

**ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY
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COUNTRY REPORT - INDONESIA

**Prepared Specifically for Asia Pacific Forestry
Commission (APFC) Study “The Asia Pacific Forestry
Sector - Towards 2010”**

by

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INFORMATION NOTE ON ASIA-PACIFIC FORESTRY SECTOR OUTLOOK STUDY

At its sixteenth session held in Yangon, Myanmar, in January 1996, the Asia-Pacific Forestry Commission, which has membership open to all governments in the Asia-Pacific region, decided to carry out an outlook study for forestry with horizon year 2010. The study is being co-ordinated by FAO through its regional office in Bangkok and its Headquarters in Rome, but is being implemented in close partnership with governments, many of which have nominated national focal points.

The scope of the study is to look at the main external and sectoral developments in policies, programmes and institutions that will affect the forestry sector and to assess from this the likely direction of its evolution and to present its likely situation in 2010. The study involves assessment of current status but also of trends from the past and the main forces which are shaping those trends and then builds on this to explore future prospects.

Working papers have been contributed or commissioned on a wide range of topics. They fall under the following categories: country profiles, selected in-depth country or sub-regional studies and thematic studies. Working papers are prepared by individual authors or groups of authors on their own professional responsibility; therefore, the opinions expressed in them do not necessarily reflect the views of their employers, the governments of the Asia-Pacific Forestry Commission or of the Food and Agriculture Organization. In preparing the substantive report to be presented at the next session of the Asia-Pacific Forestry Commission early in 1998, material from these working papers will be an important element but will be blended and interpreted alongside a lot of other material.

Working papers are being produced and issued as they arrive. Some effort at uniformity of presentation is being attempted but the contents are only minimally edited for style or clarity. FAO welcomes from readers any information which they feel would be useful to the study on the subject of any of the working papers or on any other subject that has importance for the Asia-Pacific forestry sector. Such material can be mailed to the contacts given below from whom further copies of these working papers, as well as more information on the Asia-Pacific Forestry Sector Study, can be obtained:

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1. INTRODUCTION

Forestry problems, challenges and opportunities are different from one country to another. The only similar thing is that the global forestry objective is to achieve sustainable forestry development. In this sense, one country's experience in achieving this objective, for instance, can have valuable lessons for other countries so that all countries can more rapidly complete the learning process in developing and utilising their forests. The forestry role of one country would hence yield interesting aspects from both economic and environmental points of view. In the face of global economy and free trade issues in the immediate future, the exchange of experience will have special meaning, particularly for countries in the Asia Pacific region.

On the basis of the idea stated above, the regional outlook study provides a useful opportunity for Indonesia to firstly inform others about its present situation and possible important experiences in developing the forestry sector as required by the Asia Pacific Forestry Commission (APFC) and, secondly, for learning of other countries experiences in the sector. To Indonesia the opportunity may yield good lessons in further planning its future forest and forestry development path, especially towards the year 2010 and beyond.

2. CONTEXT

2.1. The Indonesian Economy and the Role of Forestry

Indonesian forestry plays an important role in increasing economic development partly through foreign exchange earnings, job and business opportunities, as well as acceleration of development for remote regions. In the 1980's decade, forest-related employment accounted for about 5.4% of the total labour force (MoF, 1991). In this period, the forestry sector contributed an average 16% of total foreign exchange earnings annually and 27% of non-oil export earnings. These figures were relatively sustained at least until 1994, when foreign exchange from forestry sector was about US\$4.2 billion.

During the last two years (1995-1996) the forestry sector contributed an average 3.85% of total gross domestic product (GDP) which in 1995 was about Rp. 454,514.1 billion, and in 1996 had increased to Rp. 532,630.8 billion. Both these GDP figures decrease slightly when calculated on non-oil basis, namely Rp. 417,705.8 billion (1995) and Rp. 490,316.6 billion (1996). In this two-year period, the growth rate of the total GDP is about 18.91% (1995) and 17.19% (1996), while for non-oil-based, the GDP growth rate is respectively 19.79% and 17.38%¹. In the same period, the corresponding GDP growth rate for the forestry sector was about 7.15% (1995) and 6.67% (1996).²

Indonesia's population growth rate is decreasing; in 1992 the population was about 184.49 million and it just reached 196.81 million in 1996. A study by Capricorn Consult Inc.

¹ The basis for GDP growth estimation reported here appears to differ from that generally used by the Asian Development Bank, the estimates of which suggest GDP growth at 8.1% in 1995 and 7.9% in 1996.

² 1996 Statistical Year Book of Indonesia. Central Bureau of Statistic (data was recalculated).

projected that the population will become 211.20 million by the year 2000. The average annual growth rate of population during this period (1992-1996) is around 1.6% (Table 1). Compared to the 1980's decade rate of around 2.12%, this reduced figure shows a good achievement by Indonesia in managing her population, mainly through success of family planning programmes. Average per capita income of Indonesian has grown from US\$80 in 1967 to US\$650 in 1990 and to US\$1,155 in 1996³ although following recent turmoil, the latest data (1998) indicate that average per capita income has decreased to US\$610⁴ based on assumptions that economic growth is zero, inflation rate is 20%, population growth rate is 1.6%, while exchange rate is US\$1.00 to Rp. 5000.

Table 1 - Indonesian Population 1992-1996 (million)

Year	1992	1993	1994	1995	1996	2000*
Population	184.49	187.60	190.68	193.75	196.81	211.20

Source: Central Bureau of Statistic, 1996 except for the year 2000 cited from Capricorn Indonesia Consult Inc.

MoF believes that sustainable development of wood and non-wood forest products can provide 6 millions to 8 millions job opportunities by the year 2000. Should industrial growth be uncontrolled, however, resource sustainability would be seriously affected in the longer-term. Hence, it is also realised to be extremely important to Indonesia to manage its forest resource in such way as to ensure resource sustainability over time. To accommodate this idea, MoF has also committed itself to implementing sustainable forest management (SFM) scheme encouraged by International Tropical Timber Organisation (ITTO), under which Indonesia intends to attain sustainability in terms of economic, ecological and social functions of forests. The recent economic turmoil, however, will result in more and more uncertainty in predicting the achievement of all goals and commitments in the future. The turmoil also requires that Indonesians work harder and harder for a better future.

2.2. Long Term Objectives and Goals

Considerable development of Indonesian forest and forestry was initiated 30 years ago. Forestry became one of the lead sectors for development and during this period Indonesian forestry has constituted a very essential sector of the Indonesian economy. The forestry sector contributes to employment, the development of backward and remote areas, foreign exchange revenues, and generates goods for other sectors of the economy. In short, directly and indirectly, forests greatly contribute to the social and economic welfare of the country. Indonesian forests provide raw materials to a large number of industries so that forest and wood-based industries have domestic and export markets and provide significant multiplier effects.

The Major Guidelines for National Development of Indonesia (GBHN) indicate that Indonesia forest resources should be utilised in a rational and sustainable way with regard to their environmental role and the needs of future generations. The specific goals of Indonesian forestry are related to: (a) environmental conservation, (b) economic growth, (c) social

³ Calculated on the basis of 1 US\$=Rp. 2400, before monetary crisis of 1997-98.

⁴ KOMPAS Daily, Tuesday February 17, 1998 p. 2.

welfare, (d) reduction in unemployment, (e) trade-off in involvement of private, public and co-operative sectors especially in economics activities, (f) promotion of investment and economic growth in less developed regions, and (g) attention to global environmental issues.

The more specific goals of Indonesia forest resource management have been centred upon: (a) develop the outer islands so as to relieve population pressure in Java and Bali; (b) utilise forests, including plantations, for national development; (c) develop more productive man-made forests and convert degraded-unproductive areas to produce more wood; (d) generate livelihood opportunities for forest communities and the rural population through the multiple-use management of forests; and (e) conserve natural resources to benefit present and future generations.

In implementing these policies, the MoF derives the programmes on the basis of some items of legislation. Some legislation relevant to forestry development are Act No. 5 of 1967 - the basic forestry law; Act No. 4 of 1982 - the basic environmental management law; and Act No. 5 of 1990 - the conservation of natural living resource and their ecosystems. Under the Act No. 5 of 1967, the Government of Indonesia (GOI) through the Ministry of Forestry (MoF) holds authority to control, manage, and administer the forest resource. The Act No. 5 of 1967 basically determined that forest resource development be directed to: (a) water regulation, (b) flood and erosion prevention, (c) wood and non-wood production, and (d) source of income. The Act also covered the sustained yield principle and the rights of present and future generations to access to and hence benefit from the forest.

In fact, the policies on forestry are mainly based on national development objectives defined under a 25-year long-term national development plan (Pola Dasar Pembangunan Jangka Panjang (PJP) further detailed in a 5-year national development plan (Pelita). Indonesia is now in the period of the second long-term national development plan (PJP II) from 1994 to 2019, under which the national objectives are directed to economics, environmental, religion, culture, national defence and security, as well as politics. In the beginning of this period, particularly during the ongoing Pelita VI (1995-2000), the objectives of forestry sector emphasise sustainability, conservation, people's participation in forestry activities, poverty alleviation as well as economic and political stability. This would be further implemented consistently in the future.

How far all these long-term objectives can be achieved now depends greatly on success of the government in handling the recent monetary and confidence crisis. In facing the crisis, the government is now preparing some strategic and practical responses to hold the targets and objectives unchanged partly through implementation of the 50-point Letter of Intent agreed upon with the IMF.

2.3. Indonesian Forestry: A Regional Context

Indonesian forest products exports came of age in the early 1980s and are showing the growing pains of a sector set on a rapid course of improvement in terms of foreign exchange earnings and of employment through value-added processing. Second only to oil-based exports in 1989, forest product exports bring annually between US\$3 and 3.5 billion of gross foreign exchange earnings - slightly more than 50% of the US\$6 billion of positive balance of visible trade for the nation.

A common perception is that appropriate policies and strategies have succeeded in giving Indonesia rapid development of very positive international trade trends and the achievement by Indonesia of its rightful position as a world leader in trade of tropical forest products.

The phenomenal development in economic and trade growth in the East Asia Region (including China) and South East Asia has given positive impetus to Indonesia's foreign trade. Additionally, the Republic of Korea, Taiwan Province of China, China's Hong Kong SAR, and Singapore and other ASEAN member countries have until recently shown quite high economic growth. The position of Indonesia in the regional econo-political constellation in Asia has benefited from the performance of these economies; however, Indonesia faces the challenge of cost-competitive labour from the developing countries in this region. The development challenge is likely to be harder in the future considering that, like Indonesia, some other ASEAN countries are now suffering from the recent economic and monetary crisis.

ASEAN Free Trade Area (AFTA) has wide implications for the national economy and economic relations among ASEAN member countries, some of which export similar forest products to Indonesia; this must be anticipated and considered in determining the policy of national economic development including in forestry. AFTA would then be used to strengthen solidarity and enhance the spirit of ASEAN to increase the bargaining power of its member countries towards the future free market under the General Agreement on Tariffs and Trade (GATT) and successor arrangements under the World Trade Organization.

One of the problems of GATT which will put South countries under pressure is the issue of trade related aspects of intellectual property rights (TRIP). TRIP is perceived to be mainly meant as an effective mechanism to slow down technology transfer. The implementation of GATT will open the market access of forest products industries in the international market. In the open market system, only high quality products will (easily) sell and these can be produced only by countries with qualified human resources. Given the recent economic crisis situation in some Asian countries, such as the Republic of Korea, Thailand, Malaysia, Singapore and also Indonesia, competition to attract foreign investors will get tighter. Indonesian forestry industry therefore has difficulties to specify precisely its orientation to the future, since almost all economic sectors in the country are now still looking for the easiest solution for relieving the effects of the crisis through economic and political reform.

In addition to being mainly a wood source, it has been realised that Indonesian forests have a number of multiple functions, including: (a) as a storage of germ plasm of great diversity, a storage (in the form of wood) for carbon, and producer of non-wood products; (b) as protector of the life-supporting ecology, through the hydrological, carbon/oxygen, and nutrient cycles;

(c) maintaining the existence of biodiversity and the ecosystem; and (d) as a resource for research, education and nature appreciation through tourism and recreation services.

The functions and uses of forest will be continuously enjoyed if the management pays due respect to principles of sustainability. The mission of forestry development in Indonesia is to carry out management of forest resource for the needs of present and future generations, through wise utilisation with due respect to the multiple functions of the forest. Ecotourism is one of the major forms of sustainable utilisation of the forest being continuously developed in Indonesia. It will be developed more in both Nature Recreation Parks and Hunting Parks. There are 34 established National Parks ready for developing ecotourism areas; ecotourism will also be developed in production and protection forests. Ecotourism is likely to be another major avenue of forest utilisation in the near future.

In supporting conservation objectives, Indonesia is also involved and actively participates in the implementation of the Convention on International Trade in Endangered Species (CITES) and Ramsar Convention protecting wetlands. Indonesia ratified the Convention on Biological Diversity (CBD) and also hosted the third Conference of the Parties of the convention. Besides, Indonesia has also been intensifying the maintenance of its allocated 49.5 million hectares *totally protected area* (TPA) in order to conserve its wildlife ecosystem richness. It consists of protection forests and conservation areas to include national parks, nature reserves, game reserves, hunting parks, and grand forest parks. In line with the spirit of UNCED, Indonesia has also made serious efforts to implement continuously the *integrated conservation and development programme* approach in the management of national parks.

2.4. Issues

The forest fires which repeatedly occurred between August - November 1997 have been a major environmental issue to Indonesia because of their global impacts. It has been reported that the disturbance of smoke and haze from the fires spread widely over some neighbouring countries mainly Singapore and Malaysia. In this period the fires burned thousands of hectares of forest and plantation land in the two major islands of the country, Sumatra and Kalimantan. Some valuable help came from Malaysia to fight the fires as rapidly as possible. All the efforts and the changes of weather have allowed significant progress in gradually terminating the fires. Again, forest concessionaires and tree crop plantation have been considered to be major contributors. They have been a key factor increasing the possibility of the fires to occur. One of the implications is that the fires set back the implementation of forest management according to SFM requirements. Facing the issue, the government implement some practical efforts to cope the fires and reduce the impact.

In the first week of February 1998 new forest fires started and burned some 6,200 Ha of East Kalimantan forest land. The most recent information indicates that in order to overcome the fires in Indonesia, the government through the Agency for Technological Investigation and Application (BPPT) is seeking international co-operation. Together with Canadian International Development Agency (CIDA) Indonesia is going to design an integrated forest fires protection system and will carry out mapping to classify forest areas having potential for serious forest fires. Meanwhile, with Malaysia, Singapore, and Brunei Darussalam, Indonesia

is going to establish a forest fire information system. The first co-operation will be implemented over two years beginning this year (1998).⁵

In addition, the GOI also maintains a National Team for Forest Fire Control. To anticipate the occurrence of forest fire during the dry season, every year, the GOI launched a *Forest Fire Awareness Campaign* led by several cabinet ministers related to forestry. There was no major forest fire occurrence during the 1995, but serious forest fires occurred in 1997 partly because of long-dry season and El-Nino effects. Forest concessionaires and tree crop plantations, however, have been considered to be major contributors to the starting of fires.

Population pressure on forest areas is still an issue; pressure is expected to be more serious over time. The government, however, is continuously intensifying many social-related forestry programme such as forest village development scheme (PMDH), community-based forest management, and people's participation in forest management. In 1995, forest disturbance considered to be caused by the pressure of people is shown in Table 2.

Table 2 - Forest Disturbances in 1995

No.	Type of Forest Disturbances	Area (Ha)
1.	Forest land encroachment (stealing)	12,886.55
2.	Illegal occupancy	3,210.00
3.	Overlapping forest utilisation	1,573.00
4.	Illegal cutting	29,285.53
5.	Forest fires	0
	Total	46,955.08

Source: 1995 Forestry Statistics of Indonesia. Secretariate General of Ministry of Forestry (recalculated)

The village development scheme (PMDH) is a kind of legal arrangement for the involvement of local communities in forest management. The scheme involves forest concessionaire, the dwellers and/or local communities, local government, and the Ministry of Forestry (MoF) itself. Under this scheme, forest concessionaires have obligation to care for the local communities through creation of activities designed and determined by them by fully involving local communities participation and responding to its aspirations. Besides, the PMDH programme together with other similar activities like social forestry were also designed to alleviate property (tenure) problems. It is reported that as of July 1996 there are 475 units of prospective PMDH implemented, covering 689 villages around the country and involving no less than 62,723 households of villagers (MoF, 1996).

The recent monetary and economic crisis is another major issue being faced by Indonesia. The crisis has had negative impacts on the confidence of people in the Indonesia currency (Rupiah), market structure, and even in the political stability. The exchange rate of the US dollar to the Rupiah has recently been considered to reflect irrational behaviour of local and international speculators; to cope with the crisis, Indonesia has signed a 50-points Indonesia - IMF memorandum called "Letter of Intent" indicating the necessary liberalisation and structural reform steps to be taken by Indonesia in financial, economic as well as political spheres.

⁵ Kompas Daily, February 18, 1998 p. 12.

The conditions requested by the IMF cover various economic and monetary aspects containing an economic recovery package programme, namely: (a) the recovery of the financial sector, (b) fiscal policies, (c) monetary policies including policies related to currency exchange rates, and (d) structural adjustment.

Structural adjustment is basically aimed at increasing the national efficiency and the competitiveness of the Indonesian economy. It partly covers: (a) gradual reduction of import duty tariffs, (b) gradual reduction of exports barriers including export tax, (c) re-view of investment and expenditure in the public sector including government expenditure for state-owned companies and strategic companies. Privatisation will continue, including the privatisation of government banks after mergers have been completed.

There are at least eight articles of the IMF memorandum directly related to the forestry sector, namely articles 10, 12, 36, 37, 38, 40, 42, and 50. All these articles basically call for so-called forestry reform including liberalisation in forest industry and trade. The articles are mainly aimed at increasing the national forest industry efficiency and its competitiveness in the future international market. The articles also underline the importance of intensifying the implementation of the principles of sustainability forest management. In short, the eight articles substantively require three key points, namely:

- create consistency and transparency specifically in decision-making processes regarding utilisation of forests as a public goods,
- open competitive market mechanism⁶, and
- strengthen property rights in forest utilisation to make it more clearly defined. The most important thing to Indonesia now is then how all these point can completely be taken into account in formulating policies regarding production forest utilisation and future export market mechanisms, especially for plywood industries.

3. INDONESIAN FORESTRY: STATUS AND TRENDS

3.1. Forest Resources

Based on the latest (1996) data, the present area of state natural forest lands covers 139.5 million hectares, consisting of 113.8 million hectares as permanent forest lands and 25.7 million hectares convertible forest lands. The permanent forest lands consists of 30.7 million hectares of protection forests, 18.8 million hectares of conservation forests (national parks, nature reserves, etc.) and 64.3 million hectares of production forests. Over 3.068 million hectares of forest lands had been converted to agricultural crop land and 0.93 million hectares for transmigration. The conversion is likely to be gradually eliminated in the near future because of environmental reasons.

The permanent forest land has been largely demarcated in the field. As of September 1996, MoF has established 226,865 kilometres of boundaries, of which 163,273 kilometres outer forest boundaries and 63,529 kilometres were concessions boundaries. Compared with 1989

⁶ It is understood that among key liberalisation measures will be freedom to export logs (Editor).

when the length of forest boundary was only 51,019 kilometres, the achievement on forest boundary establishment during the last 6 years (1990-1996) has more than tripled or equivalent with 320 percent increase (Table 3). It is intended that the trend continue in the future in line with the efforts to implement sustainability scheme which partly requires certainty or assurance of tenure for forest land.

Table 3 - Forestry Boundary Establishment in Indonesia (as of September 1996)

No.	Year	Forest Boundary Completion (Km)*	Concession Boundary Completion (Km)	Total (Km)
1.	Up to 4th Five Year Development Plan (Pelita IV)	51,019.80	7,538.99	58,558.78
2.	Fifth Five Year Development Plan (Pelita V)	70,092.25	34,352.92	104,445.17
3.	Sixth Five Year Development Plan (Pelita VI) **	42,160.95	21,700.58	63,861.53
	TOTAL	163,273.00	63,592.49	226,865.49

Ministry of Forestry (1996)

Notes: * Outer and function forest boundaries; ** up to September 1996

The production forests, with total area of 64.3 million hectares, for instance, mostly fall into four vegetation types: mixed hill forests, peat swamp forests, fresh-water swamp forests and tidal forests (mangrove). Most production forests (73%) consist of mixed hill forests located up to 1,300 meters above sea level with the most important commercial species being, among others, Meranti (*Shorea spp.*), Keruing (*Dipterocarpus spp.*), Kapur (*Dryobalanops spp.*), Mersawa (*Anisoptera spp.*), Agathis (*Agathis spp.*), Ramin (*Gonystylus bancanus*), and Merbau (*Intsia spp.*).

As of March 1996 there were 483 units of concessionaires being operated covering 56.14 million hectares in natural production forest lands. The number of concessionaires and their area are decreasing compare to the 1990's figure when Indonesia had 575 concessionaires covering around 60 million hectares. Consistent with serious efforts on enforcing the law, the number of concessionaires are likely to be limited in the future. It is reported that in the coming five years the number of concessionaires are going to be reduced further through mergers, with the number declining to only 50 concessionaires throughout the country.

Besides, Indonesia is also continuously developing plantation forest under its timber estate development programme (TE), community forest development programme, and community mangrove forest development programme. The programme are mainly aimed at anticipating log shortage from natural forests as well as being a strategic effort to rehabilitate secondary and logged-over areas. Moreover, the programme is also directed at reducing social problems and the people pressure on the forest area.

The TE development programme has been implemented since 1983; until 1991, there were only two kinds of TE programmes, namely TE for pulp and TE specifically allocated for supporting plywood industries. In 1992, TE was also combined with transmigration development programme called TE-Trans (HTI-Trans). Starting in 1993 there is also a TE-like programme named "priority trees". TE therefore has four types of development programme. As of 1995, all TE development programmes covered an area for about 1.75 million hectares (Table 4); TE development programmes are to be continuously implemented in the future for

social and environmental reasons and are targeted to have achieved about 6.4 million ha TE by the year 2000.

Table 4 - Timber Estate Development Programme (1989-1995) (Ha)

Year	TE-Pulp	TE-Plywod	TE-Trans	Priority Trees	Total
1989	29,160	102,495	0	0	131,655
1990	65,661	104,213	0	0	169,874
1991	104,222	109,769	0	0	213,991
1992	83,962	139,771	11,120	0	234,853
1993	113,066	138,625	50,021	71,895	373,607
1994	117,940	56,253	44,620	77,973	296,786
1995	162,200	54,449	48,551	61,248	326,448
TOTAL	676,211	705,575	154,312	211,116	1,747,214

Source: 1995 Forestry Statistic Indonesia. Secretariate General of Ministry of Forestry, Indonesia (recalculated)

Data for 1995 indicate that community forests covered 637,750 Ha distributed in all provinces in the country except Jakarta Special District. The distribution of community forests around the country is shown in Table 5.

Data for 1995 also indicate community mangrove forest development for last the five years. Until 1995, the development covered 18,009 Ha and no less than 108 sampling units as shown in Table 6. The development is likely to be further implemented continuously as, like other community forests, it has been designed for social and environmental reasons.

Table 5 - The Distribution of Community Forest Area (1995)

No.	Province	Area (Ha)	No.	Province	Area (Ha)
1.	Aceh Special District	7,696	15.	East Nusa Tenggara	127,949
2.	West Sumatera	17,540	16.	West Kalimantan	11,442
3.	North Sumatera	16,200	17.	Central Kalimantan	1,875
4.	Riau	14,500	18.	South Kalimantan	9,700
5.	Jambi	6,325	19.	East Kalimantan	4,158
6.	South Sumatera	19,459	20.	North Sulawesi	10,577
7.	Bengkulu	10,381	21.	Central Sulawesi	5,794
8.	Lampung	5,250	22.	South Sulawesi	35,618
9.	West Java	73,356	23.	South-East Sulawesi	11,247
10.	Central Java	96,013	24.	Maluku	2,658
11.	Yogyakarta Special District	9,968	25.	Irian Jaya	2,288
12.	East Java	127,728	26.	Jakarta Special District	-
13.	Bali	2,453	27.	East Timor	0.185
14.	West Nusa Tenggara	7,390			
TOTAL					637,750

Source: Directorate General of Reforestation and Land Rehabilitation, Ministry of Forestry (1995)

Table 6 - Community Mangrove Forest Development (1991-1995)

Development	1991	1992	1993	1994	1995	Total
Sampling Unit (units)	28	20	25	-	35	108
Mangrove Forest Plantation (Ha)	3,161	2,785	4,250	5,263	2,550	18,009

Source: 1995 Forestry Statistics Indonesia. Ministry of Forestry

The condition of most forest area can be assessed from the figures of existing critical land. The Ministry of forestry calculates that the critical forest land during the sixth five year development plan (PELITA VI) has reached serious proportions, namely 25.03 million Ha consisting of 17.52 million Ha outside forest area and the balance (7.51 million Ha) inside forest area as detailed in Table 7. There is a possibility of success in many efforts on land rehabilitation which give reason to hope that the amount of critical land will drop significantly in the near future.

Table 7 - Estimates of Critical Land before and after PELITA VI

Location of Critical Land	Area of critical land by time period (approximate)			
	By end of PELITA VI	PELITA VI	PELITA VII and beyond	TOTAL (Ha)
Inside forest area	3,759,260	941,680	2,817,580	7,518,520
Outside forest area	8,758,370	2,626,470	6,131,900	17,516,740
TOTAL	12,517,630	3,568,150	8,949,480	25,035,260

Source: 1995 Forestry Statistics Indonesia. Ministry of Forestry

(**Note:** Pelita VI spans 1994/1995 - 1999/2000; Pelita VII will start in year 2000/2001; **all figures have been rounded off - Editor**)

3.2. Environmental Initiatives

With regard to its forest management and utilisation, Indonesia is seriously giving attention to environmental matters. As mentioned earlier, Indonesia actively participates in the implementation of the CITES of wild flora and fauna and the Ramsar Convention. The country ratified the CBD in 1994 and Indonesia also hosted the third COP of the convention in May 1995. Furthermore, Indonesia has also been intensifying the maintenance of its allocated 49.5 million hectares *totally protected area* (TPA) in order to conserve its wildlife ecosystem richness. The TPA consists of protection forests (30.7 million hectares) and conservation areas (18.8 million hectares) to include national parks, nature reserve, game reserve, hunting parks, and grand forest parks.

Serious efforts have been maintained to implement the *integrated conservation and development programme* approach in the management of national parks. It is consistent with the spirit contained of UNCED 1992 outcomes. Currently (1996) there are 34 national parks covering 10.154 million hectares land and sea/water areas (Table 8).

Table 8 - National Parks in Indonesia (up to 1996)

No.	National Parks	Location	Area (Ha)
	<u>NATIONAL PARKS</u>		
1.	Gunung Leuser	Aceh ; N. Sumatera	792,675
2.	Kerinci Seblat	W. Sumatera, vic.	1,368,000
3.	South Bukit Barisan	Bengkulu; Lampung	365,680
4.	Berbak	Jambi	162,700
5.	Bukit Tiga Puluh	Riau; Jambi	127,698
6.	Siberut	W. Sumatera	190,500
7.	Way Kambas	Lampung	130,000
8.	Gunung Gede Pangrango	W. Java	15,000
9.	Halimun	W. Java	40,000
10.	Ujung Kulon	W. Java	122,956
11.	Alas Purwo	E. Java	43,420
12.	Baluran	E. Java	25,000
13.	Bromo Tengger Semeru	E. Java	58,000
14.	Meru Betiri	E. Java	50,000
15.	Bali Barat	Bali	19,002
16.	Gunung Rinjani	W. Nusa Tenggara	40,000
17.	Kelimutu	E. Nusa Tenggara	5,000
18.	Komodo	E. Nusa Tenggara	173,300
19.	Bentuang Karimun	W. Kalimantan	800,000
20.	Wakatobi	N. Sulawesi	1,390,000
21.	Bukit Baka Bukit R	W & C. Kalimantan	181,090
22.	Gunung Palung	W. Kalimantan	90,000
23.	Tanjung Puting	C. Kalimantan	355,000
24.	Kutai	E. Kalimantan	198,629
25.	Lore Lindu	C. Sulawesi	229,000
26.	Rawa A. Matumohai	SE. Sulawesi	105,194
27.	Bogani Nani W	N. Sulawesi	287,115
28.	Manusela	Maluku	189,000
29.	Wasur	Irian Jaya	308,000
30.	Bunaken	N. Sulawesi	89,065
31.	Kep. Seribu	Jakarta	108,000
32.	Cendrawasih	Irian Jaya	1,453,500
33.	Karimun Jawa	C. Java	11,625
34.	Taka Bone Rate	N. Sulawesi	530,765
	TOTAL		10,154,234

Source: MoF (1996). Progress Towards Sustainable Management of Tropical Forests (Objective Year 2000)

Note: National Park No. 30-34 printed bold are Marine National Parks.

Ujung Kulon and Komodo National Parks which have been certified by the IUCN as the World Heritage Sites are given priority in management. Gunung Gede Pangrango, Tanjung Puting, Lore Lindu and Leuser National Parks which have been designated by the UNESCO as Biosphere Reserves are also maintained with the maximum attention possible. Berbak National Park and Danau Sentarum Wildlife Reserve which have been designated as Ramsar sites are also given special attention. Three conservation areas, Wasur National Park in Irian Jaya among them, are being proposed to be Ramsar site too. The number of protected wildlife species is still the same, 538 species including 15 marine species. Indonesia has bred and cultivated more than 40 species of wildlife, including 12 wildlife protected species.

Some foundations were created to strengthen financing of various conservation measures are actively contributing to the conservation efforts in the country. They include the Wallacea Foundation to support the management of Bogani Nani Warta Bone National Park in Sulawesi; Leuser International Foundation to support Gunung Leuser National Park in Sumatera.

In line with sustainable forest management scheme, MoF enacted Decrees No. 252 of 1993 and No. 576 of 1993 concerning the Criteria and Indicators (C and I) of Natural Production Forest Sustainability at National Level. These were followed by the issuance of MoF Decree No. 610 of 1993 concerning Sustainable Management of Natural Production Forest at Management Unit Level. Furthermore, the Director General of Forest Utilisation enacted Decree No. 208/1993 concerning Technical Guidance on C and I for Management Unit Level. The basic structure of these decrees are consistent with the ITTO C and I; the C and I have been used in considering applications for the extension of concession permits. Additionally, the Association of Indonesian Forest Concessionaires (APHI) established a Timber Concession Guidance Committee to, among others tasks, supervise the concessionaires in the application in the field of the C and I of sustainable forest management. In 1994/1995 the committee, in co-operation with some universities, conducted thorough performance assessment of 61 timber concessions. For the working year 1996/1997 it was planned to assess 180 concessions but only 40 of them were completed. It was observed that the issuance of the C and I has improved the concession performance.

Moreover, Indonesia Ecolabelling Institute (LEI) which was established in 1994 as a third independent body, is actively preparing the concept and implementation of C and I of sustainable forest management at the forest management unit level in the short run. Consistent with this, the GOI is also establishing a forestry accreditation committee called Technical Accreditation Committee (KAIT) composed of members from relevant forestry institutions including NGOs under coordination of the MoF.

3.3. Wood-based Industries

As of year 1995 there are at least 494 units of concessionaire-wood-based industry in Indonesia. These consist of 303 sawmill units with total annual capacity of 8.3 million cu m; 113 plymill units with total annual capacity of 10.9 million cu m; and 78 blockboard mills with total annual capacity of 1.5 million cu m. Besides, there are 2,094 units of non-concessionaire wood-based industries consisting of 2,024 units of sawmill (total capacity 10.67 million cu m/year), 7 units plymill (total capacity 146,650 cu m/year), 24 units of blockboard mill (total capacity 427,650 cu m/year) and 39 units of particleboard mill with total annual capacity of 2.7 million cu m. Details on this are in Table 9.

Table 9 - Wood-based Industries in Indonesia (1995)

Industry	Concession		Non Concession	
	Units	Capacity (cu m)	Units	Capacity (cu m)
Sawmill	303	8,304,199	2,024	10,670,903
Plywood	113	10,966,797	7	146,650
Blockboard	78	1,511,005	24	427,650
Particle Board	-	-	39	2,675,297
TOTAL	494	20,782,001	2,094	13,920,500

Source: Capricorn Indonesia Consult Inc. 1997

Total production of plywood in 1995 was 10.65 million cu m, while total production for blockboard and particleboard were respectively, 1.28 million cu m, and 1.17 million cu m. Data on total wood-based panels production for the last five years (1991-1995) are shown in Table 10 indicating that total production of wood-based panel industries has tended to decrease during the period. This trend is mainly because of significant decrease in plywood production⁷.

Table 10 - Total Production of Wood-based Panel Industries (1991-1995)

Type of Panel	1991	1992	1993	1994	1995
Plywood	10,617,000	11,664,000	11,912,000	11,682,000	10,646,000
Blockboard	1,014,000	1,056,000	1,184,000	1,211,000	1,283,000
Particleboard	510,000	589,000	746,000	971,000	1,166,000
Total Wood-based Panel	12,141,000	13,230,000	13,792,000	13,864,000	13,095,000
Growth (%)		8.23	4.25	0.52	-5.55

Source: Capricorn Indonesia Consult Inc. 1997

Total production of logs and sawn timber for the last 5 years (1991-1995) shows significant fluctuations as well as overall significant decrease in production tend to decrease significantly, primarily after 1992. (Table 11). This phenomenon is probably in line with the claim that logs production during the period have been absorbed mostly by the national plywood industry so that national sawmill industries have experienced log/raw material shortage.

Table 11 - Timber Production (1991-1995)

Timber	1991	1992	1993	1994	1995
Logs (cu m)	23,809,761	26,049,496	26,848,010	24,027,277	24,850,061
Sawn Timber (cu m)	3,006,046	4,276,532	2,910,459	2,005,783	2,014,193
Total	26,815,807	30,326,028	29,758,469	26,033,065	26,864,259
Growth (%)		13.1	- 1.87	- 12.52	3.19

Source: 1996 Statistical Year Book of Indonesia. Central Bureau of Statistics

As of 1995 Indonesia forest-based industries also consist of 52 pulp and/or paper mills producing newspaper, printing paper, kraft paper, corrugated, and tissue papers and boards. Total annual capacity is 3.31 million tons (CIC, 1995). Production of pulp industries in five year period (1990-1994) is shown in Table 12.

⁷ Of particular interest in terms of structural shift in the panels industry is increase of particleboard from 4% of panels in 1991 to nearly 9% in 1995. Total output has grown 229% while that of all panels has increased only 8% (Editor).

Table 12 - Production of Pulp Industries (1990-1994)

Type of Pulp	1990	1991	1992	1993	1994
Long Fibre (ton)	133,604	128,102	113,203	98,148	282,839
Short Fibre (ton)	741,300	822,321	777,388	688,059	756,925
Total (ton)	874,904	950,423	890,591	786,207	1,039,764
Growth (%)		8.63	- 6.30	- 11.72	32.25

Source: Capricorn Indonesia Consult Inc. 1997

Domestic consumption, export and import of wood-based products are shown in Table 13, while Table 14 indicates the corresponding figures for paper and paperboard as well as consumption for pulp.

Table 13 - Domestic Consumption, Export and Import of Wood-based Products (cu m)

Wood-based Products	1990	1991	1992	1993	1994
PLYWOOD					
Domestic Consumption	1,677,000	1,583,000	2,131,000	2,545,000	2,639,000
Export	8,864,000	9,054,000	9,533,000	9,367,000	9,043,000
Import	-	-	-	-	-
BLOCKBOARD					
Domestic Consumption	618,000	517,000	375,000	675,000	635,000
Export	358,000	443,000	681,000	659,000	558,110
Import	-	-	-	-	-
PARTICLE BOARD					
Domestic Consumption	348,000	421,000	484,000	625,000	681,000
Export	85,000	92,000	108,000	223,000	279,000
Import	1,000	3,000	3,000	2,000	7,000

Source: Capricorn Indonesia Consult, Inc. 1997

Table 14 - Domestic Consumption of Pulp; Domestic Consumption, Export and Import of Paper and Paperboard

Pulp and Paper	1990	1991	1992	1993	1994
PULP (Domestic Consumption)					
Virgin Pulp	1,028,073	1,155,608	1,342,365	1,501,273	1,767,543
Used Paper	418,543	474,013	576,669	660,920	793,356
PAPER AND PAPERBOARD					
Domestic Consumption	1,371,370	1,479,100	1,844,400	2,091,700	2,399,100
Export	190,330	384,800	533,000	591,800	826,200
Import	123,600	114,900	114,600	111,400	171,300

Source: Capricorn Indonesia Consult, Inc. 1997

3.4. Non-wood Forest Product

There are many non-wood forest product (NWFP) produced, traded and consumed in Indonesia of which those which are economically worth mentioning are rattan (*Calamus spp.*), resin, cayuput oil, turpentine, and gum resin - these are by far are the most important non-wood products. Production of all these NWFP is shown in Table 15.

Table 15 - Production of NWFP (1991-1995)

NWFP	1991	1992	1993	1994	1995
Rattan (ton)	64,020	69,384	88,149	78,340	36,256
Gum Resin (ton)	37,141	53,090	78,369	74,204	47,960
Turpentine (ton)	8,593,000	9,038,000	11,439,000	13,175,000	8,975,000
Cayuput Oil (ltr)	274,124	280,305	312,831	332,478	235,497
Damar Resin (ton)	10,416	14,253	5,149	0	3,869

Source: 1996 Statistical Year Book of Indonesia. Central Bureau of Statistics

Indonesia has the most diverse rattan resources in the world and a major portion of the world's total rattan resource is found in Indonesia's forests. Rattan is socially and economically the most important NWFP. Rattan has excellent properties for furniture manufacturing and is extensively used by furniture industries in many countries. While marketed in the local market as a basic material for the furniture industry and smallholders handicrafts, rattan has a long-established reputation as an export oriented commodity.

Before the 1988 export ban of semi-processed rattan, about 170,000 to 180,000 tons of rattan were harvested annually, of which 60% was exported. This harvest level has left certain areas depleted of rattan stocks. The export ban of semi-processed rattan has resulted, however, in some dramatic changes in the rattan industry: the number of industrial units increased from 109 at the end of 1986 to 381 at the end 1988 increasing capacity from about 61,000 tons to 439,000 tons. At the same time, the development of rattan plantations has been slow (partly because of rattan farmer are no longer interested in rattan plantation for some reasons); the total area of rattan plantations is about 21,400 hectares. As a result, the production of rattan has tended to decrease significantly, as shown in Table 15.

Additionally, other NWFPs are recognised to be cayuput oil, gum resin, and damar resin. Resin tapping is carried out to a great extent in Java by the state-owned corporation, Perhutani. Besides, small scale resin tapping by private companies take place in the province of North Sumatera and Aceh. In Java about 30,000 hectares of pine (*Pinus spp*) plantation were brought under resin tapping by 1980. In this period resin production amounted to 15.5 thousand tonnes to yield about 10 thousand tonnes of rosin and 1,400 kilo litres turpentine. The area brought under resin tapping has grown steadily and reached 73,500 hectares in 1988. Consistent with this figure, the production of resin has also shown a steep increase: the production amounted to 45,200 tonnes representing more than three times increase over 1980 production level. The level of 1993 production was a peak level, since then the production level has significantly decreased (Table 15).

Other non-wood products which are currently utilised are also of fauna and flora products. Currently being utilised and harvested directly from the wild or through captive breeding are

135 species of reptiles, 16 species of mammals, 99 species of birds, 71 species of corals, 40 species of amphibians, 2 species of fishes, 3 species of arthropods, 1 species of tree ferns, 17 species of butterflies, and 2 species of agar woods. The foreign exchange from this utilisation is estimated to be about US\$6 million annually.

Development of captive breeding programmes is being boosted in order to meet market demands as well as ex-situ conservation. About 40 species are currently in the programme involving 133 captive breeder companies. In the future, the wild harvest will tend to decrease as the result of habitat losses and the success of captive breeding programme. The programme developed mainly for commercial purposes is also directed to improve the welfare of the people surrounding the habitat. Sustainable fauna and flora utilisation will be directed towards the increase of value added such as export of only finished products, diversification of species and commercial efficiency.

3.5. *Services of the Forest*

Forest resources in Indonesia are also utilised for non-timber services purposes. In this sense, some forest areas are specifically designated for research, education as well as recreation purposes. All national parks, for instance, are also directed to accommodate such purposes. Besides, some other forest areas are already designated for serving such purposes as well, namely Grand Forest Parks (GFP). As of 1995, there were at least 9 GFPs in Indonesia. The name, location, and area of the GFPs are listed in Table 16.

Table 16 - Grand Forest Parks in Indonesia (1995)

No.	Name of Grand Forest Park	Location	Area (Ha)
1.	Dr. Mochamad Hatta	West Sumatera	500
2.	Bukit Barisan	North Sumatera	51,600
3.	Wan Abdul Rachman	Lampung	22,244
4.	Ir. H. Juanda	West Java	590
5.	R. Soeryo	East Java	25,000
6.	Sultan Adam	South Kalimantan	112,000
7.	Ngurah Rai	Bali	1,373
8.	Murhum	South-east Sulawesi	8,146
9.	Palu	Central Sulawesi	8,100

Source: 1995 Forestry Statistic of Indonesia. Secretariate General of Ministry of Forestry.

4. THE FUTURE

4.1. Supply vs Demand

On the basis of Table 10, the growth of wood-based products is around 4%. This figure seems to be caused by shortage of natural logs. Table 17 illustrates the log demanded by wood-based industries. The demand for logs seems to be continuously increasing over time and this is likely to continue as the wood market is going to be more open in the future.

Table 17 - Wood-based Industries Log Demand

Wood-based Industries	1990	1991	1992	1993	1994
Logs for Sawn Timber *	22,200,000	21,000,000	21,200,000	21,600,000	21,800,000
Logs for Plywood **	21,082,000	21,234,000	23,328,000	23,824,000	23,364,000
Logs for Woodworking ***	193,644	223,032	228,526	237,674	242,411
TOTAL	43,475,644	42,467,032	44,756,526	45,661,674	45,405,411

Source: Capricorn Indonesia Consult, Inc. 1997

Remarks:* based on calculation 2 cu m log/cu m sawn timber

** assumption: other wood-based panels use sawn timber, other products waste, etc.

*** based on calculation 1.35 cu m log/cu m woodworking

Compared to the log production (Table 11), it is clear that wood-based industries experienced log shortages in the period and this situation is consistent with an increasing incidence of illegal cutting. Additionally, the log shortage experienced for sawn timber (see also Table 11) is considered to be a logical consequence of unfair domestic log market mechanism which favours plywood although it is understandable because the plywood in that period and even up to now is the major (and single) priority product for export purposes.

Based on Table 12, it is estimated that the prediction of production and consumption of pulp in Indonesia by the year 2000 is as given in Table 18.

Table 18 - Prediction of Production-Consumption of Pulp (1995-1999)

Description	1995	1996	1997	1998	1999
Consumption (ton)	1,902,707	2,276,233	2,534,165	2,702,951	2,862,018
Production (ton)	1,910,566	2,282,385	2,587,885	2,923,560	3,045,520
Balance (ton)	7,859	6,152	53,720	220,609	183,502

Source: Capricorn Indonesia Consult, Inc. 1997

Table 18 suggested that there is increasing trend in balance of pulp in domestic market considering to be potential supply for export market. It is a good opportunity to open a new market segment, especially for helping domestic pulp mills are not integrated with downstream industry.

On the basis of the figure above, and considering that the ASEAN Free Trade Agreement takes effect in 2003, a world free market comes into effect in 2006 as well as IMF demands among others to eliminate export tax gradually, the structure of wood-based industries is expected to change dramatically. All kinds of wood-based industries would face a similar challenge and could seek opportunities to become a "winner" in exports. They have to fight to become winners and competition is expected to be more and more serious as players from other countries are also freely involved in the same markets. Under this scenario, one thing that will most probably occur is that environmental and social problems could increase significantly.

Facing the above potentially unstable future, Indonesia is going to hold consistently to the implementation of the principle of sustainability already stated in GBHN. Under this commitment, all possible structural change would be required to operate within imposed limits. The key point is that the future log production from natural forests will be based strictly on natural carrying capacity expressed as the amount of annual allowable cut. Besides,

Indonesia would intensify continuously the establishment of forest plantations such as TE, community forests, and community mangrove forests. To achieve realistically all this, Indonesia would involve all possible stakeholders to actively participate in all steps of the forest development process.

4.2. *Future Development*

Indonesia is one of the key forestry countries of the Asia-Pacific region and the world. Ideally, a vision of the future developments would have been prepared but the preparation of this document has occurred at a time of particularly high uncertainty. The country has just agreed upon some substantial policy reforms for the economy as a whole, some (such as the proposed liberalisation of the log market) with direct bearing on forestry; the currency has devalued precipitously; many industries have become dislocated. The Ministry of Forestry will need to respond to these rapid changes in addition to recent decisions which give it responsibility for caring for estate crops like rubber, palm oil, tea, etc. In view of this situation, it is best to await a return to more settled conditions before outlining what the future may hold for the forestry sector.

The phenomena and scenarios illustrated above suggest some implications partly that it is the time to rapidly reform the structure of wood-based industries by providing all industries similar opportunities to develop their industries in a more fair and competitive market atmosphere. It is also necessary for the industry to strengthen its capability and efficiency to get a better bargain in world markets while not forgetting to remain with the bounds of SFM.

The establishment of forest plantations would be intensified through strengthened human resources to speed up the programme. The programme itself is aiming to compensate for log shortage from natural forests as well as to serve as a strategic effort to rehabilitate secondary forest and logged-over areas. In other senses, the programme is also designed to reduce social problems and people pressure on the forest area that will be more serious in the future.

Another possible alternative is to actively promote diversification of forest utilisation, with a view to sustainability; in other words, it is time to intensify non-timber forest utilisation as a complement to timber harvesting. Ecotourism is one prospective choice of such forest utilisation in the future, with the basic idea behind ecotourism being “saving nature by selling it”.

The perfect implementation of the above ideas will make it possible to achieve suitable trade-offs between the present and future generations’ needs in terms of forest resources. To implement all the above ideas, Indonesia will adopt appropriate supportive policies as well as relevant financial resources.

4.3. *Implications*

The likely future conditions illustrated above have implications that are very important for Indonesia. Firstly, there is need to implement structural change in forest-based industries partly to assure reform of the log market and trade mechanism that takes into account a future where world market mechanisms are more influential. Secondly, strongly encourage all forest-based industries to have their product produced efficiently and sustainably so that they can increase their competitiveness in the future world market. Thirdly, since efficiency is a key idea in this context, it is also necessary to create consistency and transparency especially in decision-making processes regarding utilisation of forest as public goods. Fourthly, property rights in forest utilisation must be strengthened and made more clearly defined in future. Finally, relevant policies and actions will be directed to support all these things and make it possible for them to be further implemented. Possible policies and actions will be based on in-depth and comprehensive research and development activities.

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