

## China's Forest Sector in the Reform Era

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### Introduction

China is often referred to as being “forest poor.” Per capita forest coverage is one-fifth the global average, and per capita standing forest stock is just one-eighth the global average. Yet, according to the Chinese government, China is now the world’s largest producer and exporter of forest products. In order to understand China’s current role in the global forest products market, it is useful to examine changes during the reform period beginning in 1978. This piece provides an overview of China’s forest sector within the context of three broad stakeholders: the forests themselves, the people who live in or near forested areas, and the forest products industry.

### The Maoist Period: 1949-1978

The period between 1949 and 1978 was marked by rapid resource exploitation and depletion, with little concern for regeneration or active management. Widespread harvests and forest destruction were aimed toward fueling economic growth and freeing up land for agricultural production, particularly during the Great Leap Forward. Although no inventory data are available for the 1950s, various estimates show forest coverage between a low of 5% a high of 12%. Investment in both silviculture and industry declined from 1965 to 1969, and did not return to pre-1965 levels again until 1972. According to official estimates, timber production grew from 5.7 million cubic meters (CUM) in 1949, increasing gradually before spiking to 45.2 million CUM in 1959; during the 1960s, it then declined precipitously, bottoming out two years later at 21.9 million CUM in 1961. Lumber production also followed this trajectory, spiking between 1958-1960 before declining rapidly and not recovering Great Leap Forward production levels again until after 1979.

### The Reform Era: 1978 – Present

Land tenure reforms since 1981 have been the most consequential for the long-term economic welfare and stability of rural populations. Agricultural reform is widely recognized as having been a propelling force in expanding economic reforms to other sectors during the early part of the reform process. Less recognized are the concurrent forestland tenure reforms. In the early part of the reform era, decentralization of collective property rights and an upward shift in agricultural prices led to dramatic improvements in the incomes of rural people. Reforms in the forest sector were intended to be as

pragmatic as those in agriculture.

The first collective forest reform was the Resolution on Issues Concerning Forest Protection and Development, also known as the “Three Fixes Policy,” in 1981. This reform led to three new forms of household management. Although management and resource ownership shifted, land

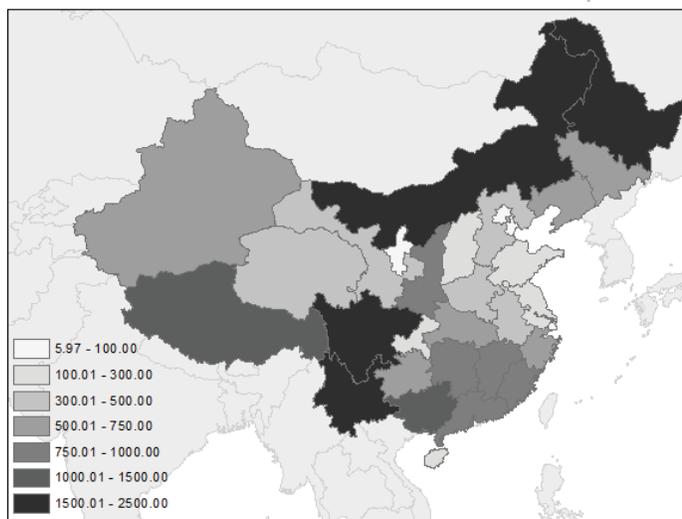


Figure 1. Forest area by province (10,000 ha), 2004-2008

ownership itself was retained by the collective. Although these reforms were intended to improve tenure security, they have since been described as initially exacerbating the problem. In some cases, fear of fluctuating land tenure policies may have led some farmers to harvest trees on their property at the outset of the reform era (Harkness 1998). Initially, households had been permitted to sell timber produced above quota; in 1985 the two-price system was dropped and households were allowed to sell at market prices.

This initial period of reform witnessed widespread illegal cutting (Song et al. 1997), and a reduction in forest coverage in southern collective forests. This was certainly not limited to the collective sector and took place across the state sector as well. The high rates of harvest during this time also led to changes in stocking, species composition, and fragmentation of forests (Liu and Edmunds 2003). In response, the government quickly reversed course, suspending household tenure reforms in 1985. Timber markets reverted

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# Director's Notes Outlook for the Chinese Wood Market

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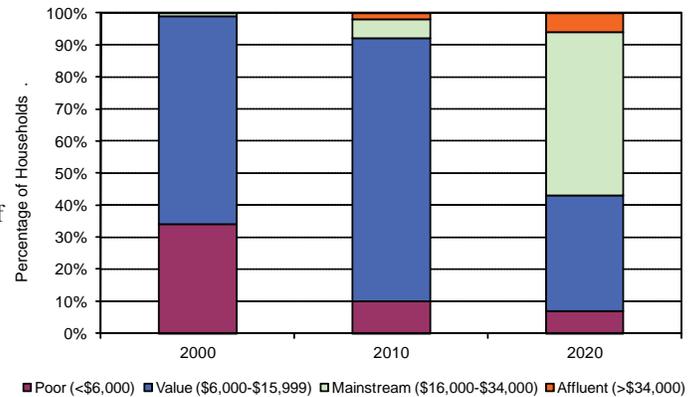
The Center for International Trade in Forest Products addresses opportunities and problems related to the international trade of wood and fiber products. Emphasizing forest economics and policy impacts, international marketing, technology developments, and value-added forest products, CINTRAFOR's work results in a variety of publications, professional gatherings, and consultations with public policy makers, industry representatives, and community members.

Located in the Pacific Northwest, CINTRAFOR is administered through the School of Environmental & Forest Sciences at the University of Washington under the guidance of an Executive Board representing both large and small companies, agencies, and academics. It is supported by state, federal, and private grants. The Center's interdisciplinary research is carried out by university faculty and graduate students, internal staff, and through cooperative arrangements with professional groups and individuals.

The steep decline in Chinese wood exports observed in December 2011 (down 8.3% from November) and January 2012 (down 31.6% from December) caused much consternation within the global timber trade, signaling a short-term adjustment in Chinese timber demand. Despite this end of year adjustment, the value of Chinese wood imports in 2011 increased by an impressive 41% over 2010. However, Chinese imports through May of 2012 have been relatively quiet, increasing by only 3.1% over the same period last year. After two years of spectacular double digit increases, this trend has come as sobering news for wood exporters who have looked to China to offset flagging demand in other regions.

Yet, the slowdown in Chinese timber demand is likely due to high inventories resulting from reduced demand for wood products in Europe and the US. Over the medium-term we should see demand for timber products pick up in China for several reasons. First, the government will continue to emphasize the export-oriented wood manufacturing sector as a driver of employment and economic activity. While there will be some consolidation in the industry and geographic dislocation (as some firms move inland in search of lower wage rates), the lack of a mature and high quality timber supply means that China will continue to rely on timber imports for the foreseeable future. Second, continued investment in expanding and improving the transportation infrastructure will support imports of construction grade lumber and wood-based panels. Third, the Twelfth Five-Year plan (2011-2016) calls for the construction of 36 million affordable housing units; an increase of seven million housing units per year in addition to the large number of market rate housing units being built in China. While housing units in China are generally multi-story concrete and brick buildings, interior finishes (including flooring, wall panels, cabinets, mouldings and stair parts) as well as furniture, use a substantial volume of higher quality wood.

Finally, increasing affluence in China and the rapid growth of the Chinese middle-class (see figure below) will support the import of higher quality interior wood products and provide an opportunity for introducing brand name value-added wood products. A recent report by McKinsey estimates that the share of Chinese households that will move into the mainstream income level will jump from 6% to 51% between 2000 and 2020, while the total number of households will increase from 226 million to 328 million. This unprecedented surge in household wealth will have huge implications for wood manufacturers around the world. For example, the combination of increasing affluence and families moving into new housing caused Chinese consumption of wooden furniture to increase from just over \$5 billion in 2003 to almost \$30 billion in 2011.



Source: Meet the 2020 Chinese Consumer. McKinsey & Company 2012

It is good to remember that there will always be short-term reversals to long-term trends, even in the exceptional case of China. But it is important to keep an eye on the underlying trends and dynamics at play in the marketplace. Given this, the medium and long-term outlook for exports of wood products to China, including value-added wood products remains bright.

## Graduating CINTRAFOR Students

**Alicia Robbins** successfully defended her dissertation entitled "China's Forest Sector: Essays on Production Efficiency, Foreign Investment, and Trade and Illegal Logging" and received her degree in Natural Resource Economics in Fall Quarter 2011.



Dr. Robbins is currently a Research Associate at the University of Washington and is conducting research related to the economic benefits of urban open and green space.



**Jake Grossman** returned from his Peace Corps assignment in Paraguay where he was serving as an agroforestry extension volunteer from September 2009-December 2011. He successfully defended his paper entitled: "Smallholder Eucalyptus Plantation

Forestry in Eastern Paraguay: A Case Study of Silvicultural, Economic, and Environmental Context" and received his Masters degree at the end of Spring Quarter 2012. Jake has accepted a scholarship to the doctoral program at the University of Minnesota where his field of study will be Ecology, Evolution, and Behavior and his research will focus on biodiversity and ecological function in plant communities.

back to state control in 1986, although they were once again liberalized in 1993.

Provinces were not required to implement the 1981 Resolution and implementation of forest reforms has varied by province; thus their impacts have varied regionally. The southern collective region has faced timber quotas, low fixed procurement prices and high taxes, while the north has been subject to no such fixed procurement system or quotas and low taxes. This regional discrepancy has been blamed for the low investment in afforestation and replanting in the south. The agricultural tax, which formerly comprised up to a 16% rate of timber-derived income, was eliminated in 2009.

Particularly since 2003, there has been a renewed effort aimed at individualizing collective forests and securing tenure rights. Further reforms were introduced in 2008 with the Comprehensive Collective Forests Reform. Although retaining collective ownership, this policy established individual farmers as the dominant landholders, allowing them to lease or transfer their plots to other farmers. It established the length of the contract period as 70 years, with the right to extend. It also called for the clear demarcation between commercial and public benefit forests, distinguishing commercial forests as subject to household management decisions.

After the establishment of the People's Republic in 1949, the first forest-specific regulation clearly recognized the degraded state of the forestland base and was aimed at increasing forest coverage. The government called for the afforestation of nearly 10% of total land area during the 1950s, with the focus on creating protected areas and planting fast-growing species of high economic value. However, these early efforts at afforestation have been largely dismissed as ineffectual, with high rates of mortality; a lack of technical expertise, poor selection of sites and species and an inadequate definition of responsibility that led to neglect in the maintenance and protection of young forests.

At the time of the first national inventory (1973-1976), it was estimated that forest cover stood at 121.9 million hectares, or nearly 13% of total land area. Forest inventories reported a decline in forest cover between 1980 and 1988, a period of ineffectual reforms, very intensive timber harvesting and land conversion. The mid to late 1980s witnessed a period of reforestation and the creation of forest plantations, although in some cases those plantations replaced natural forests. Particularly since 1998, subsidies from the government and loans from multilateral institutions have facilitated the establishment of large-scale, fast-growing plantations. It has been pointed out that there are very few close-to-mature forests remaining, that young- and middle-aged forests have a lower stocking level than older forests, and have lower productivity (Yin 1998). At present, forestland is defined as land with at least 20% canopy cover. Forest cover includes all trees, including fruit and other cash crop trees, and shrubs. There is some

question about the structure, quality and diversity of the trees planted in afforestation and shelterbelt programs (Rozelle et al. 2003). There are even questions about whether afforestation efforts are leading to the degradation of soils, thereby potentially exacerbating the very desertification problems that such a policy was intended to combat (Cao 2008).

The Seventh Forest Inventory 2004-2008 (SFA 2009) reported a 12% overall increase in forest coverage. Total forestland increased by 20 million hectares (ha) to 195 million ha from the previous inventory, and forests now account for 21% of total land area. Figure 1 shows forest area by province.

Soon after the beginning of the reform era, the government introduced a series of new laws aimed at the protection of forests and biodiversity. In 1978, the Three North Forest Protection Project, or Great Green Wall, was launched. This program is the country's oldest ongoing afforestation effort and continues today. The late 1980s and early 1990s saw an expansion of the legal framework surrounding forest resources, as well as the adoption of several international agreements. In 1995, the Ministry of Forestry put together the Forestry Action Plan for China's Agenda 21. The Action Plan is characterized by three main objectives: a) ensuring sustainable forestry and increasing overall forest coverage and volume; b) modernizing forestry as an industry and raising productivity and efficiency levels; c) revamping the management system and improving education and public awareness (MOF 1995). The development of the forest sector since then has largely conformed to the guidelines outlined in this framework.

All of the above efforts were dwarfed, however, by the policies introduced in the wake of severe flooding along the Yangtze River in 1998. As a consequence of the massive floods, the Central Committee and State Council introduced the National Key Forest Program (NKFP), which is characterized by two monumental conservation efforts: first the Natural Forest Protection Plan (NFPP), followed in 1999 by the Sloping Land Conversion Program (SLCP).

The NFPP called for a reduction in annual timber harvests from natural forests and the conservation, afforestation and revegetation of millions of hectares of forestland. The specific objectives included implementing logging bans in the upper reaches of the Yangtze and Yellow Rivers, reducing logging in state-owned forests, engaging in reforestation and improved silvicultural treatments, and subsequently providing alternative employment opportunities for state workers formerly employed in harvesting activities (Miao and West 2004). The NFPP's reach is extensive, covering 18 provinces and autonomous regions, and focusing mainly on the upper Yangtze and Yellow Rivers, as well as state-owned forests in the northeast and on Hainan Island.

The second policy with important consequences for collective forest owners is the Sloping Land Conversion Program (SLCP). The purpose of this ambitious 337 billion RMB plan is to reduce water and soil erosion and increase forest coverage by converting certain crop

growing areas with steep slopes above a 25% grade into grass or forest lands. The SLCP has been held up as the world's largest payment for ecosystem services program, and claims poverty alleviation as a key component to the program. The program primarily pays for farmers to receive grain and cash subsidies and saplings to plant in lieu of engaging in agricultural activities. A secondary goal of the program is to shift rural farmers into less intensive agricultural activities and off-farm employment (Xu et al. 2004). To date, the SLCP has enrolled more than 21 million hectares of farmland. By the end of the program, it will have enrolled or affected the landholding size of an estimated 40-60 million households, living in 2,000 counties across 25 provinces (Xu et al. 2010).

Taken altogether, the six national key forest programs, of which the NFPP and SLCP are two, will comprise the most expensive reforestation and conservation program in the world. Between 1999-2009, approximately 269 billion RMB (\$42 billion USD) was invested in these programs. These programs vary in terms of their cost. However, the SLCP is more than twice as expensive as the NFPP and significantly more expensive than some of the government's other conservation efforts, such as the Three Norths Shelterbelt.

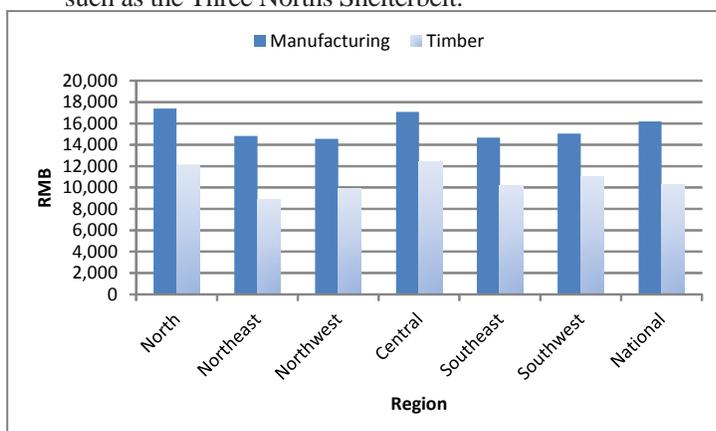


Figure 2. Real ten-year average manufacturing and timber processing wages, 1999-2008

### Industry Reforms

Since the 1950s, China's forest sector has changed dramatically, both in scale and in structure. To gain a sense of the scale of change, one can begin by examining investment and its changes. In the 1950s, investment was small and dedicated almost exclusively to industry. From the 1960s through the end of the 1990s, investment grew slowly and still largely favored industry over silviculture and afforestation by a ratio of 2:1. However, after 1998, expenditures were dramatically shifted into afforestation and silviculture, with expenditures in this sector coming to dominate industry by a ratio of 9:1. Only since 2008 has industry again increased as a percentage of total investment.

Additionally, while investment in the early years came exclusively from the government, the share of government investment has been consistently decreasing. From 2003 to 2009 alone, the government share of investment dropped from 77% to 53%. This decline

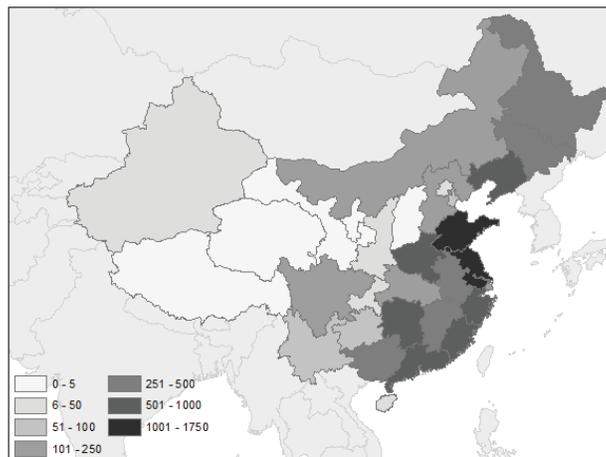


Figure 3. Distribution of forest processing enterprises by province, 2008

mirrors the overall structural change in employment by ownership type in the processing sector. As the state sector has declined, private ownership has flourished. The share of privately owned processing enterprises grew from 15% in 1999 to 75% in 2008. While SOFES, collectives, foreign, cooperative, and shareholding all shrank their share of employment, privately-owned and other ownership types increased their share.

Those working in the timber processing sector earn less than those in the manufacturing sector overall (figure 2). For the ten-year period between 1999 and 2008, real manufacturing wages averaged 36% higher than those in the timber processing sector. The average rate of change in timber processing wages follows the same pattern as the rate of change in manufacturing wages across provinces and rose by an average annual rate of 10% between 1999 and 2008.

The greatest growth in number of wood processing enterprises has occurred primarily along the coast. Jiangsu, Shandong, Fujian, Zhejiang and Guangxi experienced the most significant expansion in number of enterprises. Other provinces, including Guangdong, Henan and Hunan, also grew during this period, increasing their overall number of enterprises. Although Liaoning, Anhui, Jilin, Heilongjiang, Jiangxi and Shanghai were all large centers of industry at the start of this period, they experienced slower growth through 2008. The only region to experience a decline was the northwest, which lost 30% of its enterprises. Figure 3 shows the distribution of processing enterprises, with a higher density along the coast.

In terms of volume of secondary products manufacturing, the coastal region produces more than the other five regions combined. This is largely because the coastal region is the center of wood panels and flooring production, although it is also the primary center of production of lumber, wooden beds and veneer. In 2009, the coastal region produced 61% of the country's wooden flooring, and 48% of its panels. In particular, Zhejiang and Jiangsu provinces are the primary centers of production for flooring, while Jiangsu is the largest producer of panels.

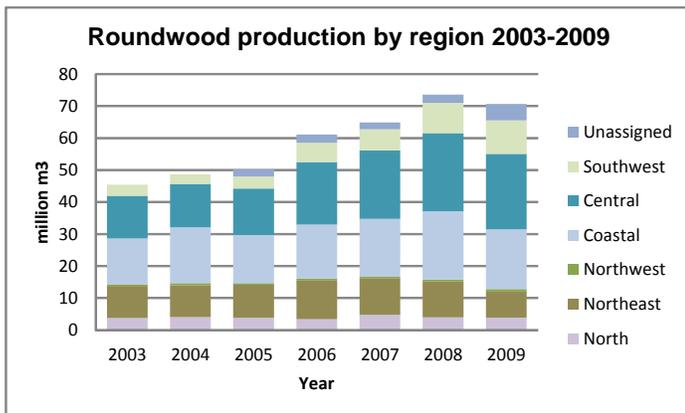


Figure 4 Log production by region 2003-2009

Production of logs is controlled by quotas set by the central government and these are intended to limit harvest to volumes at or below the annual incremental growth. Domestic logs are consumed or processed domestically (figure 4). Guangxi, Hunan, Guangdong, Fujian and Yunnan are the top five producing provinces. From 2003 to 2008, total harvest of logs increased from 43.2 million CUM to 73.6 million CUM, although

Table 1. Total official log production and contribution of imports, 2005-2009 (million CUM).

	Domestic production	SFA Reported Imports	Imports as % of total consumption	FAO Reported Imports	Imports as % of total consumption
2005	50.23	29.37	31%	30.73	38%
2006	61.12	32.15	33%	33.08	35%
2007	64.92	37.13	38%	37.92	37%
2008	73.57	29.57	30%	30.30	29%
2009	70.68	28.06	29%	28.65	28%

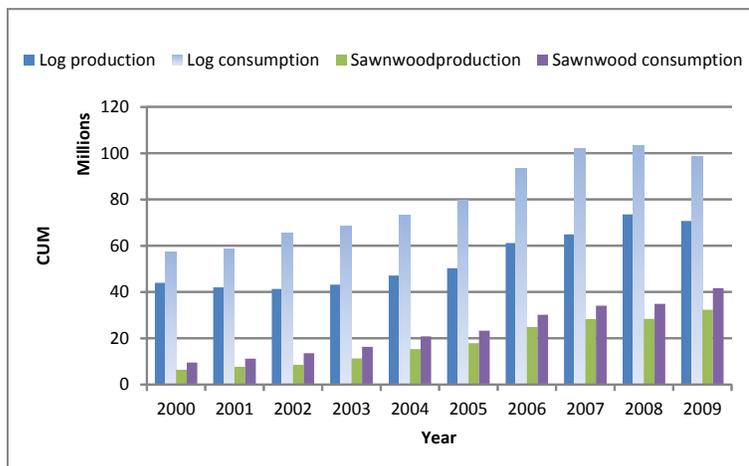


Figure 5. Officially reported log and lumber production and consumption 2000-2009

the harvest volume in 2009 dropped to 70.7 million CUM. However, these official statistics ignore above-quota production, which may be close to double the reported production volume. For example, in 2003, the SFA estimated that above-quota log production had averaged 75.5 million cubic meters per year from 1998-2003. Underestimation of domestic production of logs or imported log volumes presents challenges in reconciling production, consumption and exports of processed wood products. Lumber, panels and other semi-finished and finished goods are much less likely to be underreported than are timber resources; given the more than 19% annual growth rate in lumber and panel production in China in the last decade, it seems improbable that total log consumption did not also grow apace.

Fraud appears to be widespread: between 2003 and 2008, 1.7 million cases of forestry “misconduct” were reported. Misconduct includes activities such as falsified logging permits and ownership certificates. Recent discoveries of falsified documents at companies such as Sino Forest and Cathay Forest point to an expansion of the problem into the private sector. As a result of the revelation of such scandals, these companies have seen their stock prices plummet. This type of fraud poses a threat to continued foreign and private investment in forest management, which may become increasingly important as the government continues to reduce its own investment levels.

Although official production of roundwood has increased, demand continues to outpace the domestic

supply (figure 5). As a major producer of semi-finished (e.g., plywood) and finished wood products (e.g., furniture), China is now often referred to as the world’s wood workshop. However, China is increasingly reliant on roundwood imports to fuel its growth. According to official Chinese statistics, total consumption of logs, by volume, grew at an average annual rate of 7.6% between 2000 and 2008, before declining by 4.2% in 2009. The average contribution of imports to this (official) consumption was 33% (table 1). The growth in consumption has led China to become the largest importer of logs, accounting for nearly 42% of global imports of coniferous and non-coniferous logs in 2010.

The total value of Chinese wood product exports grew from 27 billion RMB (\$3.34 billion USD) in 2000 to more than 102 billion RMB (\$15 billion USD) in 2009, while imports grew from 28 billion RMB (\$3.4 billion USD) to 51 billion RMB (\$7.5 billion USD), meaning that nearly half of the value of

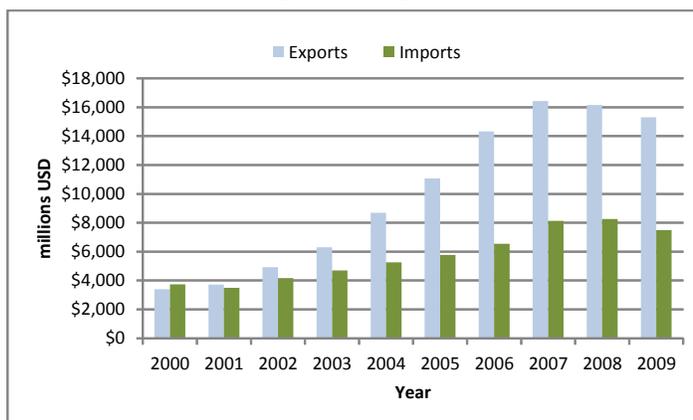


Figure 6: Total value of imports as compared to exports

its exports came from the cost of imports (figure 6). The relative value declined during this time, having peaked in 2000, when the value of imports exceeded the value of exports. This reflects the growth of the processing industry within China.

China relies heavily on the developing world for its tropical log imports. The largest source of tropical logs in 2008 was Malaysia, supplying 48% of its tropical logs. There is wide concern that Malaysia serves not only as a source of logs, but also as an intermediate for logs exported illegally from Indonesia, which ranked very low in terms of its own exports to China. According to the FAO, other primary sources included Papua New Guinea, Gabon, and to a lesser extent, Congo, Myanmar, Cameroon, and Equatorial Guinea. The largest single source for coniferous logs is Russia. In 2010, Russia supplied 40% of the coniferous logs to China, down from its 75% share prior to its implementation of the log export tariff. Other primary sources of coniferous logs include New Zealand, the US and Canada.

Domestic constraints to international trade are almost non-existent. Import tariffs on logs were eliminated in 1999 and anyone holding an import license is eligible to import forest products into China. Concerns about the legality of the world's wood products trade, including those that flow through China, have led to the emergence of non-tariff barriers in many of China's most important export destinations. The EU's Forest Law Enforcement, Governance and Trade (FLEGT) program and Voluntary Partnership Agreements serve as de-facto trade agreements. The US' Lacey Act Amendment requires importers to supply adequate documentation in order to prove the legality of wood brought into the US.

Non-policy mechanisms are also being implemented to control the trade of illegal and unsustainable wood products. Many international NGOs and multilateral institutions have collaborated with the Chinese government to encourage the development and expansion of forest management and chain-of-custody certification schemes within China. Three current schemes exist: the Programme for the Endorsement of Forest Certification (PEFC), the Forest Stewardship Council (FSC), and the emerging national China Forest Certification Council (CFCC).

### Conclusion

The government has been acutely aware of the resource shortages since before massive flooding prompted conservation-oriented logging restrictions in 1998. The annual allowable cut, quotas, permits, high taxes, and other restrictions have been used to reduce supply. It is widely recognized that the domestic resource base is extremely constrained and will be for the foreseeable future, particularly since per-capita forest coverage is low and demand is high for fiber, both for industrial and non-industrial uses. The concern over illegal logging has largely been referred to in the context of imports. However, it continues to be a problem domestically, as evidenced in the harvest estimates, and fraudulent logging permits and ownership certificates. Consumption has only partly been addressed with product substitution policies by encouraging the use of non-

wood building materials such as concrete and brick in construction, which, of course, are not without their own adverse environmental effects. This has pushed the country to become increasingly reliant on imports to fuel its export-oriented wood products industry. One result is that many of these timber products come from countries with lower costs and poorly enforced environmental standards

The most important changes in the forest industry have come about as a result of market reforms: the transformation of state-owned entities and township and rural enterprises into private enterprises. During the period 1999-2008, there was a near tripling of jobs and a quadrupling in the gross output value in the wood processing sector. Trade liberalization by the Chinese has opened up markets for foreign imports, exports and sources of capital. In the last few years, the government has begun to direct increased attention to developing its wood processing industry, as evidenced by the Forestry Revitalization Plan, and increased investments in industry. These moves indicate a strong commitment by the government to affirm China's role as an exporter and a more efficient producer of higher-quality goods.

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- WP120 Japanese F-4Star Formaldehyde Rating Process for Value-Added Wood Products .....  
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