

The Africa–China timber trade

Diverse business models call for specialized policy responses

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Key points

- China has become the largest importer of tropical wood and is the destination of more than three-quarters of Africa's timber exports. This demand has raised international concern about the environmental and socioeconomic impacts of Chinese timber supply chains in Africa.
- Many types of Chinese actors are active in the timber industry in the Congo Basin and the Miombo Woodlands. A variety of Chinese private (as opposed to state-funded) logging companies and traders play a major role in facilitating timber exports to China.
- These private businesses (logging companies and traders) operate according to the local standards of legal, customary or informal practices depending on the producer countries and vary significantly in terms of location of headquarters, nationality/ethnicity of owners and investors, size and supply chains.
- In terms of environmental and social impacts, our research on Chinese timber supply chains demonstrates mixed results depending on the location, business type, and specific timber species and products.
- Illegally harvested timber finds its way to China through complex networks of large and small Chinese and non-Chinese companies, local loggers operating in largely informal local timber markets, and local elites connected to the trade. Though such practices may infringe on state laws, they may involve active participation from local small producers and may be aligned with local informal sector norms.
- The diversity of operators (nationals, Chinese, European and other), the types of operations (small- vs. large-scale or mixed) and markets served (national, regional, African and international) do not support the oversimplified narrative of China's role in Africa that circulates in policy circles and the media. We found that a wide variety of business models and value chains are used. As a result, we argue that there are multiple potential leverage points for policy intervention. Effective policy making on all sides must take into account the characteristics of specific business models.

Introduction

China's investment and sourcing of natural resources in Africa has received much attention from policy makers, scholars and the press in recent years (Colchester et al. 2006; Asche and Schüller 2008; Tjønneland et al. 2006; Brautigam 2009; Mol 2011). The forestry sector is no exception, as China has become a major export destination for timber-rich African countries from both the Congo Basin in Central Africa and the Miombo woodlands in Southern/Eastern Africa. The proportion of African timber exports destined for China increased from 35% in 2000 to 78% in 2009 (Huang et al. 2012), making timber the third largest commodity exported out of Africa after oil and mineral ores (Ibid). The increase in exports was coupled with increased Chinese engagement in producer countries: for example, by 2010, Chinese companies

owned around 25% of timber concessions in Gabon (Putzel et al. 2011), a proportion that continues to increase as companies acquire more holdings.

International perceptions of Chinese investment and trade in Africa's forests have largely pointed to negative environmental and social outcomes, including deforestation (Environmental Investigation Agency 2012; Cuypers et al. 2013), damage to local livelihoods (Mackenzie 2006; Environmental Investigation Agency 2012), corruption and illegal logging (Milledge et al. 2007; Roque 2009). However, while the large volume of Chinese business interests in the forests logically could entail environmental and social externalities, there has been a lack of scientific evidence behind most statements made to date.

This brief was prepared to provide a better understanding of Chinese involvement in the timber sector in Africa. Specifically, this brief aims to:

- Provide an accurate description of Chinese investment and trade in Africa's timber sector based on in-depth fieldwork on Chinese timber supply chains in four countries; and
- Examine the current policies across the selected African countries and offer policy recommendations for the future.

We draw on research conducted by CIFOR researchers and partners between 2011–2013 in four countries, two in the Congo Basin region (Cameroon and Gabon) and two in the southern Miombo Woodlands region (Mozambique and Zambia) (see Table 1). Figure 1 illustrates the recent export trends to China from the selected countries and the export values in 2012. Gabon, Cameroon and Mozambique were selected as cases on the basis of export amounts and a growing number of studies on the topic. Zambia was added as it represents a quickly evolving case.

In 2012, the selected countries together constituted nearly 40% of Africa's wood export to China by value (General Administration of Customs of the People's Republic of China). Although limited to research conducted in the four countries, this brief attempts to provide a representative picture of the Chinese forestry investment and trade on the continent. This brief proceeds as follows: (i) it first presents the profiles and business models of Chinese companies, (ii) it examines the characteristics of their engagement, and (iii) finally assesses the current policies and offer recommendations for the future.

Ultimately, this brief establishes the complexity of Chinese trade and investment: Chinese actors are diverse and their business models are varied: local actors heavily participate in the value chains (both legally and illegally), perhaps making such trade and investment as much Chinese as African in some instances. While Chinese businesses may exhibit some unique traits in comparison to European counterparts, they are also greatly shaped by local

resource governance rules. We conclude by pointing out that a blanket-approach to policy making will have limited impact, and that in order to achieve sustainable and socially responsible timber trade, policy makers from China and Africa should collaborate to design targeted policies for each type of value chain, strengthening enforcement, educating businesses as well as addressing the livelihoods needs of local African loggers and forest-dependent communities.

The methodologies used in our research included: literature review (both peer-reviewed and grey literature), primary documents review (legislation, trade data, documentation of fines, etc.) and in-depth interviews (semi-structured and focus group discussions). Informants included direct participants in the timber value chains (Chinese, African and European loggers, traders and intermediaries), as well as key informants such as policy makers, civil society members and industry experts. In total, this brief draws on an analysis of 26 Chinese companies and interviews with more than 200 informants.

The Africa–China timber trade: A diversity of actors and business models

On the ground, we observed a great diversity of Chinese actors and their business models. They varied in terms of size, finance structure, sourcing strategies and degree of connection to the Chinese government. Below, we attempt to represent the heterogeneity of 'Chinese' trade and investment in the four countries.

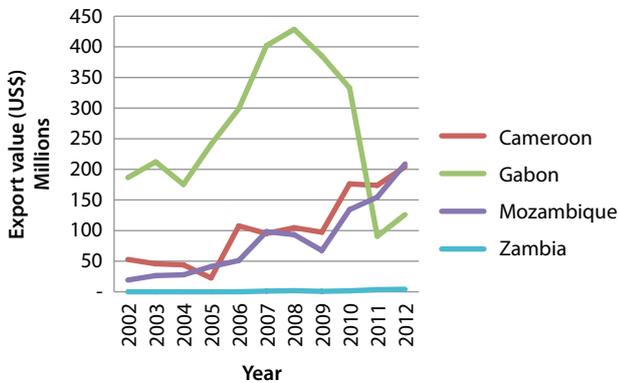
Profiles of Chinese actors

Although it is difficult to define precisely a 'Chinese' business, as illustrated in past studies in the Amazon and the Congo Basin (Putzel et al. 2008, 2011), this study defines Chinese businesses as those owned and operated by individuals holding Chinese nationality and/or headquartered in mainland China (including Hong Kong). In general, two types of timber company were observed: logging companies and timber trading companies. The former may be state-owned or private (though more private

Table 1. Summary of studies from which the contents of this brief are drawn. Published studies are available at www.cifor.org/China-Africa. Unpublished studies are available upon request to the authors.

Country	Types of Chinese business examined	Geographical Scope	Number of informants	Source
Cameroon	Concession logging companies	National	24 key informants and focus groups in 15 villages	Cerutti et al. 2011
	Timber trading companies	National, focus on the South Province	67 informants	Weng, <i>in preparation</i>
Gabon	Concession logging companies	National	16 informants	Bia Zafinikamia et al. <i>in preparation</i>
Mozambique	Concession logging companies	Cabo Delgado Province	26 informants	Wertz-Kanounnikoff et al. 2013
	Concession logging & trading companies	Cabo Delgado Province	17 informants	Ekman et al. 2013
Zambia	Concession logging & trading companies	Western Provinces (Kaoma & Sesheke Districts)	73 informants	Kandulu, <i>unpublished</i> ; Schmidt, <i>unpublished</i>

Wood exports to China by value (4 countries)



Wood exports to China by value (Zambia)

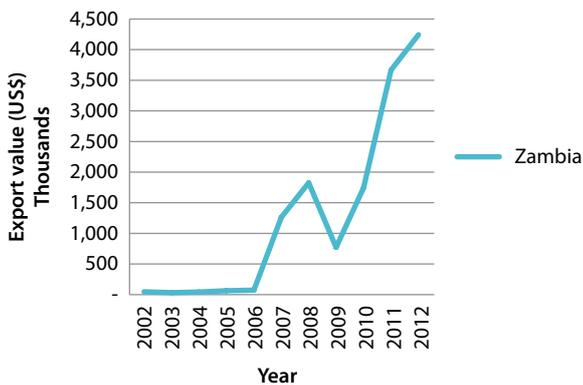


Figure 1. Top: Value of wood exports to China from Cameroon, Gabon, Mozambique, and Zambia, reported by China. The drop in exports from Gabon, starting with the financial crisis and followed by a log export ban, is largely compensated by exports from other African countries. Bottom: While starting from a small base, Zambia’s exports to China are rapidly increasing. Source: UN Comtrade, authors’ analysis.

companies were observed), the latter are almost exclusively private businesses. Across the four countries, these companies demonstrate a number of variations: in size, financial structure and strategies used to acquire timber. One of those strategies is the acquisition of forest concessions.

Size

The size of Chinese logging concessions examined varies considerably, between ca. 5000 and 900,000 ha, which to some degree reflects national forestry laws. In Cameroon, a Chinese logging company owns approximately 660,000 ha, the largest concession in the country. In Cabo Delgado, Mozambique, Chinese companies hold logging rights to concessions ranging between 10,000 and 200,000 ha—taken together, these Chinese

companies hold the largest concessions amongst the foreign timber companies in Cabo Delgado. In Zambia, three of the Chinese logging companies interviewed hold 5000 ha of timber concessions each while another holds 10,025 ha. Among the four countries studied, Gabon saw the earliest—and the largest—expansion of Chinese-owned concessions. In 1999, Chinese occupied merely 1.08% of Gabon’s total concession areas. However, in 10 years, the ratio increased to 25% (ca. 3.5 million ha). These Chinese concessions in Gabon range from approximately 52,000 ha to 925,000 ha, totaling 14,219,000 ha in 2013 (Assembe-Mvondo and Billard 2014).

In addition to the logging companies, Chinese trading companies are also highly active in the four countries. These private trading companies tend to be small in size, some with only two or three Chinese staff members on the ground. Some of these businesses are family run; for example, a father and a son manage two Chinese companies in Western Zambia. Some other companies are started and managed by individual entrepreneurs who emigrated to African countries—some had moved recently, others had arrived more than 20 years ago and still others had worked in other African countries before. Observed across all four countries, these Chinese trading companies often utilize their ethnic trade networks, dealing with business associates from their hometown, province or region.

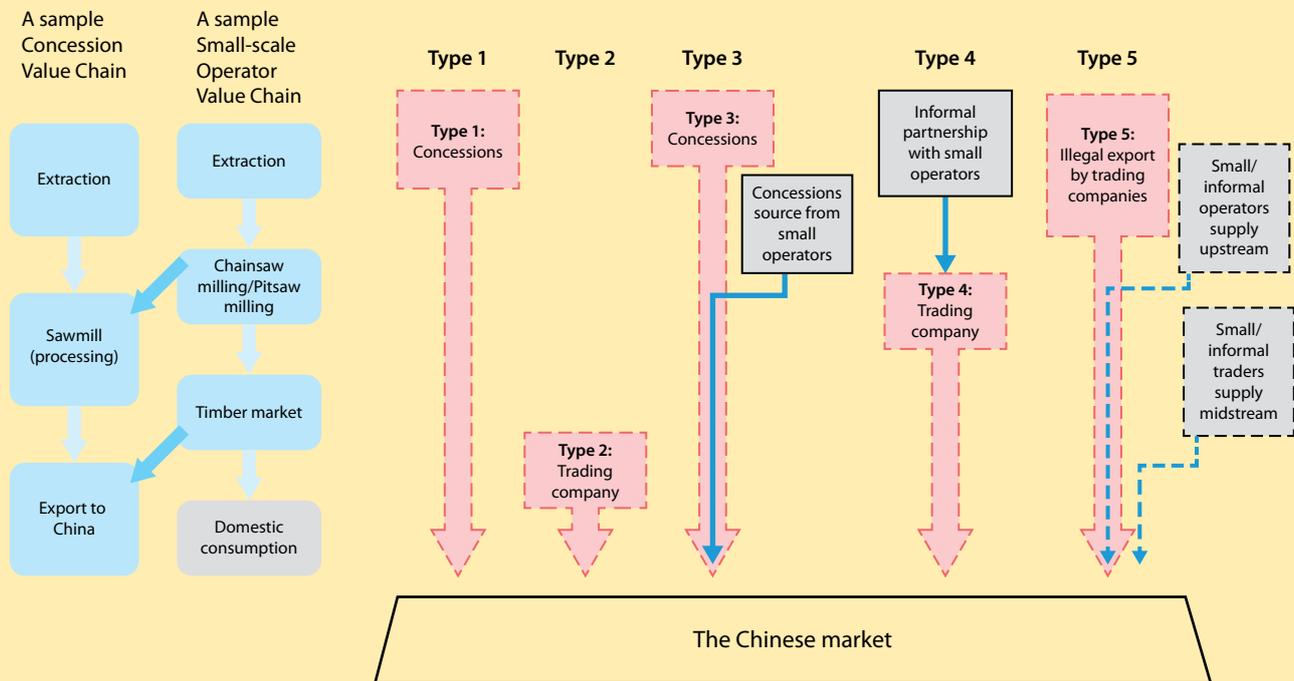
Source of finance

Most of the companies in Cameroon, Mozambique and Zambia are private companies with their own source of funding, with no financial link to the Chinese government. In fact, some Chinese companies explain that it is extremely difficult to obtain bank loans as a private timber company in China. Instead, at least three Chinese concessionaires from Mozambique and Zambia used their personal savings and loans from families to start businesses while another received forward financing from a manufacturing company in China. Another option for obtaining capital (from a study conducted in relation to this project in the Democratic Republic of Congo) is to seek public listing and raise funds on the stock market (Putzel and Kabuyaya 2011).

In Gabon, only two Chinese companies out of 10 were state-owned enterprises (until one of them was sold to a private group in 2012) and thus had direct financial links to the Chinese government and state banks. The rest of the Chinese companies there, however, are private and maintain no link to Chinese development banks (Putzel et al. 2011).

Acquiring concessions

Among the concessions, the Chinese logging companies used various strategies to acquire concession licenses across the four countries. In Gabon and Cameroon, the Chinese concessionaires generally did not compete in the tendering process; instead, they acquired titles through purchasing existing companies with concession titles or entering into agreements with license holders for them to transfer licenses. In Mozambique and Gabon, Chinese

Box 1. In-country timber value chains in Cameroon, Gabon, Mozambique and Zambia

Through interpretation of our field interviews with market actors, we distinguish five main supply chain types, illustrated above, in the Africa–China timber trade. Type 1 and 2 are commonly observed in all four countries. Type 1 illustrates the vertical integration of a large-scale logging concessionaire and timber trader through all stages, from extraction to export. However, Assembe-Mvondo and Billard (2014) note that Chinese operators in the Congo Basin with concessions follow three patterns: (1) operating with an approved forestry management plan; (2) operating without a management plan but working towards compliance and (3) operating extra-legally.

Type 2 illustrates trading companies only involved in exporting processed timber products. The trading companies may source both from industrial concessions or small-scale/informal operators. In Mozambique, these traders are mainly of Chinese and Asian origins.

companies have moved from being mainly traders to becoming concession holders, in order to establish direct and steady supplies of timber to the Chinese market (Ekman et al. 2013; Bia Zafinikamia et al. in preparation). In Zambia, both methods were observed. For example, one Chinese company in Western Province (Kaoma) applied for a concession license and went through the entire process of license acquisition and thereafter sub-contracted production to a non-license holder; another Chinese company purchased an existing company with a concession. Yet another Chinese company leased a concession license from a Zambian concessionaire.

The business models

The business models employed by Chinese actors are equally diverse. Box 1 describes the five types of in-country value chains observed in Cameroon, Gabon, Mozambique and Zambia. Some

of the business models are also common among European and African counterparts (Types 1 and 2). Others may be more unique to Chinese actors as they actively source timber from local small-scale/informal loggers (Types 3–5). Each type is explained in detail below.

It is important to highlight the heavy participation of local small-scale loggers in Types 3–5. While concessionaires and small-scale loggers are generally considered to serve different markets (the former almost exclusively for export markets and the latter mostly for the domestic markets, as illustrated by sample value chains in Box 1), our research does demonstrate that, in the case of Chinese timber companies, there is a significant interaction between Chinese concessionaires and small-scale loggers. The potential economic benefits to small operators arising from this interaction are rarely addressed in the current policy debate, which is discussed further in the next section.

In Zambia, they source timber from small scale producers and this is most common at the central market in Lusaka where small-scale producers and individuals transport and pool their timber for customers to buy.

Type 3 is observed among concessions in Zambia and Mozambique. Since concession harvests alone do not meet the large volumes of demand from China, these concessionaires source from local small operators to meet the extra demand. One Chinese concessionaire in Mozambique explained that his concession only provides a third of his supply; he sources the rest from small operators holding simple licenses (Ekman et al. 2013). In addition to sourcing timber from small operators holding pit saw licenses, Chinese concessionaires in Zambia also source their timber from local Zambian operators holding commercial licenses (fellow concessionaires). In some cases, the concessionaire abandons his license operations and operates in the form of trading companies (Kandulu, unpublished).

Type 4 is observed among trading companies in Mozambique, Cameroon, Zambia and possibly Gabon. Chinese traders enter into informal partnerships with small operators using semi-industrial equipment and often holding short-term permits to log small areas, which may, however, be used to cover illegal practices. Buyers formerly often provided forward financing and/or equipment as loans conditional on receiving timber products harvested. This model is being increasingly abandoned as Chinese traders cite lack of trust with local operators who engage in 'side-selling' (when operators sell to other Chinese buyers who offer higher prices instead of completing the contract). For this reason, in fact, in Mozambique, none of the interviewed Asian traders currently provide forward financing. In Gabon, although our study did not specifically explore this aspect, one may speculate that this model is also common, given Gabon's growing informal domestic sector (Wit and van Dam 2010; Lescuyer et al. 2011) and the prevalence of Chinese trading companies (Bia Zafinikamia et al. in preparation); however, further research is needed.

Type 5 is observed in Cameroon, Mozambique and Zambia. In Cameroon, particularly regarding the illegal logging and export of an endemic species called *bubinga* (*Guibourtia* sp.). Prior to the export ban in 2010, our research reveals that illegal logging and export of *bubinga* to China involved local small-scale loggers from the informal sector. Although technically illegal, recent estimates show that Cameroon's informal sector may be as large as or larger than the formal sector (see Wit and van Dam 2010; Lescuyer et al. 2013). While formal concessions mainly serve the export market, domestic demand is largely met by these chainsaw millers who operate in the informal sector. Generally, Chinese traders remain downstream and receive supplies from local informal chainsaw millers and intermediaries. At least in one community deep in the forest, however, a Chinese company was said to have set up a semi-permanent operation with around 30 Chinese staff and employed local informal chainsaw millers (Weng, in preparation). While the Type 5 *modus operandi* is commonly observed in the *bubinga* trade, it may be applicable more to specific specialty species than to the broader timber market. In Mozambique, traders (sometimes unregistered) reportedly buy timber logged by *furtivos* (illegal small-scale loggers). In Zambia, this type has been observed mid-stream of the value chain and involving timber trading companies engaged in the smuggling of round logs to China.

Characterizing the China–Africa timber trade

Despite the diversity observed in our fieldwork on Chinese actors and their business models, our research also highlights some common aspects of the Chinese engagement in Africa's timber sector. This section illustrates the characteristics common to the Chinese market on one hand, and to Chinese actors on the other hand. The distinction between the characteristics of the market versus actors is a necessary one, as the traits of the former seem to impact all timber companies exporting to China regardless of their owners' nationality, while the latter specifically refers to the behaviors of Chinese companies on the ground. We also attempt to describe the sustainability attributes of Chinese investment and trade, albeit based on limited evidence. Finally, because the 'China in Africa' debate suggests a 'uniqueness' of Chinese engagement in comparison to Western engagement, we attempt to shed light on what differentiates Chinese engagement in particular.

The Chinese market

First, across the countries studied, Chinese market demand consistently displayed one important trait: a clear preference for unprocessed timber products, as indicated by previous studies (Canby et al. 2008; Huang and Wilkes 2011; Huang and Sun 2013). Due to the developed timber-processing industry (Huang et al. 2012), sometimes (and counter-intuitively), sawn wood can fetch a lower price than logs in China, leaving little financial incentives for companies in producer countries to engage in further processing (Ekman et al. 2013). Such a strong demand for unprocessed timber, however, is constrained by the forest legislation of the four African countries studied. In Zambia, the government has imposed a quota and incremental tax increase on unprocessed timber products since 1996 (GRZ, 2013). The same law also maintains a ban on the export of raw timber in the form of round logs. In 1999, Cameroon enforced a partial export ban of logs of selected species while

Mozambique implemented a similar ban in 2007. Gabon is the newest to join this list with an export ban of all logs in 2010. In addition to addressing illegal logging and trade issues, the governments adopted these policies among others to encourage the development of the domestic timber processing industry, with the hope of capturing more value from natural resource extraction and trade.

These policies have severely affected the profitability of timber export to China. Indeed, the profit of the five main Chinese companies in Gabon decreased by 60% on average with one of them reporting 90% reduction in its profit since the log export ban of 2010 (Bia Zafinikamia, in preparation). Timber companies (Chinese and non-Chinese alike) have responded to these regulations by concentrating on sawn-wood exports. However, many interpret sawn wood to include the most rudimentary processed timber products, and very few Chinese companies move beyond primary processing. Even when a Chinese company produces plywood products, they are destined for India, North Africa and Europe, and not China (Bia Zafinikamia et al. in preparation). The companies interviewed across the countries cite three reasons for which further processing is not profitable: lack of skilled workers, high transportation cost (because of unreliable and inadequate infrastructure) and limited opportunities to recycle waste (as opposed to the developed Chinese processing industry where most waste can be sold for further manufacturing, *ibid*). When one Chinese company in Mozambique experimented with further processing, it proved too costly. Another Chinese company in Mozambique recently made a large investment to upgrade its facility for further processing; however, the products are not destined for the Chinese market, but to supply the burgeoning Mozambican domestic market for construction materials (Ekman et al. 2013). Similarly, a Chinese company in Zambia also manufactures furniture, doors and school desks for the local market using timber that is left over from exports.

Although many forest-rich African countries have banned the export of unprocessed timber in order to develop the domestic processing industry, the efficacy of these policies is questioned, as illegal exports continue and little economic incentives are provided for further processing, as will be discussed further in the next section.

Characteristics of Chinese actors on the ground

Chinese actors operating within the four African countries exhibit a number of noteworthy—and to some extent unique—characteristics. Below, we explore four topics: (i) competitive and dynamic supply chains, (ii) operations upstream, (iii) active participation of local loggers and (iv) occasional illegal practices.

Competitive and dynamic value chains

First, in the countries studied, Chinese trading companies operate in a competitive dynamic market. Chinese actors interviewed repeatedly described fierce competition among themselves; such

sentiments were especially common among informants from trading companies in Mozambique and Cameroon. This appears to refute the common perception held by other timber companies that the Chinese timber buyers reorganized into a group of cooperating oligarchs fixing prices at a lower level (Mackenzie 2006; Ekman et al. 2013).

In Cameroon, Chinese traders complained that there were too many Chinese competitors. One remarked, “Now too many Chinese know about this. In the past, I could earn a profit of CFA5000 (ca. \$10)/m³, but now, some Chinese take it even at CFA2000 (approx. \$4)!” (Weng, in preparation). When local operators were asked to estimate the number of Chinese buyers in the informal *bubinga* trade, Cameroonian informants repeatedly expressed that there were too many to estimate. In Gabon and Mozambique, the competition among Chinese companies is also evident in the fact that small loggers frequently engaged in side-selling to companies that placed higher bids (*ibid*).

In Zambia, competition was also rife for the most preferred species, Zambian rosewood (*Guibourtia coleosperma*), at both production sites and central timber markets. Competition in production areas was observed most in Kaoma where the number of Chinese concessions increased from one to four during the study period. At the central timber markets in Lusaka, the number of timber trading companies increased from fewer than 10 in 2005 to 70 in 2011. Of the total, 77% were Chinese-owned companies registered in Zambia, 7.7% were Zambian owned and the rest belonged to other nationals (GRZ 2005–2011). The increased number of Chinese timber trading companies increased the demand for the rosewood species, resulting in price increase especially in the timber markets in Lusaka.

Moving upstream

Second, although most Chinese companies in Gabon and Mozambique initially started as trading companies downstream, they moved upstream closer to the extraction stage by acquiring concessions. For example, a Chinese manager in Gabon comments, “We were purely exporters. We became operators and then we acquired factories.” (Bia Zafinikamia et al. in preparation).

The primary reason for moving upstream is to secure stable supplies of timber because local supplies are unreliable according to a number of informants. For example, in Mozambique, a Chinese furniture manufacturer had initially placed orders with small-scale loggers (i.e. simple license holders). However, the supply was unreliable because the small operators would frequently sell the timber to other traders who offered better prices, causing shortages in their manufacturing facility in China (Ekman et al. 2013). Similarly in Zambia, a Chinese trading company became a concessionaire by taking over a Zambian-owned concession in order to secure timber supplies. A Chinese manager in Gabon also confirms the insecurity they face in dealing with suppliers and explains the reason behind moving upstream: “the main objective was, above

all, to obtain forests to secure wood supplies' (Bia Zafinikamia et al. in preparation). Both in Cameroon and Mozambique, a lack of trust between Chinese buyers and local suppliers increasingly led Chinese buyers to abandon forward financing to small operators (Ekman et al. 2013; Weng in preparation). Some informants also cited cost reduction by skipping intermediaries as a motivation behind the move.

In addition to Chinese logging companies moving upstream to acquire concessions, Chinese companies also operate informally at the extraction stage in Cameroon. One Chinese company established a semi-permanent facility in the forests, employing local villagers and 30 Chinese workers as loggers, sawyers and carriers to source woods from nearby forests illegally (Weng in preparation). While difficult to observe, it is also important to note that companies may sometimes use concession licenses to launder illegal timber logged elsewhere, as observed among companies operating in Peru (Putzel 2009).

Active participation of small-scale loggers

Another noticeable characteristic is the high frequency of dealings between Chinese-owned companies and small-scale loggers, as illustrated by Type 2–5 value chains in Box 1. As discussed earlier, Chinese timber demand possibly represents an important source of cash income for families in rural areas (see, e.g. Lescuyer et al. 2013). Indeed, in Zambia, pitsaw-licensed companies prefer to transport and sell their timber, particularly rosewood, at Lusaka's timber market, where they can sell to Chinese companies at favorable prices. Furthermore, our study in Cameroon found that the cash payments made by Chinese buyers to Cameroonian rural loggers of *bubinga* timbers were used to pay for subsistence household activities, providing much-needed cash income to the impoverished communities at least in the short term. Although the active participation of small loggers was widely reported across the four countries, further studies are needed to verify the prevalence of their participation and estimate the actual benefits accrued across rural Africa. It must be taken into account that Chinese business relationships with small-scale and artisanal loggers often come without social safeguards and are often temporary and changeable, with limited impact on long-term development. Nevertheless, because policies to control the Chinese trade and investment may inadvertently affect small loggers, our research urges policy makers to consider the impacts of Chinese engagement on rural livelihoods.

Illegal practices

Our research confirmed the persistence of illegal practices by Chinese actors in some instances—it should be noted, however, that the violations of the law are not necessarily unique to Chinese businesses. Illegal practices such as abuse of permits, bribery, and transport permits and customs declaration with falsification of species identifications and misreported volumes were often observed among local African actors (be it a concessionaire or

small-scale logger), sometimes involving active participation of government officials, and sometimes observed even among European actors as illustrated below.

Abuses of concession licenses were observed in Mozambique, Zambia and Gabon. In Gabon, for example, Chinese companies continued to operate without management plans after their initial provisional licenses had expired. Such practices, however, were relatively common among all concessions given a permissive attitude on the part of government officials (Bia Zafinikamia et al. in preparation). In comparison, in Mozambique, Chinese companies occupied the highest percentage of those operating without management plans. In both instances, because Chinese actors still held licenses issued by the government, they effectively engaged in 'illicit formalization,' where companies do not fully comply with forest legislation yet operate within a semi-legal sphere. They may have the licenses and necessary permits to transport and export timber, yet one or more aspects of their conduct may be illegal. Specific violations include under-reporting of export volume, lack of management plans, and harvesting and transporting undesignated species. Although Chinese companies were the most noticeable in such violations, these practices were also observed among Mozambican—and to a limited extent among European—concessions (Wertz-Kanounnikoff et al. 2013). In Zambia, problems include Chinese companies not implementing management plans, logging before receiving approvals, encroaching on other concessions and customary land, and finally smuggling round log via routes with fewer monitoring facilities bordering Mozambique.

It is important to note the complicity of government officials and the crucial role they play in enabling the above-mentioned illegal activities. First, lenient law enforcement by officials was observed across the studies. In Gabon, the authority had been allowing concessions without sustainable management plans to continue their operations, regardless of the national origin of companies. Second, our research shows strong evidence of bribery of government officials by Chinese companies or local intermediaries in Cameroon, Mozambique and Zambia. In Zambia, poorly remunerated officials reportedly receive bribes at various checkpoints for trucks carrying illegally harvested timber to pass. In Mozambique, local informants report the cost of bribery to lie at \$520 for exporting a container of logs illegally with bribes having to be paid out to at least four government officials (Ekman et al. 2013). Similarly, in Cameroon, local loggers and traders operating in the informal sector report how they bribe officials "from the bottom to the top levels" to arrange for illegal harvests, transports and exports of *bubinga*, which has been subject to a partial export ban applicable to timbers harvested outside concessions since 2012. The pervasiveness of corruption observed in our research is in line with the published literature on resource governance practices in these countries (Cerutti et al. 2013). Finally, perhaps more problematically, there is also evidence of the active participation of government officials in illegal exports. In Cameroon, notably,

local informants report hiring government officials to escort trucks carrying illegal timber; at checkpoints, the hired official goes forward to negotiate for passage (Weng in preparation).

Finally, it is also important to understand the facilitative role of local loggers in these illegal Chinese operations. As explained earlier small-scale loggers are extensively involved in the supply chain of Chinese trading companies in Zambia, Cameroon and Mozambique. In Cameroon, the extent of local involvement is encapsulated in the following words of a government official: "Do you think Chinese can do it alone in the forest? No, Cameroonians help them!" (Weng in preparation). In countries with large informal timber sectors, such as Cameroon, illegal logging for exports to China may be driven by local actors as much as Chinese actors. In Zambia, purchasing of illegal timber from local communities has been cited as one of the challenges frustrating government's efforts to curb unsustainable exploitation of timber tree species (Simusa, 2013). For example, timber that is pooled at central loading bays or markets may have been produced legally (by small scale producers—pit saw license holders) or illegally by rural loggers with no license. Paperwork is easily obtained from these sources to conceal the illegal timber within legal consignments purchased from legal small-scale operators (pit sawyers).

Sustainability of Chinese investment and trade

The environmental implications of Chinese investment and trade vary across the four countries. Specifically, our research addresses three aspects: sustainable management plans, the Chinese market demand for secondary species and illegal practices.

First, assuming that sustainable management plans are an indicator of sustainability, the absence of sustainable management plans in Mozambique and Gabon is likely to lead to negative environmental effects. In Mozambique and Gabon, a large share of Chinese companies operated concessions without approved management plans. In fact, in Mozambique, the Chinese owned more concessions without management plans than any other nationality. On the contrary, in Gabon, although most Chinese companies operated without management plans at the time of research, such practices were also common among non-Chinese concessions. In Zambia, while management is required for license applications, the plans are often not implemented on the ground when the logging starts. This is common for both the Chinese and non-Chinese concessionaires however and it can be attributed to lack of monitoring by the responsible institutions.

Second, and conversely, the preference of the Chinese market for a wider range of species (as observed in Cameroon and Zambia) could result in a more efficient management of concessions over time, though the resulting environmental impacts may be debatable. On one hand, some of Cameroon's industrial concessions currently face the risk of being abandoned once companies exhaust the primary species popular for exports to Europe. However, the Chinese demand for secondary species and its less stringent requirements for the quality of timber may provide markets for

new timber products currently not harvested in concessions. As a result, the Chinese demand may sustain companies' interests in managing concessions, therefore maintaining an important source of revenue for the government (Cerutti et al. 2011). On the other hand, in the case of Zambia, recent Chinese demands for a more densely stocked species (*Brachystegia* spp.) may lead to clear cutting of forests in order to lower production costs. More studies are needed, however, to verify such impacts across the industry in other African countries.

Finally, in regards to illegal logging issues, our research in Cameroon demonstrates the unsustainability of illegal logging: informal chainsaw millers harvest *bubinga* trees without sustainable logging plans to supply Chinese buyers. This informal *bubinga* market poses considerable threats to the remaining *bubinga* stocks, leading the government to impose the partial export ban. Interestingly, however, legal logging likewise is a threat to conservation of *bubinga*. The only stock assessment ever conducted points to the unsustainability of logging by industrial concessions, yet their exports are allowed under special authorization from the Ministry of Forests and Wildlife. Recent trade statistics show that the amount of legal export with special authorizations has not decreased significantly since the sustainability of *bubinga* logging has been called into question (Weng, in preparation). Although there is a clear need to regulate illegal logging, our research also highlights that problematic legal logging may pose threats, therefore requiring equally urgent action.

Policy implications

The complex interplay between diverse Chinese actors and business models, within the political environment of each producing country, necessitates highly nuanced and targeted policy responses. Problems associated with the trade include a lack of appetite for processed timber products in the Chinese market, the continued illegal conduct of actors serving that market and the persistence of unsustainable logging practices. This section evaluates the existing efforts of the African and Chinese governments and offers suggestions for the future based on our findings. In assessing the effectiveness of the current policies and offering recommendations, our research indicates the need to promote sustainable and socially responsible Chinese trade and investment. Therefore, policy making should aim to achieve both environmental and social objectives.

Current policies: The African side

The African governments of the countries examined have attempted a variety of measures to improve the sustainability and value addition of timber exploitation in their forests, through requiring sustainable forest management plans, export bans on unprocessed timber products, and tackling illegal logging through law enforcement and monitoring. Although most were not specifically directed at Chinese investment and trade, their impacts on China–Africa timber trade have been significant as discussed earlier. Below, each policy is assessed.

First, sustainable forest management has seen limited success in the context of China–Africa timber investment as Chinese companies operate without approved sustainability plans (as observed in Gabon, Mozambique). Additionally, even if these companies adopt management plans, they may not guarantee environmentally friendly operations (as observed in Zambia and Mozambique). For example, previous research in Mozambique noted how management plans might be only ‘lip service’ to regulations without playing a central role in business planning (Bossel and Norfolk 2007).

Second, the export bans of unprocessed timber have achieved limited success in developing the domestic timber industries. To comply with the regulation, most Chinese companies only engage in minimum processing—in Mozambique and Zambia, some companies reportedly own sawmills with inexpensive machinery, which they never operate, in order to satisfy the requirement for acquiring a concession (Ekman et al. 2013). Although the Mozambican and Zambian government provides tax incentives, most companies do not apply because of the time-consuming application process (*ibid*). Moreover, in Cameroon and Mozambique, smuggling logs out to China has proven more profitable than legally exporting sawn wood because the Chinese market offers higher prices for logs. Our research in Mozambique, Cameroon and Zambia suggest that, given the inefficiency of domestic processing, current legislation provides strong incentives for local and Chinese companies to engage in illegal export of logs destined for China. For example, in Zambia, the Timber Producers Association of Zambia (TPAZ) described the ban as misplaced as it did very little to sanitize the sector. The associations cited rampant smuggling of sawn timber, logs and other wooden products among the causes of the failures that resulted in a loss of K 80,000,000 (ca. US\$14,300) in uncollected timber revenue during that period (Afrique en ligne 2008).

Finally, the African governments’ efforts to strengthen law enforcement and monitoring have produced limited success. Our research across the countries pointed to the pervasiveness of bribery received by government officials throughout the various stages of timber production: felling, transporting and export. In the case of Cameroon, although law enforcement seemed to have decreased the overall level of illegal logging of *bubinga*, informants also reported increased bribe taking from officials in the face of stricter law enforcement. Additionally, our research identifies poor remuneration received by lower-ranking officials as one factor that encourages corruption. Therefore, stricter law enforcement without addressing this monetary incentive may only produce limited outcomes. In addition, lack of capacity to monitor and enforce remains a challenge in the countries studied. The challenges include a lack of a sufficient number of personnel in rural areas and monitoring equipment and technology such as computers, diameter tapes, calipers for verifying volumes, vehicles to travels, tracking systems at the ports of exit and in transit.

Current policies: The Chinese side

On the Chinese side, Beijing has launched a number of booklets containing guidelines intended to instruct Chinese companies operating overseas. Specifically, the State Forestry Administration has issued multiple guidelines intended to prevent illegal logging and trade and to promote sustainable forestry practices (Ministry of Commerce 2007; State Forestry Administration 2010; China National Forest Products Industry Association 2012; Jiao 2012). Other Chinese initiatives include the Guidelines on Foreign Investment and Cooperation in Various Countries and Regions, issued by the Ministry of Commerce (MOC) in 2009, advising Chinese Companies to protect the environment and comply with local laws in the host nation. China also put forward the Green Credit Policy, which attempts to control financing of environmentally sensitive projects (Huang et al. 2012). Most recently, in 2012, China launched legality verification initiatives. Currently, the China National Forest Products Industry Association is working with eight member companies to implement its pilot legality verification work (ITTO 2013). As Lawson and MacFaul (2010) write, “all relevant Chinese government agencies” are engaged in the issue of China’s role in illegal logging. While these initiatives are indicative of the Chinese government’s willingness to address some of the negative social and environmental externalities associated with Chinese companies and the Chinese market demand, to date there is limited evidence of their effectiveness on the ground (see e.g. Kaplinsky et al. 2011)

Although these government-issued guidelines promote social and environmental awareness in its overseas investments, our research indicates that actual implementation has fallen short of expectations. On the ground, companies have been slow to take up and implement them, as seen from the lack of sustainable planning and the incompliances observed among the Chinese companies interviewed. Another problem attributed to the Chinese market demand (rather than Chinese actors on the ground) is the lack of awareness among companies and consumers in China. As buyers rarely inquire about legality, Chinese companies do not consider legality of timber as a factor that enhances their competitiveness (*ibid*). Finally, the measures are largely mistargeted. While large-scale state-owned firms with investment from Chinese banks may have incentives to comply with Chinese policies on logging and timber trade overseas, small individual actors and companies with no direct ties to Chinese authority may be either ignorant of the guidelines, financially unable to comply and operate profitably, or simply greedy. In any case, enforcement of these guidelines by China is likely only feasible in regards to the few conventional large-scale actors currently in operation, compared to myriad small players.

Moving forward

Given the limited success of existing efforts to achieve sustainable and socially responsible timber trade between China and Africa, our research offers suggestions for both Chinese and African governments as well as the international community. In addition to the specific suggestions outlined below, our research provides

two general policy lessons. First and foremost, policy makers must acknowledge the diversity of Chinese actors and their business models, and the active participation of local African actors. These factors make it difficult for a single authority to regulate effectively. Instead, our research indicates that each business model would require a targeted response from the authorities and at times, even extensive collaboration among them. For example, we consider the scenario in which local informal loggers illegally harvest logs to sell to Chinese buyers. In order to prevent this form of illegal behavior, authorities would have to address each stage of the value chain. Legality verification at the port of departure in Africa and the port of arrival in China may be helpful, but it is even more crucial to deter officials from receiving bribery and potentially integrate local informal actors into the legal domain.

Second, policy makers should acknowledge that simply strengthening law enforcement may not achieve both environmental and social objectives. Although some issues doubtless require strong law enforcement, such as ensuring concessions to adopt and follow sustainable management plans, other instances may benefit from re-examination of existing laws, whether they adequately address environmental and social equity concerns. As discussed earlier, our research clearly displays the disadvantages of enforcing inadequate legislation. The heavy involvement of small loggers across value chains highlights the necessity to take social equity into consideration in policy making. Indeed, scholars have cautioned on how forest legislation in some countries risk being highly 'anti-poor,' therefore simple law enforcement may further marginalize rural communities that rely on forest resources for survival (Colchester et al. 2006).

Recommendations

To the Chinese government:

Given the diversity and complexity of the Chinese investment and trade in Africa's forests, we suggest the Chinese government should:

- Support substantive research by multi-disciplinary Chinese researchers to develop an endemic understanding of China's own socioecological footprint in Africa;
- Encourage further adoption and implementation of the existing guidelines, among both privately run and state-owned businesses by strengthening links between the norms proposed in the guidelines and the actual investment practices of Chinese import-export and development banks and other credit institutions investing in forestry businesses;
- Join relevant networks promoting forest governance and sustainable forest management in Africa, including the Congo Basin Forest Partnership and the Southern African Development Community's nascent timber association;
- Enhance inter-ministerial/organizational communication and collaboration between the State Forestry Administration, Ministry of Commerce and Chinese embassies;
- Improve control measures against illegal imports at Chinese ports by improving collaboration between the Chinese customs agency and the State Forestry Administration, and

prioritize governance of the timber trade in bilateral trade agreements;

- Raise awareness of sustainable timber products among consumers and domestic retailers through education campaigns; and
- Increase the availability of credit to Chinese-owned timber operations that comply with sustainability standards and develop value-added processing facilities in producing countries in Africa.

To African timber-exporting countries:

Given the extensive interaction between Chinese and local actors (both loggers and government officials), there is a large scope for action from the host government side. Specifically, we suggest the African governments should:

- Enter into direct exchanges with relevant Chinese government ministries, including the Ministry of Commerce, national banks, the State Forestry Administration, and the customs agency with the specific purpose of establishing and strengthening controls over the trade in timber and all biological products;
- Strengthen law enforcement and monitor the sustainability practices of all timber concessions, including Chinese-owned concessions;
- Address corruption among officials and deter their complicity in illegal dealings, especially at higher political levels;
- Address social equity concerns in informal/illegal logging through more inclusive policy making;
- Assess the pros and cons of decentralizing the logging and timber transport license approval systems in order to minimize the cost of application for rural operators and to empower districts and provinces to take more responsibility over their local resources;
- Conduct ecological studies and inventories of the forest resource base in order to better understand the stocks and regeneration potential of specific timber species and establish sustainable harvest levels prior to granting of concessions;
- Improve monitoring of exports and review the species currently being exported in order to limit unsustainable logging of over-exploited and ecologically important tree species; and
- Develop more efficient domestic processing and manufacturing sectors by investing in processing and transport infrastructures and by training skilled workers.

To the international community:

In addition to the initiatives taken by Chinese and African authorities, we suggest the international policy circle and civil society should:

- Recognize the multiplicity of Chinese actors and the limited direct control exerted by the Chinese government over private businesses operating internationally as a basis for engagement with decision makers on both sides;

- Work toward engaging directly with Chinese actors on the ground by bringing them into networks engaged in improving management of the sector;
- Include diverse African and Chinese stakeholders in bilateral, multilateral and civil society-led sectoral development and policy platforms;
- Prioritize social equity issues when working with African governments and designing legality verification legislation, including (but not limited to) the EU's FLEGT Action Plan and associated instruments.

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