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USAID Forestry Programs

Technical Notes on Emerging Issues in Global Forest Management

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These technical notes serve to inform USAID missions and collaborating partners of two emerging global issues or trends that are having a dramatic impact on forests and the forest sectors of national economies throughout the world. The intent of this technical note is to provide an overview of these issues, not in-depth research, and the reader is encouraged to read the sources listed at the end of this paper, as well as other sources of information available on these topics, for a more in-depth analysis. The exclusion here of other important issues affecting forests does not reflect USAID's priorities or future direction.

Issue I: China's Growing Demand for Wood and Its Impact on Global Forests

Forests are affected by local events (fire, resource extraction, natural species succession) and from events thousands of miles away (climatic events, disaster induced migration, changing supply and demand for forest resources). Consequently, global and national events can have dramatic impacts on forests throughout the world, and bilateral donor agencies like USAID must constantly adapt their programs to

these ever-changing global conditions.

One of the most pronounced forces in the first few years of the 21st century is China's increasing consumption and demand for forest products. This growing demand is driven by domestic demand for end products (paper, furniture, and construction material) and also by international demand for China's

wood based-exports — primarily low-cost finished wood products such as furniture. (The papers footnoted at the end of this discussion, one by Forest Trends, and one published by World Wildlife Fund, provide an in-depth analysis of China's effect on the global trade of forest products, and serve as the source of most of the statistics quoted herein.)



NIGEL SIZER/THE NATURE CONSERVANCY

China's increasing consumption is resulting in dramatic changes in global trade in forest products. Softwood logs, as depicted above, are shipped to China from all over the world.

This dramatic increase in China’s demand for wood is reverberating throughout the national economies and forestry sectors of many countries where USAID works.

Wood fiber is, in most cases, a commodity that is bought and sold in the global market in the form of saw logs, pulp, paper, wood chips, or finished lumber. Since its harvest season is flexible, and the end products non-perishable, its price is a function of global supply and demand. Moreover, the most significant barriers to entry, or conversely, competitive advantage, are cheap land, adequate soil and rainfall, and year-round growing seasons — conditions most often found in developing countries. A significant change in the global market place, such as China’s emergence as a major market, will undoubtedly affect developing countries. It will have environmental effects, pressures on communities, new governance challenges, and significant impacts to national economies.

What follows is a discussion of these impacts and how this trend is

affecting countries with a USAID presence.

Cause of Increasing Demand

China’s increasing demand for wood is predicated on a variety of factors. First, China has one of the fastest growing economies in the world. Its economy grew an average of 8 to 10 percent per year throughout the 1990s and in the first few years of this century. This growth is fueled with huge amounts of natural resources, including food crops, coal, gas, oil, iron, and wood.

Statistical data to quantify China’s increasing consumption of wood are still rare, but some telling data are available. For example, China’s imports of wood products more than doubled in round wood equivalent volume between 1997 and 2002. Measured in U.S. dollars, China has increased its timber-based imports from \$6.4 billion in 1997 to \$12.9 billion in 2003.

Another factor affecting China’s demand for wood is its approach to managing its own forest resources. A

number of studies show that 80 percent of China’s forest enterprises have exhausted their mature timber resources and can no longer support their own mills. Furthermore, in 1998, China responded to disastrous floods by instituting logging bans and reforestation critical watersheds. This further reduced the domestic supply of wood in the short term.

Also contributing to China’s increasing consumption are more indirect factors, such as a stronger regional economy after the Asian financial crisis in 1998 and China’s entrance into the World Trade Organization. Figure 2 illustrates the growing disparity between China’s production and consumption of wood.

Impacts to Global Trade

There is no question that China’s wood imports have increased dramatically during the last decade. China’s market for industrial timber, pulp, and paper is now second only to the United States. Statistics that quantify just how this demand is affecting the economies of other countries are scarce, but some data are available.

The most obvious impact is new export opportunities for timber exporting countries, especially those countries with good access to Chinese ports. For example, Russia has vastly expanded its exports to China and is positioning itself to capture an even larger segment of China’s wood import market. By 2003, Russia had increased its exports of softwood logs to China by 14 times its 1997 level. In 1997, Russia provided 5.0 percent of China’s wood imports; by 2003, it was providing 21.3 percent. This equates to an approximate 80

Table 1. Examples of China’s Impact to the Global Trade in Forest Products

Country Affected	Significant Changes between 1997 and 2002
Indonesia	Increased pulp exports by 250% and lumber exports by 470%. Exports of lumber dropped in 2002 — probably linked to a log export ban in Indonesia in 2001.
Australia	Exports of wood and paper increased from A\$7.4 in 1996 to A\$88 million in 2001
Thailand	Log exports to China increased by 2700 percent
Gabon	Was China’s top supplier of hardwood logs in 1997, but was in fifth place by 2002 – surpassed by Russia, Malaysia, New Zealand, and Papua New Guinea
Papua New Guinea	Exports of hardwood logs grew by 500%, and in 2002 supplied 13.2% of China’s hardwood log imports
Equatorial Guinea	China is funding major expansion in the forestry sector

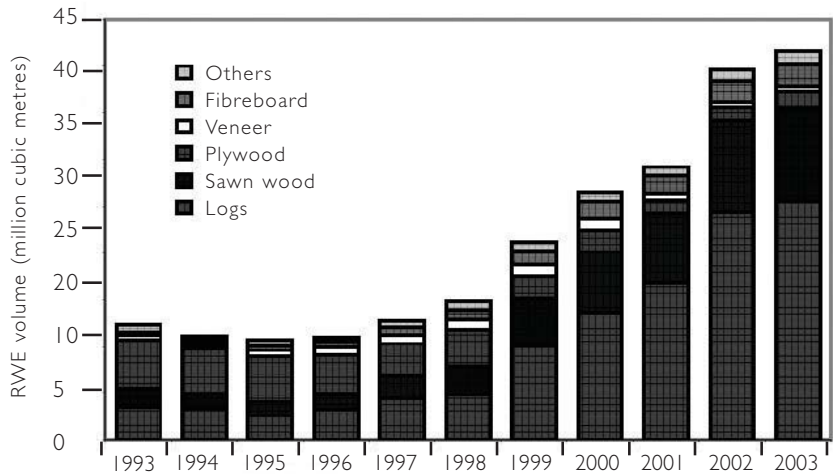


Figure 1: The growth of China's forest products imports from 1997 to 2003

Source: WWF, 2005

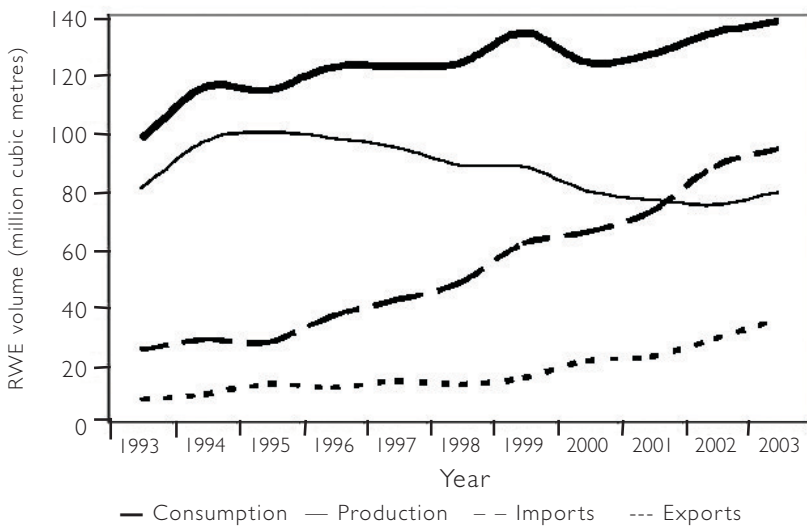


Figure 2: Growing disparity between China's production and consumption of wood

Source: WWF, 2005

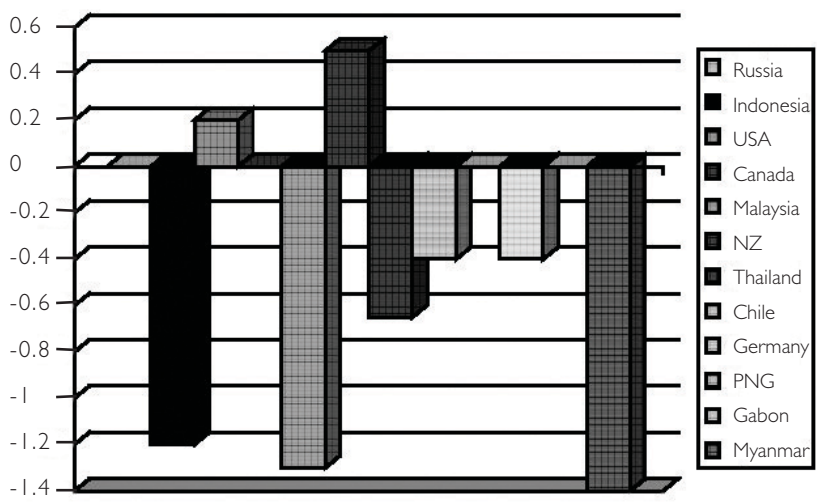


Figure 3: Annual rate of change in forest cover (1990-2000) in China's main supplying countries

Source: WWF, 2005

percent increase per year in wood exports to China (Sun, 2004).

Anecdotal evidence of China's impact on global patterns of wood trade is also telling. A member of USAID's Sustainable Forestry Products Global Alliance (a public-private partnership to expand the market for sustainable produced wood products) reports that in 2004 it had difficulty finding ships that could transport its wood supply, because most shipping companies were under contract to China's wood importers. Examples of other changes in the global trade of forest products most likely caused by China's growing demand are highlighted in Table 1.

Impacts to the Price of Industrial Forest Products

Although solid evidence is unavailable, it is likely that China's increasing appetite for wood is creating an economic incentive for more large plantations to come into production. As the world market adapts to China's increasing wood imports by establishing more pulp plantations (see the following discussion on "fast-wood" forestry), downward pressure is applied in the long term on the price of products that are produced most efficiently in a plantation system – such as paper and pulp.

Impacts to Forest Sector Governance

Any major change in a global industry based on a natural resource will have corresponding impacts on the environment and communities that live and work where the resource is produced and/or extracted. Economic benefits often have environmental costs, and these trade-offs must be considered from a variety of perspectives.

Although difficult to quantify, the Chinese market is surely causing an increase in the illegal harvest of timber from primary forests in Cambodia, Indonesia, Laos, Malaysia, Papua New Guinea, Russia, and Thailand. Various studies (i.e., environmental investigative agency, 2005) have estimated that between 50 to 80 percent of the wood harvested from primary forests in the region is harvested illegally, with most of it ending up in China.

Impacts to Global Deforestation Rates

Approximately 9.3 million hectares of forest cover was lost each year during the 1990 to 2000 period, according to the most recent Food and Agriculture (FAO) assessment of global forests. Figure 3 shows the rate of change in forest cover in the countries that are China's main suppliers of wood products; as this shows, forest cover is decreasing dramatically in most of China's main wood suppliers since 1990.

Unfortunately, the extent to which China's increasing demand for wood is primarily, or at least significantly, responsible for increasing the rate of global deforestation is indeterminable at this time.

In fact, there is a growing body of evidence that timber extraction is not a leading cause of deforestation, when compared to large-scale agriculture (e.g., soy in Brazil), subsistence "slash-and-burn" agriculture, urban sprawl, and other social and economic trends. Recent figures provided by the FAO suggest that only between 6 to 7 percent of the forests lost each year is primarily a result of timber harvesting; the rest is driven by agriculture and industrial development.

It is possible that China's demand for wood could result in such an increase in planting trees that it will slow the rate of global deforestation. Some evidence exists that, within China itself, this is the case.

For example, official statistics show that forest tree cover increased from 145 million hectares in 1990 (15.6 percent of land area) to 163 million hectares in 2000 (17.5 percent of land area). This is primarily a result of recent Chinese policies that restrict the harvest of natural forests and provide incentives to plant trees. Government agencies, entrepreneurs, and farmers are responding to these incentives with massive reforestation projects.

But this increase in global tree cover may not be as welcome as one might expect, as discussed in more detail in the following discussion of fast-wood forestry.

Conclusion

China's emergence as a global economic power is likely to continue, and its dependence on forest products, both domestic and imported, is expected to continue to grow. This will have dramatic social, environmental, and economic impacts on the global forest sector. Just as China's increasing consumption of oil is changing the global oil market, China is also changing the global market for wood products. Countries, companies, and communities that have or use forest resources are being forced to adapt to this changing marketplace.

And just as the private sector must adjust to these changing conditions, the NGO and donor community, including USAID and its partners, must also analyze these trends and adapt their programs to respond to these changing global conditions.

Issue II: Fast-Wood Forestry

An increasing amount of the world's wood supply is being produced in growing conditions more similar to farming than traditional forestry. These forestry systems, often referred to as tree farms or tree plantations, are found throughout the world, and include pine in the southern United States, Australia, and Chile; poplar in the Midwestern United States, China and Eastern Europe; eucalyptus in China and Brazil; Acacia mangium in Indonesia; and teak in Costa Rica, Indonesia, Malaysia, the Philippines, and Thailand – just to name the most prominent plantation countries.

According to the FAO's 2002 forest assessment, in 1990, 43.6 million hectares of plantations existed throughout the world; by 2000, this figure had increased to 187 million hectares. The FAO estimates the global rate of new planting at 4.5

million hectares per year, with Asia accounting for 70 percent of this growth, predominantly in China, Indonesia, Malaysia, and Vietnam.

Fast-Wood Forestry Defined

Producing wood under a “plantation” system is not new. But there is an emerging trend to take the plantation system one-step further into what is often referred to as “Fast-Wood Forestry.”

The biggest difference between fast-wood forestry and traditional tree plantations is in how the trees are managed. Whereas a traditional tree plantation is planted and left to mature with only limited fertilization, weed control, thinning, and pruning, Fast-Wood Forestry requires intensive management throughout the rotation. This results in much higher per hectare yields

and much shorter periods between planting and harvest.

Fast-wood plantations are usually defined as large blocks of a single species managed intensively to produce wood at high growth rates (mean annual increment of no less than 15 m³ per hectare). Fast-Wood Forestry plantations are usually harvested within 20 years of being planted, whereas traditional plantations have a 20 to 30 year rotation in tropical climates and a 40 to 80 year rotation in temperate climates.

The trend toward forestry plantations and Fast-Wood Forestry in particular, is a function of environmental restrictions, economics, and technology. Improved genotypes and recent advances in silvicultural technologies (and potentially genetically modified clones) have led to spectacular yields — which can be two to three times higher than in traditional softwood plantation conditions, and five to 20 times the per hectare yields in natural forests. And many countries are, or are trying to, reduce harvesting from native forests.

In short, fast-wood forestry is simply more profitable than managing natural forests or planting traditional plantations, and the global marketplace is responding to this opportunity to meet the requirements of a growing market more efficiently.

Environmental Impacts

The environmental advantages and disadvantages of plantation forestry in general, and Fast-Wood Forestry in particular, have been debated extensively in other publications and



Eucalyptus trees are one species often used in Fast-Wood Forestry systems.

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Table 2. Fast-Wood Forestry Plantation by Species and Country

Species	Mean annual increment at an operational scale (m ³ /ha/year)	Time to reach maturity (years)	Estimated extent fast-wood plantations only (*000 ha)	Main countries (in decreasing order of importance)
<i>Eucalyptus grandis</i> and various eucalypt hybrids ¹	15—40	5—15	+/- 3,700	Brazil, South Africa, Uruguay, India, Congo, Zimbabwe
Other tropical eucalypts ²	10-20	5-10	+/- 1,550	China, India, Thailand, Vietnam, Madagascar, Myanmar
Temperate eucalypts ³	5-18	10-15	+/- 1,900	Chile, Portugal, northwest Spain, Argentina, Uruguay, South Africa, Australia
Tropical acacias ⁴	15-30	7-10	+/- 1,400	Indonesia, China, Malaysia, Vietnam, India, Philippines, Thailand
Caribbean pines ⁵	8-20	10-18	+/- 300	Venezuela
<i>Pinus. Patula</i> and <i>P. elliotii</i>	15-25	15-18	+/- 100	Swaziland
<i>Gmelina arborea</i>	12-35	12-20	+/- 200	Costa Rica, Malaysia, Solomon Islands
<i>Paraserianthes falcataria</i>	15-35	12-20	+/- 200	Indonesia, Malaysia, Philippines
Poplars ⁶	11-30	7-15	+/- 900	China, India, USA, central and western Turkey

Notes for Table 2

- 1 Mainly hybrids involving: *E. grandis*, *E. urophylla*, *E. tereticornis*, *E. camaldulensis*, *E. pellita*.
- 2 Mainly *E. camaldulensis*, *E. tereticornis*, *E. urophylla*, *E. robusta*, *E. pellita*, *E. deglupta*. India alone reports 8 million hectares of eucalypt plantation (FAO 2001). It is estimated that a large share of this does not qualify as fast wood due to its modest growth rates.
- 3 Essentially *Eucalyptus globulus*, but also several frost-resistant species (mainly *E. nitens*).
- 4 Essentially *Acacia mangium*, but also *A. auriculiformis* and *A. crassicarpa*.
- 5 Essentially *Pinus caribaea var. hondurensis*.
- 6 The last forest inventory in China reports an equivalent of 3.7 million hectares of poplar plantations. Our estimate is that a large share of this is line planting, and that not all block planting is fast-wood plantation.

fora such as “Pulping the South” by Ricardo Carrere and Larry Lohmann.

In short, tree plantations do have much less biodiversity than a primary or even secondary forest, and converting large swaths of land

from multi-use, to single use, has major impacts for ecosystems and forest dependent communities. However, new plantations support industries that provide jobs throughout the production chain; and some argue that by producing more wood on less land, more land

is available for protection, conservation or multiple uses.

The point of highlighting this issue is not to enter into this debate. Rather, it is to quantify and draw attention to a few of the causes and effects that this trend is having on

the world's forest sector, so that development practitioners in general, and USAID missions and partners in particular, can respond appropriately.

As discussed, China's demand for wood and wood-based commodities such as pulp and paper is growing rapidly, and China is meeting this demand through major reforestation efforts, including small woodlots, traditional plantations, and increasingly, Fast-Wood Forestry. Currently China has approximately 54 million hectares of tree plantations, which equates to about 33 percent of the country's total forest resource and approximately 2 million hectares of industrial or Fast-Wood Forestry plantations are established each year.

Geographic Scope

Excluding China, Indonesia is the country most radically transforming its forestry sector to respond to an growing global demand. Indonesia has witnessed a massive conversion of tropical forest to Fast-Wood Forestry plantations, mostly Acacia mangium. By the end of 2001, it had 1.4 million hectares of fast-wood

plantations, and approximately one-half of these plantations were on land cleared of primary tropical rainforest in the last 20 years. Critics charge that some major multinational corporations target primary forest to "mine" for wood until the new fast-wood plantations are old enough to harvest.

This trend does not appear to be diminishing. For example, USAID's partners in Indonesia report that two of Indonesia's largest forest products companies are planning major plantation expansions to respond to the Chinese market. One company plans to develop 50,000 hectares of plantation per year, increasing to 150,000 hectares per year by 2015. And Indonesia is not alone in this trend. Other countries with major fast-wood forestry projects are highlighted in Table 2.

Conclusion

There is a growing global trend toward Fast-Wood Forestry. This trend is being driven by global factors that are unlikely to be suppressed or controlled. It is important for all forest resource stakeholders to be aware of what is

happening and understand why it is happening, so that they respond appropriately and effectively.

As summarized in the Cossalter and Pye-Smith paper, "Fast-wood forestry is neither inherently good, nor inherently bad; it is a neutral technology which, when poorly planned and executed can cause grave problems; and which, when well planned and executed, can deliver not just large quantities of wood, but a range of environmental and social benefits... but there should be a presumption against any planting which would lead to the loss of primary forest... or other important ecosystems."

USAID cannot reverse the trend toward Fast-Wood Forestry. But USAID can work to promote policies that incorporate a broad spectrum of stakeholders in deciding when and where Fast-Wood Forestry is appropriate.

The Agency can help build capacity within communities and local governments to manage existing forest resources for the full spectrum of environmental, social, and economic benefits.

References

The following sources were used extensively, but not exclusively, in the development of this discussion paper:

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http://www.usaid.gov/our_work/environment/forestry/index.html