

Tropical Hardwood Flows in China: Case Studies of Rosewood and Okoumé

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List of Acronyms

ASEAN	Association of Southeast Asian Nations
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EU	European Union
EUTR	European Union Timber Regulation
EU ETS	European Union Emissions Trading Scheme
FLEGT	Forest Law Enforcement, Governance and Trade Action Plan
ha	Hectares
ITTO	International Tropical Timber Organization
m ³	Cubic meter
NDRC	National Development and Reform Commission, P.R. China
PE	Private Enterprise
PNG	Papua New Guinea
SAQSIQ	State Administration for Quality Supervision and Inspection and Quarantine, P.R. China
SOE	State-Owned Enterprise
UNCOMTRADE	United Nations Commodity Trade Statistics Database
US	United States of America
VAT	Value Added Tax

1. Introduction

China now plays a dominant role in the global forest products market. Booming domestic consumption together with limited per capita forest resources and restrictions on domestic harvesting have fuelled rapid growth in China's imports of forest products. Demand in the United States (US), European Union (EU) and other markets for wood products manufactured in China has also contributed to China's increasing demand for timber imports.

Despite efforts to increase China's domestic timber supply, mainly through forest plantations, China's wood industry depends on imports for almost 50% of its timber supply. Sourcing of materials for this large and growing market is crucial to the long term sustainability of the industry in China and of forest resources and wood industries around the globe.

China is now the world's largest consumer of tropical timber (ITTO 2011) and is expected to maintain this role in the future. Following the 2008 financial crisis, US and EU demand for wood products from China grew much slower than Chinese domestic demand, which maintained strong growth largely due to a stimulus package that invested heavily in infrastructure and housing (ITTO 2012). As a consequence, many producers shifted from export markets to meeting domestic demand. With projections of strong demand during the current Twelfth Five Year Plan period in China, domestic demand in China is expected to continue to grow in the coming years.

The rising importance of Chinese domestic demand occurs at a time when markets in the US and EU are making increasingly stringent requirements for assurance about the legality or sustainability of imported timber. This has been driven by a range of different initiatives to verify the legality of timber sources, growing consumer awareness in these markets and global pressure to mitigate climate change impacts by combating illegal logging and associated trade. These initiatives include the amendment to the Lacey Act in the US, the EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan and the EU Timber Regulation (EUTR), the Australian Illegal Logging Prohibition Bill, and a range of public and private sector responsible purchasing policies. However, there is no timber legality requirement for wood products consumed in China. For some Chinese businesses, stringent international requirements mean that it is easier to sell their products domestically than to export to the US or EU.

China's imports of timber products from tropical countries are mainly in the form of logs (Figure 1). China accounted for more than half of the world's total tropical log imports from 2001 to 2012. Together with India (the second largest importer of logs), the two economies account for over 80% of global tropical log imports.¹ About one-third of China's 38 million cubic meters (m³) of log imports in 2012 were tropical hardwood logs.² In terms of supplying countries, in 2011 Papua New Guinea (PNG) and the Solomon Islands were the two largest suppliers of China's tropical log imports, together accounting for nearly two-thirds of China's total imports in that year.³

Previous research has largely focused on the impacts of China's imports in Africa and Southeast Asia. However, the drivers of particular trade and consumption patterns and the actors involved in this trade on the Chinese side have rarely been investigated. A better understanding of the actors and their operating environment within China itself can contribute to a better understanding of opportunities to promote legal and sustainable timber trade.

Through two commodity chain case studies, this report describes and analyzes the complex tropical log product flows inside China. Two categories of tropical wood were selected: okoumé (*Aucoumea klaineana*), which mainly derives from Africa, and rosewood (or padauk as it is recorded in Chinese customs data), which derives from Africa, Southeast Asia and Latin America. In the last 10 years, these two categories have accounted for an important share of China's tropical log imports. From late 2012 to mid-2013, key informant interviews with market actors and other stakeholders were conducted in Guangdong, Shanghai, Fujian, Yunnan, Guangxi, Shandong and Beijing. The market

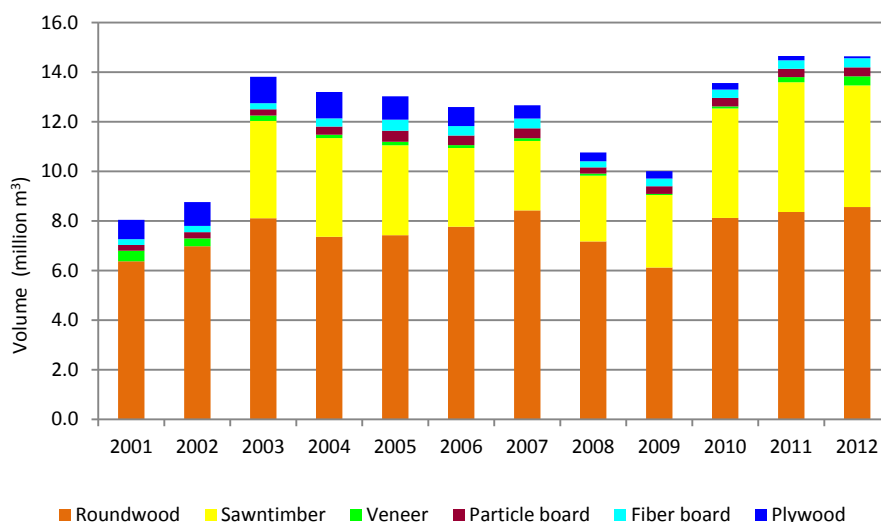
¹ UNCOMTRADE data, last accessed in May, 2012

² China customs data.

³ China customs data.

actors and stakeholders interviewed included importers, wholesalers, retailers, wood processors, industrial experts and government representatives. Unless otherwise stated, information in this report derives from interviews with these stakeholders or from the authors' observations in the markets.

Figure 1: China's Imports of Major Timber Products from Tropical Countries



Source: UNCOMTRADE, compiled by authors

2. Rosewood

2.1 The Chinese Market for Rosewood

Rosewood (hong mu, 红木) is an informal term referring to a group of hardwood species that are red in color and widely used in furniture processing in China. Rosewood has been used in furniture manufacturing since at least the tenth century, but its extensive use by emperors' families during the late Ming and early Qing dynasties have endowed these woods with special cultural implications for Chinese people (Xu & Li 2003). Rosewood is divided into two groups: huali (花梨) and zitan (紫檀). Huali is typically represented by *Dalbergia odorifera* and zitan by *Pterocarpus santalinus*, but some other similar species are also used in their place. Moreover, with increased international trade, new species have begun to be used by the rosewood product manufacturers in China.

Given the use of materials of differing value and quality within the industry, a national standard (SAQSIQ 2000) was issued in 2000 to identify the legally mandated scope of the rosewood category. The standard identified 33 rosewood species belonging to 2 families and 5 genera (Table 1). This standard can be legally enforced in relation to product marketing claims, and has played a key role in guiding the choice of materials in rosewood product manufacturing and consumption. Despite the clear listing of species in the national standard, some rosewood manufacturers make use of other hardwood species with similar texture and appearance to listed species (e.g. *Millettia stuhlmannii*, *P. angolensis*).

The species identified in the standard are mainly distributed in tropical areas of Africa (five species), Latin America (seven species) and Asia (21 species). Of these 33 species, six are listed in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): *D. caerensis* (CITES Appendix I), *P. santalinus* and *D. cochinchinensis* (CITES Appendix II), *D. retusa*, *D. stevensonii* and *D. louvelii* (CITES Appendix III), all of which are popular species in the Chinese market. Three rosewood species are endemic in mainland China: *D. odorifera*, *D. fusca* and *Cassia siamea*. Natural forest containing *D. odorifera* is virtually non-existent in China now, and although *D. fusca*

and *Cassia siamea* can be found in southwest China, it is rare to find trees of suitable quality for industrial use. Given the economic value of rosewood, eight species have been introduced in southern tropical and subtropical areas of Yunnan, Guangxi and Guangdong (Xu 2011). Widely planted species include *P. indices*, *P. macarocarpus*, *P. Santalinus* and *P. Marsupium*. Currently, the largest rosewood plantation is in Zhaoqing city, Guangdong province, which covers a total area of more than 20,000 ha. Nevertheless, owing to the long rotation of rosewood species, domestic supply remains far below demand, and the industry is heavily dependent on imported material. Most actors in the rosewood industry are aware of the limited availability of high value rosewood resources and some have called for a broadening of the range of species listed in the national standard.

Table 1: Rosewood Species Defined in the Chinese Rosewood National Standard for Legal Marketing Purposes

Family	Genus	Scientific Name	Main Source Areas
Leguminosae	Pterocarpus spp.	<i>Pterocarpus santalinus</i>	India
		<i>P. cambodianus</i>	Indo-China peninsula
		<i>P. dalbergioides</i>	Andaman Islands
		<i>P. erinaceus</i>	Africa
		<i>P. indicus</i>	India, Southeast Asia, China (Taiwan)
		<i>P. macarocarpus</i>	Indo-China peninsula
		<i>P. marsupium</i>	India, Sri Lanka
		<i>P. pedatus</i>	Indo-China peninsula
	Dalbergia spp.	<i>Dalbergia odorifera</i>	China
		<i>D. cultrate</i>	Myanmar, India
		<i>D. fusca</i>	China, Myanmar, India, Vietnam
		<i>D. latifolia</i>	India, Indonesia
		<i>D. melanoxyton</i>	East Africa
		<i>D. nigra</i>	Brazil
		<i>D. spruceana</i>	Amazonia
		<i>D. stevensonii</i>	Belize
		<i>D. louvelii</i>	Madagascar
		<i>D. cearensis</i>	Brazil
		<i>D. bariensis</i>	Asia
		<i>D. cochinchinensis</i>	Indo-China peninsula
		<i>D. frutescens</i> var. <i>tomentosa</i>	Brazil
		<i>D. granadillo</i>	South America and Mexico
		<i>D. oliveri</i>	Indo-China peninsula
		<i>D. retusa</i>	Central and South America
	Millettia spp. & Cassia spp.	<i>Millettia laurentii</i>	Congo basin
		<i>M. leucantha</i>	Myanmar, Thailand
		<i>Cassia siamea</i>	South and Southeast Asia, China
Ebenaceae	Diospyros spp.	<i>Diospyros ebenum</i>	Sri Lanka, India
		<i>D. crassiflora</i>	West Africa
		<i>D. poncei</i>	Philippines
		<i>D. celebica</i>	Indonesia
		<i>D. philippensis</i>	Philippines, Sri Lanka, China (Taiwan)
		<i>D. pilosanthera</i>	Philippines

Source: SAQSIQ (2000)

Industry experts' judgment and observations in marketplaces throughout the country suggest that around 16 species are relatively common in the market. Among Chinese traders, these common species are classified as either 'collectable,' implying high value, or 'ordinary,' which can further be subdivided on the basis of the value of each species (Table 2). Cultural preferences play a strong role in determining the market prices of rosewood species. Among 'collectable' rosewoods, *D. odorifera* and *D. tonkinensis* praion fetch very high market prices⁴ (ca. US\$ 2 million per m³). The former is considered a traditional species and is highly preferred in China, while the latter, originating in Vietnam and not listed in the Chinese national standard, is often confused with *D. odorifera* and thus also commands a high price. *P. santalinus* also has a long history of use in China, and due to restrictive export policies in India supply is limited, so it has a high market price in China of around US\$ 150,000 per m³.

Among 'ordinary' rosewoods, high-end species such as *D. louvelii*, *D. cochinchinensis* and *D. retusa* are very popular for rosewood furniture, fetching prices of around US\$ 40,000, US\$ 20,000 and US\$ 10,000 per m³, respectively. Mid-market species are mainly from Southeast Asia and prices are around US\$ 2,000 to 3,000 per m³. Rarity is not the driving force of price determination. Low-end species are mainly from Africa and average prices are below US\$ 1,500 per m³ (Table 2). Since cultural preferences strongly influence market prices, even some relatively rare species (e.g. *P. macarocarpus*) are classified as mid-end ordinary species.

Table 2: Market Classifications of Common Rosewood Species and their Origins

Market Classification by Value		Scientific Name	Main Origin
Collectable class	Class I	<i>D. odorifera</i>	Hainan province, China
		<i>D. tonkinensis</i> praion	Vietnam
	Class II	<i>P. santalinus</i>	India
Ordinary class	High-end class	<i>D. louvelii</i>	Madagascar
		<i>D. cochinchinensis</i>	Mekong Region
		<i>D. retusa</i>	South America
	Mid-end class	<i>P. cambodianus</i>	Mekong Region
		<i>D. cearensis</i>	Mekong Region
		<i>D. oliveri</i>	Mekong Region
		<i>P. macarocarpus</i>	Mekong Region
		<i>P. pedatus</i>	Mekong Region
		<i>D. stevensonii</i>	South America
	Low-end class	<i>M. laurentii</i>	Africa
		<i>M. leucantha</i>	Mekong Region
		<i>D. melanoxyton</i>	Africa
		<i>P. erinaceus</i>	Africa

Source: Author's observations in various rosewood markets.

The Chinese rosewood market has undergone dramatic change in the past decade. After moderate and steady price increases from 2000 to 2005, the price of high-end rosewood has risen significantly since 2006, stimulated by growing demand and market speculation. For example, before 2005, *D. odorifera* was available on the ordinary market at a price below US\$ 15,000 per m³. The price rose to over US\$ 100,000 in 2006, US\$ 500,000 in 2007 and is now around US\$ 1.5 million per m³ (annual increases of more than 500% per year. The percent increase between 2005 and 2012

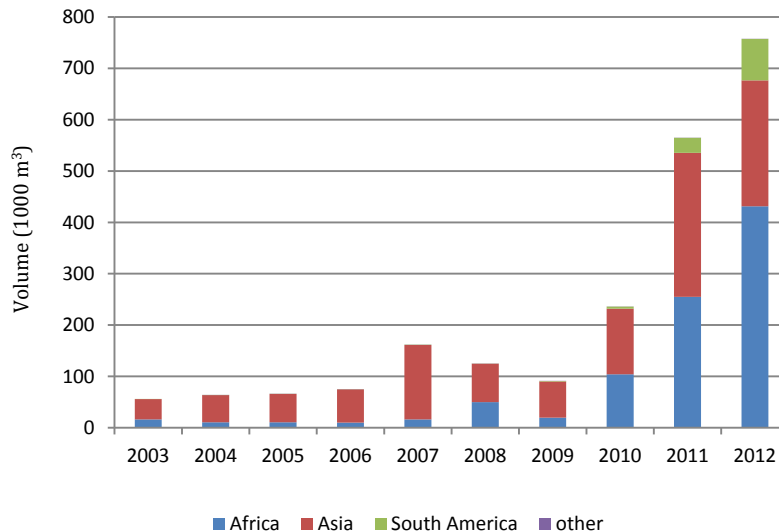
⁴ The basic unit of rosewood market trade is the metric ton, which in this report is converted into cubic meters.

was more than 10,000%) The current (2012) price of *D. cochinchinensis*, US\$ 15,000, is 15 times higher than its price in 2005. By contrast, mid- and low-end ordinary class prices have remained steady in the last few years. Since value largely reflects traditional cultural preferences, one can expect the price of traditional, high-end species to continue to increase.

2.2 China's Rosewood Imports

In 2012, China imported 757,600 m³ of rosewood, accounting for less than 10% of total Chinese tropical log imports, though this figure does not include some species not listed in the national standard. From 2003 to 2006, rosewood imports rose only gradually (Figure 2). Following a sharp rise in imports in 2007, imports declined, most likely affected by the 2008 financial crisis. Import volumes recovered by 2010, after which volumes have continued to increase rapidly, averaging 180% growth per year. This can be attributed to China's economic stimulus package, which was particularly favorable for the real estate sector, and thus drove consumption of wooden furniture and decorative material for the large number of newly completed apartments. The booming rosewood market in recent years has attracted a large number of new entrants to the business, which further boosted the demand for material and gave rise to a speculative demand as well.

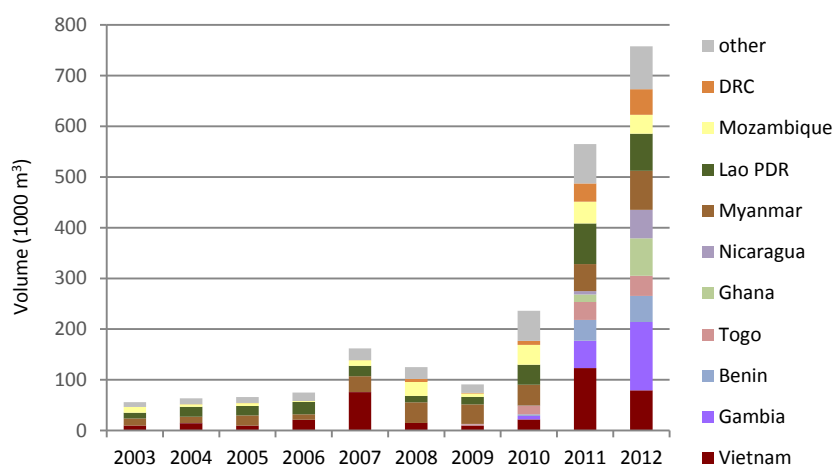
Figure 2: China's Rosewood Log Imports by Region of Supply



Source: China Customs, compiled by the authors.

Southeast Asia supplied much of the material to meet this rapid growth in Chinese demand. Chinese market actors believe that Southeast Asian countries increased their exports to cope with the effects of the financial crisis, and even loosened some restrictive timber export policies. However, much of the rapid growth in Chinese imports was supplied by a number of African countries (e.g. Gambia, Benin, Togo and Ghana) (Figure 3). By 2012, Africa supplied 60% of China's rosewood imports. This is mainly because African rosewood provides a cheap and relatively abundant source of raw material compared to the high prices and limited resources of traditional species in Southeast Asia. Market actors also note that the rapid growth in demand from 2010 onwards coincided with a period of active exploration of African timber resources by Chinese firms. China's sources of rosewood imports are now diverse, with no single country dominating supply (Figure 3).

Figure 3: China's Rosewood Log Imports by Country of Origin



Source: China Customs, compiled by the authors.

2.3 Rosewood Log Product Flows in China

2.3.1 Import Routes

Currently, there are two main modes of rosewood import to China: regular trade and 'express import.' Regular trade consists of both ocean-going trade and direct cross-border trade with neighboring countries. 'Express import' is a mode of import primarily used for high value rosewood species that have emerged in the last few years.

In the early 2000s, China exempted logs and sawn timber from import tariffs, but wood products were still subject to an import value added tax (VAT) (13% for logs, 17% for sawn timber) levied on the estimated value of each shipment. Until 2008, under a preferential policy, 50% of VAT was exempted for wood products imported through direct cross-border trades. This benefited the import of high value rosewoods from Southeast Asian countries and gave rise to a booming rosewood trade at the borders between China and major neighboring supplying countries, such as Myanmar, Vietnam and Laos. Other countries that do not share a border with China (e.g. Cambodia) also transported their timber to China through these countries. However, this preferential policy was abolished in 2008. This gave rise to cost pressures for importers and their customers and resulted in a decrease in direct cross-border imports of high value rosewood.

Many importers of high value species shifted to other trade routes. One alternative to direct border trade has been to import rosewood through Hong Kong. Hong Kong does not levy import taxes and offers comparatively simple customs procedures, and there are reportedly many ways for traders to avoid paying import taxes and undergoing customs inspections on entry to Shenzhen. Therefore, after 2008, many traders in high value rosewood species began to import rosewood through Hong Kong and Shenzhen, in what is known as the 'express' trade. With less incentive for traders to take on the risks of smuggling, mid- and low-end rosewood species continue to be traded through regular ocean-going trade routes.

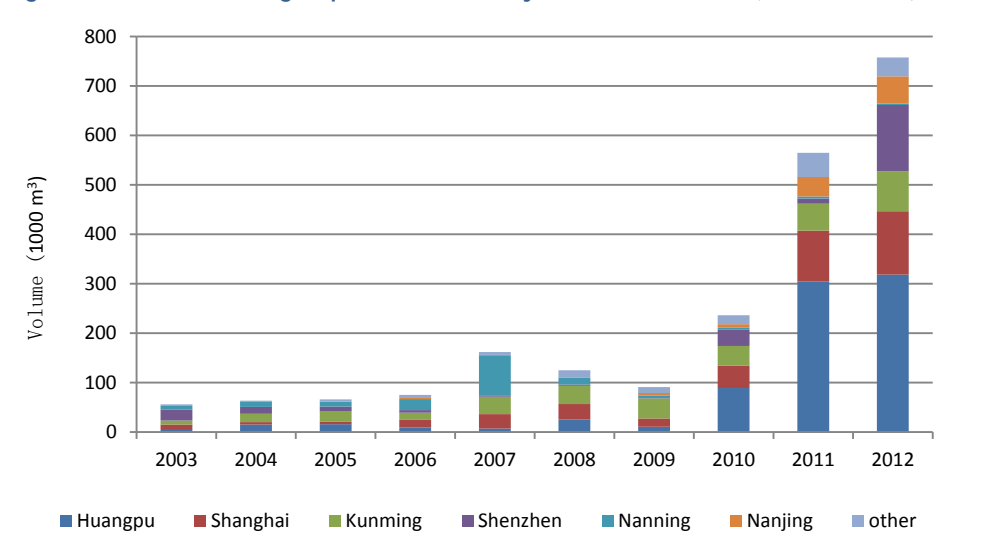
Many rosewood traders use import agents who assist in the customs clearance process. The agent system derives from the early period of international trade reform in the 1980s (Deng 2011), when only state-owned enterprises were licensed to engage in foreign trade. Collective or private enterprises had to rely on licensed importers to engage in trade. Although restrictions on private firms engaging in trade have been progressively loosened over time, there is still strong demand for the services of agents. On the one hand, this is because of the convenience in completing customs procedures that the agents provide. On the other hand, the use of larger companies as agents also enables smaller firms to reduce their financial risk and improve cash flow, because the smaller firms working through agents

do not have to pay for the timber several months in advance but can pay upon receiving the shipment. However, owing to their good social networks with customs offices and other agencies, the agent system may also increase risk of illegal import activities.

Figure 4: Rosewood Log and Product Flows in China



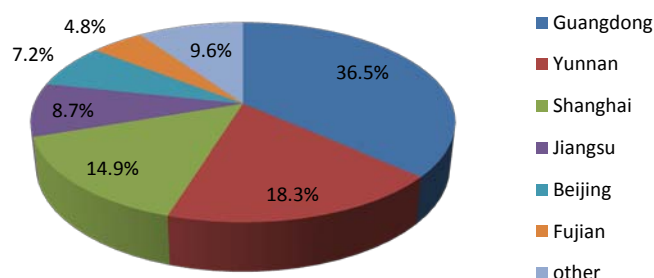
Figure 5: Rosewood Log Imports to China by Customs District (2003 to 2012)



Source: China Customs, compiled by the authors.

Figure 4 shows the location of the major ports through which rosewood imports are recorded.⁵ Imports through Huangpu, Shanghai, Kunming, Shenzhen, Nanning and Nanjing have accounted for over 90% of recorded rosewood imports in the last 10 years (Figure 5). These ports are the gateways to three regions: South China (Huangpu, Shenzhen), East China (Shanghai, Nanjing) and Southwest China (Kunming, Nanning). More than 60% of rosewood log imports are through South China customs.

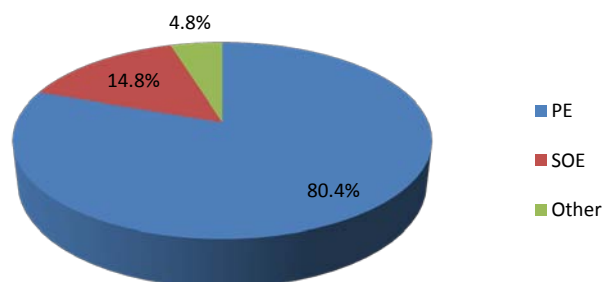
Figure 6: Rosewood Logs Importers by Area of Registration in China (2012)



Source: China Customs, compiled by the authors

China customs data on specific importing companies also reflects this general geographic distribution of rosewood trade within China. In 2012, there were 208 importers of volumes exceeding 100 m³. The largest firm imported 57,000 m³, but 90% of the firms imported less than 1000 m³. Over one-third of importing firms are registered in Guangdong province, and the rest are based in Yunnan province, Shanghai city, Jiangsu province, Beijing city and Fujian province (Figure 6). More than 80% of importing firms are private companies, which mainly reflects the involvement of large numbers of small business in rosewood log trade (Figure 7).

Figure 7: Rosewood Logs Importers by Ownership (2012)



(PE indicates private enterprise, SOE indicates state-owned enterprise)

Source: China Customs, compiled by the authors.

South China: Huangpu and Shatian harbours serve the cities of Guangzhou and Dongguan in Guangdong province. Trade is managed by Huangpu customs district. Guangdong province is the biggest wooden furniture industry cluster in China, with strong timber processing capacities in Zhongshan, Shenzhen and Xinhui. Market actors estimate that over 50% of rosewood entering these ports will be transported to factories in the area for processing. In addition, Guangdong has one of three national timber markets in China and is a regional distribution center. Prior to 2010, Huangpu customs reported a relatively low share of total Chinese rosewood imports, averaging around 15% between

⁵ It is probable that a significant 'express trade' in high value rosewoods is not reflected in the data presented in Figure 4.

2003 and 2009.⁶ Since 2010, Huangpu has recorded much of the increased trade in African rosewood, and by 2012 two-thirds of all rosewood imports were through Huangpu customs district. In 2012, more than 70% of imports in the two South China customs zones were from Africa. Most imports were low-end species (e.g. *P. erinaceus* and *M. Laurentii*). The growth of trade in low-price African rosewood has increased Guangdong's role as a regional distribution center.

The nearby city of Shenzhen has a land corridor with Hong Kong, and Shenzhen has played a major role in the 'express import' business. Luohu, Shekou and Yantian harbors are the major entry points for rosewood logs in Shenzhen customs district. Since 2010, recorded rosewood trade in Shenzhen has increased rapidly, exceeding 100,000 m³ in 2012, or 17.7% of total imports in that year.⁷ Rosewood timber entering Shenzhen comes from Southeast Asia, Latin America and Africa, and tends to be high-end ordinary class species (e.g. *P. santalinus*, *D. cochinchinensis*, *D. retusa*, *P. macarocarpus*) or 'collectable' class species. Around 30% of imported rosewood timber is directly delivered to customers who pre-placed an order, and the rest is transported to several timber markets in Guanlan district in Shenzhen city.

East China: Shanghai city is one of China's main economic centers, and Shanghai Harbor has been an important entry point for rosewood in the past decade, accounting for around one fifth of annual log imports.⁸ Import volumes have increased in recent years, reaching 128,000 m³ in 2012.⁹ Before the emergence of Shenzhen and Huangpu, Shanghai was the major rosewood import and distribution center. Now, Shanghai mainly supplies manufactures in the nearby Yangtze River Delta and in North China, where traditional rosewood processing centers are located. In 2012, Shanghai mainly imported mid and low-end ordinary class species from Southeast Asia and Africa.¹⁰

The nearby Nanjing customs district reflects imports at Zhangjiagang and Jingjiang Ports in Jiangsu province. Together, these ports form one of the biggest timber importing hubs in East China. Several hundred traders, including wholesalers, brokers and manufacturers, operate from these ports, and rosewood trade is a major part of their business. African timber accounts for over 90% of the imported rosewood in this customs district, and most species are mid- and low-end ordinary class species (e.g. *P. erinaceus*, *M. laurentii*). These ports mainly supply the industry clusters in the Yangtze River Delta, though some is also transported to North and South China.

Southwest China: Kunming Customs district, in Yunnan province, monitors trade on more than 4,000 kilometers of border with neighboring Southeast Asian countries. Given its proximity to major traditional rosewood producing countries, such as Myanmar and Laos, Yunnan province has a long history of rosewood trade. In 2012, rosewood was one-fifth of Yunnan's total wood product inputs, and more than 80% of rosewood in Kunming customs district was imported from Myanmar,¹¹ consisting mainly of high and mid-end species, such as *D. cochinchinensis*, *D. oliveri* and *M. leucantha*. Specific trade locations along Yunnan's borders have shifted as rosewood resource availability has changed. Following exhaustion of forest resources in areas of Myanmar near Tengchong, trade moved to Ruili city. Mohan is a main point of entry for rosewood from Laos. Several other ports also play a role in rosewood cross-border trade (e.g. Simao, Xishuangbanna, Menglian, Yingjiang). Market participants estimate that nearly 70% of imported rosewood is transported to the industrial clusters in South and East China (Figure 4). However, recently, rosewood processing has also begun in Ruili city, mainly because of the lower labor costs compared to eastern China.

In addition to regular cross-border trade, some illegal import occurs.¹² Although China signed a bilateral agreement with the Myanmar government in 2006 and strengthened efforts to combat illegal timber trade (Wood and Canby

⁶ China Customs data, last accessed in December, 2012

⁷ China Customs data, last accessed in December, 2012

⁸ China Customs data, last accessed in December, 2012

⁹ China Customs data, last accessed in December, 2012

¹⁰ China Customs data, last accessed in December, 2012

¹¹ China Customs data, last accessed in December, 2012

¹² Author's interviews with various key informants.

2011), informal trade is still extensive, facilitated by the long border between the two countries and the unstable political situation in Myanmar.

Nanning Customs district monitors and records trading activities in Guangxi province, which borders Vietnam and Laos. Pingxiang and Dongxing are the major land ports for rosewood material in this region. Imports of rosewood in Guangxi began in 2007, after restrictions were imposed on wood product imports to Yunnan from Myanmar, and Yunnan province imposed a levy of 155% for a silvicultural fund in the province. However, trade was adversely affected by suspension of the border crossing VAT exemption policy in 2008, and rosewood trading activities shifted to nearby Guangdong province and the 'express trade' route. Vietnam also began to encourage local processing, so trade in rosewood logs in Guangxi fell, and Nanning Customs district now records only a small volume of trade, recording 8000 m³ in 2012.¹³

However, trade in semi-finished rosewood furniture has begun to grow, as some Chinese firms have outsourced production to Vietnam to take advantage of low labor costs. Currently, there are hundreds of Chinese and Vietnamese firms engaged in this trade across the borders at Pingxiang and Dongxing. Because of strict logging restrictions in Vietnam, the material of the imported semi-final furniture usually comes from Laos, Cambodia, and Myanmar, and includes mainly ordinary high and mid-end species (e.g., *D. cochinchinensis*, *P. macarocarpus*, *P. marsupium*, *P. pedatus*).

2.3.2 Distribution Hubs

There are four major regional centers for rosewood distribution in China: Shanghai Furen International Timber Market in East China, Guangdong Yuzhu International Timber Market and Shenzhen Guanlan Timber Market in South China, and Beijing Dongba Precious Wood Market in North China. Each market is located close to a manufacturing center.

Figure 8: Burmese Rosewood in Shanghai Furen Timber Market



¹³ China Customs data, last accessed in December, 2012

Shanghai Furen Timber Market was established in 1999, when China started to implement the Natural Forest Protection Programme, which restricted supply of domestic forest products and stimulated imports of logs. It has now grown to be one of China's largest markets transacting valuable wood materials. The market now transacts around 200,000 m³ of rosewood per year, accounting for about 20% of total market transactions. Furen Timber Market mainly sells timber entering through Shanghai, Zhangjiagang and Jingjiang ports, though some rosewood imported through Guangdong can also be found. Many traders in the market are directly involved in importing through these ports. Most rosewood in this market is mid- or low-end ordinary class, and is supplied to processors in the Yangtze River Delta, though some is also shipped to manufacturers in the Beijing area because there are no direct ports of entry used by rosewood importers in North China.

Guanlan district in Shenzhen city has several timber markets, and with the growth of express trade and the shift away from imports through Guangxi, Guanlan has become the largest center for wholesale and retail rosewood in China. Annual sales in Guanlan district can reach 500,000 m³, with a value of billions of US dollars. The major markets in Guanlan are Dadicheng, Hongshunxing, Tianmuxing and Yangguang, which are privately owned. The largest of these is Dadicheng, which was established in 2006 and has around 300 traders. The markets in Guanlan also serve as timber storage and transit centers for the 'express' route from Hong Kong. While most rosewood is stored and sold in these markets, some is re-shipped to pre-ordering customers. Guanlan mainly supplies to industries in the Pearl River Delta and nearby Fujian Province (ca. 60% of sales), with the remainder supplied to other manufacturing clusters around China. Most of the rosewood traded in Guanlan is collectable class or high-end ordinary species, the majority of which is imported through Shenzhen.

Figure 9: Rosewood in the Timber Markets of Guanlan District



Guangdong Yuzhu International Timber Market is located in Guangzhou city, close to Huangpu Harbor, which supplies more than 50% of the market's goods. Timber from Shenzhen, Shanghai, Zhangjiagang port and Yunnan is also traded here. This market is a state-owned enterprise and opened in 2001. Rosewood trade accounts for 10% to 20% of total transactions in the market, with an annual turnover of more than 200,000 m³. The species traded largely reflect imports through Huangpu harbor, i.e., mid- and low-end ordinary class species. Most firms trading at the

market import rosewood in small annual quantities of several hundred cubic meters. Yuzhu market mainly supplies nearby furniture manufacturers in the Pearl River Delta, Guangdong province.

Figure 10: Burmese Rosewood in Guangdong Yuzhu International Timber Market



Beijing Dongbai Precious Timber Market, located in the east of Beijing, was opened in 2005. It is the largest timber market in North China and the only rosewood trading center in this region, with over 40 booths dedicated to this trade. Since the rosewood manufacturing industry in North China is not large, the annual trade in around 50,000 m³ of rosewood is only a small proportion of total trade in this market. Timber in Dongbai market is mainly from Shanghai, Guangdong and Yunnan, and around 70% is supplied to factories in Beijing and Dacheng County, Hebei province. The remainder is supplied to factories in Northeast China and Shandong province. Species in this market are mainly 'collectable' class and high- and mid-end ordinary class species.

2.3.3 Processing Hubs

It is estimated that more than 90% of rosewood material in China is used to produce wooden furniture and the remainder is used for making handicrafts (e.g. wooden carvings, bracelets, necklaces). Traditionally, there have been three major manufacturing centers in China, each with its own traditional style: Guang (Guangdong) style, Su (Jiangsu) style and Jing (Beijing) Style. Each regional style is characterized by distinct rosewood furniture designs (Lu, Wen and Zhu 2010). Until recently, western furniture designs were preferred, and for some time traditional furniture styles were only a very small share in the market. However, along with the rise in consumer spending in recent decades, interest in traditional cultural objects has increased, and rosewood furniture manufacturing has experienced rapid growth.

The current major manufacturing centers have strong connections to the traditional manufacturing centers of rosewood furniture manufacture: the Pearl River Delta, Yangtze River Delta and near Beijing (see Figure 4). There are now more than 10,000 rosewood furniture manufacturers, employing more than 1 million people, with an annual sales value in 2011 of around US\$ 7 billion (Wang, Chen and Xin 2012). The Pearl River Delta is the largest rosewood manufacturing cluster, focused in Dachong and Shaxi counties. The Yangtze River Delta cluster is smaller and mostly

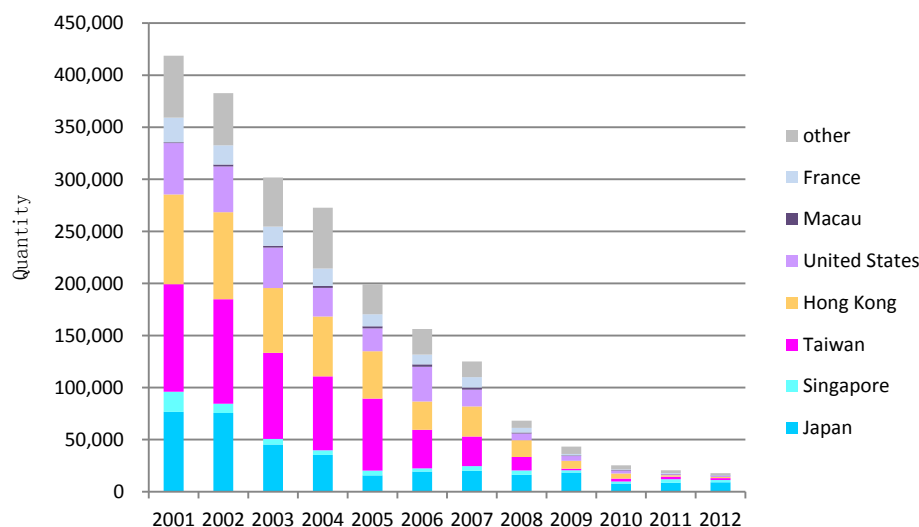
based on traditional, small-scale family-owned workshop production. Beijing is the smallest cluster, but draws on the cultural associations with imperial culture and aspires to high value products.

In addition to these traditional manufacturing areas, in recent years some new clusters have emerged in Fujian and Southwest China. Some market actors estimate that companies from Fujian account for more than 50% of total timber trade in China, and rosewood manufacturing in Fujian has grown rapidly. Xianyou County in Fujian plays a significant role in manufacture of high-end rosewood products. There is also an emerging trend in the rosewood industry to shift the location of processing operations from the east to the less developed western parts of China and to Vietnam, where labor costs are lower. Several factories have established branches or outsourced processing to locations near the major ports of entry in Yunnan and Guangxi.

2.3.4 Final Markets

Customs data confirm that the vast majority of rosewood products are supplied to the domestic market in China. Over the last decade, exports of rosewood furniture have decreased significantly, such that export volumes in 2012 were only 4% of the export volume in 2001. In 2012, China exported 17,800 pieces of rosewood furniture, which represents around 1000 m³ of material, or 0.01% of total imported logs if converted into roundwood equivalent units. Most of the exports were to Asian countries and regions where rosewood also has strong cultural associations, i.e., Japan and the ethnically Chinese regions of Singapore, Taiwan, Hong Kong and Macao (Figure 11). Given slow economic growth internationally since 2008, most manufacturers have turned their attention to the domestic market.

Figure 11: Export Destinations for Chinese Rosewood Furniture



Source: China Customs, compiled by the authors.

2.4 Government Agencies and Regulations

There are seven government agencies involved in the rosewood industry. Importation relates to the Entry & Exit Inspection and Quarantine Agency (under SAQSIQ), which processes import applications, checks whether commodities are in accord with the submitted documents, and issues certificate of origin, commodity inspection certificates and quarantine certificates. The Endangered Species Import & Export Management Office is responsible for monitoring imports of endangered species. For species listed in CITES, Endangered Species Import Permission Certificates may be issued, while for non-CITES species, Non Endangered Species Import Permission Certificates are issued. China Customs inspects contracts, invoices, the bill of landing, packing lists, certificates of origin, commodity inspection certificates, quarantine certificates, and endangered species import permission certificates, checks whether the commodities are in accordance with submitted documents, and levies the value added tax. Agencies

under the Ministry of Transport relate to transportation of materials within China, enforcing national regulations on transportation, such as restrictions on the maximum load carried by trucks.

In the manufacturing and processing stages, local bureaus of the Quality and Technology Supervision agency (also under SAQSIQ) are responsible for identifying the species and issuing related certification. They regularly inspect the operations of rosewood manufacturers to ensure that product quality standards are followed. The Industry and Commerce Bureau manages company registration for rosewood manufacturers and retailers, inspects their business operations and also plays a role in protecting consumers' rights. The Taxation Bureau is responsible for levying taxes on domestic business operations.

In addition to the general regulation of business activities, government agencies are responsible for enforcing regulations and policies specific to the rosewood industry. There are five national standards relating to rosewood. The National Rosewood Standard (SAQSIQ 2000), referred to above, was issued by the State Administration for Quality Supervision and Inspection and Quarantine (SAQSIQ) in order to regulate the standard and quality of wood materials traded as rosewood. In 2011, SAQSIQ also issued a Rosewood Furniture General Technical Specification (SAQSIQ 2012), which specifies labelling requirements and requirements of manufacturing processes for rosewood furniture. The National Development and Reform Commission has issued a sectoral standard for 'Dark and Precious Hardwood Furniture' (NDRC 2008), which identifies species that may be used and the physical characteristics of acceptable wood materials.

There are also two sectoral standards: Rosewood Commercial Labelling (MOFCOM 2012a) and Rosewood Product Classification (MOFCOM 2012b). These sectoral standards were developed by the China Timber and Wood Products Distribution Association and published by the Ministry of Commerce in August 2012. The former summarizes the commercial and common names of rosewood species listed in SAQSIQ (2000), and the latter provides a standard for classifying the quality of rosewood products.

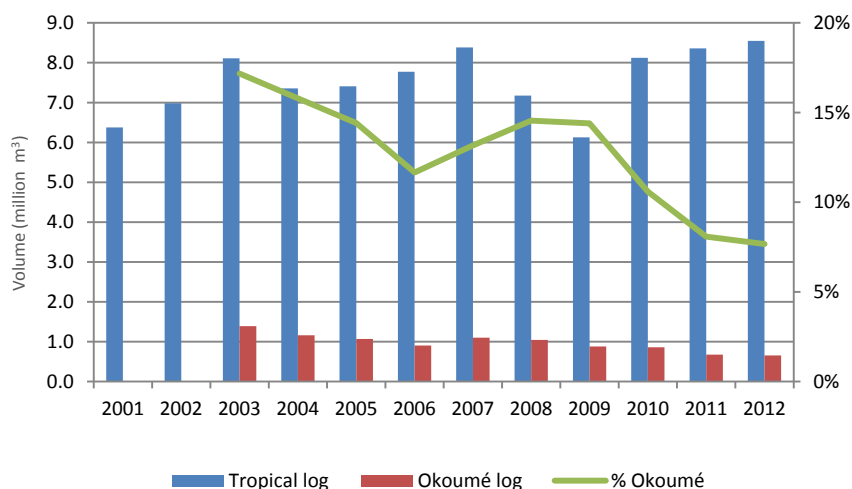
Specific government policies supportive of the rosewood industry are limited to the local level, where rosewood manufacturing can be an important contributor to local employment and economic development. For example, in Dachong and Shaxi counties, Guangdong province, government has worked with local universities to establish the Dazhong Rosewood Furniture Research Center (CFA and CLIC 2001). It has also helped local companies to source rosewood resources from Africa and improve manufacturing technologies (e.g. kilns, engraving machinery), and has worked with banks to ensure access to preferential credit for rosewood manufacturers (He and Cai, 2011). Xianyou county government in Fujian province considers the rosewood furniture industry to be a main pillar of the local economy, and offers supportive policies and funding support to the industry. The local government has worked with the industry to establish a rosewood industrial park and to support product research and development, quality testing, timber material trading, marketing and logistics, as well as supporting labor supply to the industry (Lin 2011). Dongyang city, Zhejiang province, has encouraged companies to establish research and innovation centers, and has established the Zhejiang Province Rosewood Engraving and Furniture Quality Testing Center in an effort to strengthen product quality. Local government has implemented supportive policies, such as offering land to newly established factories, providing special funds to improve labor skills, and working with banks to issue preferential credit for rosewood material sourcing (Wang and Liu 2012). Pingxiang in Guangxi, and Ruili in Yunnan province, have also issued policies to support development of the emerging trade and processing industries in those areas. Pingxiang has established the China-ASEAN (Pingxiang) Rosewood Log and Semi-final Product Trading Center, and has supportive policies to improve the quality of human resources (Liang 2012). Ruili has developed a rosewood industrial park, offering preferential terms to attract investment in new factories (Yang 2012).

3. Okoumé

3.1 China's Okoumé log imports

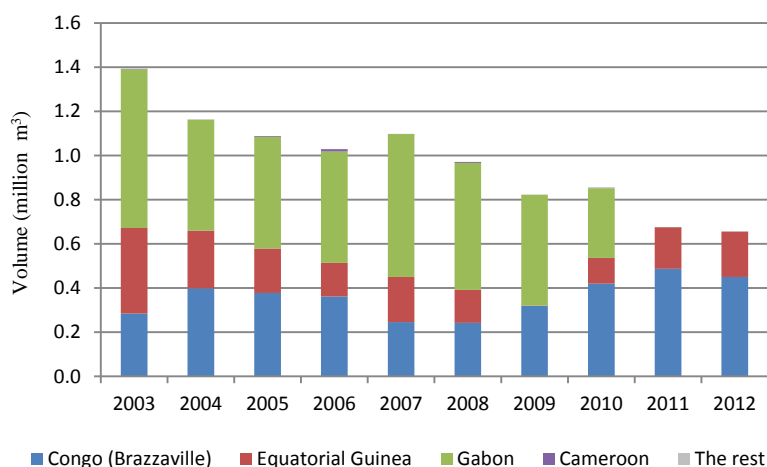
Okoumé (*Aucoumea klaineana*) is a tropical hardwood species native to central Africa. It is mainly distributed in Gabon, with smaller distributions in neighboring countries, such as Cameroon, Congo (Brazzaville) and Equatorial Guinea (White 1998). China started to record specific trading data on this species in 2003, selecting okoumé because on average it accounted for more than 60% of total imports from Africa. From 2003 to 2012, China imported a total of over 9 million m³ of okoumé, which accounts for 12.8% of China's total tropical log imports during that period (Figure 12).

Figure 12: China's Tropical Log and Okoumé Log Imports and Okoumé Log Imports as a Proportion of Total Tropical Log Imports



Source: China Customs, compiled by the authors.

Figure 13: China's Okoumé Log Imports by Supplying Country (2003 to 2012)



Source: China Customs, compiled by the authors.

In recent years, however, China's imports of Okoumé logs have been declining. Until 2010, Gabon was China's major supplying country, providing more than half of China's okoumé imports. However, in 2010 Gabon banned export of logs, following which log exports to China virtually ceased, while sawn timber exports increased.¹⁴ At the same time, imports of logs from neighboring countries Congo (Brazzaville) and Equatorial Guinea have increased, but this was only able to compensate for a portion of the decrease in imports from Gabon (Figure 13).

3.2 Okoumé log product flows in China

3.2.1 Import Routes

Ocean trade is the only way in which okoumé is imported to China from Africa. Particularly for smaller companies, import agents also play an important role in the okoumé trade. However, because okoumé has a relatively low market price (ca. US\$ 350 per m³), the changes in tariff and taxation policies that affected higher value rosewoods have not affected the okoumé trade. This also implies that there is limited incentive for illegal trade.

Unlike rosewood trade, okoumé log import volumes are highly concentrated among a small number of firms. Table 3 lists the ten largest importers in 2012, who together accounted for nearly 80% of the logs imported in that year.

Table 3: Major Chinese Importers List of Okoumé Logs (2012)

No.	Company Name	Quantity (m ³)
1	Dejia Wood Co. Ltd.	121,162
2	Shandong Jiangquan Industrial Co., Ltd.	109,861
3	China Light Resource Imp & Export Co., Ltd.	69,758
4	Rizhao Shengye Wood Co., Ltd.	53,454
5	Huzhou Huayang Decorative Material Co., Ltd.	52,957
6	Shandong Longsheng Imp & Export Co., Ltd.	45,087
7	Wenzhou Timber Group	28,711
8	Guangdong Guangxin PACO Technology Co., Ltd.	14,359
9	Rizhao Sunly Trading Co., Ltd.	10,863
10	Foshan Nanhai Yonghua Timber Co., Ltd.	10,530

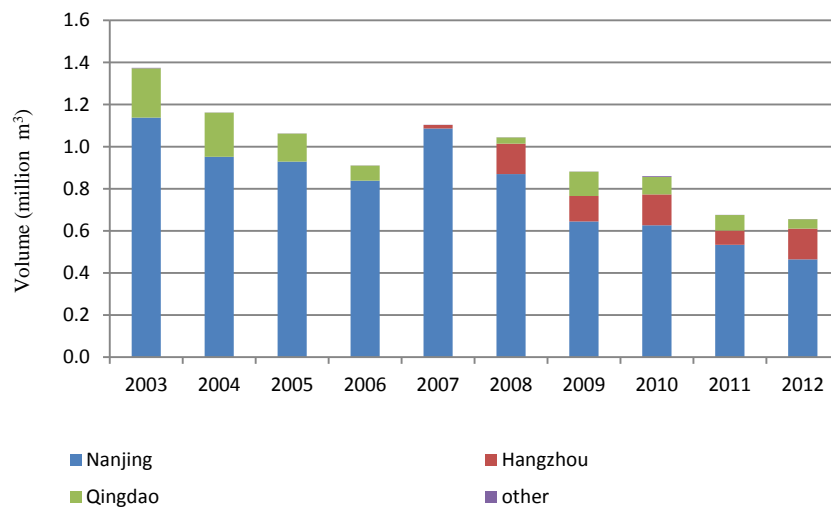
Source: China Customs, compiled by the authors

Figure 14 presents the major customs districts reporting imports of okoumé logs. Since 2003, an average of 82% of total okoumé log imports have been through ports in Nanjing Customs district in East China. Qingdao in Shandong province has also been a significant port of entry, and since 2007 Hangzhou, also in East China, has been increasingly involved in this trade. Nanjing customs district covers Zhangjiagang and Jingjiang ports. The former, located in Nanjing city, Jiangsu province, was established in 1986 and has a long history of timber imports from Africa, importing 90% of total African timber imports until the emergence of nearby Jingjiang port and Huangpu (Shenzhen) in the last few years. Jingjiang port was established in March 2009 through private investment, and a significant proportion of timber imported from Congo (Brazzaville) and Equatorial Guinea now goes through this port.

Zhangjiagang port is also a key distribution center for imported okoumé timber. Market participants estimate that over 70% of okoumé transactions are completed at the 'Golden Triangle Compound' in Zhangjiagang port, where numerous trading companies have representative offices. Within the compound, both spot and future trades are made, depending on the adequacy of supplies. Future trades were particularly common after the log export ban in Gabon led to limited supply, but since future transactions are riskier, most buyers prefer to engage in spot transactions.

¹⁴ China Customs data does not record the species for all sawn timber, so it is not possible to assess the overall effects of a shift from roundwood to sawn timber exports in Gabon on total okoumé exports to China.

Figure 14: China's Okoumé Log Imports by Customs District



Source: China Customs, compiled by the authors.

Figure 15: The Flow of Okoumé Logs in China



3.2.2 Distribution Hubs

Shanghai Furen International Timber Market is another major primary market for the distribution of okoumé timber, mainly supplying manufacturers in the Yangtze River Delta. Moreover, Shanghai Harbor is an important port of entry for okoumé sawn timber. Okoumé logs can also be found in Guangdong Yuzhu Timber Market and Beijing Dongba Precious Timber Market. After import to China, the okoumé logs are transported to Guangdong and Beijing by domestic ocean shipping or road transportation. The former is cheaper, but the latter is faster, with traders deciding the mode of domestic transport on the basis of the timing of the orders they have taken on.

3.2.3 Processing Hubs

Okoumé is particularly associated with the plywood industry in China. Because of their texture, okoumé logs are mainly processed into veneer that is applied to the surface of poplar or birch plywoods. Plywood is an intermediate wood product that is widely used in wooden furniture, decorative materials, and other wood-based products. The major plywood processing centers for okoumé in China include Linyi city in Shandong province, which consumes around 80% of imported okoumé logs, and Pizhou city in Jiangsu province (see Figure 15).

The wood industry in Linyi City began in the late 1970s, and developed a focus on wood panel processing (i.e., plywood). There are now more than 6,000 companies engaged in plywood manufacturing in the area, mainly located in Fei county, Yitang town, and Lanshan district. Use of okoumé in Linyi began in the mid-1990s, when manufacturers in Linyi began to copy the processing methods using okoumé of Taiwanese plywood factories in nearby Jiangsu province. There are now around 100 factories engaged in okoumé processing in Linyi city. Around half of these firms are family-run workshops. Industry experts in Linyi estimate that around 400,000 m³ of okoumé is processed in Linyi each year.

Figure 16: An Okoumé Factory in Linyi City



The original use of okoumé in processing was stimulated by the former strength of overseas markets, where consumers preferred red wooden products, while okoumé was relatively cheap and abundant. At its climax in 2006-7, more than 1 million m³ was being processed each year, and more than 600 factories were involved in the business. Increasing market demand led to a rise in the price of okoumé logs from US\$ 300 per m³ in the first half of the 2000s to US\$700 per m³ in 2007.¹⁵ With rising input prices, many manufacturers began to seek cheaper substitutes with a

¹⁵ UNCTAD data on Gabon FOB okoumé log prices also show the same rising trend through 2007. See <http://unctadstat.unctad.org/TableViewer/tableView.aspx?ReportId=30727>

similar texture, and following the effects of the 2008 financial crisis on international demand, the number of factories involved and the total volume processed sharply declined. Since mid-2010, the Chinese Yuan has appreciated significantly against the US dollar, and factory owners in Linyi report that this, combined with rising labor costs, has made them uncompetitive. As a result, many processors, particularly larger enterprises, are turning to other, cheaper materials (e.g. melamine) and ceasing their purchases of okoumé.

Figure 17: Okoumé Logs in Linyi City



Figure 18: Okoumé Plywood in Linyi City



3.2.4 Final Markets

As a common material in intermediate wood products, the final products of okoumé logs supply both overseas and China's domestic markets. Industry experts estimate that around 30% of okoumé plywood is directly exported, with the major destinations including the US, EU, Middle East, Latin America, and even Africa. The remaining 70% is used in the manufacture of wooden furniture, decorative material and other wood products manufactured in China. Although estimates are tentative, experts speculate that of the final products, over 30% will be exported and more than 60% will be sold in the domestic Chinese market. Given the international economic climate and the continued growth in the Chinese market, it is expected that the Chinese market will become increasingly important in the future.

3.3 Government Agencies and Regulations

The government agencies with responsibilities related to import, transport, processing and sales of Okoumé logs are the same as those described in Section 2.4 above. According to interviews with key government agencies, there have been no central or local government policies targeting either the plywood industry or users of okoumé materials.

4. Discussion

China accounts for over 50% of global tropical log imports. While slow growth in international demand is expected in the coming years, Chinese domestic market demand is projected to continue to grow strongly. The two case studies in this report show that the dynamics of imports and Chinese domestic industry trends differ among tropical species, and that a number of diverse factors affect these dynamics.

Business responses to cost pressures for high- and low-value wood products: Rosewood is highly valued in China as the raw material for high value furniture. Given the long cultural history of rosewood furniture, Chinese consumers are discerning regarding style and various quality traits. The traditional processing hubs face increasing pressure from rising labor costs. Some processors have responded by relocating processing operations to locations in southwest China or Vietnam, closer to supply sources where wages are lower. Given the high value of the rosewood furniture industry, local governments have also provided preferential policies to attract investments in the processing and manufacturing industries, and to ensure competitiveness of local manufacturers by supporting improvements in human resources, product quality and innovation capacities. Demand for lower-priced raw materials has also grown, which has translated into an increase in demand for many African rosewood species. Changes in taxation policy have particularly affected importers of high value rosewood, and some have responded by shifting to illicit trade modalities. By contrast, okoumé processing is not a mainstay of local wood based industries, and has a lower profit margin than rosewood. Facing both rising wages and an appreciating currency, okoumé processors have shifted to cheaper materials as substitutes for okoumé.

Demand characteristics and its impact on tropical forest resources: Rosewood has been used in traditional Chinese furniture for centuries and demand for particular species is driven largely by cultural preferences. Although the Chinese National Rosewood Standard identifies 33 species that can be used to make rosewood products, cultural preferences have focused demand on a few traditional species (e.g. *D. odorifera*, *P. santalinus*, *D. cochinchinensis*). The most traditional species, *D. odorifera*, has virtually disappeared from the market, and traders report that even high-end ordinary class species, such as *j*, which mainly originates from Laos, may become unavailable within just a few years. By contrast, use of okoumé logs in plywood manufacturing initially developed due to consumer preferences in overseas markets. Chinese processors have a strong preference for logs, rather than sawn timber imports, and have been able to respond to declines in supply from major supplying countries (e.g. Gabon) by switching sources of origin (e.g. Congo (Brazzaville)) and have responded to cost pressures by seeking substitute materials. The pressure on natural forest resources of particular tropical species therefore varies depending on the reasons for demand for each particular species.

Response to overseas export policies: Since the major use of okoumé is in plywood processing, the Chinese market has a high demand for logs. Imports of sawn timber or other processed products cannot fulfill Chinese processor requirements. When major supplying countries have restricted exports of logs (e.g. Gabon in 2010), Chinese traders have responded by seeking alternative sources of supply and by seeking substitute imports of other species from other supplying countries (e.g., PNG). By contrast, Vietnam's restriction on log exports has translated into a growing trade in semi-finished rosewood furniture. Considering both wood material availability and low labor costs, some Chinese firms have outsourced production to Vietnam. The consequences for supplying countries of Chinese businesses' responses to overseas forest export policies can therefore differ.

Implications for timber legality and sustainability initiatives: Analysis in this report of business responses to trade regulations suggests that incentives for illegal trade are stronger for higher value, rare products. Due to the low market price and abundant supply of okoumé, there are few incentives for illegal trade. Moreover, we find that

because export markets still account for an important share of final demand for okoumé products, processors are more familiar with international practices. Some processing enterprises are even Forest Stewardship Council certified. By contrast, final demand for rosewood is largely within China. Yet China has not implemented a regulatory system equivalent to the EU Timber Regulation or the US Lacey Act. In the absence of particular legality or sustainability requirements, the domestic industry mainly focuses on product quality, rather than environmental impacts. Industry actors are keenly aware of the declining availability of rosewood resources. Industry response has been to call for a revision of the scope of species recognized in the Chinese National Rosewood Standard, so as to allow more flexibility in species sourced to produce rosewood furniture. Under the current regulatory system, the location of final demand for tropical timber products therefore affects Chinese businesses responses to legality and sustainability issues.

Recommendations regarding rosewood: Six of the 33 species identified as rosewood are listed in CITES. Supply of several key rosewood species is threatened, which signifies the potential impacts of the Chinese rosewood industry on global biodiversity and also indicates a resource crisis for China's rosewood industry itself. The resource impacts of the rosewood industry are particularly driven by the narrow focus on a limited number of valuable species. Rarity along with cultural and economic value provide incentives for illegal trade activities. The risk of illegal trade appears to be exacerbated on the Chinese side by the import agent system. A more common response within the industry has been to call for a revision of the National Rosewood Standard, so that a wider range of species, including more abundant species, can be used to make rosewood products. Changes to sectoral guidelines on the appearance of rosewood products could help divert market demand from the limited number of currently emphasized species. Cultivation of a rosewood plantation, as in Zhaoqing city, would also help ease resource pressures in the longer-term. In addition to activities on the demand side, strengthened governance of forest resources and forest product trade in supplying countries would help protect endangered species.

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Appendix

Table 4: Major Rosewood Industry Centers in China

Region	Area	Number of Companies	Major Products	History	Features	Annual Turnover
Southern China	Zhongshan city, Dachong and Shaxi counties, Guangdong province	> 500	Furniture and wood carving	More than 30 years	The biggest Rosewood manufacturing industry cluster in China; Relatively large firm size; mainly uses mid- and low-end ordinary species, i.e., African rosewood;	1 billion US dollars
	Shenzhen city, Guangdong province	> 80 ¹⁶	Furniture	10 years	Has several of the largest firms in the industry; Mainly uses high-end ordinary class species and some collectable class species	-
	Xinhui district and Daijiang Town, Xinhui city ¹⁷ , Guangdong province	500	Furniture and wood carving	30 years	Mostly small-scale workshops; Mainly uses low-end ordinary class species, i.e., African rosewood;	500 million US dollars ¹⁸
East China	Dongyang city, Zhengjiang province	1000	Wood carving and furniture	-	Mostly small-scale workshops; Mainly use low-end ordinary class species, i.e., African rosewood;	30 million US dollars ¹⁹
	Guangfu town, Suzhou city, Zhejiang province	100	Wood carving and furniture	-	Mostly small-scale workshops Mainly use high-end ordinary class species	Unknown
	Changshu city, Jiangsu province	100	Wood carving and furniture	-	Mostly small-scale workshops Mainly use high-end ordinary class species	20 million US dollars ²⁰
	Nantong city, Jiangsu province	600	Wood carving and furniture	-	Mostly small-scale workshops	20 million US dollars ²¹
	Xianyou county, Fujian province	500	Furniture and wood carving	10	Large companies dominate the industry; Mainly use high-end ordinary class species and collectable species;	1 billion US dollars

¹⁶Zhao Chuan, 2011, It's hard to decide the order in weeks. Shenzhen Business, released March 30, 2011

¹⁷<http://www.asia-home.com.cn/2012/0522/115057.html>, accessed April 5, 2013

¹⁸http://news.ifeng.com/gundong/detail_2011_03/19/5250556_0.shtml, accessed April 5, 2013

¹⁹Li Bingfeng. Dongyang Wood Carving Growing Fast. *Jianhua Daily*, released July 21, 2010

²⁰<http://dfj.sipac.gov.cn/tszs/491.html>, accessed April 5, 2013

²¹<http://www.ntjoy.com/news/hm/2012/12/2012-12-27178863.html>, accessed April 5, 2013

Region	Area	Number of Companies	Major Products	History	Features	Annual Turnover
	Zibo city, Shandong province	100	Furniture and wood carving	10	Mostly small-scale workshops Mainly use high-end ordinary class species	2 million US dollars ²²
North China	Beijing city	60	Furniture and wood carving	-	Large companies are dominant; Mainly use high-end ordinary class and collectable species	-
	Dacheng county, Hebei province	600	Furniture and wood carving	30 years	Mostly small-scale workshops	200 million US dollars ²³
Southwest	Pingxiang city, Guangxi province	300 ²⁴	Furniture and wood carving	10 years	Mostly small-scale workshops Mainly use mid- and low-end ordinary class species;	-
	Dongxing city, Guangxi province	200	Furniture and wood carving	10 years	Mostly small-scale workshops Mainly use mid- and low-end ordinary class species;	200 million US dollars ^{25,26}
	Ruili city, Yunnan province	100 ²⁷	Furniture and wood carving	10 years	Mostly small-scale workshops Mainly use mid- and low-end ordinary class species;	200 million US dollar ²⁸

²² http://blog.sina.com.cn/s/blog_70111dcd0100nyr5.html, accessed April, 5, 2013

²³ <http://www.chinavalue.net/General/Blog/2010-9-10/468349.aspx>, accessed April, 5, 2013

²⁴ http://www.pxhwm.com/newsweb/list/page.aspx?n_id=4141&lb_id=1, accessed April, 5, 2013

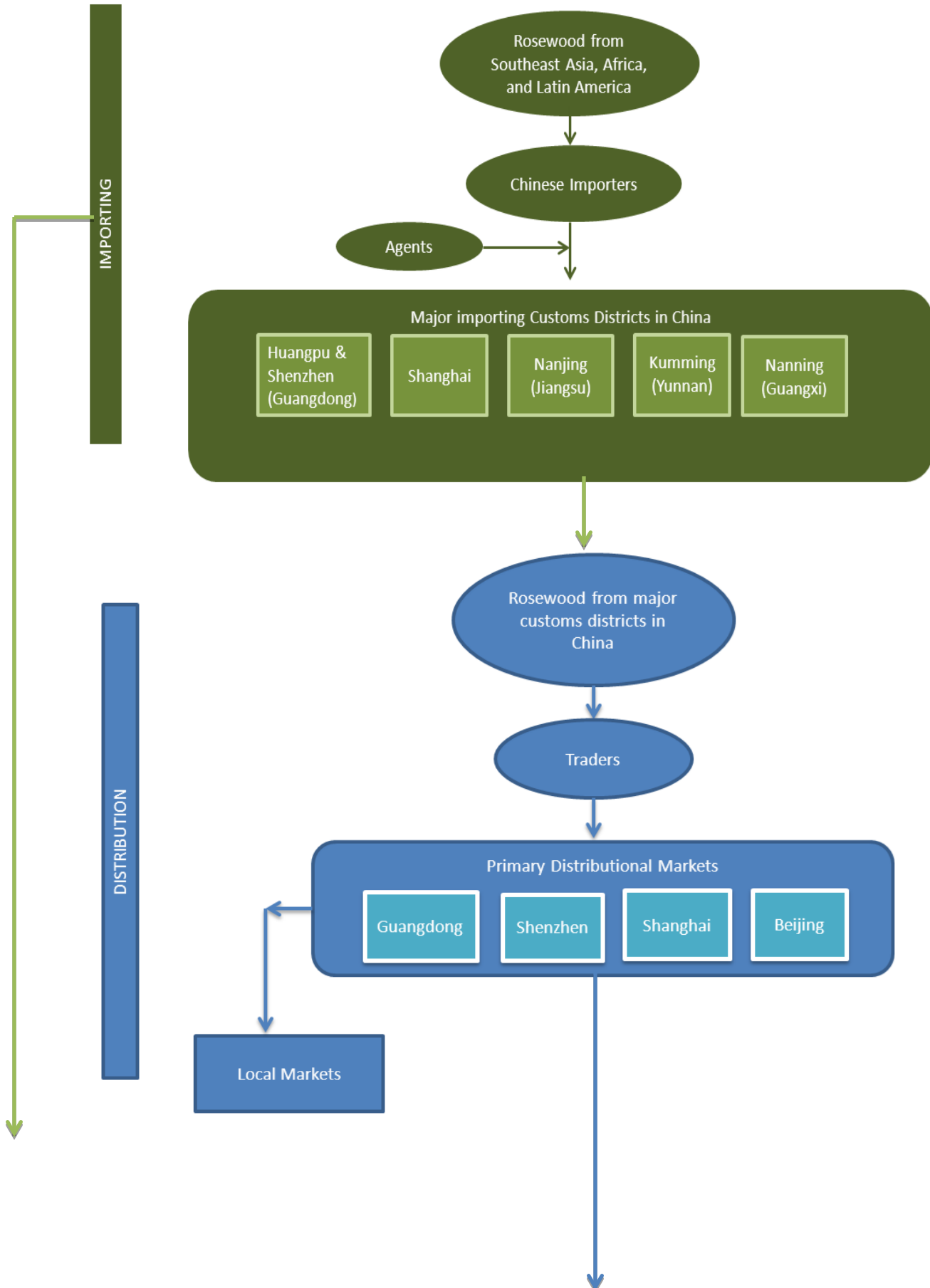
²⁵ <http://www.chinavalue.net/General/Blog/2010-9-10/468349.aspx>, accessed April, 5, 2013

²⁶ <http://collection.sina.com.cn/jjhm/20111221/113749638.shtml>, accessed April, 5, 2013

²⁷ Gong Xia, 2012. Rosewood industry in Ruili, Yunnan Daily, Edition 10, June, 26, 2012

²⁸ <http://www.chinavalue.net/General/Blog/2010-9-10/468349.aspx>, accessed April, 5, 2013

Figure 19: Rosewood Log Commodity Chain in China



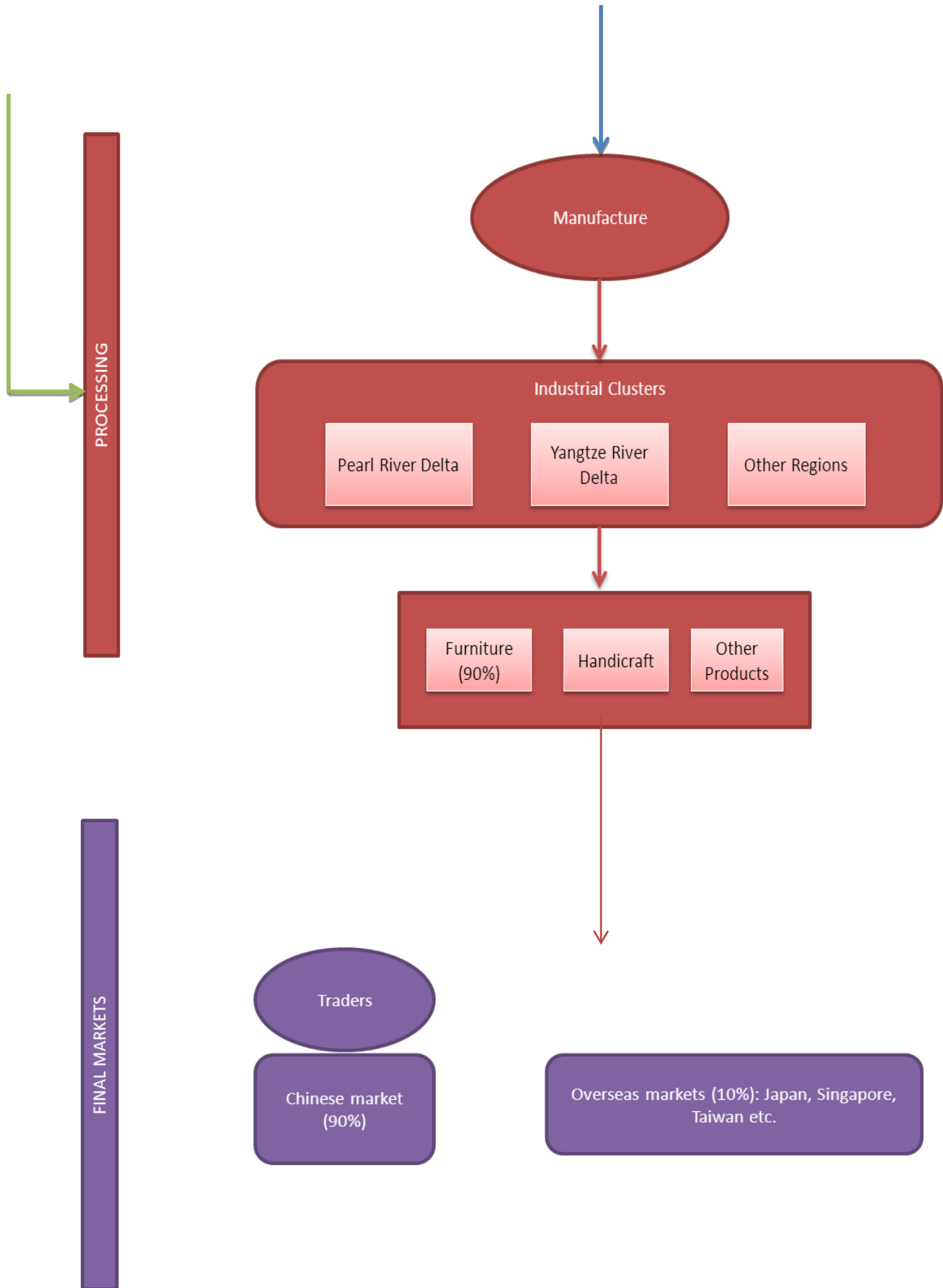
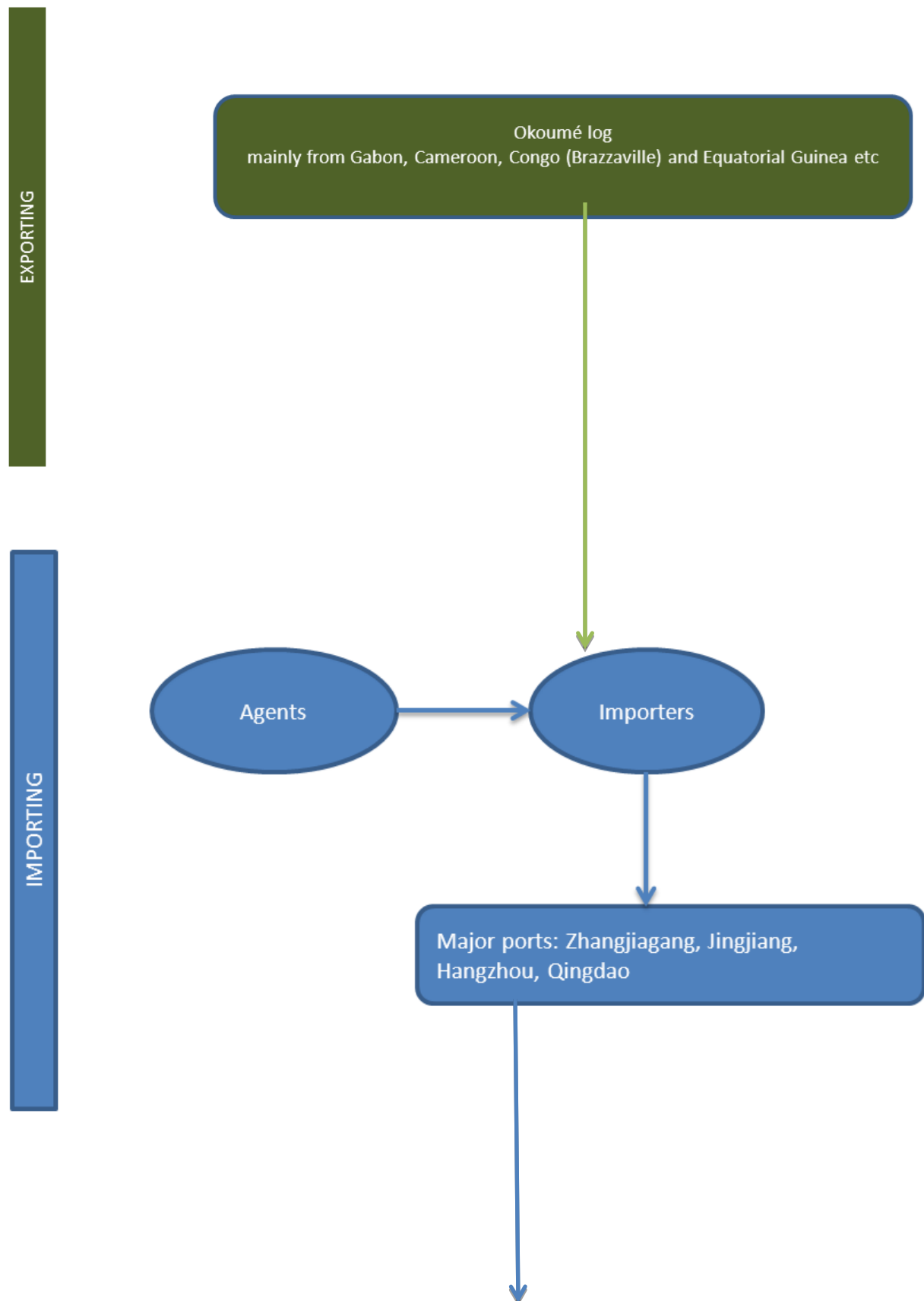
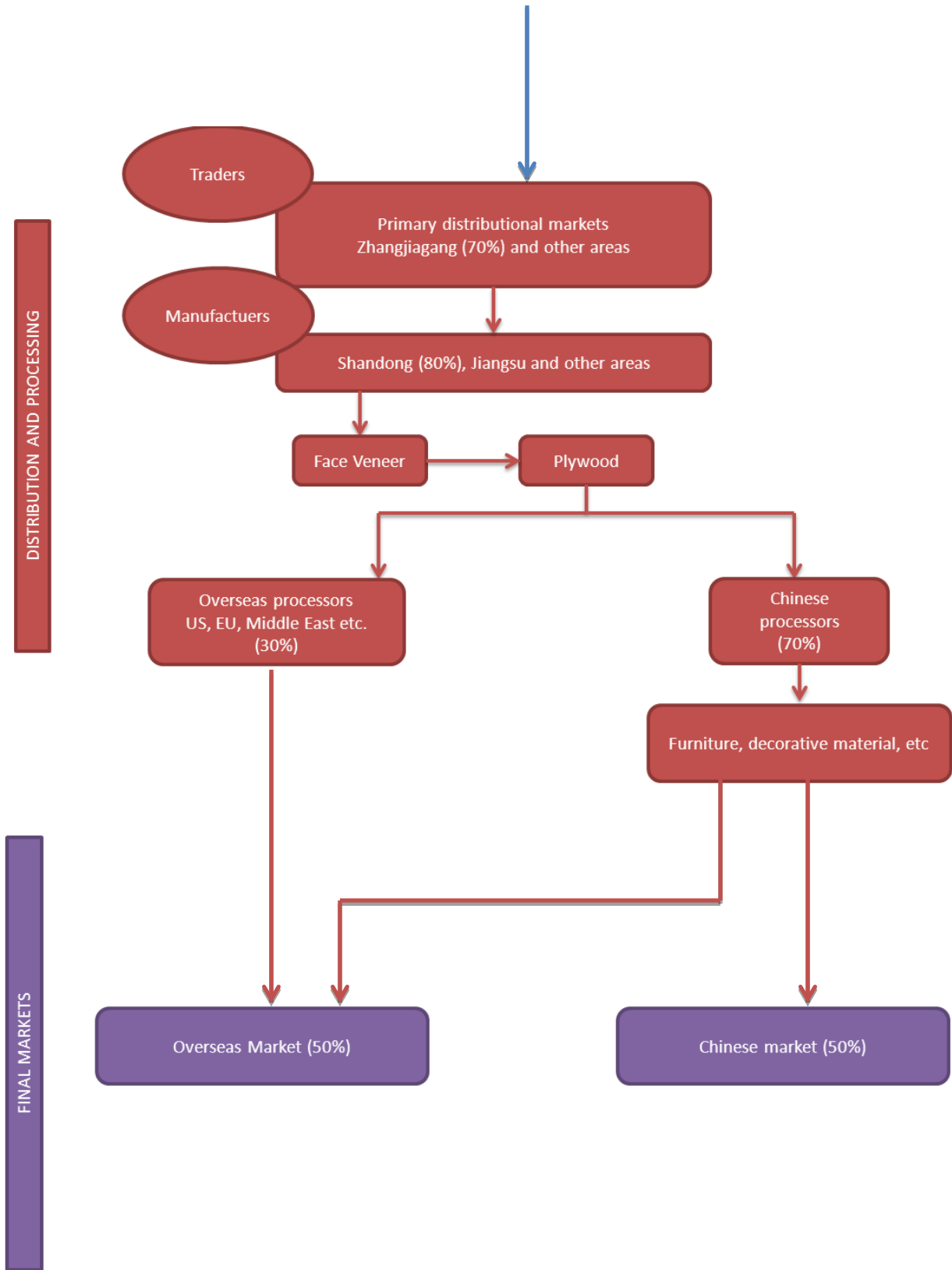


Figure 20: Okoumé Log Commodity Chain in China





Collaborating Institutions

Forest Trends (<http://www.forest-trends.org>): Forest Trends is an international non-profit organization that works to expand the value of forests to society; to promote sustainable forest management and conservation by creating and capturing market values for ecosystem services; to support innovative projects and companies that are developing these new markets; and to enhance the livelihoods of local communities living in and around those forests. Forest Trends analyzes strategic market and policy issues, catalyzes connections between forward-looking producers, communities and investors, and develops new financial tools to help markets work for conservation and people.

The World Agroforestry Centre (ICRAF) is a CGIAR Consortium Research Centre. ICRAF's headquarters are in Nairobi, Kenya, with regional offices located in Mali, Malawi, Cameroon, India, Indonesia and Peru. The Centre's vision is a rural transformation in the developing world as smallholder households strategically increase their use of trees in agricultural landscapes to improve their food security, nutrition, income, health, shelter, social cohesion, energy resources and environmental sustainability. The Centre's mission is to generate science-based knowledge about the diverse roles that trees play in agricultural landscapes, and to use its research to advance policies and practices, and their implementation, that benefit the poor and the environment

The Center for International Forestry Research (CIFOR) is a nonprofit global facility dedicated to advancing human wellbeing, environmental conservation and equity. The center conducts research that enables more informed and equitable decision making about the use and management of forests in less-developed countries. CIFOR's analysis helps policy makers and practitioners shape effective policy, improve the management of tropical forests and address the needs and perspectives of people who depend on forests for their livelihoods. CIFOR's multidisciplinary approach considers the underlying drivers of deforestation and degradation, which often lie outside the forestry sector: forces such as agriculture, infrastructure development, trade and investment policies and law enforcement.

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