difficulty selling their wares on the domestic market as a result of competition from the informal market and cheap imports. There is no common market for larger industrial enterprises and artisanal transformers.

Artisans in the wood-processing sector should be provided with opportunities to exchange, learn, train, as well as promote their legally sourced products destined for the domestic market. According to our study results, the majority of wood processing sector SMEs (73%) do not have access to benefits associated with being part of a larger network that could provide training opportunities; they are in need of increased structure for their sector and recognition. To make this change, encouraging the formation of professional associations will be important to promote the eventual formalization of and professionalism in the artisanal sector.

It is crucial to continue to develop lower cost, good quality products for sale on the local market. Cooperatives or professional associations can support the development and ensure the sustained supply of these products to the market. To limit the pressure on a few known species and in turn, pressure on intact forest areas, lesser known species and their qualities should be promoted as they are fit for transformation into a variety of wood products, including housing and framing. This could be achieved through increased support for lab tests for durability, resistance, resilience, and application testing. Following, these species and their attributes would need to be included in the norms that set the standard for applicable species for specific usages. Finally, these products would need to be marketed with promotional pricing (perhaps no or a reduced tax to support the launching and maturation of this segment of the market). Complementing this process, better knowledge of wood transformation facility locations would facilitate the provision of capacity building support to small and medium-sized timber processors.

Industrial and semi-industrial wood transformation enterprises are well-equipped but have difficulties competing on the domestic market as they are subject to higher taxes than smaller enterprises, operating informally. In addition, semi-industrial operators may need support to industrialize their processing lines so that they are able to provide lower-cost, good-quality products like structural panels for housing. Over the medium term they may need support to identify market niches where they can sell their higher quality/legal products on the domestic market.

Alongside these measures, consumer education and awareness is paramount—especially for the growing middle-class: consumers need to be made aware of the true value of domestic wood products in supporting the local economy, as well as the importance of supporting the transformation of legally-sourced wood products. The government could play a strong role in promoting the benefits of local and legal wood through various incentives, along with their procurement, tax, and trade policies. Additional outreach to local thought leaders and influencers, like religious leaders, community groups and teachers, and through teaching materials and social media could support this sensitization process.

43. The EU's Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan was established in 2003. It aims to reduce illegal logging by strengthening sustainable and legal forest management, improving governance and promoting trade in legally produced timber.
44. A Voluntary Partnership Agreement (VPA) is a legally binding trade agreement between the European Union and a timber-producing country outside the EU. The purpose of a VPA is to ensure that timber and timber products exported to the EU come from legal sources. The agreements also help timber-exporting countries stop illegal logging by improving regulation and governance of the forest sector

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ANNEX I — QUESTIONNAIRE FOR JOINERS AND CARPENTERS

Interviewer: ______________________________ Date : ______________________

City: ______________________ Administrative District (Arrondissement): ______________________

Neighbourhood (Quartier) : ____

GPS Coordinates: ____

Owner’s name: ____

Owner’s age: ____________________ Ethnic group: ______________________________

Date of workshop’s founding: ______________________ Size of workshop: ______________________

Days and hours of operation: ____

Membership in a professional association (formal or informal): ______________________________

Active employees in workshop

Type of work	Number	Permanent / Temporary	Full–time / part–time	Type of remuneration

- Types of products produced and percentage in workshop:
  - » Furniture
  - » Buildings and public works (frames, scaffolding, palisade,…)
  - » Door frames (doors, windows, trim…)
  - » Others (to be described):

- What are the steps of transformation that are performed in your workshop?

Main types of equipment used in your workshop:

Equipment	Purchase Date	Origin	Products

Is there demand for legally–sourced products?

Product	Type of customer	Customer's motivation	Number of products sold in 2015	Source of wood material

- How would you describe the current situation of demand for legally-sourced wood products?
- What are the constraints to accessing legally-sourced primary wood materials?
- Evolution of this sector's activity over the next 5 years
- Evolution of this workshop's activities over the next 5 years
- Final comments?

What are the products produced and sold by your workshop in August and September 2015?

Product	Amount of wood used	Quality of wood used	Source of wood material	Species	Number of products sold	Price of products	Principal buyers

ANNEX II — QUESTIONNAIRE FOR FURNITURE STORES

Interviewer ____________________ Date(s) : ____________________

City : ____________________

Administrative District (Arrondissement): ____________________

Neighbourhood (Quartier) : ____________________

GPS Coordinates : ____________________

Business name: ____________________

Name and position of interviewee: ____________________

Name of owner (or manager) of the establishment: ____________________

Date of founding of the establishment: ____________________

Main types of work carried out by the establishment: ____________________

Main taxes paid by the establishment: ____________________

Approximate size of the establishment: ____________________

Days and hours of operation: ____________________

Staff employed by the establishment, linked to the sale of furniture

Type of work	Number	Permanent / Temporary	Full–time / part–time	Monthly salary

Earnings in 2014 linked to the sale of furniture:

Proportion of total shop earnings from the sale of furniture:

What types of furniture are on display at the shop?

Product	Tree species	Geographic origin(s)	Legal origin	Products sold in 2015 (#)	Product price	Primary purchasers

What kinds of furniture can be ordered at the shop (which may not be on display)?

Product	Tree species	Geographic origin(s)	Legal origin	Products sold in 2015 (#)	Product price	Primary purchasers

Is there demand for legally–sourced furniture from sustainably managed forests?

Furniture	Type of buyer	Motivation of seller	Number of furniture items sold in 2015	Type of sustainability standard

How would you describe the current state of demand for legal products from sustainable sources?

What types of furniture orders does your shop usually fill?

Date	Client	Type(s) of furniture	Number or volume	Value	Who obtains the designation of origin?

Are there specific challenges associated with the current procedures for the importation of furniture?

Is it possible to replace certain imported furniture items with domestic products?

How do you believe that sector will develop over the next 5 years?

Any additional comments?

ANNEX III — MAPS OF SURVEYED AREAS

Figures 9 and 10 show the geographical distribution of most workshops and stores surveyed in Kinshasa and Douala.

Figure 9. Indicative locations of the surveyed workshops and stores in Kinshasa

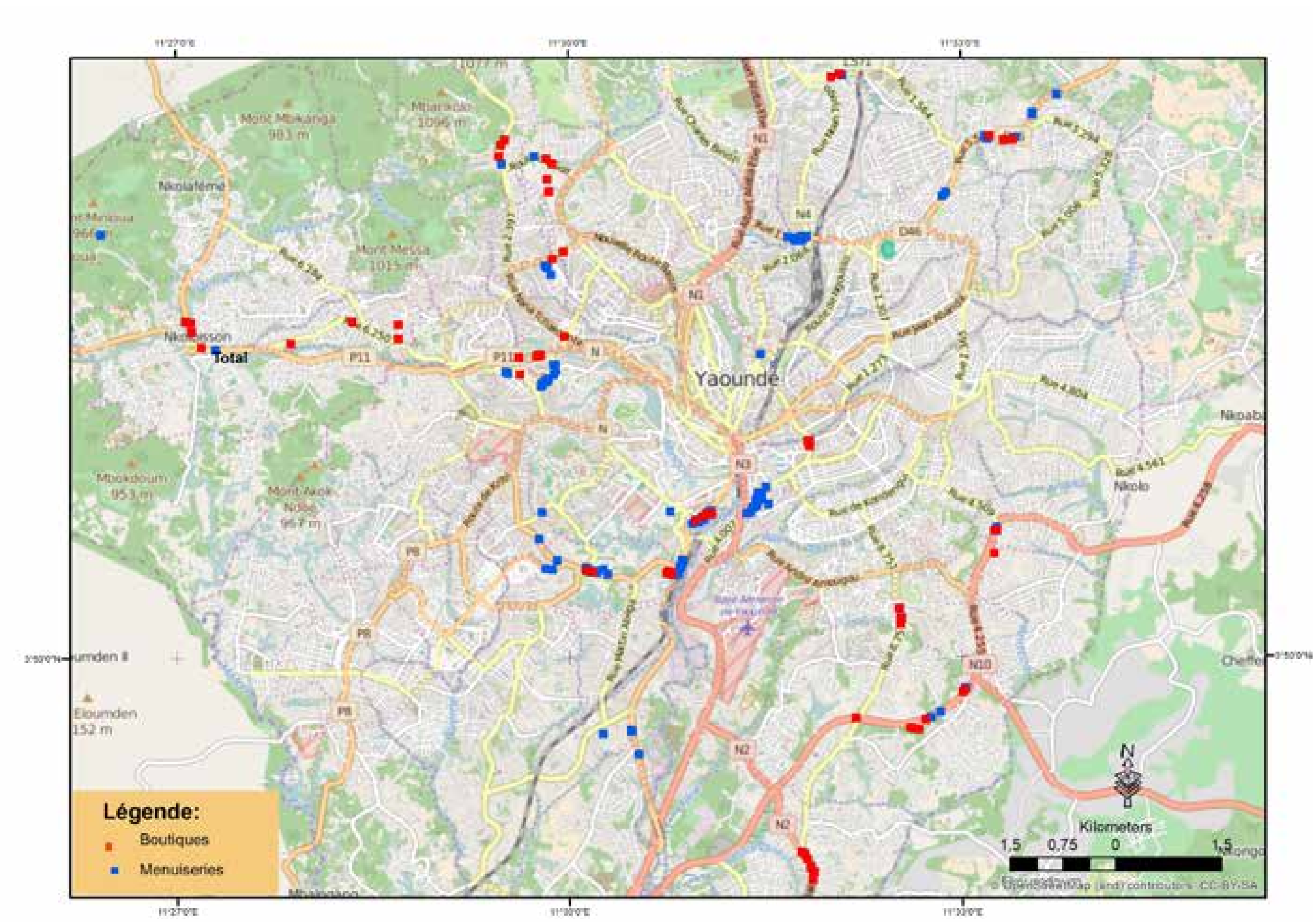
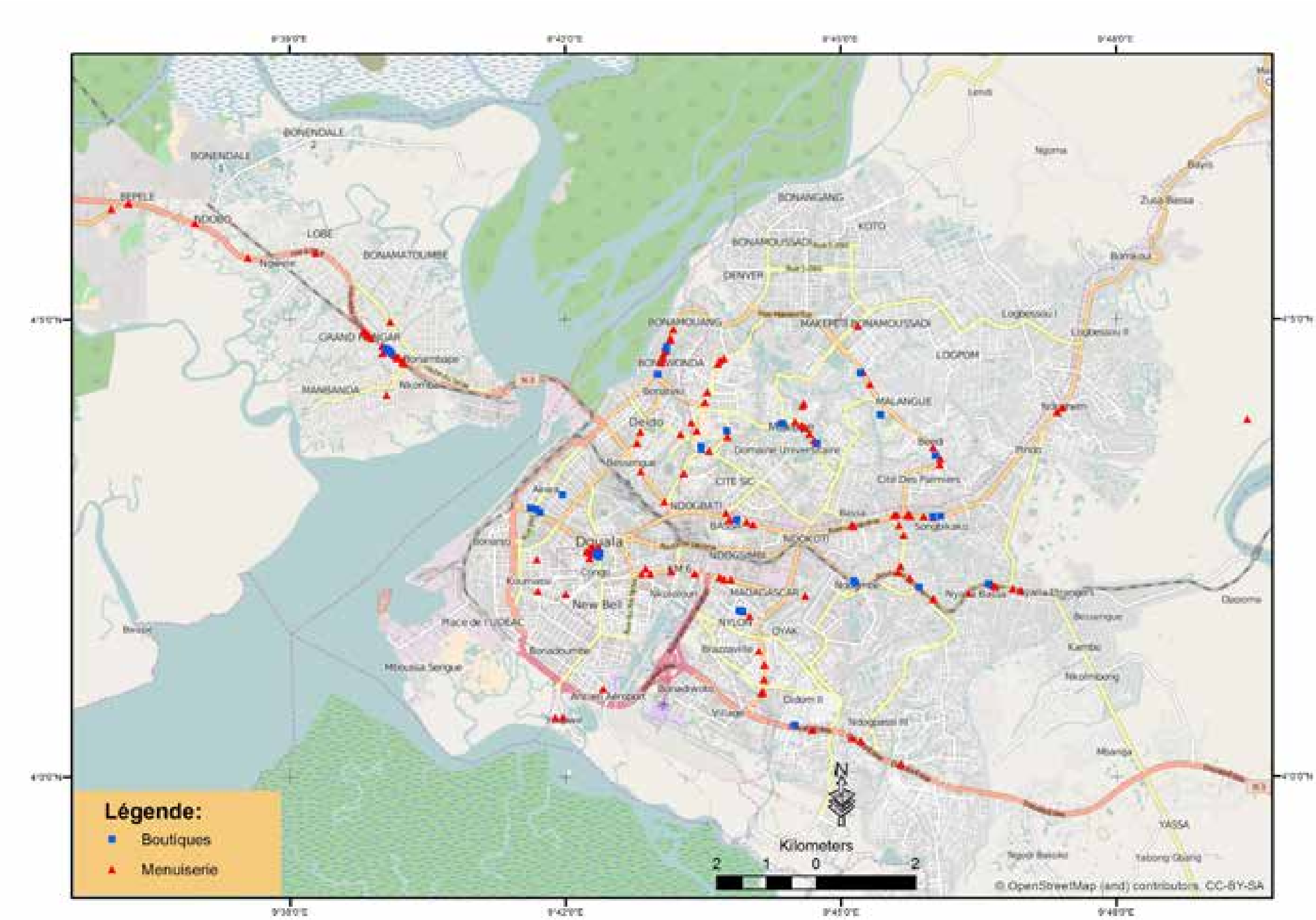


Figure 10. Indicative locations of a selection of surveyed workshops and stores in the district of Akwa in Douala



Examining the potential to boost the volume of legal wood used in construction and furniture making in the Congo Basin

In the Congo Basin, up to one-third of the total wood market is sourced from traditional (or artisanal) woodcutting, with these products primarily destined for domestic markets. Due to the informal nature of much of the domestic value-added wood product market, the sector's real contribution to GDP and to local livelihoods is challenging to measure. However, urban timber markets contribute to economic growth and provide jobs, with an annual turnover of at least USD 15 million and employment of some 5,000 individuals in Yaoundé, Douala, and Kinshasa alone.

Boosting the share of locally-processed wood used in domestic construction and furniture-making could represent a significant business opportunity for small, medium and large-sized enterprises in wood fiber-based value chains: smallholders, community forest holders, forest concessionaires, as well as SMEs and larger companies involved in transportation logistics, wood processing industries (large or small), wood workers, builders, and even designers, with the right policy incentives and enabling environment. Domestic processing capacities are low, almost entirely limited to primary processing: sawnwood, peeling and slicing for plywood, and veneer production. Industrial and semi-industrial wood transformation enterprises are well equipped, but have difficulties competing on the domestic market as they are subject to higher taxes than smaller enterprises, operating informally.

This report aim to improve knowledge and prioritize options for policies and targeted investments for improved domestic timber utilization in Cameroon and the Democratic Republic of Congo (DRC). The report builds on prior knowledge to better understand the solutions needed to overcome barriers to expanding the market for legal (and possibly sustainable) timber and processed wood products used in the domestic furniture and construction markets in the two countries.

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