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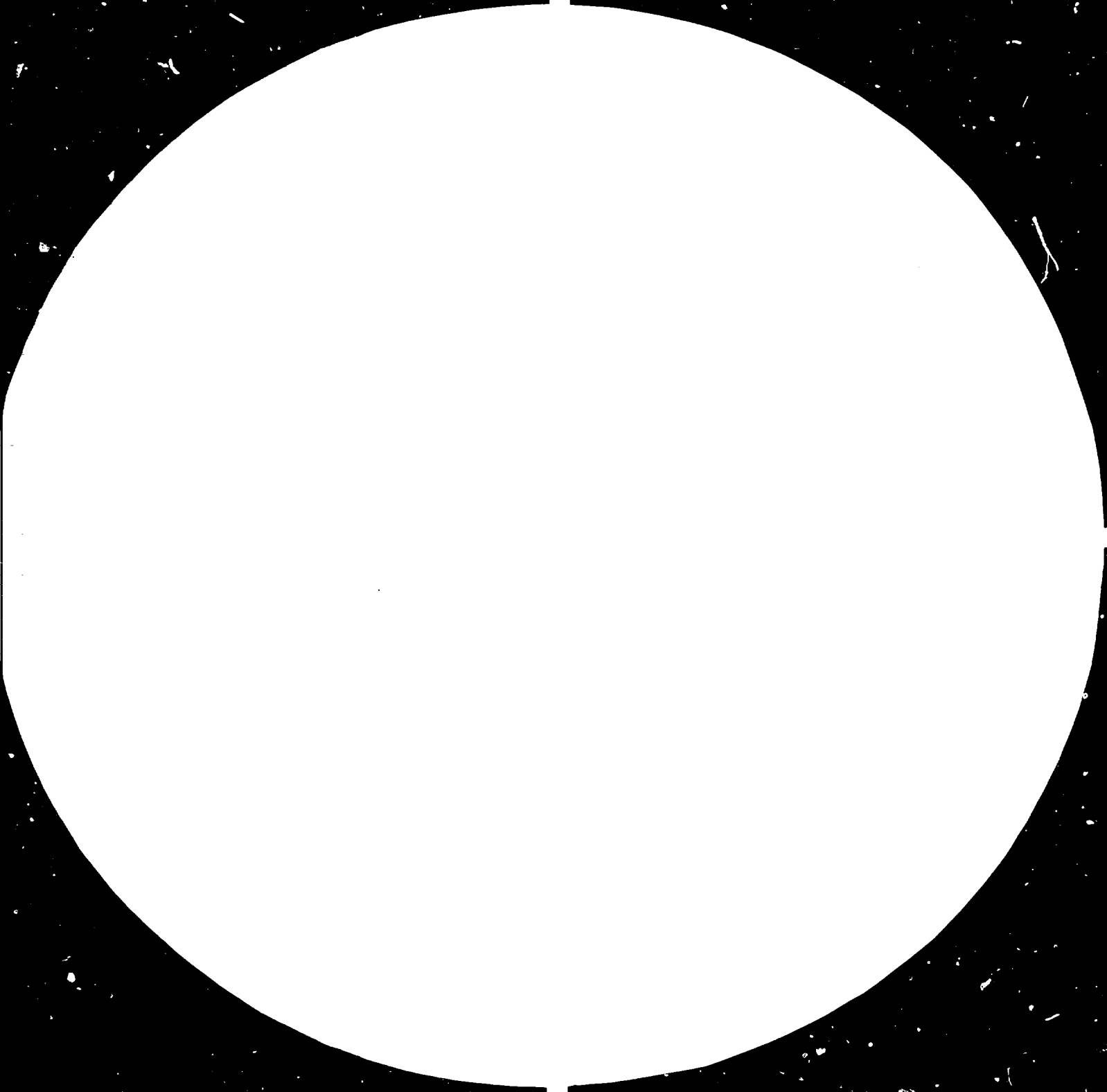
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Resolution Test Chart, NA 2000-01-01, 100%



11424



Distr.
LIMITED

IND/WG.371/5
29 April 1982

ENCLOSURE

United Nations Industrial Development Organization

Regional Preparatory Meeting for Asia in preparation
of the First Consultation on the Wood and Wood
Products Industry
Manila, Philippines, 22-26 March 1982

CONCISE VIEW ON THE DEVELOPMENT OF WOODBASED INDUSTRY
IN INDONESIA *

by

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Chapter I

STATE POLICY, PRIME CAUSE OF DEVELOPMENT
OF WOOD-PROCESSING INDUSTRY

1. The General Directives of the State Policy provide that the main aim of the long-range national development plan is the establishment of a well balanced economic structure with the emphasis on the industrial sector, which in turn is supported by a strong agriculture.

The aim shall be achieved in stages through the implementation of a series of five-year development plans (Repelita), the first one starting on April 1969, while next April 1982 will be the start of the 3rd year of the IIIrd Repelita.

2. Within this context, the forest wealth has been recognized one of the biggest natural resources in Indonesia, if not the largest and most important because of the fact that forests play a vital role in sustaining a healthy human environment, as they influence climatic conditions as well as the land and water household of the country. Besides, unlike mining products, forests are a renewable resource. It is therefore a matter of basic principle that the 122 million HA of forest land which covers more than 60% of the total land area of 191,359,000 HA must be properly managed and rationally utilized and regenerated for the maximum benefit of the people. The country now has a population of approximately 147 million which is growing with an annual rate of 2.4%.

It is to be noted that 65% of the population or appr. 95 million live on Java and Madura, with a total land area of only a little more than 13 million HA or 6.9% of the total land area of the country. The forests covering those two islands, however, amount to only 2,891,000 HA or 22% of the land area which constitutes only 2.4% of all forests in Indonesia, though they are well managed and regularly regenerated since 1873.

The big forest reserves are in other islands as shown by the following table.

A r e a	In percentage of total forest area	In percentage of resp. land area
Sumatra	23.2 %	60 %
Kalimantan	33.9 %	76 %
Sulawesi	8.1 %	52 %
Bali & Nusa Tenggara	1.7 %	28 %
Maluku	4.9 %	82 %
Irian Jaya	25.8 %	75 %
Java & Madura	2.4 %	22 %
Indonesia	100.0 %	64 %

3. In view of the huge forest wealth which if properly managed and rationally utilized can play a key role in boosting development of economically and socially less favoured regions, it is understandable that the

government gives highest priority to forest industries development in these timber rich areas outside Java.

Consequently infrastructural improvement is being given greatest attention in these areas.

4. Indonesia is generally seen as the last major source of tropical hardwoods in the world. Forest exploration is being pursued in more remote regions and more detailed surveys are being conducted in timber concessions areas so as to obtain exact data concerning the production capacities of the forests.

**Table 2. Trend of Logs Export
(in 1000 m3)**

1970 - 7,800	1975 - 13,921	1980 - 12,800
1971 - 10,760	1976 - 18,521	1981 - 6,000
1972 - 13,590	1977 - 18,634	1982 - 4,500
1973 - 19,433	1978 - 18,904	1983 - 3,000
1974 - 18,083	1979 - 18,106	1984 - 1,500
		1985 - 0

From table 2 hereabove one can see that by 1981 Indonesia is no longer a major logs exporter, and will continue to phase out the export until there will be none at all by 1985.

Considering this trend of logs exports and projecting it into the massive forest industry development programme, the government is

tightening the control on the performance of logging enterprises and the forest industry as well so to ensure stricter adherence to regulations in order to safeguard regular and progressive supply of logs to the fast growing domestic wood processing industries.

5. With the rapid expansion of the wood converting industry, forest conservation is of course of vital importance. With this regard the government since the beginning of the 5 year development plan has been performing readdorestation and land rehabilitation projects which in the current 3rd Repelita, is aiming at one million hectares annually i.e. 300,000 for reafforestation and 700,000 for land rehabilitation. The species planted mainly include *Pinus merkusii*, *Acacia* Sp. and *Eucalyptus* Sp.

It is to be understood that reafforestation is undertaken in forest areas, while land rehabilitation in private lands.

It may be mentioned that until the end of the 2nd Five Year Development Plan in 1978/79, a total area of 2,633,849 HA has been reforested, while the target for the 3rd Repelita started in 1979/80 has been set at 5 million HA with a budgetary provision of 60 billion Rupiah.

6. It should be pointed out that the wood industry development drive does not concern only plywood manufacturing - although this being accorded highest priority in current Repelita - but it includes also other kinds of woodbased industries as well, like e.g. sawmilling, particle boards, furniture parts, mouldings, pulp and paper.

In order to minimize wastage, integrated wood processing industries and

the utilization of wood waste for power generation are encouraged.

The latter is in line with the government policy and efforts to develop new sources of energy other than oil, such as hydro -, coal, geothermal, solar energy and last but not least wood as well as wood - and other vegetative derivatives. The latter sources of energy are being given more attention recently as they are found in abundance particularly in rural areas, and besides they are renewable.

CHAPTER II

POTENTIALS OF INDONESIA TO BECOME MAJOR SUPPLIER OF HARDWOOD PRODUCTS

A. Raw Material Aspect

As far as raw material resource for hardwood products is concerned, Indonesia is undoubtedly the most promising place for the creation of big scale wood processing industries which are to sustain regular supply to meet increasing demand for hardwood products, at home as well as over seas.

There are 3 sources of raw material supply for the wood processing industry i.e. :

1. Natural Forests.

56,000,000 HA is economically accessible and therefore designated as production forests, with a potential harvest of \pm 68 million m³ annually.

The actual supply of logs which is relevant to the expected growth of the sawmilling and plywood industry, however, is projected on Table 3.

Table 3. Projection of Logs Supply
(x 1000 m³)

Year	to Sawmills	to Plywood mills	for Export	Total
1981-1982	13,600	4,140	5,600	23,340
1982-1983	15,000	6,120	4,100	25,310
1983-1984	16,000	8,200	3,300	27,980
1984-1985	18,400	10,350	2,500	31,250
1985-1986	20,400	12,420	-	32,820

Year	to Sawmills	to Plywood mills	for Export	Total
1986-1987	22,400	12,800	-	34,200
1987-1988	24,400	12,800	-	37,200
1988-1989	26,400	12,800	-	39,200

Note : Logs supply calculated 98% of optimal capacity.

Source : Coordinating Team for Forest Product Industry, 1991.

2. Man made Forests.

In 7 provinces spread over the islands of Sumatra, Kalimantan and Sulawesi there are now potential forest areas of 3,000,000 HA to sustain the industry (pulp, paper, rayon). Fast growing species like Pinus, Eucalyptus, Albizia and Accacia are generally chosen for cultivation. But plantations on those islands has been started only in the last decade. Only the man made forests on Java of 2 million HA with its production capacity of \pm 1 million m³ can be accounted for at this juncture. The main species concerned here is Teak, and in less amount also Pinus, Agathis, Mahagony a.s.o.

3. Wood Waste

Huge amounts of waste coming from the logged forest as well as from the sawmill and plywood industry, as shown on Table 4, give ample opportunities for the development of other woodbased industries like blockboard, particle board, fibre boards, etc.

Table 4. Estimate of Wood Waste in 1981-1989

Year	L o g g i n g		I n d u s t r y		Total Wood Waste
	Log Production	Logging Waste	Sawmill Waste	Plywood mill waste	
1981-1982	23,340	10,000	6,800	2,270	19,070
1982-1983	25,310	10,950	7,500	3,410	21,760
1983-1984	27,980	11,990	8,200	4,550	24,740
1984-1985	31,250	12,250	9,200	5,590	27,140
1985-1986	32,920	14,060	10,200	6,830	31,290
1986-1987	33,280	14,260	10,200	7,080	31,540
1987-1988	37,200	15,970	12,200	7,080	35,250
1988-1989	39,280	16,830	13,200	7,030	37,110

Source : Coordinating Team for Forest Product Industry, 1981.

As modern mechanical logging has been practiced since the last decade, and keeping in mind the existing government regulations pertaining to felling systems, log export restrictions, forest conservation and reforestation, which are being imposed with escalating firmness and strictness particularly during the last five years, the growing wood processing industries do feel more assured of a regular supply of raw materials for many years to come.

B. Manpower Aspect

Wood processing industry is indeed a relatively labour-intensive enterprise. And this is one of the main reasons why the government is encouraging the development of this kind of industry in order to provide employment for the growing labour force.

As modern woodbased industry has started to grow quite recently, the available labour force, however, is predominantly unskilled, hence to be trained mostly within the jobs. But, a relatively high percentage of the people who seek for employment display willingness to work and great ability to learn. On the other hand, it is rather hard to get skilled wood workers (as sawmasters, lathe operators, etc) and skilled technicians (e.g. mechanics, electricians, etc.) and experienced managerial staff both on the technological and commercial field (marketing, finance, administration).

Most of the above-listed posts have to be filled - at least for the first year or two following the establishment of the plant - by foreign workers who subsequently during the same period have to undertake the training of suitable nationals who have to replace them in due course. This foreign personnel is usually recruited from Asian countries like Malaysia, Singapore, Philippines, Taiwan, Korea, Japan, and is subject to government regulations, among other things, e.g. a work permit is required.

Occasionally, within the framework of its longterm development plan, an enterprise - especially a big one - may even before starting production send abroad up to 40 selected persons for future staff for a period of up to one year for training either at similar production plants or for special tasks (saw doctoring, kiln drying, veneer cutting, glueing, maintenance, etc.) by the manufacturers of the machineries.

Having in mind the above mentioned conditions of labour supply vis-a-vis

the fast growth of the wood processing industries now taking place, it is obvious that there is an urgent need for the organization of training centres, in particular for the plywood industry. With the help of some international organizations a project especially for that purpose is being developed. Such training centres have to operate as soon as possible and their extension as well as diversification have to be vigorously pursued in order to meet the great need of skilled labour for the fast growing industry, and especially for the plywood mills.

C. Infrastructure Aspect

Indonesia is a vast country consisting of not less than 13,000 islands; big and small. Development of infrastructure during the colonial time was concentrated on Java and the East Coast of North Sumatra. It was not until 1970 that economic development could really and systematically start, as the period between 1945 and 1970 was marked by independent struggle which lasted 5 years and political consolidation was only firmly accomplished by 1967.

No wonder then, that compared with the situation in other Asian plywood producing countries Indonesia has been logging behind in the infrastructure field. As to the plywood industry, Indonesia has started only in 1973, which means 25 - 30 years later than other neighboring countries.

While most advanced infrastructure is to be found in the densely populated island of Java where forests have been reduced to hardly 3 million HA out of 13 million HA of land area, and in much less degree in Sumatra, on other

major islands like Kalimantan, Sulawesi, Moluccas and Irian Jaya where most of the forest resources are located, the situation is far from ideal for the development of industries, particularly wood working industries. Unfortunately for the timber industry, but perhaps fortunately for the country as a whole, all these islands including a big part of Sumatra are endowed with considerable wealth of timber rich forest.

That was indeed one of the reasons why in the early stage of development investors preferred to set up their mills near big harbour cities on Java and Sumatra. Not only because plenty of labour can be recruited there, but transport and communications facilities to local as well as foreign market are much more developed.

During the last decade, however, a lot of improvement has been materialised in this field. Air - sea and tele communications between all provinces have been improving quickly, so that by now the government no longer allows new primary wood processing plants to be erected on Java. It must rather be set-up as near as possible to the raw material sources in Kalimantan, Sumatra, Sulawesi, the Moluccas and Irian Jaya.

This does not mean that all problems affecting new and big industries like plywood plant have been resolved. Big investment have still to be made by the government and in many cases even by the private sector concerned before adequate infrastructure can be functioning properly. Most important are e.g.:

1. Provision of cheaper electric power, since most plants have to use their own generators.

2. Fresh water supply still requires greater attention.
3. Harbour and shipping facilities badly need expansion and/or improvement in order to allow orderly and smooth shipments of wood products which is swelling with great speed.
4. Extension of educational and training and research facilities are also urgently needed in the areas with great potentialities for economic development in order to provide ample skilled and trained local workers.

The creation of Production Centres and Terminals of products seems to be the ultimate answers. While for other branches of industries this kind of centres have already been started and advancing steadily, for the timber industry they have still to be created.

Being fully aware of the basic importance of adequate infrastructure for economic and social development, the government, particularly in view of the need for more equal distribution of capital and human investment and spreading of development efforts which constitute the backbone policy of the 3rd Five Year Development Plan, is according high priority to rural electrification, providing transport and communication facilities as well as water in regions with great economic potentials.

D. Technological Aspects

For a developing country engaged with a massive development of wood industries, the matter of know-how transfer is naturally of vital importance. Some notes in this respect has been quoted under Chapter II, Item B here above.

It should be pointed out that the creation of training facilities is lagging far behind the formidable growth of the industry, in particular of the plywood sector. Most efforts to obtain experts and skilled labour, therefore, have been entirely exercised by the private sector, either through management contracts or in some cases joint ventures or by sending selected persons abroad for study and on the job training. These foreign and overseas trained personnel then become the instructors to the local staff recruited from the technical schools plentifully available in the country once the plant becomes operational.

This is, of course, a rather expensive way of producing plywood, at least for one or two years in the early stage of operation. Alas, it is the only way to assure that the product will be immediately competitive quality wise.

On the other hand, however, it seems to be the natural course for the more advanced countries with shortage of raw material in their efforts for the redeployment of their industry to developing countries like Indonesia.

CHAPTER III
CURRENT POSITION AND PROSPECT OF THE
WOOD PROCESSING INDUSTRY

1. The national development plan for woodbased industry aims at the creation of integrated timber processing industries, comprising the primary - as well as the secondary or down stream industries.
The primary industry which is to process wood in raw includes such kinds of industry like : Sawmills, Plywood plants, Chipmills, Reconstituted wood fibre plants (making particle boards, fibre board, woodwool board, cement bonded particle board, etc.), Pulp, paper and rayon, Energy materials (fuel wood, wood brickets, charcoal, wood gas).
The down stream industry, which is to process further the product of the primary industry, consists of the following : Joinery & Cabinet manufacture, Prefabricated Houses, Door & Window manufacture, Parquet mills, Furniture making, Boat building, Wood bending plants, Matches & Pencils manufacturing, Manufacture of boxes, crates and palets, Idem of vats and tubs, Idem of carving, turned good, etc.
2. Modern sawmilling was started in the thirties, first by the Forestry Service and soon followed by private timber traders. Teak wood on Java was then the main product of business. Those sawing other kinds of wood which prevail on the other islands were coming on stream only in the fifties and really blossoming in the seventies. The position of the sawmilling industry in 1981 is shown in Table 5.

Table 5. Position of the Sawmilling Industry in 1981.

Phase of Development	Unit	Installed Capacity (x 1,000 m3)
In Application	130	2,766
Under Construction	27	814
Operational :		
- Logging Concessions' Owned	202	2,296
- Others, incl. hand saws	p.m.	6,326
T o t a l	329 - p.m.	15,931

Source: Directorate General Forestry, 1981
 Directorate General of Multivarious Industry, 1981

1. The first two plywood mills commenced production only in 1973, and since then growing in number with a remarkable speed. The position of development in 1981 is shown in Table 6.

Table 6. Position of Plywood Industry Development in 1981

Phase of Development	Unit	Installed Capacity (x 1,000 m3)
In application	113	4,975
Under Construction	20	910
Operational	30	1,551
T o t a l	163	7,437

Source: Directorate General Forestry, 1981.

4. Further development of the Sawmill and Plywood Industry is naturally dependant on the apparent absorption potentials of markets at home and abroad. The position of the industry within this context is therefore made as appears in Table 7.

Table 7. The Position of the Sawmill & Plywood Industry vis-a-vis the Market Potentials, 1981-1989

Year	Installed Capacity		Market Potentials				Notes
	Sawmill	Plywood	Sawn Timber		Plywood		
			Domestic	Export	Domestic	Export	
1981-1982	12,300	1,552	4,900	2,000	900	900	
1982-1983	12,700	1,957	5,100	2,400	1,200	1,500	
1983-1984	15,020	3,233	5,400	2,800	1,500	2,100	
1984- 935	15,020	4,975	6,000	3,200	1,900	2,700	
1985-1986	15,020	5,846	6,000	3,600	2,400	3,000	
1986-1987	15,020	7,000	7,200	4,000	2,700	3,300	
1987-1988	15,250	7,000	7,800	4,400	3,100	3,400	
1988-1989	16,500	7,000	8,400	4,800	3,440	3,600	

Source : Coordinating Team for Forest product Industry, 1981.

5. The crucial question at the moment to be answered for us is, of course, how and to what extent the plywood and sawmill industry is to be developed year by year in order to match with the apparent demand of the market.

Table 8 and Table 9 give, therefore, detailed projection on how much mill capacities should be operational, how much to be under construction and how much to be applied for year by year up to 1989, respectively for the sawmill and plywood industry.

Table 8. Projection on the Development of the Sawmill Industry, 1981-1984

x 1,000 m3

	Market Potential	Production	Optimal Installed Capacity	Real Installed Capacity	Construction Capacity	Application Capacity
1981-1982	6,300	6,300	9,050	12,300	300	2,760
1982-1983	7,500	7,500	9,300	12,700	2,320	-
1983-1984	8,200	8,200	10,250	15,020	-	-
1984-1985	9,200	9,200	11,500	15,020	-	-
1985-1986	10,200	10,200	12,750	15,020	-	-
1986-1987	11,200	11,200	14,000	15,020	-	-
1987-1988	12,200	12,200	15,250	15,020	-	-
1988-1989	13,200	13,200	16,500	16,500	-	-

Source : Coordinating Team for Forest Product Industry, 1981.

Table 9. Projection on the Development of the Plywood Industry, 1981-1990.

Year	Market Potential	Production	Optimal Installed Capacity	Real Installed Capacity	Construction Capacity	Application Capacity
1981-1982	1,800	1,900	2,250	1,552	910	4,975
1982-1983	2,700	2,700	3,370	2,907	2,137	2,487
1983-1984	3,600	3,600	4,500	3,333	2,612	-
1984-1985	4,500	4,500	5,620	5,075	370	-
1985-1986	5,400	5,400	6,700	5,945	-	-
1986-1987	5,900	5,600	7,000	6,700	-	-
1987-1988	6,500	5,600	7,000	7,000	-	-
1988-1989	7,000	5,600	7,000	7,000	-	-

Source : Coordinating Team for Forest Product Industry, 1981.

From Table 8 one can see that at the current stage the Indonesian Sawmill industry is already overdeveloped, at least from capacities point of view. This means that further on the stress must be laid on efforts pertaining to quality improvement, diversification of product, efficient- clering of processing and marketing, until an equilibrium be obtained by 1987 - 1990.

On the other hand, as seen from Table 9, vigorous efforts shall be pursued until 1984 to raise the capacity of the plywood industry up to 7 million m³ per year which is the limit of raw material supply accorded

to this subsector. Having reached this target by 1986, 5,600,000 m³ of Indonesian plywood will be available for the market, so still well below the projected market potentials of the eighties.

5. From the existing 30 pulp and paper industries, only 3 are using wood for raw materials with a total output capacity of 140,000 tons annually. Four pulp and paper projects with a total capacity of 443,000 tons are now underway which are scheduled to commence production by 1985.
7. Disolving Pulp and Rayon are badly needed for the expanding textile industry which until now draw most of their requirement for fibre from import. Intensive study is now underway to locate most potential area for such industries. South Sumatra will be apparently the first choice.
8. As far as the down stream wood industry is concerned, it can be mentioned that they are steadily growing along with the development of the primary industry. Wood working industries manufacturing joineries, furniture parts, mouldings, etc, and also plywood prefinishing plants are noted developing everywhere near production centres either independently in big cities or integrated in the primary industries. Exact figures on this regard, however, can not be provided at this juncture as yet.

