SUSTAINABLE FOREST MANAGEMENT IN INDONESIA

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I. Introduction

Two years ago, the Sierra Club published a book called Clear Cuts. The contents of the book are horrifying : aerial photograph of miles of bald hillside, destroyed watershed, and ravaged forest stretching from state to state, country to country and continet to continent. Deforestation is a crusial global issue, demanding immediate environmental and economic policy. Indonesia's forest lands are deeply threatened in numerous ways.

Forest lands represent an ecosystem which contributes greatly to the survival of the human race : a priority consideration, since we, humans, who are talking about, thinking about, destroying and protecting of the forest lands. Indonesia's rainforest are incredibly abundant, containing 10% of the world's flowering plant species, 12% of its mammal species, 17% of its bird species, and 25% of its fish species (World Bank, 1994). Deforestation greatly affects all these living organism.

The purpose of this paper is to discuss various aspects of the growth of the forestry sector in Indonesia. First, it looks at the relationship between the forestry sector and economic growth, forestry sector contributions in production, exports, and the role of private companies in forest management. Second, it examines forestry problems, particularly deforestation and forest management. The impact of international trade on the forestry agreements and policies; and, control of deforestation are also discussed. Third, it seeks an alternative way to develop the forestry sector in Indonesia : one which can guarantee future sustainability. To this end, transparent forestry management policy is the key.

II. Forest Sector and Economic Growth

1. Economic Growth and Sectoral Contribution

Indonesian Gross Domestic Product (GDP) rose in 1995 by 8.1%, compared to around 7-7.5% during 1992-1994. The 1995 growth was again led by domestic demand. The manufacturing and construction sector continued to expand rapidly, while agriculture, trade and utilities also accelerated. Non-oil GDP aggregate grew 9.0%. GDP from agriculture growth rebounded from the drought-depressed rate of 1994, especially food crops, while a non-rice production continued to be much stronger than rice. Meanwhile, the forestry sector was stagnant because of weak export demand and supply problems attributable to unsustainable sectoral policies. Whithin the manufacturing sector, the export oriented sector grew slowly, while the sector oriented toward domestic consumption grew more rapidly (see table 1).

Final domestic demand on the expenditure side, has led growth in GDP for the second year in a row. Reflecting the strength in construction, foreign investment, and domestic investment approval (up by 33% in 1992-95), fixed investment rose by 13%. The rapid growth

of private consumption compared to growth in GDP may reflect continued sustained real wage growth and the 1995 tax cuts. In contrast, government consumption rose by only 3% in 1995.

The government annual target growth for the next five years is 7-8 percent, while private forecasters estimates exceed 7 percent. Percapita income is estimated to top $1000 and, population to grow to around 210 million by the year 2000 (*Economist*, 1993).

Indonesia's timber industry accounts for 7% of GDP and 20% of the contry's exports, much of this timber coming from Kalimantan.

The labor force is estimated around about the 80 million mark, of which about 74% is aged between 15 and 34. Although the annual population growth rate has been reduced to 1,9 percent annually, the labor force is thought to be growing at about 2.8 percent per year.

2. Economic GDP (Gross Domestic Product) and NNP (Net National Product); Taking Depletion into account

For sustained growth, attempts to forge positive linkages between forest resources-the input for industry operations, and economic growth-the target for these operations, must continue. One step taken by industrialized countries is to compile a environmental and natural resource balance (NASDAL), the principal aim being to assess the condition and availability of natural resources, including forest, and to identify the potential of the natural envi-

Table 1
Real Growth in National Ouput and Expenditure
(1993 prices, percent per year)

	1988-91	1992	1993	1994	1995
GDP	9.0	7.2	7.3	7.5	8.1
Non-oil & LNG	9.3	8.3	8.1	7.9	9.0
Agriculture	3.6	6.3	1.7	0.5	4.0
Forestry	-0.3	-2.2	1.6	0.4	0.05
Non-il/non-agric	11.1	8.9	9.8	9.7	10.1
Manufacturing	12.0	11.2	13.2	13.5	13.0
Utilities	13.7	8.9	11.1	12.7	15.5
Construction	15.0	12.4	14.5	14.9	12.9
Final Dom. Demand	11.9	6.0	7.1	8.5	10.2
Consumption	10.9	7.0	7.4	7.0	9.1
Fixed Invesment	14.6	3.6	6.6	12.6	12.9

Source : World Bank (1996) based on data from Central Bureau of Statistics (BPS)

ronment.

This type of balance can be further classified into four categories : cost balance, physical balance, depletion balance, and input-output balance (*Grambsch* et.al., 1991). Initiated by Dr. Robert Repetto, director of the World Resources Institute (WRI), the Office for the Ministry of the Environment in collaboration with the Central Bureau of Statitics, and Environmental Management in Indonesia (EMDI) has developed this concept.

WRI research (Repetto et.al., 1989) focused on the natural resources oil, forests, and land, annually inspecting these resources over the 1970-1984 period. The aim of this research was to calculate net domestic product (NDP) by incorporating the net change in the value of these three resources in the GDP and NDP figures.

This research concluded that estimates for the marco economy in Indonesia using GDP did not truly reflect the condition of the nation's natural resources. Using conventional measurement-without taking into account net changes in forest resources, oil, and land, GDP saw an annual increase of 7.1 percent between 1971 and 1984, while NDP-taking into account net changes in these resources-grew by just 4 percent over the same period.

NDP has not been calculated in this study, since the figure fluctuates greatly year to year, sometimes even registering a negative figure. As such, it can be concluded that the figures for NDP do not provide a realistic measurement of growth.

The study undertaken by the Office of the Ministry of the Environment, the Central Bureau of Statistics, and EMDI compares NDP figures, minus oil and natural gas, to GDP. Forestry resources are not included in these calculations, however.

Incorporating the NSDAL concept, this study concludes that log availability dropped significantly each year, between 1988 and 1990. Re-growth and replanting replaced just 6 percent and 9.2 percent of the volume taken up by logging, concessions, and damage. Meanwhile, the value of available logs, which takes into account production volume and unit economic rent, rose 16.3 percent. This was not due to a rise in the physical volume, but rather to an increase in log prices. Unit rent per m3 is highest for wood harvested form secondary forest in Sumatera.

The major contributing factors to the drop in log availability, of forested area, are conversion, damage and loss, and burning of more forest than is replenished by regrowth or replanting.

3. Forestry Sector and Wood-based Industries : Production, Export and Private Participation

Wood-based industries, including primary and secondary processing, furniture making, and pulp and paper production have expanded rapidly. Growth averaged 16% per annum between 1985-94, from a small base. Indonesia is now the largest manufacturer of hardwood plywood in the world. Exports of wood-based products have been even more impressive : value of plywood exports increased from $1 billion to $4 billion, and exports of pulp and paper from $28 million to $1 billion between 1985 and 1 billion between 1985 and 1995. The sector currently employs more than half a million workers, making this subsector the second most important contributor to the rapid growth of the manufacturing sector after textiles.

Wood is the single most important cost component (over 50 percent) of wood-based industries, followed by labor. Labor costs are relatively low and are likely to remain so in the medium-term. Indonesia, therefore, has a strong comparative advantage in wood products as its forestry base is among the richest in the world. Moreover, Indonesia is situated in the fastest growing region in the world, which generating strong and grow-

ing demand for such products.

However, there are a number of issues related to *the efficiency in allocation of forestry resources and marketing arrangements which have serious implications for the efficiency of growth, and future prospects.* The critical issues in the wood processing industry relate to rent dissipation, price distortions and disincentives for reforestation.[1] Indonesia has followed a deliberate policy of raising local value added in forestry output since the early 1980s : issues of logging rights to concessionaires with strong linkages to processing (particularly in the plywood subsector); a ban on export of sawn timber (subsequently replaced by high export taxes) on export of sawn timber; and tariff protection on some paper products. Plywood producers are the principal beneficiaries of government policy providing regulated preferential direct log supplies to processors, rather than encouraging them to compete for such supply. The market base of the sector, although very large in size, is narrow in scope : the great bulk of output is exported as commodity grade plywood. Margins in this trade are relatively low, and most industry profits come from economic rent.

Possessing high quality wood, and a strong base of woodworking craftsmen, Indonesia appears to have a natural advantage in the area of furniture making, moldings, and woodworking because the country. However, these industries have not developed because of restricted of access to raw materials. Much of the resource remains under the control of concessions linked to plymill operations : many sawmills, which prior to 1989 had supplied the exports market, is linked in integrated operations to plymill, and it appears that a significant proportion of log supply from these has been retained in those operations, and are not released to independent secondary processors.

The recent Bank Environment Report documents the unsustainable practices in the exploitation of the Indonesia's forestry sector. The incentive structure which applies at present to logging operations in Indonesia works counter to sustainable management. Major changes in the incentive regime and in government practices are required to maximize the long-term contribution of Indonesia's vast forestry resources to the country's development.

In addition to the above issues, the role of the powerful trade association (APKINDO) is also controversial. APKINDO is a trade cartel which exerts strong influence on is members as to how much to export to what countries and at what price. It also has great bearing over capacity expansion and distribution among its members. While APKINDO may have helped the country to capture the rents associate with market power, then non-transparent allocation of export quotas and capacities have both efficiency and equity implications.

III. Problems of Forest Management

In tropical forest covered about 1.8 billion hectares, with rainforests the most prevalent forest type in the tropics, covering almost 714 million hectares. The FAO reports the total area planted was only one fifth of the total area of natural forest converted to other uses. The world's forest and other wooded land area declined by 2 percent, or 100 million hectares from 1980 to 1990. In addition, lack of transparency regarding forestry management contributes to forest degradation problems.

This section discusses problems associated with forest degradation in Indonesia and similar countries. In general, the problems are related to the following issues; deforestation and logging prac-

1) A more detailed review of these industries is contained in " Forestry : Achieving Sustainability and Competitiveness", The World Bank, 1993.

tices; in-transparency in forest management, and ecolabeling.

In most Asian countries pollution and resource degradation are caused by hundreds of thousands of small companies and informal-sector economic activities as well as by politically influential domestic companies and multinational enterprises.

The root of environmental destruction in the Third World is that the governments of those countries have not implemented serious policy-making environment.

1. Tropical Deforestation

Estimated annual rate of deforestation in tropical areas is ranges from 2.2 per cent in Brazil, to 0.1 per cent in Gabon. The proximate causes of this deforestation are conversion to agricultural and livestock production, fuelwood emand, and commercial logging, and mining. It has been estimated that 18 per cent of deforestation may be attributed to commercial logging and mining. South East Asia currently accounts for around 20 per cent of the world's tropical moist forest (TMF). Indonesia alone has over 50 per cent of the region's TMF and over 10 per cent of the world's total.

At the global level, tropical deforestation accounts for about 25% of heat-trapping emissions. But future carbon flux will be small if, as is the case in Seberida in Riau, Sumatra most of the cleared forest is secondary forest which in term regenerates into secondary forest. Conversion of old growth forest to shifting cultivation will typically lose 30–60% of the initial carbon stock in the vegetation, whereas conversion to permanently cultivated land or pasture loses more than 90%.

Indonesia tropical forest is the evergreen type .: the richest and most complicated in the world. Ten percent of the world's tropical forests are in Indonesia, covering a total area of 191 million ha, 144 million hectares (75%) are the

Table 2
Forestry Products Export, 1985-96 (US$ Billion)

	1985	1990	1995	1996*)
Export of forets products	307.2	110.1	453.7	41.0
• Logs, sawnwood	824.7	2725.5	3462.0	286.5
• Plywood	52.9	491.1	1074.6	89.3
• Others	1184.8	3326.7	4990.3	416.8
Export of forest products				
Number Establishments :				
• sawmill concessions	2,042 units			
• sawmill concessions w/o	279 units			
• plymills	117 units			
• number of timbermills w	2,438 units			
Forest Concessionaires				
• Num concessionaires	575 companies			
• Total area	61.1 million hectare			
Nom Rates of protection (%)	1987	1992	1995	
	25	33	40	

Notes : *) Jan-April
Source : Central Bureau of Statistics, BPS, Indikator Ekonomi, various issues.

responsibility of Perhutani; 49 million ha are protected for conservation and scientific research; 30 ha million are earmarked for conversion to forest plantations (HTI); and 65 million ha are designated for timber concession (HPH). In 1993, timber concession cobered 60 million ha, the average concession being roughly 150,000 to 200,000 hectares. The largest concessionis owned by Prajogo Pangestu in five millions hectares.

Deforestation in Indonesia is accelerating from a rate of 300,000 ha/annually in 1970 to 600,000 by 1981, and in 1994 stood at around 12,000,000 ha or 12,000 squere km per year. In other words, 1.2 million ha of Indonesian forest is destroyed each year. This deforestation rate is higher than any other country except Brazil. Fire was to blame for some of the deforestation. In 1994, fires destroyed 12.5 m acres of trees. Then on April 1st, 1995 clearing forests by fire was banned. The World Bank reports that Indonesia forest harvests at 50% above the sustainable level, and annual deforestation ranges from 400,000 to two million hectares.

Two factors affect forest degradation : population and economic pressures.

1. Population pressures

Primary direct causes of deforestation in Indonesia *are agriculture*, which accounts for as much as 45%–60%. Primary forests provide 80% of the transmigration sites. Large scale development projects, transmigration and land rights policies, rising world demand for forest products, unequal distribution of land and wealth in tropical nations, and poverty result from population pressures. It is estimated that 3.3 million ha of Outer Island forest was lost during 1984-1989 due to planned transmigration programs (USAID, 1987). As such, according to Norman Myers, a leading tropical ecologist, the Government

Tabel 3
Tropical Deforestation in South East Asia and Other Regions

	Total Forest Area (mm ha)	Undisturbed Operable Forest (mm ha)	Annual Deforestation ('000 ha)	Total TMF Area Deforested (mm ha)
SE Asia Insular	167.3	72	1707	117
Indonesia	108.6		1315	
Papua New Guinea	33.5		22	
Malaysia[b]	18.4		255	
Philippines	6.5		110	
Brunei	1.3		5	
Other SE Asia[c]	39.3	18	346	n.a.
Myanmar	31.2		102	
Thailand	8.1		244	
Total SE Asia	206.6	90	2053	>117
Amazonia	613.6	453	4129	100
Central Africa	167.1	107	325	30
Other Regions	58.4	<10	1900	177[d]
World Total	1045.7	352	8480	424

Notes : [a]Unless indicated, 1990 based on Schmidt (1990). Note that tropical moist forests are defined as broadleaf high closed tropical forests, including wetland and mangrove forests but excluding the deciduous dry forests of South Asia, sub-Saharan Africa and sub-tropical South America. In 1988, the FAO estimated the total area of all tropical closed forests (including deciduous dry forests) to be 1269,6 million ha.
[b]Indludes forests from Peninsular Malaysia.
[c]End of 1980 revised estimated based on Forest Resources Division, Forestry Departement, An interim Report on the State of Forest Resources in the Developing Countries, FAO, Rome (1998).
[d]May include estimates for Thailand, and Myanmar.

sees tropical forests as obstacles to expanding civilization rather than as permanent resources.

2. Economic Factor

Indonesia has reduced its income from petroleum exports and dramatically increased its exports of forestry products. In 1986 the oil and gas sector accounted for 51% of national export earnings and 39% of gobernment revenues. By 1993 these figures were slashed to 24% and 29% respectively.

Indonesia now controls 90-95% (1994) of the world tropical plywood market, compared to 70% in 1989. Logging in Indonesian tropical forests has been the major economic factor contributing to deforestation (FAO 1981 : 211-34). Most of the logs are exported to developed countries : the consumption per person of all major forest products in industrialized countries is three and a half times that in a developing countries. World Bank estimates (1990) out forest depletion due to poor logging practices at about *15–20%.*

2. Ecolabeling Issues

In recent years environmental labeling has received world-wide attention. Many countries have already introduced their own labeling schemes, e.g., Canada, Japan, the candinavian states, Singapore and India. Meanwhile world wide international debate about basic principles for environmental labeling, resulted in much agreement[2], despite some controversial issues over realization.

In response to the ecolabeling issue in tropical forest, in late 1993 the government established an Indonesian Ecolabeling working group, in preparation for an independent Indonesian Eco-labeling Institute (Lembaga Ekolabeling Indonesia, or LEI). Certification of other products will be promoted as future program of LEI. At present Bapedal is responsible for standards and criteria for other products. Ministry of Forestry Decree No. 252/Kpts-II/1993 outlines criteria and indicators of sustainable management for forest resource, sustainable yield, conservation, socio-economic considerations, and institutional development.

Certification for sustainable forest for logging improves forest management. Germany and the Netherlands refuses to buy tropical timber for project they fund themselves. In eco-labeling scheme is being tested in Kalimantan and Riau.

ITTO agreement may not save Indonesia forests, but at least it has stimulated dialogue among timber companies, NGOS, and the government in Indonesia issue biggest effect in Indonesia may be on political system. The Eco-Labeling Foundation, headed by Prof. Emil Salim, might strengthen the role of NGO, particularly if it can still maintain its independent authority.

The government has classified forested areas into different types depending on economic purposes : protected of forests to maintain waatersheds; national parks-limited production forests for restired felling; and full production (commercial) forests.

Some researches propose a policy frame work; halt inappropriate incentive;relieve external problems (population, poverty,etc); consolidate exisiting settlements in the forests and on its dringes; integrate foresty into rural development; set up a clear forest ownership structure, a stable forest authority, and a stable framework of regulations and incentives; coordinate the authorities responsible for forest functions; make clear distinctions between policities for forest production and policies for conserving

2) The most important international unanimous declarations on priciple of environmental labelling are : the "Berlin Declaration" on Environment Labelling (1990), the "Lesvos Declaration" in the framework of UNEP/IEO initative "Promote Cleaner Production" (1991), and the "Washington Declaration " of the International Eco-labelling Forum (1994).

forest ecosystems; evaluate and keep account of the economic, social and ecological funtions of forest; encsure participation of local people; diversify forest rearsch, insist upon multiple use management of forest resources; and improve international cooperation.

There seems litlee scope for the use of trade policy interventions as a menas to reduce tropical deforestation in Indonesia. A more appropriate approroach may be to deal more directly with the problem by improving sustainable production, forest management and regulation at the timber stand level (Barbier at.al., 1993).

Implications of Timber Certification

Application of a timber certification scheme will inevitably raise the price of timber and timber products. It is difficult to asses comprehensively the benefit and cost of certification. Cost can be categorised as :

1. Cost of certification itself
2. Cost of improving forest management of concessions so that it rearcsehes a level allowing certification (cost of sustanable forest management); and.
3. Costs of foregone profit.

The willingness to pay for information indicates that demand for certified timber coming from sustainable managed forest exists, although it is still not clear how much this would affect the actual purchasing decision. Liberatization of trade barries in this increased demand for certicified and timber products in the free market, forest management may be improved. Ahmad (1994) defines ecolabeling as a scheme that provides information about the environmental characteristic of a product, thus helping consuers to make an informated choice at the of purchase. There are two broad categories of ecolabeling being proposed; (1) coprehensive eco-beling, based on a complete "Life Cycle analysis" (LCA) of the environmental impacts of a product from cradle to grave and, (2) single issue ecolabeling/certification which is based on the impact on environmental sustainability of a product at a particular stage of its life cycle (e.g. timber certification).

As announced by the government, less than 14% of forest concessionaires implemented required forest management in the fiscal year 1992/1993.

Pros and cons in Eco-labeling Issues

In environmental issues, most of the time, it is advanced countries that "push" developing countries. Why ? People in developing countries assume that advanced countries are pusing environmental issues in developing countries in order to get economic benefits. For instance, logging in tropical countries (mostly developing countries) can be banned by forcing environtmental issues. They save a lot of money, and, instead of paying the logs, advanced countries develop imitation woods, such as fiber (Germany).

In addition to economic benefits, people like Prof. Otto Sumarwoto, conceive that advanced countries are using tropical countries as a *septic tank* for industrial wastes, specifically CO2. It is possible that advanced countries' pressure through environmental issues leads to neocolonialism. In general, neocolonialism means that a country has lost its independence, for instance developing countries have to ask permission from other countries when the want to cut the forest for agriculture, housing, etc. However, Otto Sumarwoto does agree with the fact that deforestation rate in Indonesia is getting higher and higher Tempo, 2 January 1991). Northern countries just exploit southern countries. For instance, nothern countries refuse to transfer medicial technology to southern countries eventhough their forests contain abundant of genetic sources.

There are two issues in Ecolabeling : ecolabelled products and eco-

labelling of local society. Some people assume that local comunities never gain no benefit from forest exploration in their area. Sometimes, even their villages are in the HPH area. However, it is hard if not impossible to count the nominal value of forest in Indonesia. Some experts have tried to count the value by using a with a with or without method. In other words, they measure the effect of a particular project on forest value, and the effect if the project did not exist there.

Charnovitz (1994) believes that there is a large potential for new protectionism here. Although, there are no mandatory eco-labeling provisions yet that involve processing, it is only a matter of time. The difficulty with labeling provisions is that a sufficent number countries must agree to the "acceptable" standards. Even if there are different provisions for developing and industrial countries, labeling agreement is still likely to be difficult.

Trade and Forests

Several independent initiatives have been launched by governments, nongovernmental organizations (NGOs), and private-sector forest proponents-sometimes in concert with one another -to influence markets for sustainably produced forest goods and services.

CITES Monitoring and Protection

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which became effective in 1975 and now has 128 member countries, is a binding international treaty regulating trade in wildlife and plants to help protect species threatened with extinction. Commercially important timber species were not listed in CITES until 1992, when international trade in Brazilian rosewood (Dalbergia nigra) was banned. Trade in more than a dozen other timber species is either banned or strictly controlled.

In 1994, a contentious battle erupted between the signatory countries over the proposed listing of mahogany (Swietenia macrophlylla). The proposal was defeated and further resulted in the delisting of several African timber species. As a result, the Timber Working Group was established to examine the relationship of CITES to the international timber trade. It remains to be seen whether CITES can be used to more actively monitor timber species or whether it will be limited to implementation only after there is scientific consensus that a botanicaal species is indeed threatened with extincion.

International Tropical Timber Agreement

The International Tropical Timber Agreement (ITTA) of 1983 is a binding agreement govering the trade of tropical timbers and, by extension, tropical forests.

When the ITTA was renegotiated in 1994 after it expired, many criticized the secertariat for focusing too much on individual projects of questionable quality rather than on issues relevant to the broader trade, environment, and policy reform goals of the agreement. Furthermore, many argued that a renegotiated ITTA should include binding requirements for reaching Target 2000 and should be expanded to include all timbers, including temperate and boreal sources. In the end, the agreement's scope was not expanded and Target 2000

remained a nonbindign agreement. The consuming countries did, however,, commit themselves to a parallel but separate effort for the sustainable management of temperate and boreal forest (see Criteria and Indicators, above). Unfortunately, the new agreement has yet to be ratified by a sufficient number of member countries. Major unresolved issues include the agreement's continuing "double standard" problem, since it has not expanded its scope to all forests; the ability of ITTO's project approach to trapple with needed policy feforms; and, ultimately, ITTO's ability to promote sustainability within the tropical timber trade.

Forest Stewardship Council

Given the frustration and spotty performance of intergovenmental agreements, several concerned NGOs and private-sector groups have launched voluntary efforts to harness market forces to promote trade in forest products from well-managed forests. However, many critics seriously question the ability of timber certification programs to effect more sustainable practices, largely because the market has not proved willing to bear the additional costs. One prominent initiative that has emerged in this area is the Forest Stewardship Council (FSC).

FSC is an assembly of NGO's, industry representatives, scientists, and indigenous peoples established in 1993 to promote the environmentally appropriate, socially beneficial, and economically viable management of the world's forests. It is governed by a ninember board of environmental, social, and economic representatives elected by the membership. In 1994, FSC adopted a set of principles and criteria for the sustainable management of forests, as well as guidelines on how to conduct field inspections and verify the chain of custody of certified forest products as they travel from the forest to the store shelf.

In 1995, FSC developed a rigosous framework for the evaluation; accreditation, and monitoring of organizations that issue certification claims in the marketplace, as well as guidelines for developing regional forest management standarts and a protocol for endorsing national certificationinivaties. National initiatives based on the FSC guidelines are under development in more than 12 countries, ranging from Brazil to Sweden to Indonesia. aalthough FSC had 4 years of extensice consultations worldwide, some industry associations and gevernment criticize it as being anti-industry and having by a "green" agenda and too dependent on uproven auditors. Nonetheless, as the first international program endorsed by major retailers to ensure public confidence in marketing claims (particularly in Western Europe), it will set the tone for how sustainability is measured in foresty operations and in the verification of "greeen" claims.

Source : World Resource 1996/97

3. Banning Logging and Forest Degradation

For most countries,, export tax on logs generally range between 10 and 20 per cent. Export taxes on sawn timber, venceer and plywood have been negligible. Where sawn timber exports were taxed, rates were typically half that of logs. In Indonesia, the ad valorem export tax on logs was doubled form 10 ad 20 per cent 1978, while most sawnwood and all plywood was exempted. Beginning in 1980 controls on the export of logs were progresively enforced, until an outright ban

was introtuced in 1985 (Gillis, 1998). The export tax structure created nominal protection at 40% percent (see table 2) for plywood manufactures, and the drop in export revenue to the goverment from diverting log exports was not copensated by anygain in value-added in sawmilling, resuluting in a loss of US $ 15 per m3 at world prices. The result has been the creation of inefficent processing operations and expandet capacity, with consequences for the rate of timber extration and forest management. Althouh the swich tovalue-added processing of timber initially slowed down the rate of timber extration, the inefficiencies and rapidly expanding capacity of Indonesia processing may have actually increased the rate of deforestation over the medium and long term.

In 1989 Indonesia imposed substantial taxes on swamnwood in an effort to shift processing activities to plywood. A secondary objective for thepolicy was to improve competitiveness and overall efficiency of sawmills.

According to research conducted by Barbier, Bockstael, Burgess and Strand, using a two-component model which is comprised of two components : a simultaneous equation system determinging supply and demand in the logging, swanwood and plywood sectors of Indonesia and a recursive relationship determining tropical deforestation, that most timber-related deforestation, including subsequent deforestation by agricultural encroachment, may have more to do with the management and regulation of the timber stand than with the amount of logs extracted from the stand per se. Extreme trade intervention, such as the current GOI policy of prohibitive sawnwood export taxes, and total ban by consumber countries on the imports of tropical timber products, clearly impose high economic costs on Indonesia's forestry industries. An import surcharge on tropical timber imports would have minimal distortionary impacts on Indonesia's timber trade-provided that it was imposed at a level of less than five per cent. Improvements in sustainable timber forest management and regulation by Indonesia could raise log harvesting costs, but there may not be such significant impacts on Indonesia's processed products and trade. The conclusion is that the model and the policy simulations would suggest extreme caution in the use of broad trade policy interventions as a means to affect timber-related deforestation in Indonesia, and in some cases even as an economic tool to ruther develop Indonesia's timber processing capacity.

IV. Sustainable Forest Management

Policy failures in Indonesia forestry management which contribute to over-harvesting and clear-cutting of permanent production forests, as well as illegal feeling of non-production forests (Barbier, 1987; Burgess, 1989; Gray and Hadi, 1990 : Sedjo, 1987; and World Bank, 1989) have to be corrected. This would improve sustainable management of Indonesia's remaining tropcal forest, and thus reduce timber-related deforestation, but would also mean higher harvesting costs per m3 of wool extracted.

Lack of transparency discourages the sustainable management of these valuable forests. Prohibitively high export taxes on logs reduce domestic log prices below market prices, effectively giving plywood processors a large input subsidy. The market for logs and their most important processed product, plywood, is cartelized. Apkindo, the Indonesian Plywood Association, controls entry to the industry. Forestry concessions are restricted to existing processors. Finally, all plywood manufacturers are required to market their export through Apkindo.

Concessionairies have little interest or incentive to regenerate the forest, or to maintain its overall condition. Forest concessions are not transferable. The

current low royalty may not last. The penalty for over exploitation is limited to loss of concession, often after the damage is done.

The low price of logs contribute to waste through in-efficient logging and industry parctices. Wasteful logging practices and inefficient use of wood are percussive. Because of this, forestry-based exports are expected to fall off sharply in the next decade, while local communities which depend on natural forests ecperience further alienation. The loss of Biodiversity will also accelerate. The low price also reduces the attractivveness of developing industrial plantations of longer rotation hardwoods, and government revenues. According to the World Bank estimates (1996), the effective subsidy to domestic log processors, mainly plywood and paper and pulp processors, is about *$2–4$* billion a year depending on the size of logging operations. Furthermore, the cartelized domestic plywood industry is estimated to absorb some $750 million of this figure through excessive use of logs in processing. This figure is much larger than total revenues from forestry royalties (IHH) derived by the government.

On the relationship between plywood trade and the environment, Alessandra Casella provided a survey of simple theoretical results on the interaction between free trade and the provision of standards. The general conclusion is that, although standards can be used to distort trade, if policy makers are concerned about economic efficiency, then insistence on harmonization as precondition for free trade is incorrect on two grounds. First, no logical link exists between the efficiency of standards and their being equal or different across countries. Second, standards are not fixed but evolve with economic conditions and change as allocations change.

V. Conclusion

Indonesia has 60% of all tropical forests in Asia, and 90% of the remaining virgin stands. According to a report of 1990. It is important for Indonesia to need warnings from the deforestation in the neighbouring countries of the Philippines and Thailand, which were abundantly forested until this century, and are now facing dangerous levels of deforestation. Thailand was forced to ban all logging in 1988 and now has to import lumber for construction.

Another danger that Indonesia faces is the consistent confusion about the rate of deforestation. The problem goes even deeper then lack of regulation of forest lands. It is hard to figure out the rate of deforestation when inadequate information exists to estimate the extent of forest cover. The lack of information about the extent of forest cover and the rate of deforestation puts Indonesia's forests in a vulnerable position. With such confusion going on, great amounts of forest land could be abused and lost without consequences to the offenders. Even if sanctions were applied, in the form of fines or other reprehensions, they can not in any way make up for the loss to the environment.

The potential demands on the forest are far reaching in Indonesia : from communities that have drawn their livelihoods from the forest for years and continue to depend on them, throught the multi-national corporations that are drooling over the virgin tree stands that Indonesia holds, to the large number of people who have been displaced by transmigration programs, and are thus forced to encroach on forest lands for survival.

One of the demands on the forest is coverversion in from dense forest land to land that can be used for agriculture. This conversion is an important source of income. It is also important and survival for sustainability in Indonesia as the population continues to expand, and the urban development starts to encroach on exisiting agricultural land. Transformation

of forest lands to small-scalle agricultural lands is actuallyty blamed as being the leading current exiting legal framework. These laws give land ownership right to clear the land, the right o harvest forest products, the right to take water and the right to harvest fish. These rights are still an essential aspect of life in many villages. New laws only consider traditional land holding rights, and not the other rights. The latter rights are thus encroached upon when the government grats land rights to other organizations.

Another problem due to the incomplete lack of registration of the traditional rights is that unregistered land, and land rights are being taken over by transmigrants. Often the transmigrants lack the knowledge of how to properly use the land for farming, and tend to farm it to exhaustion and then move on in serch of new land.

Commercial forest harvesting is ruled as the next largest cause of deforestation after the conversion of forest lands to agricultural lands. Government regulations already exist for selective cutting which are supposed to be applied by the concessionaries managing the logging and replanting of the majority of forest land. The concessionaires are private organizations that manage the forests of the outer islands. Java forests are not managed by concessionaires, but by the Forestry Department. The responsibilities of forest concessionaires include preparing forest inventories, submitting twenty year, five year, and annual operating plants to the state Forestry Department, and protecting the concession areas from encroachment and fire.

There are atrocious problems with the concessionaires management and logging practices. A Department of Forestry report in 1990 reported that only 22 of 578 forest concessionaires followed the selective cutting and replanting system, which requires that the concessionaires replant, maintain and enrich the logged over area (Economic Analysis of the Indonesian Forestry Sector, August 1991). Aside from this low rate of adherence to the selective cutting and replanting policy, there are great problems with the policy. Surveys have shown that up to 40% of the standing trees are damaged in selective logging practices, and that the concessions are often relogged before the harbest cycle is complete.

It is important that pre-logging and post-logging inventories are conducted and reported with diligently. This is not happening, and it is reported that only 2.2% of cutover lands have ever had a residual stand inventory. There are also suspicions that bribes are given to the logging inspectors by the concessionaire so that the inspectors will under-report the actual volumes of logging.

Judging from the situation laid out above, Indonesia's forests are under great environmental pressure. There is also economic pressure that adds yet another aspect of concern for the forest lands. In developing countries such as Indonesia there is a tendency to exploit the natural resources. First of all, it is to overharvest any natural resource, because, as demonstrated by the policies mentioned above, there is usually inadequate and unenforced environmental protection, if any at all. Also, the national income levels are very low, and people need to exploit the forest resources in order to survive and create new livelihoods.

There has been an on-going problem in Indonesia with the price of logs extraced being significantly below world market prices. This low price is a result of export bans or prohibitive taxes on the export of logs. The logs are also cheap because of the low price of timber extraction, which implies that people are being paid very low wages to harvest the timber. Since the logs are priced so low, this has led to inefficient and wasteful practices in both the logging and wood processing industries.

The current demand on the forests is higher then the sustainable level of timber extraction. The current level of demand is 44 million cubic meters per year; the maximum sustainable amount is 31 million cubic meters per year. Higher pricing of the logs could perhaps decrease the demand, and also encourage domestic wood-based produstions to become more efficient. Efficiencry is very low compared to international standards due to the low price.

The forestry sector is also not providing the government with its share of economic rent. Ecnomic rent is the rate of profit above normal profit. Normal profit being equal to the profit earned if the structure of the market is fully competitive. Any profit earned, either because of the uncompetitive market structure, or as the result of natural accumulation makes up the economic rent. It was reported in 1991 that the goverment only recevied 17% of the economic rent from the forestry sector, while in the same yaer it was reported to have received 85% of the economic rent from the petroleum industry. Forest products are the second largest export after oil and gas. If the government introduced policy requiring a higher percentage rate of economic rent from theforesty sector be payable to government, then perhaps they could turn the money around and use it to inforce regulations and develop effective foresty policy.

Another issue is the inefficiency and cartelization that surrounds the systems of foreet consessionaires, mentioned above. The system to allocation of of land is accesible only to a small circle of foresty officials, and thus does not result in the government allocating the land to the highest bidder. Such a closed of allocation system means the goverment does not gain the funds it would if the bidding process were open.

Greater transparency in the management of Indonesia'a forest would contribute toward sustanible logging, higher nonil exports, and higher government revenues. This would include : first, deregulation of the plywood industry, eliminating of prohibite export export taxes on logs. and of barries to entry,and, seconds, raising royalty fees. Such fees could be further adjusted through annual royally reviews, and/or bidding for raw material supplies. Third, it would mean improving monitor of concessions by improving the capacity of administrave staff to provide effective monitoring. And fourth, in order to keep forets ecosystem sustainable, operations should involve local communities.

Economic and environmental protection merge at many cross roads in forestry in Indonesia, and there is great need to upgrading of the roads of both. At this point in time, both economic and environment issue are racing forward full blast and if the the " roads" are not improve, may seriousse accident are likely : they will not be easy to clean up.

References

Anderson, Kym and Drake-Brockman. Jane "The Entwining of Trade Policy and Environmental Issue: Implications for APEC". Center for International Economic Studies University of Adelaide Australia 1994.

Panelists. " The Economic Analysis of Indonesian Foresty sector". World Banl., Gedung Lipo., Kuningan August 8, 1991

Environment Unit Country Departement 3 East Asia and Pacific Reciion " Indonesia Environment and Development : Changllenges for the Future". Document of World Bank March 21, 1994.

The International Bank for Reconstrixction and Development, " Indonesa : sustainable Development of Forets, Land and Water" World Bank, Washington D.C. 1990.

Angelsen, Arrild, Shiting Cultivation and " Deforestation" : A Study from Indo-

nesia, World Development, Vol 223, No. 10, 1995

Barbier, Edward B., Nancy bockstael, Joanne C. Burgess and Ivar Strund, 1995 The Lingkages between the Timber Trade and Tropical Deforestation Indonesia, Blackwell Publishers Ltd.

Braatz, susan, Davis Gloria, Shen Susan & Rees, Colin, Consserving Biological Diversity A Strategy for Protected Areas in the Asia Pacific Region, World Bank Technical paper Number 193, Asia Technical Departement Series 1992.

Broad Robin, The Political Economy of Natural Resources : Case Studies of the Indonesia and Philippines Forest Sectors, The Journal of Developing Area 29 april 1995.

Casella, Aleddandra, Fair Trade and Harmonizationa : Prerequisites for Free Trade ? Volume 1 Economic Analysis, The MIT Press, Cambridge, Massachusttes, London, England.

———, Companies await ISO 14000 as primer for global eco-citizenship, May 29 1995, ENR

CSIS, Trade and Environment Linkages : A Case Study from Indonesia, A Report Prepared for the ASEAN Secretariat by the Centre for Strategic and International Studies, Jakarta, April 1996.

East Asian Executive Reports, May 1994, Protection vs. Profit in Tropical Timber.

Ewing, Andrew J & Chalk, Raymond, The Forets Industries Sector, An Operational Strategy for Developing Countries, World Bank Technical Paper No. 83, Industry and Energy Series, 1998.

Info Bisnis, Edisi 21 Tahun I, 1995, Hutan Punya Siapa ? Kraar Louis, Indonesia on the Move, Fortune, September 20, 1993.

Kramer, Randall A., Narendra Sharma, and Mohan Munangsinghe, 1995, Valuing Tropical Forests, Methodology and Case Study of Madagascar, world Bank Evironment Paper Number 13, The World Bank-Washington DC.

Low, Patrick, International Trade and the Environment, World Bank Discussion Paper, 1992.

Munasinghe, Mohan, 1993, Environmental Economic and Sustainable Development, World Bank Environment Paper Number 3, The World Bank - Washington DC.

Petrick, Joseph A. & Quinn, John F., Deforestation in Indonesia : Policy Framework for Sustainable Development, Journal of Asian business , Vol. 10, No. 2, 1992.

Republika, 24 Juni 1996, Mengutak atik Sumber Pendanaan HTI dan Industri Pulp.

Rondinelli, Demis A., Autum 1992, Business and Environmetal Protection : The Emerging Investment Opportunities in Asia, Business & The Contemporary World.

Tempo, 2 Januari 1993, Hutan dan Neokolonialisme.

Tempo, 26 Oktober 1991, Apa Kabar Hutan Indonesia?

The Economist, July 22nd 1995, Forest People.

World Bank, Indonesia Sustainable Development of forests, Land and Water, 1990.

World bank, Strategy for Forest Sector Development in Asia, World Bank Technical Paper No. 182, Asia TechnicalDepartement Series, 1992.