China's Impact on Forests in Southeast Asia[1]

Graeme Lang* and Cathy Hiu Wan Chan**

[**Abstract:** Many developed countries have gained control of their forest-exploiting industries through advanced regulatory regimes. But stricter regulation usually displaces forest exploitation into developing countries with weaker regulatory regimes. The most important current example is the shift of forest exploitation for the Chinese market from China into Southeast Asia following the logging ban in China in 1998. In this article we describe and document the impact in Southeast Asia: rapidly increasing, unsustainable, and often illegal production and export for the Chinese market. We also note the growth in exports of furniture and plywood from China to the EU, UK, and elsewhere using imported and often illegally harvested timber from Southeast Asia. It is argued that it will be very difficult to interrupt the continuing deforestation in Southeast Asia because: (i) the profits from exporting forest products from Southeast Asia to the China market and the profits for Chinese firms which use these forest products to produce plywood and furniture for export to developed countries are substantial; and (ii) there is a lack of political will at all levels to interrupt these chains of trade and flows of profit.]

KEYWORDS: Burma Cambodia China Southeast Asia forests and timber Papua New Guinea environmental NGOs

From the point of view of life on earth, forests are the planet's second most important resource after oceans. They regulate climate, control water cycles, shelter most land-based animals, and provide innumerable benefits to humans. No other form of life has so many crucial functions for land-life in general, and for humans in particular. But forests continue to decline steadily toward local and regional crisis levels even though their importance is well-known to scientists and environmentalists.

The decline is not equally distributed among forested countries. Most developed industrial or post-industrial societies have stabilized their forests. As a result of their wealth and governance capacity, they can provide expertise for the necessary regulations, monitoring, and enforcement. With most of their populations living in cities and engaged in secondary or tertiary industries, and with the resulting low fertility, they do not need to clear forests for land to support a large rural population which is struggling to survive. The most rapid declines, by contrast, are in developing or poor countries, where rural population growth leads to the clearing of forests for agriculture and cooking fuel, and to increasing exploitation of forests for rural employment. Logging enterprises which

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pursue windfall profits are active in many of those countries. The weaker capacity to regulate, monitor, and enforce forest management is compounded by corruption, which is related to poverty and regimes of exploitative governance.

There is an additional important factor: the increased control over their forest exploitation by developed countries leads to displacement of demand for forest products "offshore" to other regions, and further increases the pressure on forests in developing countries. The absence of effective regulation and environmental governance in those developing countries further hastens the decline of their forests (Zhu et al., 2004). Ironically, this effect is in direct proportion to the extent to which developed countries succeed in regulating forest exploitation within their own borders. Since the market for forest products remains strong, and the highest profits go to suppliers of the wealthiest markets, international trade to developed countries contributes to the further depletion of forests in developing countries. The profits from that trade also provide the funds to corrupt local governance, making it even more difficult for already inadequate regimes to prevent this kind of impact, even if they were motivated to do so.

In the contemporary world, there is no better example of these processes and effects than the impact of China's growing market for forest products on Southeast Asian forests, and in particular, the impact of the 1998 logging ban in China on the increased exploitation of Southeast Asian forests for the China market. This impact is now well-known but attempts to reduce the destruction of Southeast Asian forests for the China market have largely failed, as of 2005. In this article, we document these effects with some data on forest trade between China and Southeast Asia, assess the impact of illegal logging, discuss the regulatory problems facing countries in the region, and reflect on several scenarios for the near future.

Sources

When the first author started this research project, he was mainly interested in the problem of deforestation within China, the impact of the massive floods of 1998 and the subsequent logging ban on the implementation of more sustainable forestry policies, and the relation between the ban on logging and the Chinese state's historical water control project, which in turn is linked to the problem of regime legitimacy (Lang, 2002a).

The logging ban was fairly successful in reducing unsustainable forest extractions. But it was also clear that the ban had merely displaced deforestation from within China into other regions, especially, Southeast Asia (Lang, 2002a; 2002b). Subsequently, we began to study the impact of the ban on extraction of forest products within Southeast Asia, where the forests are already being rapidly depleted, where state capacity in regard to monitoring and control is often weak, and where control is heavily compromised by corruption.

We expected that it would be difficult to get a good picture of these developments. Forestry production data and forest products trade statistics from China, other countries, and trade organizations are available, and we used them as much as possible although they are not always reliable and not always unambiguous. For illegal logging and illegal exports of forest products, however, the official and publicly available data do not provide much help.

We quickly realized that the most vigorous research on some aspects of the problem, particularly on illegal logging and illegal trade in forest products, is carried out by NGOs. Their intense focus on these problems, their links with local organizations, and their willingness to take risks to document what is happening, have put them far ahead of most academic researchers on this topic. Cycles of academic research are far too slow to keep up with rapidly changing developments in the region. To write a grant proposal, get funding, hire research staff, and write an academic paper from the research typically requires several years. Academic research is also hampered by risk avoidance when trying to monitor illegal activity, and by the oversight of ethics committees in universities and research grants agencies which would not approve projects which put research staff at risk, or which exposes informants to possible violent retaliation.

Meanwhile, the activist NGOs move quickly, send dedicated volunteers into dangerous environments, use photos and videos to document illegal activity, and publish results quickly on the World Wide Web. Academics cannot compete with this kind of research effort, but can build the results into their analysis as we try to do in this article. Several of these organizations deserve special attention as we review the sources of information for this article: Global Witness,[2] the Centre for International Forestry Research,[3] the Environmental Investigation Agency,[4] Greenpeace, and the World Wildlife Fund's project to study China's forestry products trade with neighbouring countries.

In this article, using these sources as well as government and trade industry statistics, we first describe the impact of the logging ban on domestic timber production. Then we document increasing forest products imports by China as a result of changing governmental regulatory activities and displacement of demand offshore after 1998. Next we document China's growing timber imports from Southeast Asia. The regulatory activities of these countries provide gaps for illegal logging and illegal timber trading between Southeast Asian countries and China.

China's Forestry Control and the Logging Ban of 1998

China has an estimated 160 million hectares of forests, covering about 16.6% of total land area (*China Internet Information Center*, 2003). This is a considerable increase from the estimated 8.6% forest cover in 1949, and the estimated 14% forest cover in the mid-1990s (Lang, 2002a), but still very low by world and regional standards (e.g. on Japan, see Diamond, 2005: 365). The main reason for this increase in forest cover is the extensive tree planting programs – mainly for shelter belts and commercial forests – implemented by the government over various periods since 1949. However, these programs had apparently not stopped the continuing decline of China's natural forests. Cutting of forests in mountainous regions had one particularly important consequence: it reduced the capacity of forests to hold water and soil, and to reduce erosion of soil into the rivers.

The contribution of deforestation to soil erosion into rivers and thus to the raising of river beds and subsequent increased severity of flooding, was understood by some analysts in pre-modern China (Elvin, 2004). However, this knowledge did not prevent legal and illegal cutting of forests around the watersheds of major rivers in the past, nor in the 1980s and 1990s. The control apparatus was not particularly effective in preventing

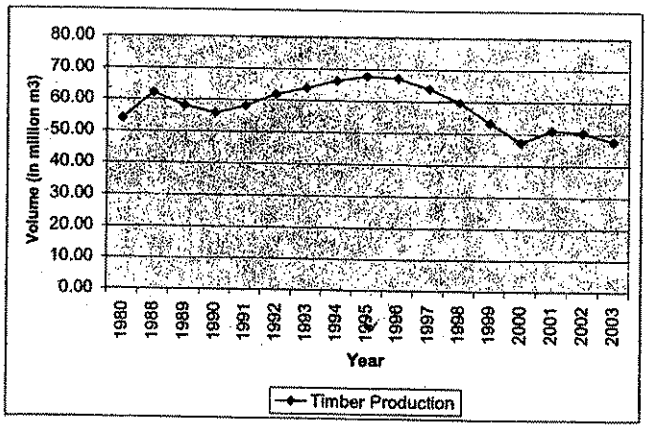
violations of the regulations at local levels, partly because of local corruption and collusion between local officials and logging groups. Timber production had apparently begun to decline even before the logging ban in 1998, because of the continuing depletion of China's natural forests and the increasing difficulty of harvesting mature timber (Zhu et al., 2004: 13), but the decline had not yet provoked an aggressive state response.

The scale of the 1998 floods, however, changed the political calculus of the regime and focused national attention on the contribution of deforestation to the disaster. While periodic peak rainfalls and consequent flooding in China's river valleys are a recurrent feature of the landscape, the floods in 1998 were the worst and most costly since the 1950s, and precipitated a strong reaction from the Chinese government. Extensive and often illegal logging in these watershed regions was immediately identified as a major contributor to the scale of the disaster, and was subsequently banned in 17 provinces (Lang, 2002a). Enforcement of forestry regulations is always precarious and subject to incursions whenever enforcement energy lags (Lang, 2002a; Economy, 2004: 122).[5] But the curtailment of logging in key watersheds seems to have been fairly successful. Even so, there were no measures to reduce the demand for forest products. Hence, the inevitable result was to displace the demand to other countries which could supply the demand.[6]

Impacts of Logging Ban on Timber Production and Imports

Domestic timber production in China reached a peak of more than 67 million cubic metres (m^3) in 1995, but had declined to less than 48 million m^3 by 2003 (*Mississippi Development Authority*, 2004). The Chinese government had started to reduce logging by 5 million m^3 every year in 1997. Figure 1 shows timber production since 1988. Although some data are missing, we observe that the timber production reached a peak in 1995 and then began to decline after 1995, to 47.24 million m^3 in 2000. After a brief rise in 2001, it declined again in 2003 to 47.6 million m^3.

Figure 1: China's Timber Production (1980, 1988—2003)



Source: For 1980, 1988, 1993, Rozelle et al. (2000, p. 20); for 1989 to 1994, Hammett et al. (2001, Table 1); for 1995 to 2001, Cohen et al. (n.d.), Pandora Australia's Web Archive (2000), and *Timberhunt* (2002); for 2002, China's Statistical Bureau cited from Brabant (2003); for 2003: *Asiawoodweb* (2004).

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The declines in timber production in China did not result from a decrease in demand for timber. Table 1 and Figure 2 show increases in China's importing of forestry products. From 1980 to 1986 and from 1991 to 1996, the import of timber products remained below 11 million m^3. However, between 1997 and 2003, imports rose from 12.6 million m^3 "round-wood-equivalent" (RWE) to 40.2 million m^3 RWE — an increase of 319% within six years. The imports of pulp and paper also increased greatly – by 1,650% – between 1995 and 2003. China's per capita consumption of forest products is below the world average, and its estimated per capita "forest ecological footprint" (0.08 ha), is still far below that of the US (1.35), Western Europe (0.58), and Japan (0.33), but the size of China's population produces a large collective impact, and China is now the world's second largest consumer of wood after the US and Japan, as of 2000 (Zhu et al., 2004: 27-8).

Table 1: China's Forest Product Imports from 1980 to 2003: Overall Volume and Volumes in Timber Product and Pulp & Paper (in million m^3 RWE)

Year	Timber Product Imports	Pulp & Paper Imports	Total Forest Product Imports
1980	1.8	\	\
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1984	7.9	\	\
1985	9.7	\	\
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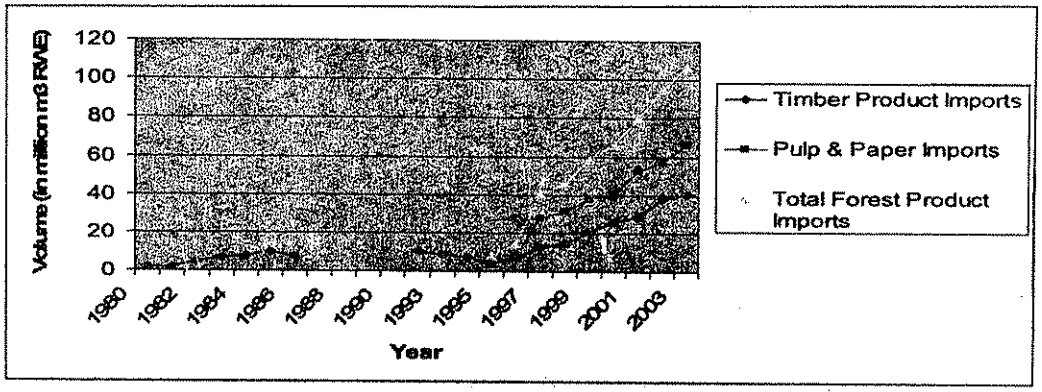
1991	10.5	\	\
1993	8.2	\	\
1994	7.5	\	\
1995	4.3	3.8	8.1
1996	6.3	8.0	14.3
1997	12.6	27.6	40.2
1998	14.6	31.2	45.8
1999	20.6	38.0	58.6
2000	25.8	40.3	66.1
2001	28.1	52.3	80.4
2002	38.1	57.0	95.1
2003	40.2	66.5	106.7

Notes: For 1980-86: Li et al. (1988: 210); for 1991: Marchak (1995: 169); for 1993-94: Zhao and Shao (2002); for 1995: Waggener and Xu (1997); for 1996: Shi et al. (1999); for 1997-2003, Sun et al. (2004). Timber Product Imports: 1987-90: no data available; 1991: includes industrial roundwood and sawnwood only; 1993-94: the statistics do not show the types of timber; 1980-95: Pulp and Paper Imports: before 1995, data unavailable. Volume of imports of timber products, pulp and paper is in m^3; for 1996: timber product imports include logs, sawn timber, plywood and veneer; for pulp and paper imports, waste paper and board are also included; for 1997-2003, volume is in m^3RWE.

Figure 2: China's Forest Product Imports, 1980-2003

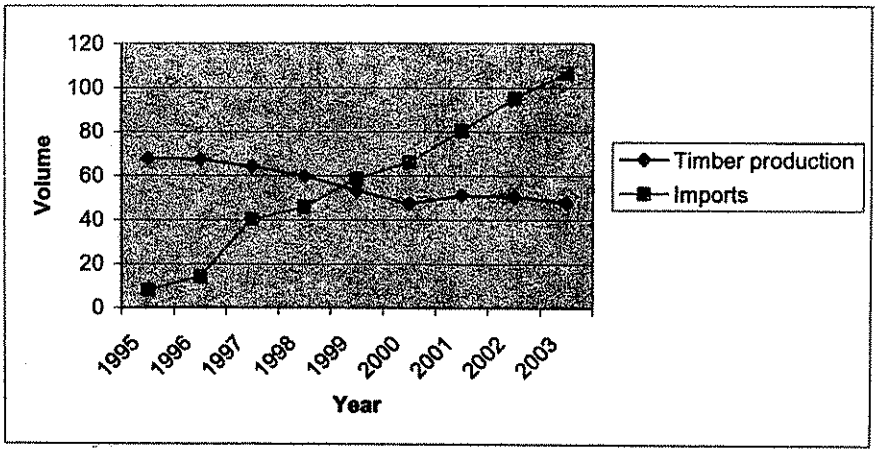


Sources and notes: Same as Table 1.

Under the logging ban which was implemented from September of 1998, the decrease in domestic timber production led to a timber shortage in China and resulted in rising prices. For example, timber prices increased by 20% to 30% at the Beijing wood market in 1998 (Studley, 1999 cited in Zhao and Shao, 2002). Prices of domestic timber would have risen much more rapidly, without the importing of timber which acted as a substitute for declining domestic timber supply.

The decrease in domestic timber production in China and rapid increase in imports of forestry products are shown graphically in Figure 3.

Figure 3: China's Timber Production and Timber Imports, 1995-2003



Notes: The data in Figure 3 are from Table 1 and Figure 2.

Reasons for the Increase in Demand for Forest Products

The demand for wood products in China was increasing in the late 1990s, and is likely to continue to increase, for three main reasons: (i) economic development and related

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increases in housing construction and in production of paper; (ii) reductions in tariffs and changes in regulations on importing of forest products, related to accession to the WTO; and (iii) increasing Chinese exports of wood-derived products, particularly, furniture. Some other developments will add further demand, such as the construction of housing prior to the 2008 Olympic Games. Before we proceed to the impact of this demand on Southeast Asian countries, we briefly outline the main factors.

China's economic growth over the past ten years has been estimated to average 8% to 9% per year. Accompanying the economic boom, rapid expansion of the stock of housing in urban areas, and related new housing policies, fuelled the demand for timber (Zhu et al., 2004: 17). China had started to reform the housing system through the National Housing Reform Programme (NHRP) since 1988. It abolished the workplace distributed housing system and replaced much of it with private housing. The area for housing has expanded at the same time.[1] Meanwhile the government intended to increase the living space in urban areas from 8.7 m^2 per person in 1997 to 10 m^2 per person in 2003, with a predicted further increase to 13 m^2 per person by 2010 (*Natural Resources Canada*, 2003). The improving standard of living also raises the demand for interior decorations and furniture, as industry sources have noted (Halstead, 2001; *Natural Resources Canada*, 2003; *Mississippi Development Authority*, 2004; Zhang et al., 1998). The demand for higher quality plywood also increased.

China's imports of pulp and paper have also increased greatly between the late 1990s and 2003. Imports of pulp rose from less than 10 million m^3 in 1993 to about 28 million m^3 by 2003 (Zhu et al., 2004: 21). Most of the pulp comes from Canada, Indonesia, and Russia. Some of the pulp comes from mills which are joint ventures between Chinese and Southeast Asian firms in Malaysia and Thailand (Zhu et al., 2004: 30). Some of the imported pulp is used to meet growing internal demand in China for high quality paper produced from wood fibre, but China's exports of paper have also increased rapidly; most of the paper is exported to Hong Kong, the US, and Japan (Zhu et al., 2004: 20).

WTO: Lower Tariffs and Reduced Value-added Tax

Although economic development and construction increased the internal demand for imported timber, lowering import tariffs is also a key factor in expanding import volumes. To prepare to enter the World Trade Organization (WTO), China loosened the restrictions on import and export of timber, such as tariffs and export licenses, thus facilitating foreign investments in forestry industries in China (Halstead, 2001; Hammett, et al., 2001; *Mississippi Development Authority*, 2004; *Natural Resources Canada*, 2003; *South Carolina State Government*, 2004; Zhang et al., 1998). Continuous decreases of import tariffs[2] have been accompanied, unsurprisingly, by increased imports of wood products (Zhang et al., 1998). Such declines of import tariffs on wood products make foreign investors more interested in the timber trade with China.

A value-added tax (VAT) still applies on imported timber, increasing the market price. But the VAT on 19 products including newsprint and wood pulp was removed on June 1, 2003 (Brabant, 2003; *South Carolina State Government*, 2004). Moreover, half of VAT on all goods entering from border countries will be or has been reduced in order

to promote economic development in China's border regions, which may encourage timber imports from border countries such as Burma and Russia.

Removal of Import Licenses

The loosening of import and export licenses of timber encouraged the forestry industries invested by foreign countries in China. In the past, there were strict controls over timber import and export licenses. For example only the state-owned companies could get wood import licenses. It limited not only sources of import of timber and the distribution of timber within China, but also the investment from foreign industries (*M2 Presswire*, 2001). After the removal of the Importing License in January 1999, all companies can directly import wood products based on their assessment of the market and on the quality of the timber (Cohen et al., n.d.). The removal of the import license also attracted foreign direct investments.

Exports of Furniture and Other Timber Products

China's exports of wood-using products increased rapidly during the past decade. The volume of wood used in these exports increased from about 4 million m^3 RWE in 1993 to about 24 million m^3 by 2003, with furniture comprising the largest portion of these exports (Zhu et al., 2004: 18-20). Most of the volume of wood used in exported furniture – about 5.5 million m^3 RWE by 2003 – went to the US, with substantial exports also to Japan and the EU (Zhu et al., 2004: 19). Whole districts in China near the coast are devoted to processing logs imported from Indonesia and elsewhere, and hundreds of local and foreign invested factories in the coastal provinces produce furniture from these logs for export to North America, Europe, and Japan, using cheap labour to generate high profits from sales to wealthy markets in developed countries.[3]

Forest Products Imports from Russia and Southeast Asian Countries

China imports forest products from a number of countries and regions, including Russia, Southeast Asia, New Zealand, Canada, Brazil, and increasingly, from several countries in Africa.[4] It has been estimated that by 2010, even with growing production from domestic tree plantations, China will have to import as much as 125 million m^3 RWE of timber and wood products to supply the domestic market as well as the industries which export wooden furniture and paper products to developed countries (Zhu et al., 2004: 24).

Russia is currently the largest single source of timber for the Chinese market. While Russia supplied as little as 14% of the Chinese market in 1995, and 21% in 1997, it has been estimated that by 2000 more than 43% of the logs imported into China came from Russia (Branston, 2002; *Global Timber Organization*, 2004; Grigoryev, 2002; Labes, 1999; *UNECE*, 2004; Yamane and Lu, 1999). By 2003, an estimated 21 million m^3 RWE of wood products was exported to China from eastern Russia, most of it as logs (Zhu et al., 2004: 32). These imports from Russia arrive overland, such as in the northern Chinese city of Suifenhe, and in at least seven ports. Since control is often weak and corruption prevalent, it has been estimated that as much as a fifth of the tree-cutting in Siberia is illegal (Larmer and Seno, 2003; *Greenpeace*, 2005b).

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In this article, however, we focus on import and export of forest products between China and five countries: Indonesia, Malaysia, Burma, Thailand, and Papua New Guinea (PNG). China's timber imports from these countries are shown in Table 2.

Table 2: China's Forest Product Import from Indonesia, Malaysia, Burma Thailand, and PNG, 1997-2002 (in m^3 RWE)

Year	Indonesia	Malaysia	Burma	Thailand	PNG	Total
1997	5,000,000	3,900,000	295,474	550,000	250,000	9,995,474
1998	8,010,000	4,600,000	266,613	1,200,000	250,000	14,326,613
1999	8,000,000	5,600,000	463,266	1,800,000	500,000	16,363,266
2000	9,500,000	5,400,000	783,403	2,000,000	750,000	18,433,403
2001	9,900,000	3,800,000	794,805	2,200,000	1,000,000	17,694,805
2002	10,070,000	4,300,000	947,765	2,480,000	1,200,000	18,997,765

Sources: For Indonesia, Xiufang et al. (2004: 33); for Malaysia, Xiufang et al. (2004: 39); for Burma, Kahrl et al. (2004: 14); for Thailand, Toyne et al. (2002: 15); for PNG, approximate figures, from Zhu et al. (2004: 45).

Legal and Illegal Logging: Indonesia

China imports forest products from Malaysia, Singapore, Thailand, Burma, Laos, Cambodia, Papua New Guinea, and the Philippines, and in some of these countries, the governments do little to effectively prohibit illegal logging and trading. As we have seen (Table 2), the largest imports from Southeast Asia come from Indonesia, mostly in the form of timber and wood pulp. This is especially important, because of the importance of Indonesian forests – comprising about 10% of the planet's remaining tropical forest – and because of the rapid loss of those forests over the past 50 years.

From 1950 to the mid-1990s, the forest cover in Indonesia declined by about 40%, from an estimated 162 million hectares to 98 million hectares[5] (Toyne et al., 2002; Febrian, 2004). The average annual forest loss was about 1.4 million hectares. According to Toyne et al. (2002), the rate of decline has been increasing, from a loss of about 1.7 million hectares a year in the 1980s to 2 million hectares a year recently. The annual rate of forest destruction in Sumatra, Kalimantan and Sulawesi was 1.6 million hectares on average from 1985 to 1997, and 2.8 million hectares from 1997 to 2000 (Febrian, 2004). East Kalimantan contains around 14.6 million hectares of forest but loses an estimated 450,000 hectares annually (*Market New Zealand*, 2004). It has been predicted that lowland tropical forest (apart from plantation forests) would largely disappear in Sumatra and Kalimantan by 2005 and 2010 respectively (Dauvergne, 2001; Toyne et al., 2002). The massive destruction of villages and buildings in Aceh, Sumatra, during the tsunami of 26 December 2004, puts further burdens on the forest resources of Sumatra, and could lead to further extensive deforestation unless international donors provide replacement timber, for reconstruction, from outside Indonesia (Owen, 2005).

Some of the destruction of tropical forests in Indonesia is designed to clear space for palm oil plantations, which lack many of the ecological functions of natural forests. The

burning of forested areas for this purpose periodically produces massive haze problems throughout Southeast Asia as the haze drifts northward over Singapore and Malaysia (as for example in August, 2005). Although Malaysian politicians and media scolded Indonesia for failing to control such burnings, it was also noted that a number of Malaysian companies active in Indonesia contributed to this problem. One of the companies with operations in Indonesia, Rimbunan Hijau, founded by an ethnic Chinese Malaysian businessman, is one of the most active groups in many levels of the forest products trade from Africa to Southeast Asia to Russia.[6] Mainland Chinese investors are also reportedly involved in palm oil plantation development in Kalimantan (Kuppusamy, 2005).

It has been estimated that as much as 50 million m^3 of Indonesian timber is cut illegally each year (*CIFOR*, n.d.). We know that illegally cut timber is shipped from Indonesia to a number of countries, including China. One of the ways in which this becomes apparent is in the difference between Indonesian figures for export of logs to China, and the figures for the importing of logs from Indonesia into China. For example, Indonesian data indicate 336,000 m^3 of timber exports to China in 2002 while China indicated the imports from Indonesia as 1.2 million m^3. The difference – 864,000 m^3 – was illegally exported timber. The illegal logging brings not only economic loss to the government, but also the continuous depletion of Indonesia natural forests.

In fact the government of Indonesia has attempted to set restrictions such as logging bans and a quota system to prevent illegal logging for many years. The logging bans and tax on timber exports did not stop the expanding legal timber trading. For example, forest product exports from Indonesia to China rose by 48% to 71% annually from 1997 to 2002. Pulp and paper exports increased five times after 1995, and exports of wooden furniture doubled. Although more than 30% of Indonesia's timber exports still go to Japan, about 20% of the legal exports went to China by 2002 (Zhu et al., 2004: 35).

According to Toyne et al. (2002), about 73% of the timber exports were not legal in the 1990s, and the annual illegal cut reached 15 million m^3 in the mid-1990s. It was estimated that 300,000 m^3 of sawn timber was exported in 2003. Ramin, a vulnerable timber species found only in Indonesia and Malaysia and widely used in products such as wooden blinds and kitchen cabinets, was illegally logged in large amounts especially from Tanjung Puting National Park in Kalimantan (*EIA*, 2001).[7] Most of the illegal timber was shipped to developed countries such as Japan, the United States and the United Kingdom, or the developing countries such as China.

Toyne et al. (2002) estimated that China accounted for 17% of Indonesia's total legal timber exports, and 37% of its pulp and paper exports. The imports of other types of timber such as plywood, logs and lumber from Indonesia were also increasing from 1981 to 2002, and total imports roughly doubled between 1997 and 2002, from about 5 million to more than 10 million m^3 (Xiufang et al., 2004: 33; Sun et al., 2004: 13).

However, it has been estimated that over 70% of Indonesian export timber was from illegal sources. For example, Indonesia reported that it exported 336,000 m^3 of sawn timber in 2002 to China, while Chinese authorities reported the import of 1.22 million m^3 of sawn timber from Indonesia (*Greenpeace*, 2005a). Other analysts detected smaller but still substantial disparities between Indonesia reporting of forest products

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Yet, China could not import all of the illegal timber directly from Indonesia. It appears that Singapore and Malaysia are involved in illegal trading in timber from Indonesia to China. The Environmental Investigation Agency (EIA) has published reports about Singapore and Malaysia's illegal smuggling of endangered species of timber, including ramin, from Indonesia. Singapore's ports evidently serve as trans-shipment loopholes. EIA and Greenpeace allege that the Singaporean government has not taken any effective measure against such illegal trade. In *Singapore's Illegal Timber Trade* (*EIA and Telapak*, 2003), at least 19 illegal trading cases were listed. Singapore Customs policy "does not require any customs permits for goods which are 'discharged along wharves directly into a Free Trade Zones'" (*EIA and Telepak*, 2003: 5).

Neither the Singapore government nor the timber merchants attempted to combat the illegal trading, and over 150 companies were timber importers and/or exporters. When interviewers from EIA interviewed two employers of import or export companies, one of them even responded "this [ramin] smuggling is better than drug smuggling," and another mentioned that he exported "three to five containers a month of this illegal Indonesian sawn Ramin to Guangzhou Port in China under a false species name" (*EIA and Telepak*, 2003: 6). Laws have not stopped the illegal ramin trading from Indonesia to Singapore especially in the five Free Trade Zones (FTZs). The EIA reports that:

> All dutiable goods can be stored ... repacked, sorted and reconditioned in the FTZs.... Pink or White Transshipment Permits are required under certain conditions.... However, if cargo will remain in the same container it arrived in, and it will be shipped out of the country from the same FTZ, the cargo needs no transshipment permit ... no transshipment permits need to be produced for containerized cargo moving from one FTZ to another. (*EIA and Telepak*, 2003: 14).

This system clearly offers good chances for the smugglers to re-export illegal cargos.

Besides Singapore, Malaysia also plays a significant role in illegally smuggling timber and ramin from Indonesia. The Environmental Investigation Agency's report, in collaboration with Telapak Indonesia, on Timber Trafficking in Southeast Asia (*EIA and Telepak*, 2001), shows an outline of how illegal Indonesian ramin from Malaysia, Singapore and Indonesia enters the world market: Japan, Taiwan, US, UK, Hong Kong and mainland China.

The routes of illegal timber trading from Indonesia to Peninsular Malaysia and Sarawak, and Singapore, include routes from Riau (Sumatra), and from western and central Kalimantan, to Malacca, Batau Pahat, and Johor Bahru in peninsular Malaysia; and from western and central Kalimantan to Lubok Antu, Kuching, and Sibu in Sarawak, Malaysia.[8] Many sawmills have been found along the border between Indonesia and Sarawak, for example from Lanjak to Badau on the Indonesia side. They were built to provide rough-sawn timber and illegally pass it to Lubok Antu for further processing and then to Sibu. Most of the timber and ramin are then re-exported to Japan, the US, Germany, Italy, Hong Kong, Taiwan and mainland China (Zhu et al., 2004: 37).

Malaysia has extensive illegal timber importing from Indonesia, despite the fact that the Malaysian government produced a number of policies to restrict illegal timber smuggling and illegal internal timber cutting, including the ban on export of Malaysian domestic timber in 1998. These policies merely "stimulate[d] demand for Indonesian

plywood from other Asian countries" (Dauvergne, 2001, p. 99).

Internal Factors Affecting Illegal Logging in Indonesia

The Indonesian government announced several logging bans in 2002, along with forestry regulatory activities such as listing ramin as endangered tropical tree species (Sato, 2002). But internal problems have resulted in the failure of forest protection. Problems of corruption and the collusion of local elites with illegal logging operations have been exacerbated by the political decentralization which followed the fall of the Suharto regime.

Decentralization

The Suharto regime which had governed Indonesia between the mid-1960s and the late 1990s, did not manage to achieve sustainable forestry, but there was some progress towards that goal, and at least there was some central control over forestry practices. However, the progress was insufficient, up to the late 1990s, to lead to sustainable forestry and to prevent continuing depletion of Indonesian forests (Sato, 2002; Palmer and Obidzinski, 2003). But when decentralization and loss of central control occurred after the fall of Suharto, in 1999, the control over forest depletion deteriorated, and predatory exploitation of local forests was actually facilitated by the devolution of authority. This was predictable, in a society where local judicial independence is weak or absent, governance is heavily comprised by corruption, and local bosses linked to economic and military cliques, which consolidated their power during the Suharto era, are able to continue to dominate local economic affairs as central authority declines (Hadiz, 2003; Hadiz and Robison, 2003).

Palmer and Obidzinski (2003) have described the relationship between decentralization and illegal logging in detail. In 1999, the financial and political power, including the natural resources management, were in effect devolved from the central government to provincial and district authorities. With growing political instability, organizational ability to maintain the commitment to longer term protection of the forests declined. Before 1999 the concessions of logging licenses were limited to only a few owners. When the concessions were divided into many smaller concessions by the provincial and district authorities in 1999, it attracted many small groups in local areas, such as district heads (*bupati*), who "established themselves as key power figures controlling forest resources and their utilization after 1998" (Palmer and Obidzinski, 2003: 3).

For example, near the Tanjung Puting national park, a local "boss" became the kingpin of the illegal extraction of the wood from the park, with close links to the local police and with a network of workers and enforcers with a strong economic motive to support such extractions. Typically, they are prepared to threaten and even assault outsiders who arrive in the district to try to investigate.

The overlapping power among politicians, entrepreneurial groups, and powerful military groups also led to the continuing over extraction of natural resources in Indonesia. People who wish to report illegal logging may face threats of violent reprisal from military-related forces or from company guards and enforcers (Toyne et al., 2002).

During the Suharto era, there were close relationships between Suharto's family,

the army and the large concession owners (Palmer and Obidzinski, 2003). They were evidently protected by the army and they could continue with both legal and illegal logging. Though army protection declined when Suharto fell, forest destruction expanded, driven by "local communities, cooperatives, entrepreneurs and outsiders" (Palmer and Obidzinski, 2003: 9).

Some of the main Indonesian business groups involved in logging, plantation forests, and production of paper and plywood have been ethnic Chinese-Indonesian family groups. At least one of these groups has begun to operate paper mills and plantation forests in China.[9]

Timber Processing Industries and Employment

Apart from government mismanagement, the economic dependence on direct and indirect processing industries is also a key factor leading to the failure of logging bans and to rapid forest destruction in Indonesia.

With the increasing number of pulp and paper industries, employment was expanding, and hence led to increased dependency of the local and national economy on forest-related industries. There was sharp decline in employment in the 1980s[10] when the logging ban was implemented (Gillis, 1988). In the 1990s, the Indonesian government changed its industrial policy—promoting industrial plantations especially for the pulp and paper industries (Sato, 2002). This labour intensive timber industry then increased its capacity to employ more workers in the sector. Zain Masyur of the Djajati Group claimed at a forest policy workshop in 2001 that the "direct employees of the wood industry amounted to 2.5 million people, indirect employees another 1.5 million, and their families 16 million, totalling 20 million people. Investment in the industry has risen to USD$28 billion" (Sato, 2002).

The collapse of forest-related industries would lead to a substantial increase in unemployment and increased potential for social instability. During a recession in the timber processing industry in West Kalimantan, 500,000 workers had to face layoffs. In addition, the wood-related industries offered many job opportunities for the poor: an estimated 16,000 jobs in manual logging and 20,000 jobs in small concession logging in Riau alone, in Sumatra (Obidzinski, 2004). The Indonesia economy would be significantly affected if a logging ban was imposed and strictly enforced. Hence, deforestation occurs not only because of predatory elites, but also for the sake of social stability in areas where communities have become dependent on income from exploiting forests.

Burma

Burma (Myanmar) contains more than half of the remaining natural forests in mainland Southeast Asia, but these forests are declining rapidly. Burma exports hardwoods and is particularly well-known in the forestry industry for its natural teak forests and teak plantation forests. However, the military junta, which controls national resources and operates or allocates logging concessions through the military's Myanmar Timber Enterprise, appears to use the forests as an easy way to get large amounts of hard currency. In 1988, the regime awarded logging concessions to 36 Thai logging companies,

cancelling those concessions in 1992. But illegal logging continued (*EIA*, n.d.). Though the regime sets limits on logging, over-cutting for export is widespread. National data from Burma on log exports appear to report only 25% to 50% of the actual volume of exports. If we compare Burma's export data with data from countries reporting imports of timber from Burma (*Global Witness*, 2003: 39), and the under-reporting of exports to China, it may be even greater (Zhu et al., 2004).[11]

The logs are exported mainly to China, India, and Thailand. Thailand and China had both implemented logging bans after costly floods partly due to deforestation in 1988 and 1998, and both countries then turned to Burma to increase their external sources of supply of logs (Lang, 2002b). China is now by a considerable margin the largest importer of logs from Burma. The logs sent to China go overland through Yunnan province (Castrén and Wang, 2002), which shares a border with Burma and has many business enterprises which are active in Burma. Logs are also sent to China by ship via Hong Kong.[12]

The rapid increase in the import of logs and other wood products from Burma into China began the year after the logging ban. Timber imports were less than 300,000 m^3 in 1997 and 1998, but after the ban, increased to about 800,000 m^3 in 2000, and to over 900,000 m^3 RWE by 2002 (Xiufang et al., 2004: 49). Thai loggers are also very active in logging the teak forests. In Thailand, vigorous civil society groups and NGOs publicize at least some abuses within the country, but in Burma, the regime suppresses public discussion or criticism related to environmental issues (Chelala, 2004). China is a major ally, providing $200 million in aid in 2004, and is also reportedly the sole supplier of military equipment to the regime (Cochrane, 2005). Since Burma is strategically important for China, and a source of cheap imports of wood to help make up for the shortfall in the mainland market, it would be surprising indeed if China had anything critical to say about conservation issues in Burma. It is possible that the Burmese regime has begun to regulate logging more carefully, but importers in China can also get logs from areas of Burma which are less closely controlled, such as the Kachin-controlled districts (Larmer and Seno, 2003). The ethnic resistance groups in the regions along the 1,780 kilometre border with China are reportedly a major source of the logs trucked into China (Zhu et al., 2004: 43). This unsustainable logging by the military junta and its ethnic competitors provides windfall profits both to the junta and to the ethnic insurgents, for personal wealth and for military expenses.

Cambodia

Like Burma, Cambodia supplies some of the shortfall in the supply of wood products in both Thailand and China following the logging bans in the two countries in 1989 and 1998 respectively. During the period after the Vietnamese invasion of Cambodia in 1979, when the Khmer Rouge still controlled large areas of Cambodia, the forests were used to generate revenue for both the regime and the rebels. In areas of western Cambodia near the border with Thailand, the Khmer Rouge used the sale of timber across the border into Thailand to continue to finance their activities, in violation of Thailand's laws. Field research by GW along the Thai border in 1995 and the resulting exposure and publicity prompted the Thai government to close the border in 1996.

The Cambodian government also announced a ban on the export of timber in December 1996 (Lakanavichian, 2001). Since the peace agreement and the recovery of sovereignty over the whole country by the national government, timber exports have reportedly declined sharply, from peak exports of over one million m^3 in 1994 and 1995, to less than 19,000 m^3 in 2003, as indicated by *FAO* (2005) data.

To the extent that these figures indicate some real reduction in timber harvesting, it was a direct result of the dependence of Cambodia on foreign aid during the 1990s, and the pressure of foreign donor organizations and donor countries to do something about the rapid decline in Cambodian forests. During the late 1990s, Cambodia derived about half of the expenses of the national government from international aid organizations such as the World Bank and the IMF. Pressure from these organizations, particularly following research and monitoring by GW,[13] strengthened the hand of the Cambodian forestry department, which began to take more aggressive action by 1999, destroying sawmills, supposedly cancelling logging concessions, confiscating illegally cut logs, and even reportedly burning logging trucks (Dauvergne, 2001: 58). Representatives of GW have asserted that these enforcements were having an impact, and had somewhat improved the prospects for Cambodian forests.

A Forest Crimes Monitoring Unit was set up, with financial assistance from donor organizations to help to support the staff and enforcement activities, and this monitoring and enforcement unit had begun to make inroads into illegal logging by 2000. GW was contracted as an independent monitor, to assess the activities of the unit.

However, illegal logging continued despite the full knowledge of officials about the scale of the abuses (*Global Witness*, 2004). This illegal logging makes the export data unreliable. For example, FAO data for 1997 (*FAO*, 2005) indicate Cambodian timber exports of about 467,600 m^3, but other analysts have estimated as much as 3-4 million m^3 of illegally harvested timber during the same year (Zhu et al., 2004: 42, citing Magrath), almost all of which has undoubtedly been exported. A number of concessionaires repeatedly identified by GW as engaged in illegal logging in their concessions continued to do so, without any serious attempt by the government to enforce restrictions, much less, to terminate concessions. GW's role as an appointed independent monitor was subsequently terminated by the Cambodian government in 2003.

Indeed, corruption among officials in the Department of Forests and Wildlife (subsequently retitled as the Forest Administration) and other ministries continues, and the regime has not been able or willing to eradicate it. Officials investigating crime reports from GW routinely failed to find the evidence, and rejected the reports.[14] GW recently provided a lengthy list of officials and military officers, coded according to the following key: 1 = Command responsibility for subordinates involved in forest crime; 2 = Receives payments levied through extortion; 3 = Provides armed protection to timber traders; and 4 = Participates directly in illegal timber trade (*Global Witness*, 2004). Needless to say, the list has little impact within Cambodia. Indeed, some top officials are closely linked by family and business interests to illegal logging.[15] Local officials, sometimes in collaboration with military units, also seem able to make their own rules and authorize whatever logging they wish to authorize. In short, the government has proven both unable and unwilling to

halt illegal logging and the further depletion of Cambodian forests at unsustainable rates, despite some gains in monitoring and enforcement.

Logs have been trucked to the countries which share a border with Cambodia, including Thailand (Talbott, 1998), and Vietnam, and some are then transferred on to China.[16] There had been a ban on trucking logs, to try to interrupt the illegal trade, but the ban was removed later, with the support of the World Bank (which evidently wanted to increase the flow of revenue into Cambodia through industrial logging, despite arguments by NGOs that removing restrictions on the trucking of logs also made it much easier to export illegally cut timber). The close ties between China and Cambodia since the Khmer Rouge period, and the presence of many ethnic Chinese businessmen and mainland firms in Cambodia, facilitate this trade. Furniture made with illegally felled logs is also exported from Thailand, Vietnam, and other countries to Europe as if the wood had come from well-managed forests in Thailand or Vietnam instead of illegal logging operations in Cambodia.[17] In 2002, the Cambodian government suspended logging operations as a result of the failure of concessionaires to follow forest management requirements, but some logging operations continued despite the suspension (Zhu et al., 2004: 43).

Hence, it is too early to assert that the pressure from international donor organizations and monitoring by NGOs has saved Cambodian forests from continued rapid depletion. It is true that Cambodia's heavy dependence on foreign assistance, the aggressive monitoring by organizations such as GW, and the threat of withdrawal of donor assistance pending more effective action to control rampant illegal logging was crucial for the somewhat more stringent enforcement of control which was observed in Cambodia in the late 1990s and early 2000s. But in the face of continued massive corruption, the prospects remain bleak. Unfortunately, even such moderate leverage, as international donors have exercised in Cambodia, is lacking in Indonesia and Burma.

Papua New Guinea

The island of New Guinea contains "the third largest block of tropical forest on the planet after the Amazon and Congo basins" (Zhu et al., 2004: 44), and its forests are correspondingly important for biodiversity and regional climate effects. Although the highlands of New Guinea have been inhabited for more than 40,000 years, and were extensively deforested, local village-level societies developed the cultivation of casuarinas trees for wood, fuel, and soil preservation (Diamond, 2005: 282-5). However, the lowland forests in Papua New Guinea (PNG) and the Indonesian province of Papua, which covers the rest of the island, have been extensively logged, increasingly for the China market. Exports of logs to China from PNG increased rapidly after 1998 (see Table 2 above), and accounted for more than half of PNG's timber exports – about 1.2 million m^3 – by 2002 (Zhu et al., 2004: 45), and over 75% of exports by early 2005 (*Greenpeace*, 2005b: 14).

A large proportion of this timber extraction and export is carried out by the Malaysian conglomerate Rimbunan Rijau, which is allegedly able to cut and export timber in violation of PNG regulations as a result of networks of political patronage and corruption (*Greenpeace*, 2004b & 2005b).[18] Violence and human rights abuses against local people and female workers by some staff and enforcers in these companies has been documented,

and seems endemic (*Greenpeace*, 2005b: 15).

Much of the timber plundered from the forests of PNG by these companies is later processed into veneer and hardwood plywood in China and re-exported overseas to the UK and other destinations, flooding those markets with cheap products and undercutting suppliers who buy forest products from legal and sustainable operations certified by the Forest Stewardship Council. Some large corporations in the UK which have bought this material claim to support sustainable forestry, but nevertheless have continued to buy plywood from China without being very inquisitive about the origins of the wood (*Greenpeace*, 2005b).

The PNG government has noted the poor management of its forests, and attempted to implement a moratorium on new forestry concessions along with reforms in forestry management from 1999, but it seems that poor governance capacity and an unwillingness or inability to deal with corruption have hindered attempts to move toward sustainable and well-managed forestry since 1999. The World Bank eventually funded a Forestry and Conservation Project which included a study of forest regulations and enforcement in PNG, attempting to provide a framework of knowledge and expertise for conservation and longer term sustainable exploitation of the PNG forests. But the $35 million project was terminated in 2005 when it became clear that the PNG Forest Service and the Forest Minister were closely involved with the timber companies, and had no intention of taking the necessary actions (*Greenpeace*, 2005b: 15). The prospects appear bleak, as of 2005, and it has been estimated that the lowland forests, subjected to massive logging operations without much regard for longer term survival of the forests, will be logged out by 2020.

Attempts to Control the Depletion of Tropical Forests in Southeast Asia

The policy options have been well-described, particularly in *EIA* (n.d.) and *EIA and Telepak* (2005). There are several "fronts": (i) the exporting countries (central governments and local communities); (ii) the importing countries (central government and regulations); (iii) MNCs and retailers, (iv) consumers; and (v) international organizations.

The problems within the exporting countries are well-known: lack of an extensive apparatus of scientific and para-scientific expertise down to county level for monitoring forests and dealing with local variations and local conditions; lack of a powerful but independent control apparatus which can be mobilized to interrupt and punish violations of laws and regulations; corruption of the local governance institutions by economic cliques or elites which are politically well-connected, or can buy off local officials. This syndrome is extremely difficult to disentangle, all the more so in a failing state which has little effective support in rural areas except to the extent that local populations are able to maximize their incomes through their own labour without much interference from the state.

The pressure of local communities who want jobs and income, and may thus collaborate with elites, also makes it difficult to halt these processes through programs for those communities. Some local communities do resist incursions by outside forest exploiting groups seeking windfall profits,[19] but this seems to be relatively rare. It occurs only if the local community has achieved a satisfactory and stable economic livelihood

without resorting to tree-cutting, and this in turn requires a stable population, which in turn requires either low fertility, or access by surplus population to jobs in urban areas. These conditions do not apply in much of Southeast Asia, and hence, the local communities are not usually reliable allies in attempts to protect local forests when profits for exploiters are high, and incomes from logging and related occupations are much higher for local people than any alternative local employment.

Central governments in some of these states have enough contact with their own experts and access to international discourse and policy on deforestation that they may try to enact and enforce restrictive conservation and control policies. But without the funds, expertise, and reliable administrative apparatus down to county level, backed up by coercive force if necessary, they cannot do much to control deforestation carried out by local communities in league with local or regional elites for the export market, especially when government elites usually have much more pressing priorities, both personal and as regimes.

There has been a great deal of activity devoted to searching for solutions specifically adapted to Indonesian problems and needs, particularly, through the Consultative Group on Indonesia (CGI) which has met regularly since 1998 in Europe and in Indonesia to try to plan, coordinate, and fund programs to assist the government's own efforts.[20] Problems of forest exploitation and management have occupied some of the attention of the CGI. Conferences on forestry issues in Indonesia have also included international ministerial-level meetings.[21] One has the impression, however, that the discussion and analysis is a relatively ephemeral activity which has little impact on the hard realities of forest exploitation, smuggling, corruption, and massive importing of tropical wood into other countries, including those well-represented at these meetings. While assisting countries such as Indonesia is important, it is not going to solve the problems of massive and unsustainable loss of forests.

In the absence of a firm determination and political capacity within Indonesia to use all means to achieve control over the forests, international discussions and international assistance seem distressingly futile. It has been important for international organizations to try to link aid and assistance to progress in dealing with Indonesia's internal governance problems, and this is one of the missions of the CGI. NGOs within Indonesia have also supported the concept that international aid to Indonesia should be conditional on government enforcement of regulations against illegal logging.[22] But international funding, advice, and pressure does not seem to have worked very well, up to 2005. This pessimistic conclusion is even more inescapable in Papua New Guinea.

Some policy recommendations from EIA and other groups therefore direct attention to the importing countries, focusing on central governments, on buyers, and on retailers. Pressure on corporations which buy wood products can have some impact, if there is some "standard" which can be proposed for the certification of wood which is not illegally cut. *EIA* (n.d.) cites several major retailers which have adopted such policies. However, this kind of voluntary action by major buyers of wood products seems to have little overall impact, up to the present. For example, EIA, Greenpeace, and other NGOs and timber trade organizations commend the certification scheme developed by the Forest Stewardship Council (FSC)[23] to verify the sources of wood, and to track "the chain of

custody" of wood from forests to retailers, but only a small proportion of the wood supply in developed countries such as the UK is fully legitimated using such methods. Indeed, buyers of FSC-certified tropical forest products in developed countries may be undercut by other firms which buy cheaper non-certified material and ask no hard questions about the sources of the material.

International organizations have been set up to support sustainable forestry, particularly, the International Tropical Timber Organization (ITTO), which was supposed to develop and monitor good practices in sustainable forestry. However, it seems that this organization, based in Japan, has had little impact apart from its monitoring function (Dauvergne, 2001: 57).

Other policy recommendations focus on laws and enforcement in the receiving countries, particularly, the importance of passing laws which enforce prohibitions against importation of illegally exported wood. Lobbying and publicity by agencies, scientists, NGOs, and international organizations does have some impact, and has induced some G8 countries such as the UK and Japan to announce their intention to formulate policies to monitor and control the trade in illegally cut wood. However, we have seen that the "laundering" of illegally cut wood in Southeast Asia is quite sophisticated, and there is currently no very effective way to track and police the routes of most wood products from the sources to the importing countries.[24] It seems that up to now, this kind of lobbying of importing countries, while important, has been largely ineffective. The European Union published a plan in 2003 titled "Action Plan on Forest Law Enforcement, Governance, and Trade," which was intended to introduce a series of measure which could be adopted by member states to combat the trade in illegally cut timber. But by 2005 there was still nothing more than voluntary agreements between the EU and timber producing countries (*Greenpeace*, 2004b), and such agreements seem to have little impact on the ground in those countries.

If such pressures to regulate the trade in illegal timber have little impact, as of 2005, on developed importing countries with independent and relatively uncorrupted police and judiciaries, they are even less likely to have any impact on China, where the control of imports is notoriously corrupt and where the courts are often unreliable institutions for the enforcement of national import/export laws. The importers know that much of the wood has been illegally cut in other countries, but have found ways to ensure a continuing supply, even if partial enforcement in Indonesia and other countries increases the costs (e.g. for bribes) of getting the wood to China. Strict enforcement in China could have a major impact on the importing of illegally cut wood. But the prospects for such a drastic change in policing of imports seem poor, especially since the costs would be high, in terms of reduced supply, higher prices, and the loss of tens of thousands of jobs in coastal provinces.

Alternatively, with China's growing expertise in monitoring and controlling its own forests, including a network of forestry universities and bureaus, and with China's participation in a large number of international environmental exchanges, forums, and agreements, China could actually contribute to solutions in Southeast Asia by a programme of aiding developing countries to establish better infrastructures of planning, monitoring, and control. Japan has provided environment-related assistance to developing

countries in Southeast Asia for several decades (Mervio, 2005), including aid to Thailand since the 1980s to train Thai researchers and officials and to help establish Thailand's Environmental Training and Research Centre in Thailand. Some Japanese experts have also worked on forestry-related planning and policies in various posts in Southeast Asia.[25] Although generally cautious in international and regional environmental diplomacy, some Japanese politicians have shown considerable courage and vision in articulating environmental goals,[26] and have backed up these views with substantial funds for overseas environmental policy assistance.

Up to 2005, China has shown no such interests or leadership on environmental issues in the region beyond its own borders. China's internal environmental policy apparatus has developed far beyond the "see-no-evil" full-speed ahead economic developmentalism of the 1980s, and the State Environmental Protection Administration (SEPA), upgraded to ministerial status in 1998, has a greater voice in policymaking within the country. China has also been the beneficiary of huge inflows of international aid for protection programs and research, and Chinese researchers and policymakers are plugged into every major international network of scientific exchange on the environment.

However, China's external diplomacy on environmental issues is still largely devoted to rhetoric and to advocating the right of developing countries to pursue economic development rather than restricting development in favour of environmental regulation. While internal policy is influenced by SEPA, by growing environmentalist discourse in the media, and by thousands of state-approved environmentalist NGOs, China's external diplomacy is still handled by the more conservative Ministry of Foreign Affairs, which prioritizes security, alliances, and economic development over environmental considerations (Kobayashi, 2005), even if Chinese scientists see the longer-term security and development implications of collapsing ecologies in Southeast Asia. China remains a relatively selfish player in regional diplomacy. Of course, the failure of the US to show leadership on environmental protection or to impose restrictions on US economic growth for global environmental reasons has made it easy for China to avoid any concessions on such issues.

It is possible that proactive leaders in Japan, the US, Europe, and Southeast Asia could induce Chinese leaders to take a more progressive position with regard to China's impact on Southeast Asian forests, particularly to interdicting the shipment of huge quantities of illegal timber to China from the region. As of 2005, we have not seen such leaders, or such pressure.

In short, the prospects of doing much to halt the continuing deforestation in Southeast Asia using the current basket of activities seems bleak. There is no reason to expect that such measures will have much impact until we get closer to major crisis points. Lang (2002b) has argued that only regime threatening crises in legitimacy are likely to produce sufficiently forceful action by exporting countries, and we are not very close to such points in any of those countries, despite the fact that most of their remaining natural forests are likely to disappear within the next decade or two.

Conclusions

Since the 1950s the vast tropical forests of Southeast Asia have been steadily depleted

by the growing demand for wood in the giant economies of Japan, the US, Europe, and China. Pressure on those forests has greatly increased since the logging ban in China in 1998, and has led to a great increase in exports of forest products from Southeast Asia to China. Exports of logs and sawn wood are both legal and illegal. Some of the exports are "laundered" through Malaysia, Singapore, Vietnam, and Thailand, disguising the original sources of the timber in Indonesia, Burma, or Cambodia. Unlike some other regions of the world where tropical deforestation is occurring, in Southeast Asia it is not mainly driven by land hunger among impoverished and rapidly expanding populations. Instead, deforestation in Southeast Asia is mainly driven by the market for wood products, and China is rapidly overtaking Japan as the largest consumer of Southeast Asian forests.

Of course, China has had its own deforestation problems, and still struggles with enforcement, but since the 1998 logging ban, it has managed to implement a fairly effective regime of monitoring and control in regard to internal production. But the rapidly growing market for wood and paper in China has led to intensive exploitation of alternative sources in Russia and Southeast Asia. The profits from supplying the China market are high, and are sufficient to provide jobs and livelihoods in Southeast Asia for local forestry and transport workers, bribes for police and the military, and money for security personnel to intimidate investigators or critics. There is some pressure on both MNCs and central governments from investigative agencies such as EIA, GW, and Greenpeace, and publicity about illegal logging also has some impact on developed countries which are the destinations of most of the forest products exported from Southeast Asia, and on the policies of international organizations such as the IMF and World Bank. Where such donor organizations have great leverage over a national government, as in Cambodia, they can strengthen environmental enforcement by threatening to withdraw aid. But even in Cambodia, the impact is greatly reduced by corruption. Environmental agencies and international donors have much less impact in other countries in the region.

More importantly, monitoring and publicity have little impact on the importing of tropical wood into China. The supply of wood from Southeast Asia and elsewhere finds a huge, growing, and highly profitable market in China and produces tens of thousands of jobs in the production of housing and of furniture and plywood for the local and export markets.

The unpleasant but nearly unavoidable conclusion is that most of the policies which have been proposed do not have much impact on continuing deforestation in developing countries in the region. Monitoring by highly committed NGOs willing to take risks to publicize illegal logging has produced extraordinary data and reports on illegal extraction and on smuggling and laundering of wood in the process of exporting it to the most profitable destinations, and such has led to greater pressures on the countries which export, trans-ship, or import illegally harvested wood products.

But "illegal" is always defined by national rather than international or global standards, and the definition of what is tolerable is subject to pressures from elites and local employment-oriented constituencies, most of which favour intensive exploitation even if it is clearly unsustainable. Up to 2005, general statements by representatives of developed countries about controlling the import of illegally harvested forest products

China's imports of wood products probably include a much higher proportion of illegally harvested wood from Southeast Asia than any other country in the world. But any action by the Chinese government to address this problem would inevitably restrict supply, or make imported wood much more expensive, or bring costs to the central government to support and subsidize better monitoring and control in the exporting countries. To date, neither China nor any other major developed country has shown much willingness to accept such costs, for the sake of longer-term conservation of an important regional and planetary resource. It would require leadership and vision from the leaders of several major developed countries. Such leadership appears to be almost entirely lacking, even though we are only a decade or two from the point at which, at current rates of depletion, most of the natural forests in Southeast Asia will have disappeared.

As the Millennium Ecosystem Report has recently asserted across a broad range of global environmental problems (Reid et al., 2005), the changes in governance and international collective action which are required to halt these trends are much greater than what we have seen to date. Despite the outstanding efforts of NGOs to document the problem, the warnings of forestry experts, and the discussions among senior officials in a number of countries, there is nothing currently under way which seems likely to halt the destruction of the remaining tropical natural forests of Southeast Asia

Notes

1. According to one report, "The completed area of new housing in 1999 was 216 million m² (a 6.1% increase over 1998). Housing under construction jumped 78% in the first five months of 2000" (*Natural Resources Canada*, 2003).
2. Between 1990 and 1997, import tariffs were reduced four times (Zhang et al., 1998). From October 1997, tariffs on plywood, medium density fiberboard, some hardwood logs and other wood products decreased (*Mississippi Development Authority*, 2004). There are no tariffs for roundwood and sawnwood (Hammett, et al. 2001), and tariffs for logs and lumber were eliminated from January 1999.
3. See Zhu et al. (2004: 18-20), for export data on various types of wood-based products. Much of the production is located around Shanghai. Large quantities of Indonesia hardwood passes through Zhangjiagang port, just north of Shanghai, and some 200 sawmills and 500 factories in the nearby town of Nanxun are devoted to processing the wood for housing construction (Watts, 2005). Thousands of mills in Jiangsu and Shandong are involved in the production of plywood from imported timber (*Greenpeace*, 2005b: 10). In 2005, one ten meter log of merbau wood from Indonesia was estimated by a local timber merchant in Zhangjiagang to be worth about 40,000 yuan (nearly US$5,000). There are also clusters of furniture factories in Guangdong.
4. For example, China imported 167,000 m³ of New Zealand pine in 2003, double the figure for 2002 (*Mississippi Development Authority*, 2004), and an estimated 3.7 million m³ in total wood products from New Zealand in 2003, including pulp and paper (Zhu et al., 2004: 44). China has also begun to source and import forest products from Brazil and several countries in Africa, including Gabon, Nigeria, Equatorial Guinea, Liberia, Cameroon, and Republic of Congo. In 2003, imports of timber from African countries amounted to about 2.5 million m³, of which about 0.9 million m³ came from Gabon (Zhu et al., 2004: 22, 38). Chinese and Malaysian companies (e.g. the Malaysian company Rimbunan Hijau and Hong Kong-based Vicwood) are involved in the harvesting and export of this timber from Africa, and China is the largest single destination for timber exports from some of these countries, such as Equatorial Guinea, and a major importer from others such as Republic of Congo and Cameroon (Zhu et al., 2004: 40-1). Imports from Republic of Congo increased rapidly in 2001 and 2002, after the end of the civil war, and by 2002 China was the largest single export destination for Congo timber.
5. However, there are different estimates of the remaining area of Indonesian forests. According to Hopfner

(2004), for example, Indonesia has 120.5 million hectares of tropical rain forest.

6. Rimbunan Hijau was founded by Tiong To Siong, a Malaysian Chinese, in 1975, to invest in logging and export of timber and wood products, initially from Sarawak in Malaysia. Subsequently, as forests were increasingly depleted within Malaysia, the company gained timber concessions or participated in logging extractions and exports from Papua New Guinea, Indonesia, Siberia, Brazil, and several countries in Africa, with extensive timber processing also in Southeast Asia, and through various investments and joint ventures, in China. It has been alleged and documented that some of the company's activities overseas involve extensive illegal logging (*Greenpeace*, 2004a, 2004b & 2005b). As an ethnic Chinese overseas multinational group of companies, Rimbunan Hijan also seems to have developed good connections with officials in China. For example, in March 2004, the company's office in Russia apparently helped to arrange with Heilongjiang officials for crews and equipment to enter Siberia to cut logs for the mainland Chinese market.
7. Ramin is protected and controlled by CITES (the Convention on International Trade in Endangered Species).
8. Indonesian Secretary General of the Ministry of Forests estimated the timber transferred to Malaysia was 840,000 m^3 every year, but other industry sources recorded about 10 million m^3 of logs annually. The official trade data showed only 250,000 m^3 per year (*ABC*, 2002).
9. This group, the Asia Pulp and Paper Corporation, has a large paper mill in Hainan, and has been engaged in logging of natural forests and the planting of eucalyptus plantations in Yunnan, sparking protests within China and critical public comment from Greenpeace (who had investigated several sites operated by the company), and inducing the State Forestry Administration (SFA) to conduct its own investigation. The allegation of illegal logging was apparently confirmed by SFA (Cai, 2005).
10. Employment in forestry sector expanded sharply from late 1960s to 1980, yet in 1982 it only occupied 1 per cent of the labor force (Gillis, 1988: 57).
11. China's reported imports of timber from Burma were 13 times greater than Burma's reported exports to China in 1999, rising to 27 times Burma's reported exports to China in 2000 (Zhu et al., 2004: 43).
12. For example, in 1997/98, Burma exported 34,600 m^3 of timber to Hong Kong (including logs and sawnlogs). In 1999, it exported 3,700 tons of logs to Hong Kong, accounting for 11 percent of total log exports (Vallette and Bruno, 2003).
13. The researchers, at some risk, even provided a list of companies which had been guilty of extensive illegal logging in the late 1990s, recommending that their concessions be immediately terminated. The list of companies guilty of serious breaches of contractual agreements linked to their forest concessions included (partial list): Hero Taiwan, Samling, Mieng Ly Heng, Long Day Machinery, Silveroad, You Ry Sako, and Lang Song International (*Global Witness*, 2000).
14. Methods of investigation by GW included over-flights in light planes, on-the-ground visits to concessions, inspections of sawmills and warehouses, and visits to supposedly protected forests. The work was sometimes dangerous. Soldiers told GW that a local concessionaire had offered them money if they shot down the GW plane, and some concessionaires use armed guards to intimidate local people or investigators (*Global Witness*, 2004).
15. For example, Ty Sokhun was appointed Director of the Department of Forestry and Wildlife in 1998, despite the fact that his father-in-law was reported by GW to be one of the most active illegal loggers.
16. Between 1998 and 2002, China rapidly became the largest single destination for Thailand's timber exports (Zhu et al., 2004: 42, Figure 3.16). By 2003, China imported 1.8 million m^3 RWE of timber from Thailand. Since Thailand had implemented a logging ban in natural forests in 1989, and there is not enough plantation timber to account for such a high volume of exports, it is believed that much of this export volume was cut in Cambodia, Burma, and Laos, trucked into Thailand, and subsequently exported to China (ibid., 41).
17. Despite the ban on log imports from Cambodia, Vietnam continued to import processed illegal timber from Cambodia and exported it as garden furniture to Europe (Toyne et al., 2002: 33). Toyne et al. claimed that 51% of the timber was exported from Vietnam to Japan and 42% to other countries. Meanwhile 25% of wooden furniture was exported from Vietnam to Japan, 13% to the UK, and 50% to other countries (pp. 17-18). According to *Vietnam Economic Times* (1 April 2004), "In recent years, the export markets for Vietnam's wooden furniture in the United States, Europe and Japan have grown impressively"— not least because Vietnam could undercut Chinese prices for furniture as a result of the supply of Cambodian logs, and even cheaper labor costs than in China.
18. For example, *Greenpeace* (2005b: 5-6) reports, from PNG investigations in 2002, that "the Minister for

Justice is Chair of a company that holds a timber permit that it subcontracts to Rimbunan Hijau [and] a National Intelligence Organization report alleges a provincial Governor and two members of Parliament were on Rimbunan Hijau's payroll," while other Ministers also have links to the logging industry.

19. For example, in Sumatra, Indonesia, in the early 1990s, some villagers organized protests against a local factory which was responsible for water pollution and local deforestation. The government responded by closing a NGO and arresting protesters. This led to a lawsuit by a national-level environmental organization representing a group of NGOs, which charged government and industry with violating environmental regulations. The lawsuit was unsuccessful (Economy, 2004: 243). As Economy notes, environmental protests are often entwined with protests against authoritarian governance linked to resource exploitation for the benefit of elites. Such protests usually stimulate further repression.
20. The Consultative Group on Indonesia (CGI) was set up by the World Bank and a group of bilateral and multilateral donors to address common issues of relief and recovery in Indonesia faced by donors since the 1997 financial crisis, including issues of governance, and problems in the use, distribution, and coordination of aid efforts. The CGI includes representatives of a large number of donor countries, along with institutions such as the International Monetary Fund, Asian Development Bank, European Commission, OECD, Islamic Development Bank, and so on.
21. For example, the East Asian Ministerial Conference on Forest Law Enforcement and Governance met in Bali in September 2001 (Sato, 2002).
22. For example, in 2001, four Indonesian NGOs asserted that they would call for a halt in international aid to Indonesia by major overseas donors if the Indonesian government did not enforce regulations against illegal logging (Economy, 2004: 243).
23. The Forest Stewardship Council was set up in 1993 to develop a system for creditably monitoring and certifying well-managed forests, and to provide a mechanism for tracing forest products from such forests to retailers, so that consumers and NGOs could note and support products from sustainable forestry (Diamond, 2005: 473). Headquartered in Germany and funded by some businesses, governments, foundations, and NGOs, the FSC identifies and accredits organizations which do the actual inspections. It has had an impact on the procurement and purchasing practices of a number of major forest companies, and of some local governments which require FSC certified wood for their own projects. It has also induced some industry groups to organize rival organizations which claim to certify forest products, but do not require independent third-party inspections (Diamond, 2005: 479).
24. For example, Denmark imports a large amount of teak from Burma, but some of it goes through third countries such as Thailand, Singapore, Poland, the Czech Republic, Ukraine, and Romania (*Danish Burma Support Group*, 2004) where it is processed and where the origins can be disguised.
25. For example, Yuichi Sato served as a coordinator for forest planning for Indonesia's Department of Forestry from 1998 to 2001, including work for the Donor Forum on Forests under the Consultative Group of Indonesia, before returning to Japan to continue his career as a government official (Sato, 2002).
26. For example, Prime Minister Takeshita Noboru in the late 1980s apparently became an advocate of environmental policy, stating that "politicians who do not know and act for environmental issues are those who lack intelligence, education, and courage" (quoted in Mervio, 2005).
27. This research was supported by a grant from the Southeast Asia Research Centre at City University of Hong Kong. We would like to thank Kevin Hewison, Vivienne Wee, Stephen Frost, Oliver Pye, and James Hewitt for helpful comments or advice on various aspects of the research.
28. Global Witness (GW), based in London, specializes in studying the exploitation of natural resources by corrupt or repressive regimes, and is devoted to exposing extraction and trade which are illegal, or which violate trade laws and agreements (see http://www.globalwitness.org/). This requires some extraordinary investigative methods, and GW therefore occasionally sends investigating teams to various countries to document local conditions and abuses. GW's goal is to use these reports to put pressure on regimes in such countries, and on the corporations and governments which do business in them. Funded by donations and assisted by part-time and unpaid researchers, GW can be extraordinarily effective in exposing and publicizing illegal logging and related corruption in countries such as Cambodia. Not surprisingly, the organization has attracted the hostile attention of some of those regimes, and the investigative work is sometimes risky. GW occupies an important niche in the world-wide effort to monitor and publicize illegal and corrupt forest exploitation.
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29. The Centre for International Forestry Research (CIFOR) was formed in 1993 following the 1992 Earth Summit in Rio de Janeiro, by an association of governments and private foundations, which continue to provide most of its operating funds (see http://www.cifor.cgiar.org/). CIFOR has focused mainly on sustainable use of forests for the benefit of local populations, and the kinds of decentralized management systems which would be needed to produce sustainable forestry with local benefits. Headquartered in Bogor, Indonesia, it has regional offices also in Brazil, Cameroon, and Zimbabwe. It is necessarily more bureaucratized than GW or the Environmental Investigation Agency because its mission includes promotion of sustainable forestry, governance issues, and the dissemination of scientific information.
30. The Environmental Investigation Agency (EIA) is another forceful and fearless group of people determined to expose what they bluntly call "environmental crime" (see http://www.eia-international.org/index_shocked.shtml). Established in 1984 and now based in London and Washington D.C., EIA originally focused on illegal trade in animals and endangered species, and subsequently expanded into related topics such as habitat destruction and illegal logging. Funded mostly by donations, and staffed by many volunteers, the organization's publications on illegal logging are among the best documents on this problem produced by NGOs worldwide.
31. Among innumerable examples is a recent item reported by China Central Television: "The Taiyuan Forestry Department illegally took over more than 28 hectares of state-level protected forest in 2003 to build a golf course.... Local residents have only been able to gain access to the area in the Taiyuan Forest Reserve if they pay club membership fees" (*South China Morning Post*, 19 March 2005, A-8).
32. This same sequence of events has also occurred in Thailand, where costly floods in 1989 had also led to a logging ban, and thence inevitably to the displacement of demand into neighboring countries such as Burma (Lang, 2002b).

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