CHINA AND FOREST TRADE IN THE ASIA-PACIFIC REGION:

IMPLICATIONS FOR FORESTS AND LIVELIHOODS

中国与亚太地区国家林产品贸易研究

AN OVERVIEW OF THE MARKET CHAIN FOR CHINA'S TIMBER PRODUCT IMPORTS FROM MYANMAR

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Cover photo: Teak smuggler, Ruili Municipality, Yunnan Province, China by Su Yufang.

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SUMMARY

China's annual timber product[1] imports from Myanmar more than tripled between 1997 and 2002 (Sun et al. 2004). Although imports from Myanmar comprise just over two percent of China's total timber product imports, the nascent increase in logging activities along the Chinese border in Myanmar has been highly concentrated in natural forests in Myanmar's northern Kachin State, and the ecological impacts of these activities are not captured in timber product import volumes. Growth in timber product imports coincided with China's restrictions on domestic production in 1998, tariff reductions on forest products in 1999 and gradual relaxations on migration controls, the combination of which has considerably altered the structure of the timber industry and the face of communities along the border with Myanmar in China's Yunnan Province. As timber resources in northern Myanmar that can be cost-effectively harvested are rapidly depleted, there is a pressing need to develop strategies to deal with the cross-border environmental effects of prolonged, intensive logging and the livelihood implications of a diminished flow of Myanmar timber products across different segments of the market chain.

The analysis below is an extension of and builds upon an earlier study conducted by the authors in late 2003 (Kahrl et al. 2004). Research consisted primarily of literature reviews and semi-structured interviews. Interviews were carried out in the border towns of Pianma (Lushui County), Diantan (Tengchong County), Houqiao (Tengchong County), Yingjiang (Yingjiang County), Ruili (Ruili Municipality) and Nongdao (Ruili Municipality) and in wholesale markets in Kunming, Shanghai, and Guangdong.[2] This study is fundamentally scoping in nature — facts and figures are meant to paint a picture of industry *conditions* across a broad range of actors and scales, rather than establish conclusive evidence concerning industry *effects*. Based on a more comprehensive understanding of conditions, the analysis moves on to identify priority issues along the market chain.

The main route for Myanmar timber product imports into China stretches from the Yunnan-Myanmar border to Guangdong Province and Shanghai on China's eastern seaboard. According to national customs statistics, from 1997-2002, almost 90 percent of China's imports of Myanmar timber passed overland through China's Yunnan Province. 75 percent of this border timber trade was concentrated in Lushui County (Nujiang Prefecture), Tengchong County (Baoshan Municipality) and Yingjiang County (Dehong Prefecture). While the border has been home to a thriving timber industry since the mid- to late 1980s, the intensity of logging in northern Myanmar and the number of companies and workers increased significantly after more stringent limits on domestic production were administered in 1998.

The increased concentration of firms and workers along the border has created agglomeration effects, in the sense that the buyers on China's eastern seaboard who now drive the timber business along the Yunnan-Myanmar border largely bypass inland Yunnan and procure materials on the border, although prices for

[1] This analysis will use the definition of 'timber products' and 'wood products' adopted by Sun et al. (2004). 'Timber products' include roundwood, sawnwood, wood-based panels, and wood chips. 'Wood products' include these four but add pulp and paper. 'Forest products' will be restricted to and used interchangeably with 'wood products.'
[2] In China, counties typically have a county seat (a town) of the same name. In this paper, "county" or "township" (e.g., "Yingjiang County") after a place name refers to an administrative region. A place name by itself (e.g. "Yingjiang") refers to a specific town.

lower-quality, domestic timber are significantly cheaper. The same process of industrial agglomeration is occurring further east, as expanded scale rapidly regionalizes downstream manufacturing of the furniture, flooring and interior design industries. Increasingly, China's market for Myanmar timber products is polarizing toward the Yunnan-Myanmar border on one edge, and Guangdong, Shanghai and other southeastern provinces on the other.

Although the number and range of people involved along the market chain for China's timber product imports from Myanmar increase exponentially as the chain moves east, risk is not distributed proportionally across different nodes. Border inhabitants tied directly and indirectly to the timber industry along the Yunnan-Myanmar border — and permanent residents in both Yunnan and Myanmar in particular — are most vulnerable to changes in industry scale. While the boom in the timber business has provided income generating opportunities for many, from villagers in Myanmar to Chinese migrant businessmen, forests that can be cost-effectively harvested in Myanmar along its border with Yunnan are in increasingly short supply. The ensuing contraction of the border timber industry in the near to medium future entails a need to explore three priority areas:

- Transitioning border residents away from a reliance on the timber industry as part of broader support programs in northwest and western Yunnan;
- Assessing and mitigating the cross-border ecological damage from logging in Kachin and Shan States;
- Developing a more sustainable supply of timber in Yunnan through improving state plantations and collective forest management.

YUNNAN-MYANMAR BORDER – LUSHUI, TENGCHONG AND YINGJIANG COUNTIES

MARKET STRUCTURE

Industry and Trade Patterns

The combination of limits on domestic timber production beginning in 1998[3] and forest product tariff reductions in 1999[4] has engendered a restructuring of the timber-based industry in Yunnan. Based on the premise that domestic shortfalls would drive up domestic timber prices, the number of logging and processing companies along the Yunnan-Myanmar border — particularly in northwest Yunnan's Lushui, Tengchong, and Yingjiang Counties — has grown substantially since 1998.[5] The Yunnan-Myanmar border timber industry is highly concentrated in these three counties; together they comprised at least 75 percent of timber product imports through Yunnan in 2002 (Kahrl et al. 2004). Despite cheaper logs and lumber inland,[6] the increasing size of the border industry and higher timber quality in border timber markets have attracted buyers from China's eastern seaboard. Expanding industry scale along the Yunnan-Myanmar border has spelled a vicious cycle of contraction for inland processors, as they increasingly lack sufficient raw materials and economies of scale and scope to compete *(*see "Inner Yunnan" below*)*. Although timber from other areas in Yunnan is still traded locally and internationally, what is often smaller-diameter, lower-quality inland timber cannot compete with large-diameter, high-grade logs from natural forests in northern Myanmar.

Industry Structure and Size

Timber-based companies along the Yunnan-Myanmar border can be roughly categorized into large, medium and smaller companies (**see Table 2**). More generally, border timber companies exhibit the following characteristics:

- In most instances the few *large logging companies* are vertically integrated, with their own processing facilities, wholesale operations and sometimes retail arms.
- *Large processing companies* do not have subsidiary logging operations but have wholesale or retail operations.

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[3] Production limits were most notably implemented through the Natural Forest Protection Program (NFPP). A significant component of this program was a ban on logging in natural forests in 18 provinces, municipalities, and autonomous regions in the Yangtze and Yellow River watersheds. However, a lesser known factor in production limits was the reduction in harvest quotas in some areas that were not included in the logging ban.
[4] Beginning January 1, 1999, tariffs on roundwood and sawnwood imports were reduced to 0. Tariffs on plywood and veneer imports were reduced from 20 and 12-30 to 15 and 5-8 percent, respectively. It should be noted that China's tariff reductions on forest products in 1999 were part of a larger process of regional and multilateral trade liberalization in the context of Asia Pacific Economic Cooperation (APEC) commitments and, to a lesser extent, the country's requirements for World Trade Organization (WTO) entry in 2001.
[5] This assessment is based on more than 50 interviews conducted in Nujiang Prefecture, Baoshan Municipality, and Dehong Prefecture in 2003 and 2004.
[6] For instance, *xinanhua* [*Betula spp.*] logs are 400 to 500 yuan cheaper per cubic meter in Baoshan Municipality than in Tengchong County. In Kunming, domestically produced roundwood is around 200 yuan cheaper per m^3 than similar imports from Myanmar.

- Among *small- and medium-sized companies*, labor is clearly divided between companies that log, intermediaries that buy and sell logs, and companies that process them.
- In many cases, *medium-sized and larger processing companies* are segments of family-run operations that extend from the Yunnan-Myanmar border to offices at wholesale markets in Kunming, Guangdong Province, Shanghai, and, to a lesser degree, other regions of China.

Much of the Yunnan-Myanmar border timber industry is grouped into a series of umbrella clusters. Smaller companies are often forced to affix[7] themselves to larger companies to obtain access to forests, roads and requisite documentation — including tax, customs and shipping documents.[8] In addition, most of the road and relationship building with authorities in Myanmar is done by larger companies. In return, smaller companies allow larger companies to hedge risk from market fluctuations through leasing logging concessions, paying for the use of logging roads, and renting land and processing facilities.

The total number of logging companies and intermediaries in border towns is unclear — many are not registered and are highly mobile. Because of processors' more sizeable fixed assets, the number of sawmills along the Yunnan-Myanmar border is more conducive to estimates. The towns of Pianma (Lushui County), Diantan (Tengchong County) and Yingjiang (Yingjiang County) have just over 100 sawmills; the town of Houqiao (Tengchong County) has approximately 80.[9] Given the relative throughputs of different counties and prefectures then, the number of sawmills along the border that process Myanmar timber is probably between 800 and 950.[10]

Industry Profits and Price Determinants

Profit margins among larger logging companies and some processing facilities along the border are on a downward trend. Declining profits are a symptom of lower selling prices along the border combined with rising operational costs for logging companies. Chief factors influencing selling prices include: *overcapacity* and *international timber market fluctuation*. Chief factors influencing operational costs include: *resource scarcity* and *rising fees and costs*. Each of these four factors is discussed, in turn, below.

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[7] This process of "affixing" (挂靠 *guakao*) does not imply registration; many smaller companies are able to locate under larger umbrella companies without formal registration in the commercial system.

[8] In Nujiang Prefecture, for example, there are only thirteen companies with legal permission to conduct cross-border trade, in contrast with the hundreds of logging companies based in the prefecture that technically import logs from Myanmar. A smaller number of legally-licensed companies involved in cross-border trade have been the norm since State Council regulations to reign in a chaotic border trading system in 1996 returned ultimate authority for licensing to the Ministry of Commerce and State Council agencies (Liang and Liu 2003).

[9] Interviews with Forestry Bureau staff, Pianma (Nujiang), Yingjiang (Dehong), and Diantan (Baoshan), April and May, 2004.

[10] Pianma is home to the preponderance of mills in Nujiang Prefecture. Likewise, most sawmills in Dehong Prefecture are concentrated in Yingjiang; Ruili Municipality has around 50 mills *(see footnote 11)*. While the timber processing industry in Baoshan Municipality, and principally Tengchong County, is more diffuse, the number of sawmills is likely between 350 and 400 (100 in Diantan, 80 in Houqiao, 75-100 in Zizhi, and 50-75 in Guyong). Thus, the number of mills in Nujiang, Dehong and Baoshan Prefectures probably lies between 600 and 700. Matching throughput and industry size, at a conservatively high 25 percent of total cross-border timber product imports, Yunnan's three prefectures further south along the Myanmar border —Lincang, Simao, and Xishuangbanna — would have between 200 and 250 facilities that process Myanmar timber.

Overcapacity: The number of logging and processing companies operating along the Yunnan-Myanmar border has grown substantially over the past six to seven years, leading to intensified competition and depressed prices for logging firms and some primary processing companies. Shrinking profit margins have led and will continue to lead to consolidation among smaller and medium-sized companies, while driving away many larger firms. This process has already occurred in Ruili Municipality, which experienced an earlier boom and bust in its timber industry.[11] In Lushui County's main border town, Pianma, there are indications that some form of consolidation is imminent, as all large timber companies are operating at a deficit, and two out of the town's four companies have begun to close operations. Tengchong County is undergoing a similar transition, with larger companies beginning to explore other business options.

International Market Fluctuations: Heavily reliant on the international market for logs and sawnwood, prices are now transmitted from commodity markets to the Yunnan-Myanmar border by domestic, global, and in some cases regional or country-specific vectors. For instance, the 2003 outbreak of severe acute respiratory syndrome (SARS) had a severe impact on the Yunnan-Myanmar timber industry, due to both domestic (wholesale firms were unable to travel) and global (sanitation concerns over Chinese exports) influences. Political events have also affected both prices and sales in some cases. Economic downturn and political turmoil in South Korea, for example, severely depressed sales volumes for a large timber company in Lushui County that had been processing floorboards for almost exclusive export to South Korea.[12]

Resource Scarcity: Forest resources in Kachin State along the Yunnan border are being rapidly depleted; in many places forests have been logged 50 to 150 kilometers from the Yunnan border into Kachin.[13] Resource scarcity is transmitted through the supply chain via higher operational costs for logging companies and subsequent higher log prices for processors.

Higher Operational Costs: Road building is a costly enterprise in the remote hills of Kachin State, and road-building costs have brought some companies to the threshold of cost-effective logging. More generally, road building costs have experienced an upward trend as logging companies in Lushui and Tengchong Counties move their operations in Myanmar further west to the triangular region in Kachin State lying between the Mali Hka and N'Mai Hka Rivers, known in Chinese as *jiangxinpo* (江心坡).[14]

Higher Log Prices: Since 1997 the buying price of *dabaimu* (*Gonystylus spp.*) for Yingjiang County's largest processor has more than doubled from 600 yuan/m^3 to 1,300 yuan/m^3.[15] Similarly, in recent years the buying price of *tieshan* (*Tsuga spp.*) for Lushui County's largest processor has increased more than 35 percent from 1,100 to 1,500 yuan/m^3.[16]

[11] The number of sawmills in Ruili reportedly fell precipitously from around 500 in the mid- to late-90s to the roughly 50 at present (Interview with processing company staff, Ruili (Dehong), April 2004).
[12] Interview with timber company staff, Pianma (Nujiang), April 2004. In another example, because of the high concentration of Taiwanese investment in Guangdong Province and the heavy Guangdong influence along the Yunnan-Myanmar border, recent electoral turmoil in Taiwan ran tremors through much of the border timber industry (Interview with logging company staff, Houqiao (Baoshan), May 2004).
[13] Interviews with logging company staff, Tengchong (Baoshan), Houqiao (Baoshan), October 2003 and May 2004.
[14] Interview with logging company staff, Diantan (Baoshan), April 2004.
[15] Interview with processing company staff, Yingjiang (Dehong), April 2004.
[16] Interview with processing company staff, Pianma (Nujiang), December 2003.

Rising Fees and Costs: Fees and other charges, both in Myanmar and in Yunnan, have risen steeply since the upswing in the border timber industry. One interviewee estimated that fees in Myanmar are now three to four times higher per truck than they were four to five years ago.[17] Across the border in Yunnan, procedural fees for sawnwood in Tengchong County have reportedly increased from 120 yuan/m^3 in 1998 to the current rate of 160 to 200 yuan/m^3.[18] Higher fees in Myanmar and industry overcapacity have a direct relationship. Fee collection in some areas of Kachin State is contracted out and run for profit by former Tengchong County residents, many of whom moved to Myanmar in the mid 1990s. As long as rising fees do not influence demand — as long as there is overcapacity — fees will likely continue to rise.

ACTORS AND LIVELIHOOD ISSUES

Primary actors in the border timber industry include: border village and township communities, seasonal and permanent migrant workers, and local and migrant company executives.[19] Migration has intimately accompanied the border timber boom, and many border timber towns are characterized by sizeable floating populations. Among these, Pianma has the highest floating-fixed population ratio at 37,000 to 1,700.[20] Floating populations in Tengchong County's Diantan and Houqiao are similarly large, although the number of fixed residents is higher — Diantan has an estimated fixed population of 20,000 and a floating population of 40,000, with similar but slightly lower estimates for Houqiao.[21]

The large number of seasonal migrants, coupled with highly diverse and fluid industry conditions, greatly complicates attempts to assess the livelihood impacts of changes in the Yunnan-Myanmar border timber industry. The range of conditions among different actors in the border timber industry is captured in more standardized format in Tables 1 and 2. The text, alternatively, focused on elucidating more discrete themes among the three different sets of actors, including: i) border residents' participation in the timber trade, ii) safety and social issues associated with migrant workers, and iii) border timber companies' local economic contributions. Among the three primary actors noted here, it is important to note that the livelihoods of permanent residents — even when they are not direct participants in the timber trade — in and near border timber towns in both Yunnan and Myanmar are intricately wrapped up in the timber business and are much more vulnerable than non-residents to industry changes.

Border Residents: Pianma, Tengchong, Nongdao, and Kachin State

In Pianma Village, a predominantly Lisu ethnic minority administrative village just outside the town of Pianma, villagers are by and large not directly active in the timber trade. Most villagers claim that they lack the

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[17] Interview with processing company staff, Pianma (Nujiang), April 2004.
[18] Procedural fees primarily consist of the processing of a variety of documents required for outbound customs clearance. It should be noted that procedural fees are different across the region — mills in Pianma pay lower procedural fees of 120 yuan/m^3, although the service in Tengchong County is reportedly far superior.
[19] These are rough categories, and mask considerable sub-categorical nuance. For instance, migrant workers include both relatively unskilled labor and highly skilled technicians. 'Government' is another obvious actor in the Yunnan-Myanmar border timber industry, but is not a focus of this analysis.
[20] Interview with Pianma Border Trade Bureau staff, Pianma (Nujiang), April 2004.
[21] Interview with Forestry Bureau staff, Tengchong (Baoshan), May 2004.

contacts and the know-how to compete with either the entrepreneurial or the technical skills of industrial immigrants. On-the-job risks are also a significant deterrent. Only 20 to 30 of the village's 550 residents work seasonally in the timber business. Nevertheless, roughly 60 percent of villagers' income[22] reportedly comes from renting land, both to logging and processing companies and to immigrant farmers. Immigrant farmers contract out land from local villagers and sell cash crops at relatively high profits, as consumer prices in Pianma are at levels on par with Yunnan's provincial capital, Kunming. Villagers in Pianma benefit from the timber trade primarily through renting land and raising and selling livestock, rather than through farming.[23]

In Tengchong County, residents are much more directly active in the timber trade, both as workers and managers. Allegedly 50 percent of the county's population has, at some point, participated in the timber business (Kahrl et al. 2004). A significant portion of these are businesspeople rather than manual laborers. For instance, of the 70 households in Gudong Township, near Diantan, 10 have run timber businesses.[24] County-wide, the timber industry is much more locally entrenched than in areas further north and south. Before the influx of industrial migrants in the late 90s, the vast majority of businesses was locally run. In Diantan, migration has served to create unfriendly competition between locals and migrants, and local regulation tends to favor local residents.[25]

In Nongdao Township, a small border checkpoint in Ruili Municipality near the border between Myanmar's Kachin and Shan States, a number of villagers from Tengchong County spend the logging season (November to April) in Myanmar hauling teak on mules through road-inaccessible territory in Myanmar and across the border into Yunnan. This practice, although highly discouraged by the authorities in Myanmar (see Appendix 2), can net villagers 1,500 to 2,500 yuan per cubic meter hauled. There are reportedly as many as 10,000 mules operating in this fashion.[26]

According to residents in Pianma Village, village communities across the border in Myanmar's Kachin State[27] have benefited from the timber trade through renting out land to sawmills, restaurants, and casinos, and taking advantage from the spillover effects of being able to sell their produce and livestock more easily. Curiously, when asked what sorts of impacts the timber trade has had on border communities in Myanmar, Pianma residents cited water pollution from industrial runoff in Pianma, but logging was not mentioned.[28]

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[22] According to the deputy director of the Village Committee, villagers in Pianma are able to earn on average more than 10,000 yuan per year. This amount is roughly twice Yunnan Province's annual per capita income of 5,179 yuan (Yunnan Statistical Bureau 2003).

[23] The above passage is based on an interview with the Village Committee director of Pianma Village, Pianma (Nujiang), April 2004.

[24] Interview with Forestry Bureau staff, Diantan (Baoshan), May 2004.

[25] Ibid.

[26] The above passage is based on an interview with villagers in Nongdao (Dehong), April 2004.

[27] Along the Yunnan-Myanmar border there are a number of cross-border minorities, which, as in Pianma, meet regularly for market and cultural exchange.

[28] The above passage is based on interviews in Pianma Village, Pianma (Nujiang), April 2004.

Table 1: Range of Conditions – Border Villagers, Town Residents and Migrant Workers

Actor	Means of benefiting from the timber trade	Typical amount earned	Livelihood risks and issues
Villagers and Town Residents	Renting land*	~6,000 yuan/year	Land conflict
	Livestock rearing*	~3,000 yuan/year	Price fluctuations
	Logging & basic processing	20-50 yuan/day	Occupational hazards Malaria
	Hauling teak**	1,500-2,500 yuan/m^3	Occupational hazardsMalaria
	Business	Variable	Price fluctuations
Migrant workers	Cash crops***	~10,000 yuan/year	Price fluctuations
	Logging & basic processing	20-80 yuan/day	Occupational hazards Malaria
	More advanced processing	160-240 yuan/day	Occupational hazards
	Driving/transport	n/a	Occupational hazards
	Technical work	Up to 24,000 yuan/year	Occupational hazards
	Other odd jobs	Unloading: 40-50 yuan/truck Loading: 150-300 yuan/truck	Occupational hazards

*It is not clear how pervasive renting land is as a revenue generator for villagers; for instance, although villagers in Pianma rent land to sawmills, in Diantan, sawmills are only allowed to operate in specially zoned areas, and pay rent to the township government.
** This practice is limited to areas in Ruili Municipality.
*** This practice is limited to Pianma Township.Sources: Interviews in Pianma (Nujiang), Yingjiang (Dehong), Diantan (Baoshan), and Houqiao (Baoshan),October and December 2003, April and May 2004.

Migrant Workers: Safety and Social Issues

Migrant workers participating in the Yunnan-Myanmar border timber trade come from virtually every province across China. Additionally, as described in the "Border Residents" section above, border residents — primarily from Tengchong County — are frequent seasonal migrants to other prefectures along the Yunnan-Myanmar border. However, along the Myanmar border in northwest Yunnan, a plurality of skilled technical workers come from Sichuan Province, while intermediaries and other businessmen tend to come from Fujian Province. Many workers come at the request or recommendation of relatives or friends. Highly specialized technical and managerial workers, for instance, are typically brought by company heads from their hometowns.

Although the hesitance of villagers in Pianma Village to seek employment in logging or processing jobs for safety reasons appears to indicate sub-optimal working conditions in nearby logging and processing companies, conditions along the Yunnan-Myanmar border are likely not much different from other areas of China. Safety precautions are largely non-existent and migrant workers face risk from multifarious sources. Employees in sawmills across northwest Yunnan, for instance, typically do not use gloves or safety goggles. For loggers, malaria in Myanmar can be a problem, and several workers had died from malaria already in the first several months of 2004.

The recent wave of migration to the Yunnan-Myanmar border has, in some areas, led to a visible increase in social maladies, most notably a rise in gambling, drugs and prostitution. The influx of migrant workers has created a "wild west" atmosphere in Pianma[29] and Diantan; casinos lie directly across the border from each. Further south, Yingjiang and Ruili have long been convergence points for heroin trafficking, prostitution, migration and AIDS/HIV.[30] More recently, however, Dehong Prefecture, in particular Ruili (Cohen 2004), has received considerable support from Chinese agencies and international organizations to suppress the heroin trade and stem the spread of AIDS.

High levels of domestic migration are a relatively recent phenomenon in China, and migration has exploded with gradual changes to the country's household registration system — from 2 million migrants in the mid-1980s to an estimated 88 million in 2001 (Huang 2003). While some research has been conducted on migrants themselves and migration's effects on socio-economic conditions in sending areas, much less attention has been given to the equity implications of increased migration for receiving area societies. As noted at several points in this study, the ability of migrant workers from specific regions to corner and dominate access to certain markets requires particular attention.

Companies: Local Economic Effects

Overwhelmingly, both logging and processing companies along the Yunnan-Myanmar border are privately owned; state-owned forest enterprises dealing in Myanmar timber are uncommon. In addition, with the exception of some businesses in Tengchong County, timber companies along the border are, by and large, not indigenous. Companies exhibit a variety of sizes and forms, ranging from initial investments of 100,000 yuan and 5 staff to 160 million yuan and 1,000 staff (see **Table 2**).

Timber industry expansion along the Yunnan-Myanmar border has created a limited number of short-term multiplier effects, including a booming tertiary sector led by the transport industry and, as noted above, opportunities for a variety of forms of more indirect participation. However, the preponderance of these effects has been driven solely by the timber industry, and timber companies, conversely, have a generally low level of embeddedness in local economies.[31] Greater local embeddedness is constrained by an absence of longer-term natural and physical resource and organizational investments.

Low natural and physical resource investments: Logging and processing are typically viewed as short-term business options. Small- and medium-sized logging companies tend to sell timber through spot sales rather than by contract. This choice has much to do with the short duration with which most small- and medium-sized logging companies purchase logging contracts; they are more concerned with being able to harvest and sell as much as possible within the timeframe specified in the contract than being able to sell at contracted or guaranteed prices, or waiting to harvest until prices are higher. Small- and medium-sized processors similarly tend not to invest in factories and modern equipment, and many sell through spot sales as well.

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[29] See Pomfret (2001) for an illustrative description of Pianma.
[30] Ruili was once known as the "AIDS capital of China," and China's first case of AIDS was officially discovered there in 1989 (McGregor 2001). For more detailed information about the connection between migration and AIDS in Ruili, see du Guerny et al. (2003).
[31] As noted previously, embeddedness ranges from extremely low levels in Lushui County, to fairly low levels in Yingjiang County, and to moderate levels in Tengchong County.

Low organizational investments: Low investment in natural and physical resources leads to similarly low investment in organizational capacity. A number of companies, particularly in Lushui County, are allegedly just attempting to recover initial investments before pulling out of the timber business.[32] Curiously, executives at a larger timber company attribute the fact that a number of smaller companies are able to remain profitable in an environment where larger companies have been unprofitable to their virtual lack of management structures and associated costs.[33]

Table 2: Range of Conditions – Logging and Processing Companies

Actor	**Initial investment (yuan)**	**Earnings (yuan/year)**	**Workers (fixed/ seasonal)**	**Annual amount logged/processed**
Large company	1 million-1.6 billion	Losing money	60/100-1000	10,000-70,000 m^3
Large processing company	1 million-5 million	70,000-80,000	15-20/300	4,000-50,000 m^3
Medium-sized processing company	200,000-1 million	40,000-50,000	7-9/10-50	2,000-3,000 m^3
Small-sized processing company	100,000-200,000	20,000-30,000	~5/7-10	500-2,000 m^3
Medium-sized logging company	200,000-1 million	n/a	~10	1,000-10,000 m^3
Small-sized logging company	100,000-200,000	Year to year	2-3/10-50	200-1,000 m^3

Sources: Interviews in Pianma (Nujiang), Yingjiang (Dehong), Diantan (Baoshan), and Houqiao (Baoshan), October and December 2003, April and May 2004.

INNER YUNNAN: KUNMING AND NORTHWEST YUNNAN

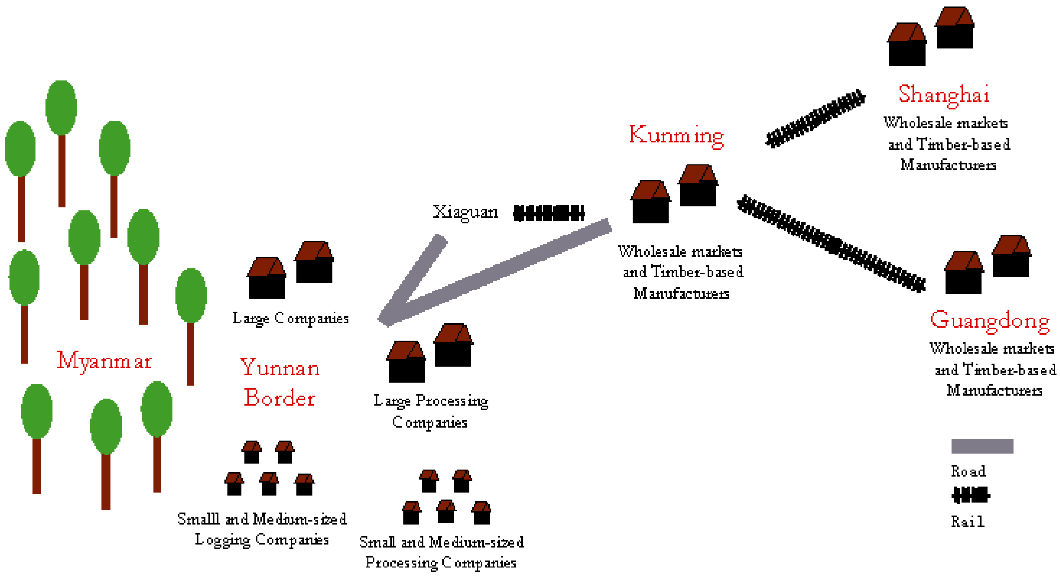
MARKET STRUCTURE

Industry and Trade Patterns

A majority of Yunnan's log imports from Myanmar undergo crude processing into sawnwood at the border, and are shipped by truck to Xiaguan (Dali) and then on to Kunming, or often directly to Kunming (see **Figure 1**). As the supply chain moves eastward away from the Yunnan-Myanmar border, a more definite industry structure takes hold. Sawnwood and other primary timber products tend to be consolidated in medium- to large-scale wholesale timber markets which service a range of downstream timber manufacturers. Larger manufacturers at times do their own sourcing, buying direct from logging companies or upstream processors.

[32] Based on a series of interviews conducted in Nujiang Prefecture, Baoshan Municipality, and Dehong Prefecture in 2003 and 2004.
[33] Interview with timber company staff, Pianma (Nujiang), April 2004.

Figure 1: Primary Routes for China's Timber Product Imports from Myanmar



Kunming serves as an intermediary processing, wholesale and retail hub for Myanmar sawnwood, and some roundwood, shipped from the border. Increasingly, however, the city is instead an intermodal transit point between the Yunnan-Myanmar border and wholesale markets and manufacturers in China's east coast cities. Provincial statistics indicate that Kunming's fiber-based manufacturing business contracted sharply beginning in 1998 — the value of the city's primary fiber-based processing industries[34] fell 83 percent from 1997 to 2002. Furniture manufacturing lost 57 percent of its value from 1997 to 2002 (Yunnan Statistical Bureau 1998 and 2003). While wood-based panel production has remained steady both in absolute terms and as a percentage of total provincial production, sawnwood production plunged both in absolute (from 99,827 m^3 to 3,771 m^3) and relative (from 11 to 2 percent of total provincial production) terms (Yunnan Statistical Bureau 1998 and 2003).

Nevertheless, sawnwood, most of it processed elsewhere, remains the key inventory item in Kunming's main wholesale timber market — Xinan Timber Market. Xinan deals primarily in timber products from Myanmar, Simao District, and, in some cases, Baoshan Municipality.[35] The prevalence of Myanmar timber products varies across companies, with some dealing primarily in Myanmar timber and others much less so; no estimate exists for the percentage of Myanmar timber products in the market.[36] The most popular woods from Myanmar include Chinese hemlock (*Tsuga spp.*), *xinanhua* (*Betula spp.*), *shuidonggua* (*Adina spp.*), walnut, and, to a lesser extent, teak.

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[34] Processing of timber, bamboo, and rattan, as well as palm and agricultural fibers are encompassed in this statistic.
[35] Together, Simao District and Baoshan Municipality produce most of Yunnan's timber — in 2001, Simao accounted for 68 percent of Yunnan's industrial wood production; Baoshan Municipality was the next highest producer at 12 percent (Yunnan Statistical Yearbook 2002).
[36] Among the companies in Kunming interviewed for this study, averages ranged from 40 to 70 percent.

While higher-value timber product imports from the Yunnan-Myanmar border travel east toward Kunming, intermediary and final destinations of lower-value timber[37] imports are less clear. For instance, there are indications that cheaper Myanmar woods may be imported for use in construction in northwest Yunnan's booming tourist city of Lijiang; the entire administrative area of Lijiang Municipality — of which the city of Lijiang is part — was included in the logging ban.

Industry Structure

Most of the companies housed in Xinan Timber Market are small- and medium-sized firms, although larger downstream timber manufacturers sit on the outskirts of Kunming. Some wholesale and retail outlets in the city have processing facilities along the border, while others purchase logs from the border, have them processed there and then shipped to Kunming. Higher quality woods, particularly teak, often undergo more extensive processing on demand. As noted in the section "Eastern Seaboard", this is part of a larger process of transition toward a more demand-driven business model in the intermediary timber product market.

Profits and Price Determinants

Although the timber industry in Kunming is influenced by price factors similar to those that shape the Yunnan-Myanmar border timber industry, changing transport costs play a much more significant role in determining company fortunes in Kunming. Shipping fees have risen significantly in recent years on both of the following two routes:

Yunnan-Myanmar Border to Kunming: In particular, more stringently enforced limits on maximum allowable truck loads have contributed to higher transport costs. For instance, for one wholesaler, transport costs have risen 15 percent per ton in recent years.[38] This phenomenon is similarly visible from rising transport costs among processors along the Yunnan-Myanmar border. In Yingjiang, for instance, shipping prices have reportedly increased by more than 25 percent since 1997.[39] In Tengchong, the price of shipping has roughly doubled since 1998.[40]

Kunming to Guangdong/Shanghai: The vast majority of timber products are shipped to the east coast by train, making reliable access to compartment space indispensable for timber businesses both along the border and in Kunming. Customers of companies in Kunming, however, have had increasing difficulty renting train compartments. Part of this can be explained by provincial rules, which give priority to agricultural goods. Another factor may be the growing competition for compartment space, although space allocation is not explored in more depth here.

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[37] "Hill prices" — roundwood prices — in Myanmar are separated into three categories. The first category is ordinary assorted woods (普通杂木: *putong zamu*); the second category comprises medium value timber, such as surian (*Toona sp.*); the third category comprises high value hardwoods, such as *xinanhua* (*Betula spp.).* Although the latter two categories are ubiquitously found in east coast markets, the former is largely absent.
[38] Interview with timber wholesale company staff, Kunming, June 2004.
[39] Interview with timber processing company staff, Yingjiang (Dehong), April 2004.
[40] Interview with timber processing company staff, Tengchong (Baoshan), October 2003.

ACTORS AND LIVELIHOOD ISSUES

Wholesalers, manufacturers, retailers and their employees are the most immediate actors in the China-Myanmar timber trade as it reaches Kunming and inner Yunnan. As noted above, restrictions on provincial timber production have put enormous stress on Kunming's timber processing industry. In equal measure, both wholesale and downstream manufacturing consolidation on China's east coast have increased competitive pressures on Kunming firms, as prices in Shanghai, Guangdong, and Kunming are roughly similar (see **Appendix 3**) even as companies in Kunming lack similar access to downstream manufacturers and overseas customers. Competition from east coast companies may, in addition, be frustrating the efforts of Kunming wholesale companies' customers to find train compartments for shipping lumber. The combination of these factors appears to be squeezing wholesale companies in Kunming out of business.[41]

As on the Yunnan-Myanmar border, the great majority of wholesale companies in Kunming are privately owned. Likewise, industrial migrants are ubiquitous. Businesses in Kunming's Xinan market, for instance, are pre-dominantly run by migrants from Fujian Province. Employees in Kunming's greater timber industry come primarily from South and Southwest China — from other prefectures in Yunnan and from Guangxi, Jiangxi, Guizhou, and Hunan Provinces. Timber-processing industry employees are lower to average urban wage earners, grossing a monthly salary of 800 yuan. Highly skilled workers can earn as much as 1,800 yuan a month (see **Table 3**) in downstream timber manufacturing companies. Working conditions in Kunming showe a marked improvement over the Yunnan-Myanmar border, due in part to differences in their respective positions in the industrial chain. Processing in the latter is largely confined to turning logs into transportable planks. The former is dominated by medium- to higher-end manufacturing, which uses more skilled labor and more advanced equipment.

Indirectly, China's timber trade with Myanmar involves a much broader set of livelihoods in inner Yunnan because of its implications for provincial forest production. Although not an explicit focus of this analysis, some of these issues are touched upon in the conclusions.

Table 3: Range of Conditions – Kunming Wholesale, Manufacturing, Retail Companies and their Employees

Actor	Initial investment (yuan)	Earnings (yuan/month)	Workers (number/company)
Large processing company	1 million-5 million	n/a	500
Small and medium-sized processing company	200,000-1 million	n/a	7-50
Typical workers	n/a	800 / month	n/a
Highly skilled workers	n/a	1,700-1,800 / month	n/a

Sources: Interviews in Kunming, June 2004.

[41] Roughly half of all businesses were closed during a visit to Xinan Timber Market in June 2004.

EASTERN SEABOARD: SHANGHAI AND GUANGDONG

MARKET STRUCTURE

Industry and Trade Patterns

The intermediate market for Myanmar timber products is heavily concentrated in China's southeastern and eastern provinces, and Guangdong Province and Shanghai Municipality are the largest domestic destinations for timber product imports from Myanmar.[42] In Guangdong, Guangzhou's Yuzhu International Timber Market and Dongguan Township's Houjie Xingye Timber and Plywood Market are the province's two largest timber wholesale markets; Furen Forest Products Wholesale Market is Shanghai's largest.[43] All three markets were either established or began to expand in 1999, and projected shortfalls in domestic production and tariff reductions in January earlier that year were deciding factors in their creation and development.[44] Yuzhu, Xingye and Furen are wholesale markets — essentially hubs for wholesale companies that retail to downstream timber manufacturers — which sell little in the way of finished retail products. The main products, estimated sales (if available), and main Myanmar timber species of each are listed in **Table 4**, below.

Table 4: Main Products, Total Output, and Main Myanmar Timber Species in Yuzhu, Xingye, and Furen Wholesale Markets

Market	Main Products	Number of Companies	Total Annual Sales*	Main Myanmar Timber Species
Yuzhu	Furniture materials, veneers, flooring materials, wood-based panels, logs, sawnwood	~300	n/a	Tamalan, Teak, Chempaka, Daru-daru, Surian, Padauk,
Xingye	Furniture materials, flooring materials, veneers, wood-based panels, sawnwood	~300	200-300,000 m^3	Chempaka, *Shuidonggua*, Daru-daru, Keruing, Teak, Padauk, *Xinanhua*, Black walnut, Mono maple, Ramin, Chinese hemlock
Furen	Furniture materials, flooring materials, wood-based panels, veneers, sawnwood	~170	150-200,000 m^3	*Xinanhua*, Teak, Padauk, Keruing, Tamalan, Chempaka, Ramin

Sources: Interviews with staff, promotional material and websites of Yuzhu International Timber Market, Houjie Xingye Timber and Plywood Market, and Furen Forest Products Wholesale Market, Guangzhou, Guangdong, and Shanghai (see **Appendix 4** for website information).
* Yuzhu did not have estimates available for total sales output.

[42] See Appendix 4 for a list of China's main wholesale markets.
[43] These three markets are not the only wholesale markets in Guangdong and Shanghai that deal in Myanmar timber; other major markets include, for example, the Jilong Timber Market in Guangdong (see Appendix 4).
[44] Interviews with staff from Yuzhu International Timber Market, Houjie Xingye Timber and Plywood Market, and Furen Forest Products Wholesale Market, Guangzhou, Guangdong, and Shanghai, July 2004.

Products using Myanmar timber comprise a significant portion — an estimated 30 to 40 percent — of wholesale products in each market.[45] The five most popular timber species in these three markets are hardwoods: teak, padauk, *xinanhua*, keruing and walnut. On the other hand, Russian hard and softwoods, which form the bulk of China's timber product imports and are imported in large volumes from northern China into Guangdong,[46] comprise less than 20 percent of the three markets' timber stocks.[47] The disproportionate abundance of Myanmar timber products in Guangdong and Shanghai's major wholesale markets suggests that i) the majority of primary timber products from Myanmar shipped overland through Yunnan are shipped to these two areas, ii) wholesalers are misrepresenting the origin of their products, or iii) national customs statistics are inaccurate. Regionally, the high concentration of tropical and higher quality hardwood in wholesale markets in China's east and southeast reflects the dual patterns of greater timber industry liberalization – with the partial elimination of import and export licenses in 1999 – and growing manufacturing specialization on the east coast – with building materials markets further north, and furniture, flooring and interiors markets further south.[48]

Over the past five years, Myanmar timber product inventories have increased in absolute terms, but the volatile nature of timber prices and subsequent changes in trade volumes makes it difficult to assess changes in relative growth. Some of the recent influx in Myanmar timber can be attributed to a rising use of Myanmar woods as substitutes for more expensive hardwoods. In Xingye, for example, *xinanhua* (*Betula sp.*) is often dyed and sold as red walnut. Catering more to China's domestic market, Myanmar woods are also employed in smaller volumes as part of a growing trend toward laminated and composite woods as an economical substitute for solid wood furniture and interiors.

Industry Structure and Size

As noted above, Yuzhu, Xingye, and Furen are primarily wholesale markets — their customers consist of the furniture, joinery and flooring, doors and interiors manufacturers that process sawnwoods, wood-based panels, and veneers into final products. In Xingye, the majority of wholesalers' customers come from Dongguan's more than 2,000 furniture manufacturers.[49] Yuzhu and Furen service downstream timber product manufacturers in greater China, some of whom frequent the two markets from as far away as

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[45] Ibid.

[46] According to China's national customs statistics, Russian timber products encompassed 41.37 percent of China's total timber product imports in 2002 (Sun et al. 2004). Guangdong's provincial statistics indicate that Guangdong's inter-provincial imports from Heilongjiang and Inner Mongolia (chiefly Russian timber) were 15 times larger than its inter-provincial imports from Yunnan (chiefly Myanmar timber) (Interview with Forestry Bureau staff, Guangzhou (Guangdong) July 2004).

[47] This is not to question the pervasiveness of Russian wood imports in China's wholesale timber markets. The standard Russian softwood imports (see Appendix 1) dominate at wholesale markets further north, and particularly timber product markets in Hebei and Shandong (see Appendix 4). Hebei and Shandong, in turn, produce 43 percent of China's wood-based panels (Global Timber & Wood Products Network website, http://www.globalwood.org/market1/aaw0601d.htm [July 2004]).

[48] Guangdong, Fujian, Zhejiang, Shanghai, and Jiangsu collectively produced 82 percent of China's furniture for export in 2002, rising to 87 percent in 2003 (Shanghai Furniture Association website, http://www.shfurniture.com.cn/ [July 2004: in Chinese], based on official customs statistics).

[49] Xingye website, http://www.chinatimber.org/xy/intro.asp (July 2004) [in Chinese]. Guangdong Province has more than 9,000 furniture manufacturers, and currently accounts for more than half of all of China's furniture exports by value (interview with Forestry Bureau staff, Guangzhou [Guangdong], July 2004).

northeast China. Scale, choice, service, brand name and convenience have all played a role in consolidating Yuzhu, Xingye and Furen's dominant market positions and have increased competition among them. One molding manufacturer from Shandong Province remarked that he bypasses the much closer Furen for Yuzhu because of larger selection and convenience.[50]

Yuzhu, Xingye and Furen house approximately 300, 300 and 170 companies, respectively. In and among the three markets, company size varies, ranging from small wholesale outlets that act as pure intermediaries, to larger outlets that do more downstream processing.[51] Medium-sized and larger firms in Yuzhu, Xingye and Furen are often part of family-run operations that extend horizontally from Shanghai and Guangdong to the Yunnan-Myanmar border. While wholesale timber product markets play a central role as intermediaries in China's timber-based manufacturing industry, some larger downstream timber product manufacturers in Guangdong and Shanghai source raw materials directly from abroad, either overland through northern and southwestern provinces or by sea.[52] Many of these larger firms are part of joint-investment companies — a large number of which have been established with Taiwanese and Hong Kong investment — and many re-export.[53]

Leaving wholesale markets, the timber industry proliferates into an array of wood-based manufacturers, making everything from hardwood chests to wooden toys. Although scattered companies produce in large volumes, the majority of companies are small and medium-sized with relatively modest levels of production. Of Guangdong's estimated 9,000 furniture manufacturers, for instance, approximately 100 could be classified as large scale (over 100 million yuan in turnover).[54] Because of this diffuse composition as well as companies' diverse hardwood import sources, linkages between Myanmar timber and manufacturing use become more tenuous outside of wholesale markets. In the aggregate, higher value wood-based products are mostly exported; 'furniture' comprised nearly 44 percent by value of China's wood-based exports in 2002 (SFA 2003).

Industry Profits and Price Determinants

Although, as noted below, prices for Myanmar timber at wholesale markets in Shanghai and Guangdong have slid as competition becomes more intense, more recently timber product prices have generally been more stable than along the border. For instance, spot prices for teak and *xinanhua* at Yuzhu remained relatively

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50 Interview with company executive, Guangzhou (Guangdong), July 2004.

51 In Furen, for example, roughly 10 percent of all companies are "larger" companies; in Xingye, however, larger companies comprise a much less significant 2 percent. In both markets "medium-sized" companies are greatest in number.

52 Overland imports shipped inter-provincially create considerable confusion in industry parlance. For instance, the great majority of "domestically-produced timber" (国产材: *guochan cai*) from Yunnan is actually "cross-border timber" (边贸材: *bianmao cai*) from Myanmar. Timber products produced in China with Myanmar roundwood, which constitute the bulk of China's timber product imports from Myanmar, are often labeled in wholesale markets as *guochan* or *yunnan cai* (Yunnan timber).

53 This is particularly true of Taiwanese firms. Of the 40 furniture production lines in Guangdong, roughly 80 percent are Taiwanese invested (Woodlab website, http://woodlab.org.cn/News/entry.cfm?NewsID=144 [July 2004: in Chinese]).

54 Interview with Forestry Bureau staff, Guangzhou [Guangdong], July 2004.

stable throughout the latter half of 2003 and 2004.[55] Part of this stability can be attributed to nascent efforts by Yuzhu, Xingye and Furen to limit price volatility by posting price information on websites, in marketing brochures, or in front offices. More recent price fluctuations have typically been the result of periodic fads within the furniture and interior design industries, and subsequent over-concentration, rather than price signals from the Yunnan-Myanmar border. Although overstocking — where wholesale companies import raw materials without corresponding market analysis — is still a recurrent phenomenon,[56] overall the wholesale timber industry is becoming increasingly sophisticated.

As along the Yunnan-Myanmar border and in Kunming, the timber industry in Guangdong and Shanghai has become increasingly oversaturated and profit margins have diminished as competition becomes more intense. While most businesses remain profitable, average profits for wholesalers have fallen considerably in the last two to three years. For instance, from roughly 1999 to 2001, companies in Xingye were able to earn an estimated average of 300 to 400 yuan per cubic meter; by 2002, profit margins had slipped to 200 to 300 yuan per cubic meter; beginning in 2003, margins had fallen to 100 yuan per cubic meter.[57] Still, price differentials between roundwood sold at the border and sawnwood sold along the coast are substantial (see **Appendix 3**).

ACTORS AND LIVELIHOOD ISSUES

As the market chain for imported timber products from Myanmar moves eastward, dependence on access to or a supply of wood from Myanmar decreases considerably. Although the larger size and number of manufacturers exponentially expands the number of actors involved, in cities along China's east coast livelihoods are not exclusively dependent on the China-Myanmar timber trade. With the notable exception of teak, most of the timber products currently imported from Myanmar can be sourced from other countries (see **Appendix 1**). Myanmar teak, additionally, is not harvested near the Yunnan-Myanmar border and a reduction in logging along the border does not imply a reduction in teak imports to China's east coast. Because of their scale, sourcing abilities and the substitutability of most Myanmar hard and softwoods, the impact of a decline in Myanmar timber product imports on wholesale markets and downstream timber manufacturers in Guangdong and Shanghai and on their employees is likely to be short term or negligible.[58] More conspicuous impacts on the wholesale and timber manufacturing industries are likely to come from industry-wide shocks.

Diversities of scale and composition among wood-based manufacturers amplify the complexity of gauging potential industry impacts. As noted above, the bulk of these companies are now small and medium-sized,

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[55] The spot price of Myanmar teak moved within a band of 7,000-12,000 and 8,000-11,800 yuan. The spot price of *xinanhua* ranged between 3200-3700 and 3400-3800 yuan (Yuzhu website, http://www.yuzhuwood.com [July 2004 | in Chinese]).

[56] Recent examples of overstocking include Douglas fir, okoume, beech, and (most recently) radiata pine (Global Timber & Wood Products Network website, http://www.globalwood.org/market1/market0401.htm [July 2004]).

[57] Interview with Houjie Xingye Timber and Plywood Market staff, Dongguan (Guangdong), July 2004.

[58] An interesting example to compare this to is Indonesia's logging ban in 2001, which plunged China's log imports from Indonesia by 887,074 m^3 (Sun et al. 2004). Most of this shortfall was covered by a roughly commensurate increase in log imports from Malaysia and Papua New Guinea (Sun et al. 2004), as well as a parallel industry shift to smaller-diameter softwoods (SFA 2002), with little macro-level effect on the overall industry.

and larger and smaller companies employ different levels of manufacturing technology. In Guangdong's furniture industry, for instance, larger companies have a disproportionately smaller number of workers. Large companies employ 200 to 300 workers; small and medium-sized companies typically employ less than 100.[59] Large furniture companies in Shanghai employ roughly 170 workers on average, while medium- and small-sized companies employ an average of 140 and 75 workers, respectively.[60] As in other manufacturing sectors along China's eastern seaboard, migrant labor is ubiquitous. Most of the workers in Guangdong and Shanghai's furniture industries are not local; in Shanghai, migrant workers comprise roughly 70 percent of the labor force.[61] Workers come from across greater China, but from Fujian, Hunan, Zhejiang and Sichuan in particular. The extent to which this migration might be more permanent than industrial migration along the border is uncertain.

FINAL CONSUMERS: CHINA AND ABROAD

Given China's diverse hardwood import sources, coupled with the diffuse nature of the country's timber-based manufacturing industry, there is a statistical disconnect between China's imports of timber products and its production, domestic use and export of finished products.[62] As China's capacity as a re-exporter of high value, finished wood-based products and its reliance on wood imports grows, this divide becomes increasingly difficult to bridge.[63] Given the lack of direct statistics, establishing links between imports, production of finished wood products, domestic use and exports must rely a great deal on inference. Anecdotal evidence gathered in this study suggests that a majority of Myanmar timber product imports are manufactured into furniture and floorboards, and that a significant portion is then re-exported.[64] Myanmar timber that is manufactured for domestic use, because of its higher cost, is typically processed into veneers that overlay composite boards. Lower value wood imports, such as walnut, Chinese hemlock (*Tsuga spp.*) and *xinanhua* (*Betula spp.*), are more likely to be processed into solid wood products for domestic consumption.

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[59] Interview with Forestry Bureau staff, Guangzhou [Guangdong], July 2004.
[60] Personal communication, Shanghai furniture industry employee, December 2004. Shanghai's furniture industry employs roughly 226,000 workers, 78 percent of whom worked in small- and medium-sized companies.
[61] Personal communication, Shanghai furniture industry employee, December 2004.
[62] This disconnect exists even between wholesalers and manufacturers, as wholesale companies appear to be increasingly reticent to divulge business information as competition rises. For instance, management from Yuzhu, Xingye and Furen reported difficulties in persuading their customers to reveal details about their business and clients. Similarly, interviews in Pianma (Nujiang) revealed that broader intra-firm cooperation has evaporated as the timber-based industry becomes more crowded and competitive.
[63] For instance, a majority of high value, hardwood furniture exported from China to the United States is manufactured from low volume but high value hardwoods imported by China from the United States (Interview with American Hardwood Export Council staff, Shanghai, July 2004; Brabant [2004]).
[64] This is supported by broader export trends for the main markets for Myanmar timber products. In Dongguan, for instance, an estimated 80 to 90 percent of the furniture produced is exported. In Shanghai, the percentage of downstream timber products exported is roughly 50 percent (Interviews with Forestry Bureau and Furen Forest Products Wholesale Market staff, Guangzhou and Shanghai, July 2004).

Several retailers interviewed for this study point to Japan and South Korea as the main destinations for secondary processed wood products manufactured with Myanmar timber,[65] with lesser amounts exported to Malaysia and Thailand. The United States and Hong Kong — China's top two destinations for furniture exports in 2003[66] — are also likely importers of furniture produced with Myanmar timber. Hong Kong's status as an export destination is misleading, however, as the territory is primarily a transit hub for outbound exports from the mainland; 99 percent of Hong Kong's billion dollar (US$) furniture exports in 2000, 2001 and 2002 were re-exports from mainland China, and 70 percent of these exports were shipped to the United States.[67]

CONCLUSIONS: INFLUENCING POLICY BEFORE MARKETS

The timing of China's logging ban and concurrent increases in wood product imports have given rise to the assumption that restrictions on domestic production engendered a relatively linear increase in wood product imports. A closer look at emergent trends in China's timber market, however, urges more qualified assessments. Although forest product tariff reductions in 1999 were likely intended to ensure a continuous supply of timber in the wake of the logging ban, these reductions, vast improvements in domestic manufacturing capacities and the pursuant agglomeration of wood-based industries in key manufacturing hubs along China's east coast may have had the potentially unintended consequence of consolidating China's emergent role as a re-exporter of finished wood-based products. More simply, the sharp increase in China's higher value, primary timber product imports may be serving in substantial measure to meet demand among international, rather than domestic, consumers. This distinction is not simply semantic — efforts to improve China's national forest management regime to meet shortfalls in intermediate demand for timber products (Zhang 2003), in particular, should be based on a sophisticated understanding of the degree to which increases in domestic production might offset log and lumber imports. Domestic policies to encourage the use of faster growing plantation softwoods in the construction sector, for instance, would not reduce hardwood imports destined for the furniture industry. More relevant here, adjusting domestic supply of or demand for forest products in China would not necessarily serve to significantly reduce the scale of logging in Myanmar in the near to medium future.

[65] This falls within expectations, as Japan and South Korea are the major Asian destinations for Chinese timber and timber-based products. The two countries, for instance, are the largest two destinations for Chinese plywood Brabant (2004). Japan is the second largest (behind Hong Kong) and South Korea is the third largest Asian importer of Chinese furniture (Shanghai Furniture Association website http://www.shfurniture.com.cn/hyxx_papge89.htm [July 2004: in Chinese])
[66] Shanghai Furniture Association website, http://www.shfurniture.com.cn/hyxx_papge89.htm (July 2004) [in Chinese].
[67] Global Timber & Wood Products Network website, http://www.globalwood.org/market/HKfurn.htm (July 2004).

LIVELIHOOD IMPACTS OF A BORDER TIMBER INDUSTRY DOWNTURN ACROSS THE MARKET CHAIN

Myanmar represents a special case among countries that export timber and timber products to China. Because the vast majority of logging in Myanmar that supplies timber to China is done by Chinese companies, the social implications of a downturn in logging in Myanmar along the Chinese border fall primarily within China's, rather than Myanmar's, borders. With few efforts on the part of Myanmar's military government to extend an enforceable regulatory framework to forests along the Chinese border in its northern Kachin State, extensive and intensive logging will soon largely deplete China's supply of timber from northern Myanmar. Industry estimates for how long logging can continue at a sustained scale generally range from 5 to 15 years, varying by prefecture.[68] The impacts of an eventual industry contraction are similarly likely to vary, within towns, from north to south along the Yunnan-Myanmar border, and from west to east from the border to China's eastern seaboard.

The spillover effects from a substantial drop in the border logging industry are likely to be much more severe on border residents, particularly on permanent residents, than on migrants, many of whom would ostensibly leave without other revenue generating opportunities. On both sides of the border, the extent of ecological damage caused by nearly 20 years of persistent and 6 years of intensive logging,[69] and its impact on border residents needs to be assessed. Among prefectures in northwest Yunnan, Tengchong and Yingjiang counties have more options available, as overland trade routes open up from China to India and areas further south in Myanmar.[70] Lushui County and Nujiang Prefecture as a whole, however, has fewer alternatives outside of the logging business.

In inner Yunnan, livelihood implications are likely to be more mixed. More at issue for companies in, for example, Kunming is the increased competitiveness of firms along the eastern seaboard. The challenge for greater Yunnan, instead, is to develop niche markets for forest products and, in particular, build a higher-quality, socially and environmentally sustainable timber supply through improved plantation and collective forestry, as discussed below. At a broader scale of resolution, the impact of a diminished supply of Myanmar timber on east coast firms, which can find readily available substitutes, is likely to be far less severe than on the border, where local economies are overly reliant on the border timber trade.[71]

[68] Estimates are based on more than 50 interviews in Yunnan, Guangdong, and Shanghai conducted for this and a previous study (Kahrl et al. 2004). Estimates tend to vary from lower further north in Pianma (Lushui County), to higher further south in Yingjiang (Yingjiang County).
[69] Logging by Chinese companies in northern Myanmar began in the mid 1980s when the Yunnan-Myanmar border was first opened.
[70] It should be noted, however, that Myanmar's exports to China were dominated by "softwood and timber" (软木及木材: *ruanmu ji mucai*), which accounted for 71 percent of total exports by value in 2002 and 68 percent in 2003 (MOFCOM website, www.mofcom.gov.cn [July 2004; in Chinese]). Efforts to promote cross-border trade as an alternative to logging and poppy production must be complemented with more focused extension assistance and market support.
[71] More generally, logging towns along the border have extremely under-diversified economies. Even Yingjiang, which has a booming jade trade to accompany its timber business, is highly vulnerable. According to one interviewee, "Without buyers from the east coast Yingjiang would collapse."

SHORTER- AND LONGER-TERM LEVERAGE POINTS

Three issues deserve the attention of Chinese agencies, international organizations and the donor community:

- Transitioning border residents away from a reliance on the timber industry as part of broader support programs in northwest and western Yunnan;
- Assessing and mitigating the cross-border ecological damage from logging in Kachin and Shan States;
- Developing a more sustainable supply of timber in Yunnan through improving state plantations and collective forest management.

All of the above areas require government engagement and involvement as an initial step; there are no "pure" market-based tools — those without initial government intervention — with which to transition the timber market in Myanmar and Yunnan toward more sustainable footing. Each of these three key issues is discussed in turn below.

Transitioning border residents away from a reliance on the timber industry as part of broader support programs in northwest and western Yunnan (shorter term)

Boom and bust cycles of the sort that typically accompany rapid timber exploitation are a relatively new issue in China, previously constrained by migration and industry controls. Evidence from the United States (Power 1996) illustrates that employment levels, income, and economic growth are higher in communities that have diversified economically than in those where timber jobs dominate. Still, in timber towns along the China-Myanmar border and to some extent in border prefectures, local governments are likely to continue to pursue volatile single commodity development models. A number of county and township governments along the border, for instance, are convinced that mining in Myanmar is a logical next step, once the supply of forests is exhausted.

The over-reliance of border economies on natural resource exploitation in Myanmar is a symptom of a broader, prefecture-level — particularly in northwest Yunnan — need for financial and policy support from provincial and central government agencies. Given the region's ecological importance, there is ample opportunity, but currently little funding, to explore the feasibility of specific forest sector improvements (see below), payment schemes for environmental service provision and eco-tourism expansion. In Myanmar, a downturn in logging may lead to an increase in poppy production, as border residents resort to their only source of non-subsistence income. As part of ongoing efforts to control the heroin trade along the Yunnan-Myanmar border, drug substitution programs in Kachin State need Chinese government and donor support.

Assessing and mitigating the cross-border ecological damage from logging in Kachin State (shorter term)

Assessing and mitigating ecological damage from logging along the China-Myanmar border entails, at a minimum, using satellite analysis and ground-truthing to establish a list of priority deforestation areas, and establishing a joint forum with Chinese and Myanmar researchers and officials to analyze the results and discuss possible regulatory and reforestation initiatives to restore and maintain degraded forest ecosystems.

Thus far, the political situation in Myanmar has served to hinder more formal China-Myanmar cooperation in border areas. Chinese researchers and agencies must work through the government in Yangon when cooperating with researchers and officials in Myanmar. Their counterparts in Myanmar, alternatively, are often unaware of the situation in and at times lack access to border areas, particularly in Kachin State. International organizations working in Myanmar, often perceived as neutral outsiders, can play a bridging role among the country's various factions. However, their status is often made difficult by international sanctions against Myanmar's military government and related restrictions on many donors. Despite challenges, there are channels and opportunities to promote dialogue and cooperation between agencies in Yunnan and Myanmar. Joint workshops between forestry departments from China and Myanmar, for example, could provide a platform for identifying shared problems. In the short term, such engagement is the only feasible option for stemming environmental degradation along the Yunnan-Myanmar border.

Developing a more sustainable supply of timber in Yunnan through improving state plantations and collective forest management (longer term)

Forestry in Yunnan Province is currently undergoing a transition toward more advanced silvicultural management. While the effects of improvements in Yunnan's forestry regime on logging in Myanmar are, in the short to medium term, ambiguous at best, in the longer term Yunnan timber could, and should, compete with timber from northern Myanmar. Equal investments should be made in plantation and smallholder forestry regimes, the latter of which can be part of a viable, regional forest management model in Southwest China (Weyerhaeuser et al. forthcoming).

Plantation Forests: At present, plantation forests in Yunnan are heavily geared toward mono-culture pine stocks, many of which are poorly maintained and thus of low value. In fact, many of the temperate hardwood timber species imported from Myanmar can be grown in Yunnan, including cedar, *xinanhua*, *shuidonggua*, Chinese hemlock, walnut, mono maple and *nanmu*. Shifting plantation forests toward higher quality, higher value species requires investments — both from the Chinese government and the international community — in new ideas to change traditional management approaches, as well as in improved technologies.

Smallholder Forests: Small-scale forestry in Yunnan comprises both collective forests, individual "freehold" plots and scattered agroforestry plots. Smallholder forestry in Yunnan often suffers from the same singular emphasis on pine species, owing to questionable extension methods and misaligned incentives structures. As detailed in Weyerhaeuser et al. (forthcoming), a commitment to collective and other forms of smallholder forestry in Yunnan requires a fundamental realization from forest agencies that smaller-scale forms of forestry can be more effective in meeting conservation goals than corporate equivalents, but that villagers ultimately need incentives to invest in their forests. Such a commitment implies overarching policy support, changes in forest extension approaches, more effective governance across different levels of administration and continued investments in village institutions. Over the longer term, investing in collective forestry is a means to promote a local industry more immune to the boom and bust cycles that have plagued the Yunnan-Myanmar border timber industry.

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APPENDIX 1: CHINA'S MAIN IMPORTED TIMBER SPECIES

Common Name	Chinese - pinyin	Latin	Mainly Imported from
Anigre	安丽格: *anlige*	*Aningeria spp.*	West Africa
Basswood	椴木: *duanmu*	*Tilia spp.*	United States
Beech	榉木: *jumu* 山毛榉: *shanmaoju*	*Fagus spp.*	Europe, United States
Belian	坤甸铁樟: *kundian tiezhang* 坤甸: *kundian*	*Eusideroxylon spp.*	Indonesia, Malaysia
Birch	桦木: *huamu*	*Betula spp.*	United States
Black walnut	黑胡桃: *heihutao*	*Juglans spp.*	Malaysia, Myanmar, United States, West Africa
Bubinga	古典苏木: *gudian sumu* 非洲花梨: *feizhou huali* 卜宾佳: *bubingjia*	*Guibourtia spp.*	Central Africa
Chempaka **Sagawa**	木莲: *mulian* 黑心木莲: *heixin mulian* 金丝柚: *jinsiyou*	*Manglietia spp.*	Indonesia, Malaysia, Myanmar, Thailand, Vietnam
Cherry	樱桃: *yingtao*	*Prunus spp.*	United States
Chinese hemlock	铁杉: *tieshan*	*Tsuga spp.*	Myanmar
Cumaru	二翅豆: *erchidou* 龙凤檀: *longfengtan*	*Dipteryx spp.*	Latin America
Daru-daru Dedaru Seranai	角香茶茱萸: *jiaoxiang chazhuyu* 芸香: *yunxiang* 达茹: *daru*	*Cantleya spp.*	Indonesia, Malaysia, Myanmar
Garapa	铁苏木: *tiesumu* 金象牙: *jinxiangya*	*Apuleia spp.*	Brazil
Goiaba	肥果山榄: *feiguo shanlan*	*Planchonella spp.*	Brazil
Guatambu (ivorywood)	巴福芸香: *bafu yunxiang* 爪塔巴: *guataba*	*Balfourodendron spp.*	Brazil
Hevea	橡胶木: *xiangjiaomu*	*Hevea spp.*	Cambodia, Malaysia, Thailand
Ipe	依贝: *yibei* 重蚁木: *zhongyimu*	*Tabebuia spp.*	Brazil, South America

Iroko African teak	非洲柚木: *feizhouyoumu*	*Chlorophora spp.*	West Africa
Kairus	贝壳杉: *beikeshan*	*Agathis spp.*	New Zealand
Kapur	冰片香: *bingpingxiang* 山樟: *shanzhang*	*Dryobalanops. spp.*	Indonesia, Malaysia
Kasai	红梅嘎: *hongmeige* 番龙眼: *panlongyan*	*Pometia spp.*	Indonesia, Malaysia, Myanmar, Papua New Guinea
Kempas Mangis Mengaris	甘巴豆: *ganbadou* 金不换: *jinbuhuan* 康帕斯: *kangpasi*	*Koompassia spp.*	Indonesia, Papua New Guinea
Kassod	铁刀木: *tiedaomu* (鸡翅木): (*jichimu*)	*Cassia spp.*	Myanmar, Africa
Keranji	摘亚木: *zhaiyamu* 柚木王: *youmuwang* 格兰基: *gelanji*	*Dialium spp.*	Indonesia
Korean pine	红松: *hongsong*	*Pinus spp.*	Russia
Keruing **In**	龙脑香: *longnaoxiang* 克隆木: *kelongmu*	*Dipterocarp spp.*	Myanmar, India, Indonesia, Thailand
Kulim **Yindaik**	黑檀木: *heitanmu*	*Scorodocarpus spp.*	Indonesia, Myanmar
Macaranduba Seminai	铁线子: *tiexianzi* 红檀: *hongtan*	*Manikara spp.*	Indonesia, Peru
Siberian larch	落叶松: *luoyesong*	*Larix spp.*	Russia
Mahogany	桃花芯: *taohuarui*	*Swietenia spp.*	Brazil, United States
Makore	麦哥利: *maigeli*	*Mimusops spp.*	Gabon, Cameroon
Maple	枫木: *fengmu*	*Acer spp.*	United States
Meranti Balau Lauan	重黄娑罗双: *chonghuang shaluoshuang* 巴劳: *balao* 柳桉: *liuan*	*Shorea spp.*	Indonesia, Malaysia
Mono Maple	五角枫: *wujiaofeng*	*Acer spp.*	Myanmar
Manchurian ash	水曲柳: *shuiquliu*	*Fraxinus spp.*	Russia
Merbau	菠萝格: *buoluoge* 印茄木: *yinjiadou*	*Instia spp.*	Indonesia, Malaysia, Papua New Guinea

Mongolian oak	柞木: *zuomu*	*Quercus spp.*	Russia
Mongolian Scotch pine	樟子松: *zhangzisong*	*Pinus spp.*	Russia
Nanmu	楠木: *nanmu*	*Pheobe spp.*	Myanmar
Okoume	奥古曼: *aoguman*	*Aucoumea spp.*	Congo, Gabon
Padauk Rosewood	花梨木: *hualimu*	*Pterocarpus spp.*	Brazil, Laos, Myanmar, Vietnam, West Africa (Gabon)
Palisander **Tamalan**	酸枝: *suanzhi*	*Dalbergia spp.*	Indonesia, Malaysia, Myanmar
Pau amarelo	金影: *jinying*	*Euxylophora spp.*	Brazil
Punah	四籽木: *sizimu*	*Tetramerista spp.*	Indonesia
Pyinkado	木荚豆: *mujiadou* 品卡多: *pinkaduo*	*Xylia spp.*	Cambodia, India, Indonesia, Myanmar, Thailand, Vietnam
Radiata pine	辐射松: *fushesong*	*Pinus spp.*	New Zealand
Ramin	白木: *baimu*	*Gonystylus spp.*	Indonesia, Malaysia, Myanmar
Red oak	红橡: *hongxiang*	*Quercus spp.*	United States
Red walnut	红胡桃: *honghutao*	*Juglans spp.*	Malaysia
Rose sandalwood	紫檀木: *zitanmu*	*Pterocarpus spp.*	Brazil, India, Myanmar
Sapele	沙比利: *shabili*	*Entandrophragma spp.*	West/East Africa
Shuidonggua	水冬瓜: *shuidonggua*	*Alnus spp.*	Myanmar
Tembusu **Anan**	黄心楠	*Fagraea spp.*	Myanmar
Surian **Thitkado**	椿木: *chunmu*	*Toona spp.*	Myanmar
Teak **Kyun**	柚木: *youmu*	*Tectona spp.*	Myanmar, Thailand,
Walnut	核桃木: *hetaomu*	*Juglans spp.*	Myanmar, United States
Wenge	非洲崖豆木: *feizhou yadoumu*	*Millettia spp.*	Cameroon, Gabon
White oak	白橡: *baixiang*	*Quercus spp.*	United Kingdom, United States
White pine	白松: *baisong*	*Pinus spp.*	Russia
Xinanhua	西南桦: *xinanhua*	*Betula spp.*	Myanmar
Zebrawood	斑马木: *banmamu*	*Microberlinia spp.*	West Africa

Source: Compiled by the authors through visits to wholesale markets and price lists for timber products. This list is not exclusive and import countries, in particular, are incomplete. Burmese names for timber species, listed under "common name," are in bold.

APPENDIX 2: FOUR TOP SPECIES OF MYANMAR TIMBER IMPORTS IN LUSHUI, YINGJIANG, AND TENGCHONG COUNTIES

County ***Primary ports***	**Species**	**Mainly processed into**	**Primary Intermediate Destination(s)**
Lushui *Pianma*	Chinese hemlock *Tsuga spp.* 铁杉: *tieshan*	Floorboards Furniture Doors and frames	Guangdong, Shanghai
	Birch *Betula spp.* 西南桦: *xinanhua*	Floorboards Furniture Doors and frames Veneers	Guangdong, Shanghai, Kunming
	Mono maple *Acer mono* 五角枫: *wujiaofeng*	Floorboards Furniture	Guangdong, Shanghai
	Nanmu *Pheobus spp.* 楠木: *nanmu*	Floorboards Furniture	Shanghai
Tengchong *Diantan Zizhi* *Houqiao*	Birch *Betula sp.* 西南桦: *xinanhua*	Floorboards Furniture Doors and frames Veneers	Guangdong, Shanghai,
	Walnut *Juglans sp.* 核桃木: *hetaomu*	Floorboards Furniture Interiors	Guangdong, Shanghai, Kunming
	Nanmu *Pheobus spp.* 楠木: *nanmu*	Floorboards Furniture	Shanghai
	Chempaka *Manglietia spp.* 白木莲: *baimulian*	Floorboards Furniture	Guangdong, Shanghai
Yingjiang *Kachang* *Nabang*	Chempaka *Manglietia spp.* 黑心木莲: *heixinmulian*	Floorboards Furniture	Guangdong, Shanghai
	Ramin *Shorea spp.* 白木: *baimu*	Floorboards Furniture Veneers	Guangdong, Shanghai
	Jiayoumu *Dipterocarpus spp.* 假柚木: *jiayoumu*	Containers (shipping)	Henan
	Keruing *Dipterocarpus sp.* 克隆木: *kelongmu*	Floorboards Furniture	Guangdong, Shanghai, Kunming

Sources: Interviews in Pianma (Nujiang), Yingjiang (Dehong), Diantan (Baoshan), and Houqiao (Baoshan), October and December 2003, April and May 2004. Imports shift from temperate to more tropical species as one moves from north, in Lushui, through Tengchong, and south into Yingjiang.

APPENDIX 3: NODE-TO-NODE PRICE DIFFERENTIALS FOR *SHUIDONGGUA* AND TEAK (ALL PRICES IN YUAN/M^3)

Shuidonggua (Alnus spp.), also known as qimu (桤木), is a fast-growing alder typically found above 700 meters in the uplands of northwest Yunnan and neighboring Myanmar. It has become increasingly popular as a commercial species on freehold hills (自留山: ziliushan) in, for instance, some areas of Baoshan, although more extensive production is limited by harvest quotas.

	Price: roundwood Tengchong	**Price: sawnwood Yingjiang**	**Price: sawnwood Baoshan**	**Price: sawnwood Kunming**	**Price: sawnwood Guangdong (Xingye)**	**Price: sawnwood Guangdong (Yuzhu)**
Shuidonggua Adina sp. 水冬瓜: shuidonggua	700/m^3	1,100/ m^3	1,500-1,600/ m^3	1,500/ m^3	1,300-2400/ m^3	1,600-2400/ m^3

Sources: Prices for Tengchong, Yingjiang, and Kunming are based on interviews in April and May 2004; prices for Baoshan are average 2004 prices, estimated by the Baoshan Forestry Bureau; prices for Xingye and Yuzhu are based on website information (see Appendix 4). Xingye and Yuzhu prices include prices for both normal grade (普采: pucai) and special grade (特级: teji).

Teak (Tectona grandis) is the most highly valued of the Myanmar hardwoods and is renowned for its flexibility, durability, and resistance to disease. Myanmar has 60 percent of the world's teak. By law, Myanmar teak exports are required to pass through official customs channels at Yangon, Myanmar's capital and chief port. However, according to management at wholesale markets in Guangdong and Shanghai, much of the teak in timber markets in Shanghai and Guangdong passes overland through Yunnan Province. A significant portion of teak imports in Yunnan pass through Nongdao Township, a provincial border checkpoint in Dehong Prefecture's Ruili Municipality. Teak planks, either in boards or studs, are dragged by mules across inhospitable territory in Myanmar and across the border into China. Although the operation itself is organized by businessmen from Myanmar, the hauling is done chiefly by villagers from Tengchong County in Baoshan Municipality. As noted in the text, villagers can net 1,500 to 2,800 yuan per cubic meter hauled. The teak logs are then stored in lots in Nongdao awaiting transport to Kunming and points east.

	Price: sawnwood Yangon	**Price: sawnood Nongdao**	**Price: sawnwood Kunming**	**Price: sawnwood Guangdong (Yuzhu)**	**Price: sawnwood Guangdong (Xingye)**	**Price: sawnwood Shanghai (Furen)**
Teak ***Tectona grandis*** **柚木: *youmu***	7,300-21,815/m^3	3,000-7,300/m3	13,000/m^3	7,000-12,000/m^3	8,500-13,000/m^3	6,000-11,000/m^3

Sources: Yangon prices are from the ITTO June 2004 Tropical Timber Market Report; prices for Nongdao and Kunming are based on interviews in May and June 2004; prices for Yuzhu, Xingye, and Furen are based on website information (see Appendix 4).

APPENDIX 4: CHINA'S MAIN TIMBER WHOLESALE MARKETS

Market	City / Province	Primary Timber Species	Primary Product(s)
Tianjin Huanbohai Market 天津市环渤海市场	Tianjin Tianjin	Ash, balau, black walnut, cherry, kasai, Korean pine Manchurian okoume, red beech, red oak, sapele, white pine, *xinanhua*	Building materials
Dezhou Shandong Timber Market 德州山东木材市场	Dezhou Shandong	Korean pine, Siberian larch, Mongolian scotch pine, white pine	Wood-based panels
Zhengding Hengshan Plywood Market 正定恒山板材市场 http://www.hsmarket.com	Zhengding Hebei	Beech, maple, cherry, walnut, white oak, red oak, Thai teak, Manchurian ash, maple, rosewood	Wood-based panels
Zhejiang Nanxun Timber Market 浙江南浔建材市场 http://www.materinfo.com	Dongyang Zhejiang	Belian, goiaba, cumaru, hevea, ivorywood, kapur, kempas, keranji, macaranduba, merbau, poplar, pyinkado, punah, red beech, rose sandalwood, teak, white beech	Flooring materials
Zhejiang Huadong Timber Market 浙江华东木材市场	Huzhou Zhejiang	Beech, kairus, kassod, merbau, red oak, radiata pine, rosewood, Siberian larch, tamalan, white pine, 红檀原木	Furniture materials, molding
Hangzhou Timber Exchange Market 杭州木材交易市场	Hangzhou Jiangsu	Basswood, beech, black walnut, Manchurian ash, ramin, sapele, Siberian larch, teak, *xinanhua*	Furniture materials, flooring
Shanghai Furen Forest Products Wholesale Market 上海福人林产品批发市场 http://www.furen-wood.com.cn	Shanghai Shanghai	*The majority of species in Appendix 1*	Furniture materials, flooring materials, molding, wood-based panels, veneers
Dongguan Houjie Xingye Timber and Plywood Market; 东莞厚街兴业木材夹板市场 http://www.chinatimber.org/xy/	Dongguan Guangdong	*The majority of species in Appendix 1*	Furniture materials, flooring materials, molding, wood-based panels, veneers
Jilong Timber Market 吉龙木材市场, http://www.jilongwood.com	Dongguan Guangdong	*The majority of species in Appendix 1*	Furniture materials, flooring materials, molding, wood-based panels, veneers
Yuzhu International Timber Market 广东鱼珠木材市场 http://www.yuzhuwood.com/	Guangzhou Guangdong	*The majority of species in Appendix 1*	Furniture materials, flooring materials, molding, wood-based panels, veneers