Socio-economic Information on Rattan in Indonesia

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CONTENTS

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INTRODUCTION

Indonesia has the largest rattan reserve in the world, with approximately 80% of the world's rattan, mainly in Kalimantan, Sumatra, Sulawesi, Maluku and Irian Jaya.

Studies indicate that there are at least 300 species of rattan growing in Indonesia. Of these, only around 30 species have been commercially exploited, with the highest production level at 214,000 tons/year. Rattan stems are generally used for producing various household articles. such as furniture and woven products.

The best species of rattan for producing furniture are locally known as manau rattan (Calamus manau) and sega rattan (Calamus caesius). It is estimated that around 47,440 tons of manau rattan and 44,500 tons of sega rattan are produced annually in Indonesia (Indoconsult Inc, 1993).

The production potential of all species is estimated around 696,900 tons/year in 15 provinces of Indonesia, based on the 1986 preliminary inventory data of the Ministry of Forestry (Nasendi. 1994).

The Government of Indonesia also promotes the cultivation of rattan to offset the exploitation of naturally growing rattan and to meet the growing demand for rattan products in domestic and export markets.

More information is needed on socio-economic aspects of the rat tan sector. Assessments are needed of production and harvesting systems. export and domestic markets. consumpt.ion levels, value added at different stages, employment and labour issues, as well as resource development and sustainability issues.

PRODUCTION AND MARKETS

Raw Material Production

Raw rattan production and export volumes have fluctuated markedly over the past 25 years. Rattan production increased from 40,775 tons in 1968 to reach its peak of 199,144 tons in 1987, and dropped to 58.000 tons in 1988. These fluctuations are reflected in export statistics, as can be seen in Table and Figure 1.

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In 1986, Central Sulawesi was the largest rattan producing province in lndonesia (12.78) %), followed by Central Kalimantan (11.7 0/0). East Kalimantan (10.6 %). West Kalimantan (7.8 1 %), and South Sulawesi (6.39 %). as shown in Table and Figure 2.

Provincial Forest Services and Regional Forestry Departments monitor rattan production on the basis of reports from HPHH (Right to Collect Forest Products) holders. However, data collection is often hindered by inadequate communication and transportation facilities, and by inadequate reports from individual HPHH holders.

The fluctuations in production and export of rattan in the last, five years, particularly the declining trend, need further research. It is not clear whether this is due to the goverment export ban on raw rattan and semi-finished rattan products (respectively in 1986 and 1989) or because the structure of the national rattan processing industry is still weak. More attention is required on the relative strenghts and weaknesses of Indonesian marketing internationally. Also, the impact of government policies on rattan collectors and farmers in the rural areas and producing regions needs further assessment.

Processing

The growth of the rattan processing industry in Indonesia was slow prior to 1986. It began to grow significantly after the issue of Decree No. 274/Kp/X/ 1986 of the Minister of Trade in October 1986, which banned export of raw rattan. Prior to the ban, the production of rattan products in Indonesia was very limited in both quantity and type. Only rattan mats had been continuously exported and most of them were produced by traditional craftsmen.

The ban on raw rattan exports led to increased export of semi-finished rattan products. which was still allowed. However, with the banning of exports of semi-finished rattan products in July 1988, businessmen turned to the production of finished rattan products. The rattan processing industry enjoyed an investment boom in 1988, when there were.54 projects with a total invesment of Rp 278 billion, most of them in the rattan furniture industry (Data Consult Inc.. 1993).

Most of the existing producers of finished rattan products in the country are located in large towns and cities, like Cirebon, Tangerang. Bogor and Bandung in West Java: and Gresik, Malang and Surabaya in East Java. Table and-Figure 3 show the geographic distribution of producers of finished rattan products by province in 1992.

Table 3 does not include'small producers (home industries) who have an average production capacity of below 50 tons/year. Further information is needed to assess concentration of home industries producing rattan products.

Investments

After. a boom in the 1987-1989 period, the number of invesment projects in the rattan products industry declined to 12, including three expansion projects during 1990- 1993. In 1988, there were as many as 54 invesment projects in the industry. Rattan processing plants in Indonesia are labour-intensive, but require relatively small investments. averaging less . than Rp 3 billion per plant (DataConsult Inc, 1993).

Further assessment is required to investigate the declining trend of the rattan processing industry in recent years, and its impact on export markets, employment, consumption and resource development.

Markets

Export

Although exports of finished rattan products have increased by an average of 35.8% in volume and 25.6% in value annually in the past five years. the rate of increase has been smaller than that prior to 1988. During the 1985-88 period. exports rose by an average of 174.4% in volume and 132.4% in value annually. In 1992, exports went up by only 0.9% in volume and 6 % in value, the rate of increase in exports being the lowest until then (See Table and Figure 4).

Japan is the biggest export market for finished rattan products from Indonesia. In 1992, the value of exports to Japan was US $ 12 1.433 million, accounting for 4 1.3% of the total value of export of finished rattan products from Indonesia at US.$293.595 million. as can be seen in Table and Figure 5. The most popular Indonesian rattan product to Japan is rattan furniture, followed by woven mats (Data Consult Inc. 1993).

Domestic

Domestic consumption of rattan products in Indonesia has grown by 27.6 % Since 1988 (Data Consult Inc. 1993). mainly in rattan furniture products, as can be seen in Table *and Figure* 6. Further assessment is needed to study factors influencing the rapid growth of domestic rattan markets, future trends, and policy implications.

Value Added

Government policies to ban raw and semi-finished rattan products in 1986 and 1989, respectively, were intended. among others, to increase value-added in rattan industry.

Table and Figure 7 show the estimated historical added value fluctuations and trends of Indonesian rattan products in the last 25 years (1968- 1992). Table 8 speaks for itself about added value figures and percentages of different rattan products in 1986.

SOCIAL ASPECTS

People and Employment

More than 150,000 people are estimated to be involved in the rattan industry and trade in Indonesia. Of this number. about 16,600 were involved in the rattan handicraft business in 1986 (Bank Indonesia and Agency for R & D Ministry of Trade, 1989).

On the whole, there is significant contribution to employment in the rural as well as the national economy through rattan resource. industrial and trade developments.

Labour and Management Issues

Rattan industry in Indonesia can be classified into three scales of operations based on scale of invesment. intake and output capacities of mills, and labour or capital-intensive product ion processes (large, medium and small).

Lampit rattan manufacturing in Kalimantan. for example can be categorised as a' labour-. intensive small-scale industry. However, there is flexibility to modify the production system towards mechanisation by which mass production with high efficiency and controlled qualily would become feasible, leading to lower production costs. This might. however, lead to problems of rural unemployment.

The rattan lampit home industry in Kalimantan is generally managed by less-educated people, using simple management, which may account for the low low level of production efficiency (Irawanti, 1993).

Further research is needed to:

a. Assess appropriate scale of invesment in the small-scale rattan industry to enable the rural sector participate in invesment and credit facilities for exports;

b. Col1ate and assess more information from studies which have been done on social aspects of rattan industry in the country;

c. Conduct case studies in selected location(s) lo monitor and evaluate the social issues and dynamic processes in the development. of rattan industries.

Such studies should look at issues such as resource availabilty and sustainability, links to environment, opportunities for forest farmers/shifting cultivators, and issues of buffer-zone management.

POLICY ASPECTS

Policy on Harvesting, Production and Supply of Rattan

Rattan in Indonesia has been harvested for hundreds of years, mainly following traditional methods. Harvesting has been limited to relatively few commercially-known species. Most of the-country's rattan production at present is still derived from natural rattan forests.

Government legislation and regulations regarding rattan harvesting are as follows:

a. Law No.5/ 1967 regarding basic guidelines for forest management.

b. Government Regulation No. 2 1/ 1970 regarding the Right of Forest Concession and the Right to Harvest Forest Products. also known under their acronyms. HPH and HPHH.

c. Agriculture Minister's Decree No. 749/Kpts/ Um/ 12/ 1974 Regarding Directives on the granting of the Right to Collect Forest Products (HPHH), including wood and non-wood products, such as rattan, etc.

Legislation and regulations are used by provincial governments as the basis for granting rights to harvest rattan in their respective areas.

A rattan harvesting licence (HPHH) is issued by the provincial Governor or the Chief of the Provincial Forest Service and granted to companies of legal forms such as PT, CV, Fa and Cooperatives (KUD), as well as to individual businessman from local communities or inter-island entrepreneurs.

Recently, there has been interest in planting of rattan industrial estates. Planting has been done on several scales. For example, in the Perum Perhutani forest areas in Java, rat tan has been planted with teak and non-teak standing trees. Other initiatives include rattan planting in rubber estates in Sumatra and Kalimant-an, and in large timber estate projects in the outer Java Islands.

The Minister of Forestry, in 1989, issued Decree No. 148/Kpts-II/1989 regarding rattan plantation and estate development under the HPH system. This decree has been further extended by the Director General for Forest Utilisation's Decree No.28/Kpts/IV-PHH/ 1991 of January 30, 1991, regarding directives on rattan plantations and estate development under the HPH-estate system. The directive defines several aspects of rattan estate development, including site preparation and stock and resource inventory analysis, planning process, planting, community participation, protection and conservation, reporting system and controls on rattan plantation and estate development.

The rule regulates the harvesting of rattan and the restoration of rattan resources through t.he development of rattan estates. It was issued to minimise inefficient rattan harvesting methods, which may destroy the country's rattan resources within a few years. Rattan-HPH is granted to state companies, private firms of various forms, and cooperatives. Rattan HPH holders are obliged to own and operate rattan processing plants.

The rule, if fully implemented. will secure rattan inputs for domestic industry for the years to come as rattan (forest) resources will be preserved through sustainable annual cuts. Up to 1988, about 150 companies applied for rattan HPH in various provinces.

Policy Regarding Rattan Export

The Trade Minister's Decree No. 274/ 1986 of October 7, 1986, regarding rattan exports, prohibited the export of rattan materials such as washed and sulfured. split, and roughly-polished rattan products. The ban on exports of semi-finished rattan products such as finely polished rattan, rattan cores, rattan bark and parts of chairs and other products came into force on January 1, 1989.

In addition, as of November 16. 1986, all rattan exports have been inspected by the state-owned surveyor, PT. Sucofindo, before they are shipped overseas. The surveyor company issues export verification report. Based on the Finance Minister's Decree No. 910/ 1986 of October 24, 1986, the export tax on semi-finished rattan products has been raised from 5 % to 30 % while finished rattan goods are exempted from the export tax.

The rattan association, HPRI, in cooperation with the Government, has also tried to set. up joint marketing boards for rattan to prevent unhealthy competition among the exporters. This arrangement seems to have been prompted by the great success of joint plywood marketing boards set up by the Indonesian Wood Panel Association, APKINDO, in order to monitor international market developments, negotiat e export prices, enforce trading rules among HPRI members and to study rattan export markets. Since 1988. eight joint marketing boards have been set up, with 285 members.

Each joint marketing board consists of one chairman and one or more vice-chairmen and a secretary.

Policy Regarding Investment In Rattan.

The Government Policy regarding invesments in rattan processing industry aims at:

a. Increasing the value added genera ted by rattan.;

b. increasing foreign exchange earnings from, rattan exports;

c. Attracting new investors to manufacture finished rattan goods;

d. Accelerating the transfer of rattan-processing technology;

e. Promoting markets for Indonesian finished rat tan products;

f. Enhancing employment opportunities in rat tan industry.

According to the National Invesment. Board (BKPM) policy, rattan-based business ventures manufacturing finished rattan products for export should meet the following scales:

a. Rattan input intake of + 1000 ton/year.

b. Type of products, furniture and handicrafts.

c. 85 % of total production for export market.

d. To establish in all areas of the country, which allow for exports in container boxes (near ports having container handling facilities). availability of raw materials and workers.

e. Can be foreign or domestic invesment venture.

f. Investment of US $ 1 million not including plant site. and working capital of US $ 1.5 million.

g. Foreign exchange earned of US $9 milion a year.

h. Employment of 500 Indonesians and 5 expatriates.

Further assessment can be made to evaluate the impact of the above harvesting. export and invesment policies with regard to the success or otherwise of the rattan industry and trade, as well as to resource development progress. In some cases, it might have led to investors taking loans well over their real investment requirements. which put them under heavy debt burdens and made many of them unable to pay back their debts.

Actually. export -oriented rattan plants are labour intensive but. require relatively small investments, averaging less than Rp 3 billion per plant (+ US 2.5 million in 1988, including investment and working capital), with a capacity of 50 containers (700 to 800 chairs) (Indoconsult , 1993.)

SOCIO-ECONOMIC STUDIES

There are very few socio-economic strldies in the available literature. The Agency for Forestry Research and Development of Indonesia, Ministry of Forestry, in 1989- 1992, together with the International Development Research Centre (IDRC) of Canada funded studies on various aspects of rattan in Indonesia. These studies, however. concentrated only on assessing aspects of increasing income for rural farmers and small-holder manufacturers, as well **as** resource development of Indonesian rattan to statisfy growing demands in the markets (AFRD Indonesia IDRC, Canada, 1993). This project resulted in several reports. including:

1. Living garden research activities and its establishments.
2. Field survey at specific locations in Sulawesi, Irian Jaya, Maluku and West Nusa Tenggara on seeds and wilding aspects.
3. Botanical survey.
4. FDRC Bogor Nursery Research.
5. Silviculture and Provenance Trial.
6. Socio-economics of rattan and rat tan products on case study bases:
   a. Progress in rattan trades industry and resource development in Indonesia.
   b. Studies on rat tan industry and trade.
   c. Marketing of rat tan in the Province of East Kalimantan.
   d. A Case Study on Production Costs of Rattan Furniture in West Sumatra.
   e. Production cost and base price of polished rattan : A Case Study at Luwu, South Sulawesi.
   f. Marketing of Rattan in South Sulawesi.
   g. Production factors allocation for home insdustry of rattan Lampit in Amuntai, South Kalimantan.

There have been several other studies on the socio-economic aspects of rattan (i.e. product ion, marketing and policy aspects of rattan) in Indonesia, but very little has been recorded which could be used to trace-back the results and outcomes for sustainable development policy modelling or production-to-consumpt.ion systems development.

RESEARCH AND DEVELOPMENT

A Harvesting, Production, Consumption and Marketing Study on Rattan needs to be assessed on macro and on case study approaches. Interesting questions on fluctuations and trends of raw rnaterial harvests, production. consumption. and value-added of rat tan processing industries, and of government policy intervention on exports, investments and resource developments. would need a specific and integrated analysis.

One or more case studies are needed in selected location(s) to assess rural community participation in sustainable harvesting and production systems, links to environment and socio-economic values of rattan in buffer-zone areas of'natural forest management systems in Indonesia, and to rattan industries and trade. These studies should include assessment of government policies and its impact on sustainable rattan resource development through estate plantations of large and medium scales of rattan-HPH system.

Very little information about socio-economic research output and findings and results are available in the rattan research data-base of the country. Therefore, an overall review of Indonesian literature on social and economic and other related aspects of rat tan is called for, and a synthesis paper and an annotated bibliography in English and Bahasa Indonesia need to be prepared.

Inventory is needed of rattan resources in the natural forest areas of the country's outer-Java islands in order to facilitate better rattan resource development planning. Similarly, an assessment is needed to evaluate rattan plantations in forest estates of teak, rubber and non-teak forests in Java, Sumatra, Kalimantan, etc.

Specific studies should also be done to design ways of instrumenting rattan as community forestry plant species through reforestation and afforestation programmes and related activities. Also, its importance and value towards sustainable resource development. socio-economic welfare, and environment stability and improvement should be assessed. including evaluation of fiscal incentive and resource taxation systems.

SUMMARY AND CONCLUSION

The Government of Indonesia has taken steps to minimise the export of raw rattan and encourage both domestic and foreign investments in rattan industries. This act ion was taken to increase revenues from non-oil exports and to provide more employment opportunities for a growing population, particularly in the rural areas.

It might be some time before the government's policy of promoting exports of finished rattan goods, initiated in January 1989, succeeds in establishing the country's name in the world market of rattan products.

Continued rattan exploitation and harvesting from natural forest with minimum restoration of the resource is unsustainable.

Forestry economists, research scientists, and decision-makers have realised the importance of rattan in the welfare of the society and people, particularly of its benefits to people who live in villages and in surrounding forest areas Also, there is increased recognition of environment stability benefits in the buffer-zone areas of natural forests and community forestry for its export and foreign exchange values, etc. Rattan provides multiple benefits in many facets of life.

The preceeding study was aimed at giving some general highlights on the lessons learned from production to consumption systems of rattan and rattan products in Indonesia. The obsenvations and analysis of its socio-economic importance and research requirements to meet .future. sustainable development issues on rattan and related aspects cannot be overemphasised.

Table 1. Indonesian Rattan *Production. Export and Apparent Consumption. 1968-1992*

No.	Year	Product ion ('000 ton)	**Export** ('000 ton)	Apparent Consumption ('000 ton)
1	1968	40,775	32.42 1	8.354
2	1969	39,898	32,487	7,111
3	1970	43.076	34.324	8,752
4	1971	39.876	32.280	7,596
5	1972	50,757	45.615	5,142
6	1973	5 1,276	43.317	7,959
7	1974	59,896	53.392	6.504
8	1975	5 1.038	45,900	5,138
9	1976	65,000	52,869	12,131
10	1977	86,010	80.000	6,010
11	1978	117,805	111,600	6,205
12	1979	89,074	72,900	16,174
13	1980	97,516	83.000	14,516
14	1981	97,515	80.600	16,915
15	1982	113,431	87,900	25.531
16	1983	129,154	86,200	42,954
17	1984	141.993	90.638	5 1.355
18	1985	137,738	107,700	30,038
19	1986	183,942	143,716	39,226
20	1987	199,144	168,854	30,290
21	1988	58,000	28.062	29,938
22	1989	98,000	46,507	5 1,493
23	1990	120,000	74.6 16	45.384
24	1991	132,000	86.918	45,082
25	1992	145,200	87.674	57,526

Notes : Data has been adjusted and re-analysed based on the statistics and reports of the following sources

1. **Ministry of Forestry (I 986.1993 and 1994). Jakarta and other related reports and statistics.**
2. **Bank Indonesia and Agency for R& D of Ministry of Trade (1989). Jakarta.**
3. **Central Bureau of Statistics (1991.1992 and 1993). Jakarta.**
4. **Yudodibroto in Nasendi (eds). 1985. Jakarta.**
5. **Capricorn Indonesia Consult Inc. (1988). Jakarta.**
6. **Indoconsult Inc. (1993). Jakarta.**
7. **Import figures were disregarded since volumewise ii counted for a very small number.**

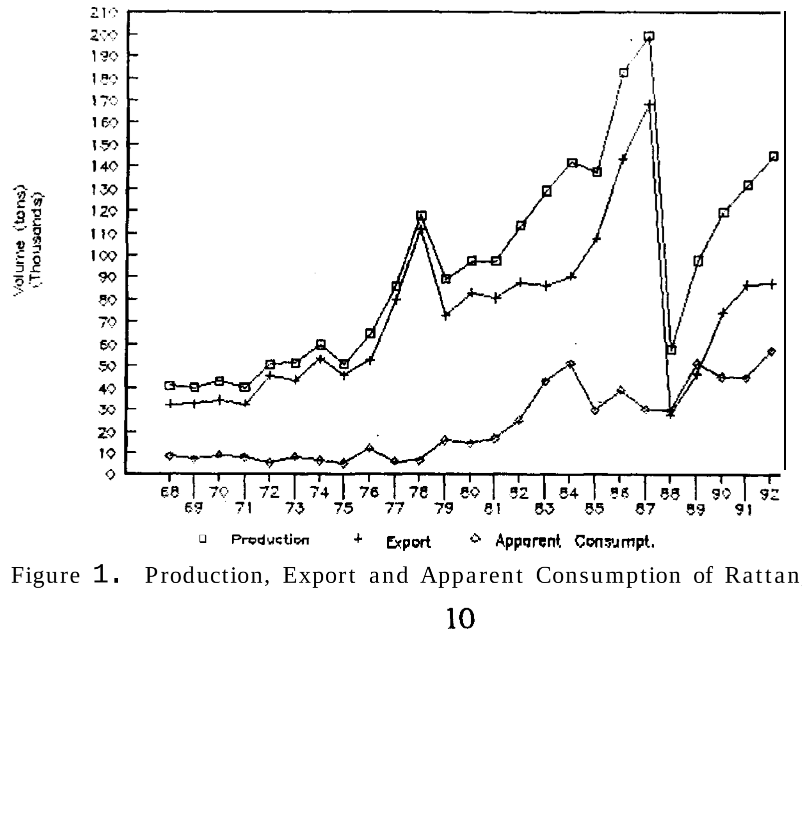
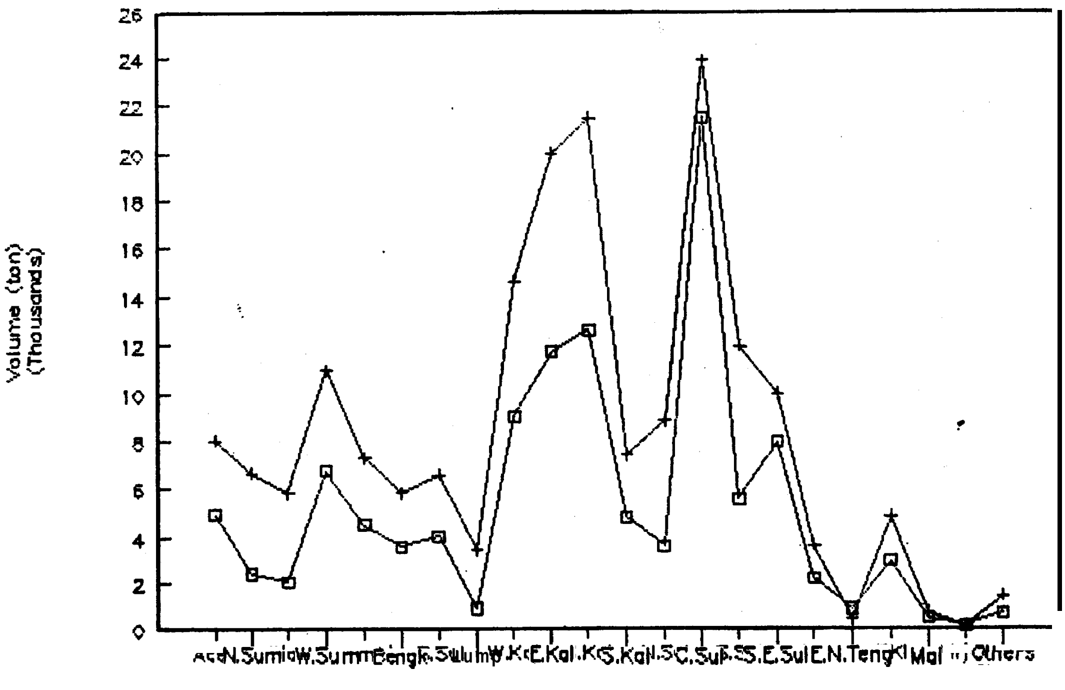


Figure 1. Production, Export and Apparent Consumption of Rattan, 1968-92

Table 2. *Geographic Distribution of Indonesian Rattan Production, 1982-1986*

NO	Province	Volume (ton)	
		1982	1986
1	Aceh	4.950	8,030
2	North Sumatra	2.420	6.650
3	Riau	2.080	5.83 1
4	West. Sumatra	6.750	10 950
5	Jamhi	4,500	7: 300
6	Bengkulu	3.600	5.840
7	South Sulawesi	4,050	6.570
8	Lampung	900	3.460
9	West Kalimantan	9.000	14.600
10	East Kalimantan	11.700	9.980
11	Central Kalimantan	12.600	2 1,440
12	South Kalimantan	4.800	7.380
13	North Sulawesi	3.600	8.840
14	Central Sulawesi	21.500	23.900
15	South Sulawesi	5.574	1 950
16	South East Sulawesi	7.926	9.950
17	West Nusa Tenggara	2.250	3 .650
18	East Nusa Tenggara	900	460
19	DKI Jakarta Raya	2.95 1	4.850
20	Maluku	500	750
21	Irian Jaya	180	136
22	Others	700	1,425
	Total	113,431	1 X2.942

Source: Ministry of Forestry from various statistices and reports. and Capricorn Consult Inc. (1 988).



'Figure 2. Geographic Distribution of Indonesian Rattan Product ion, 1982-86

Table 3. *Geographic Distribution of Producers of Finished Rattan Products by Province in Indonesia, 1992*

No	Province	Number of Companies	Production Capacity (ton/year)
1	West Java	84	95.189
2	East Java	44	53.498
3	South Kalimantan	33	11.154
4	DKI Jakarta Raya	18	10.623
5	West Sumatra	6	3.258
6	South Sulawesi	6	8.920
7	North Sumatra	5	8.635
8	Central Java	4	8.478
9	South Sumatra	2	960
10	Central Kalimantan	2	276
11	Other Province	6	6.109
Total		210	207.100

Source : 1. Ministry of Industry (1993)
2. Association of Indonesian Furniture Producers (1993)
3. Data Consult Inc. (1993).

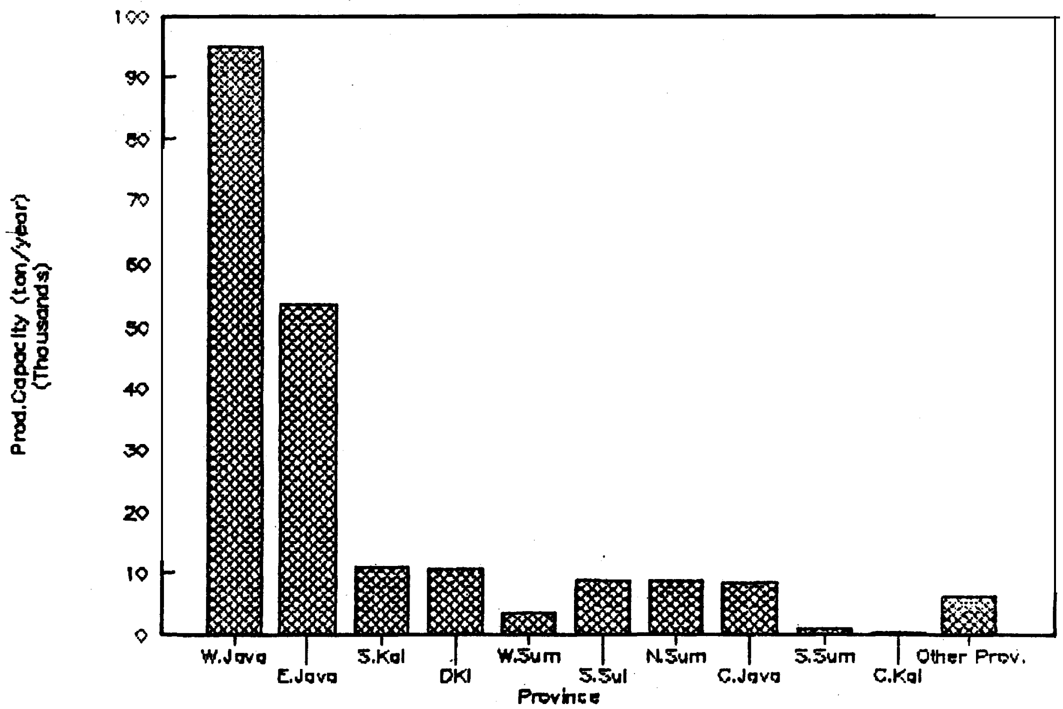


Figure 3. Finished Rattan Products Production Capacity by Province, Indonesia, 1992

Table 4. *Export of Finished Ratan Products. 1988 1992*

No.	Type	1988 Volume	1988 Value ('000 US.$)	1992 Volume	1992 Value ('00 US. $)
1	Mat	223	2,659	685	3.002
2	Woven Mat.	7,410	56.0 10	3.287	23.951
3	Basket.	3.987	10.232	7.732	23.136
4	Furniture	15.343	45.116	75.31 1	240.266
5	Others	1.057	5.954	669	3.240
	Total,	28.020	119.971	87.674	293.595

Source : Central Bureau of Statistics. Jakart a. 1993

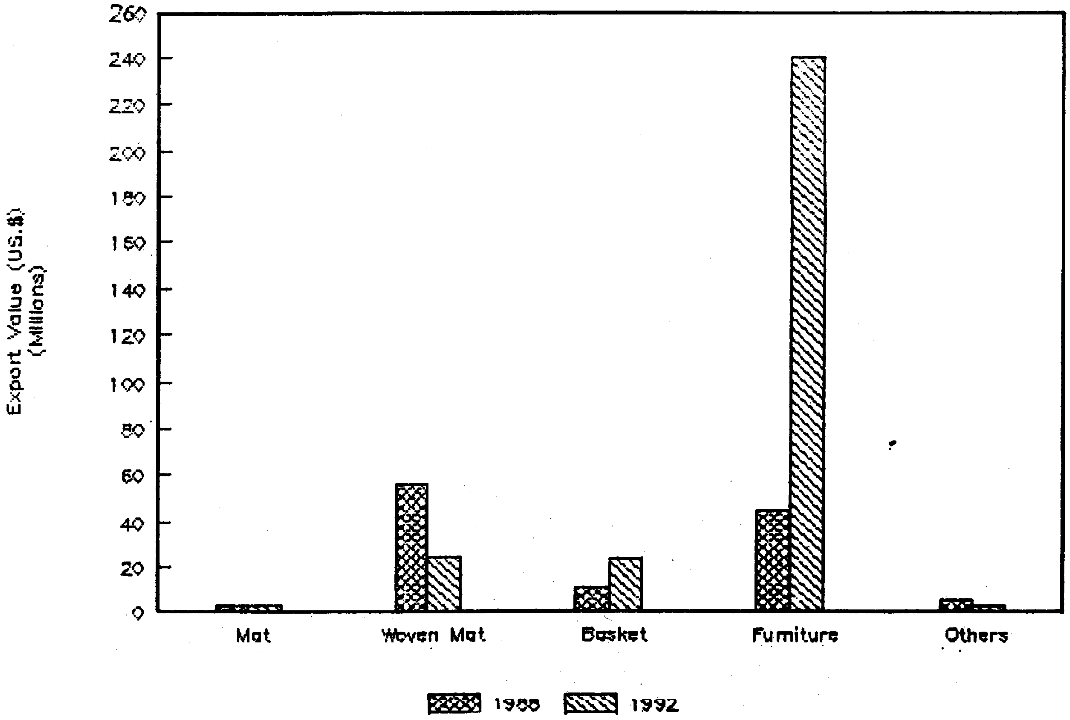


Figure 4. Finished Rattan Products Export, Indonesia

Table 5. Export of Finished *Rattan Products by Country of Destination. 1988-1992*

No	Country of Destination	1988 Volume ('000 US.$)	1988 Value	1992 Volume ('000 US.$)	1992 Value
1	Japan	13,406	74,274	30.227	121.433
2	Sout h Korea	204	971	7.953	6.122
3	Taiwan	1.141	4,256	4,668	8.468
4	USA	4,508	13,106	1 1,285	36.063
5	The Netherlands	1,564	5,636	6.178	22,017
6	France	1,346	3,488	2,742	9,898
7	Germany	641	2.213	8,785	29,899
8	UK	487	1.438	1.937	7,099
9	Belgium & Lumembourg	378	1.149	1.869	6,143
10	Spain	1,182	1.469	1.218	5.064
11	Australia	866	2.107	2.037	5.665
12	Others	2.339	10,027	8.775	35.724
	Total	28.062	120.134	87.674	293,595

Source : Central Bureau of statistics. Jakarta. 1993

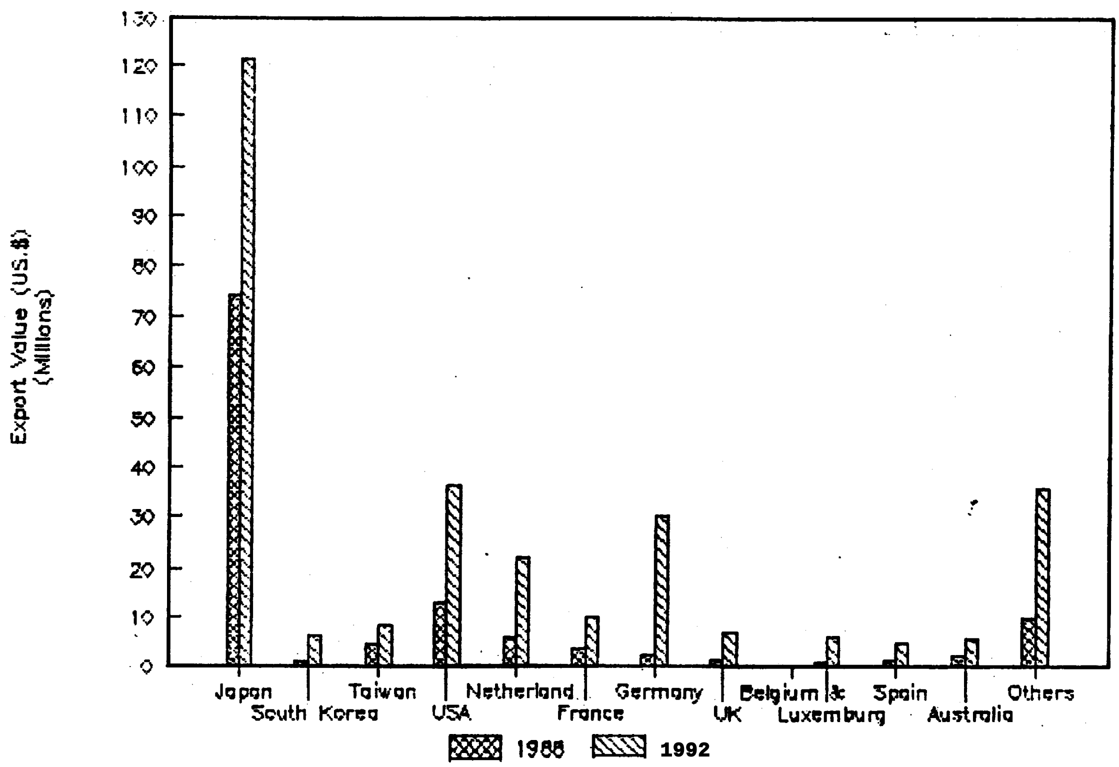


Figure 5. Finished Rattan Products Export by Country of Destination.

Table 6. Domestic Rattan Products Conmption by Products Type. 1988- 1992 (ion)

Year	Rattan Furniture	Other Rattan goods	Total
1988	17.963	11.975	29,938
1989	30.896	20.597	5 1.493
1990	27.230	18.154	45.384
1991	27,049	18,033	45,082
1992	34.516	23.010	57.526

Source : Data Consult Inc.. 1993

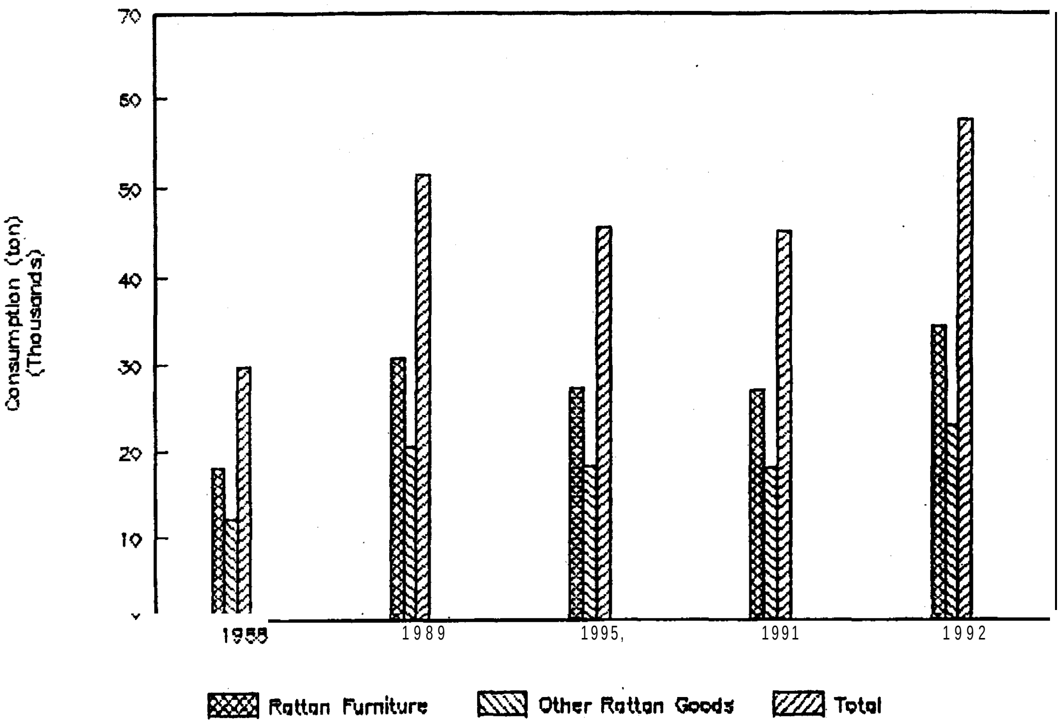


Figure 6. Domestic Consumption of Rattan Products in Indonesia, 1982-92

Table 7. *Estimated Historical Added Value Fluctuations and Trends of Indonesian Rattan Products, 1968 - 1992*

No	Year	Export value ('000 US.$)	Estimated Added Value (US. $/ton)
1	1968	690	21.28
2	1969	665	20.28
3	1970	1.012	29.48
4	1971	789	24.44
5	1972	1.474	32.3 I
6	1973	1 ,640	37.86
7	1974	1.198	22.44
8	1975	3.35 I	73.0 1
9	1976	18.147	342.24
10	1977	28.287	353.59
11	1978	48.687	436.26
12	1979	80,048	1.098.05
I 3	1980	82 650	995.w
14	1981	80.969	1.004.58
15	1982	84.735	963.99
16	1983	85.681	993,98
17	1984	93,224	1.028.53
18	1985	97,065	90 1.25
19	1986	1 19,647	832.52
20	1987	212.609	1.259.15
21	1988	147,863	5,269. I5
22	1989	194.067	4.172.86
23	1990	274,900	3,684 .20
24	1991	342.710	3.942.91
25	1992	293,595	3348.7

Notes :
1. Source of the data-base is same as Of Table 1.
2. Estimated Added Value was assumed as a function of average FOB price at the Indonesian ports, which was calculated by dividing Export Value to its volume exported, by assuming also that result of a higher average price of rattan per ton FOB due to the added value component in the products.

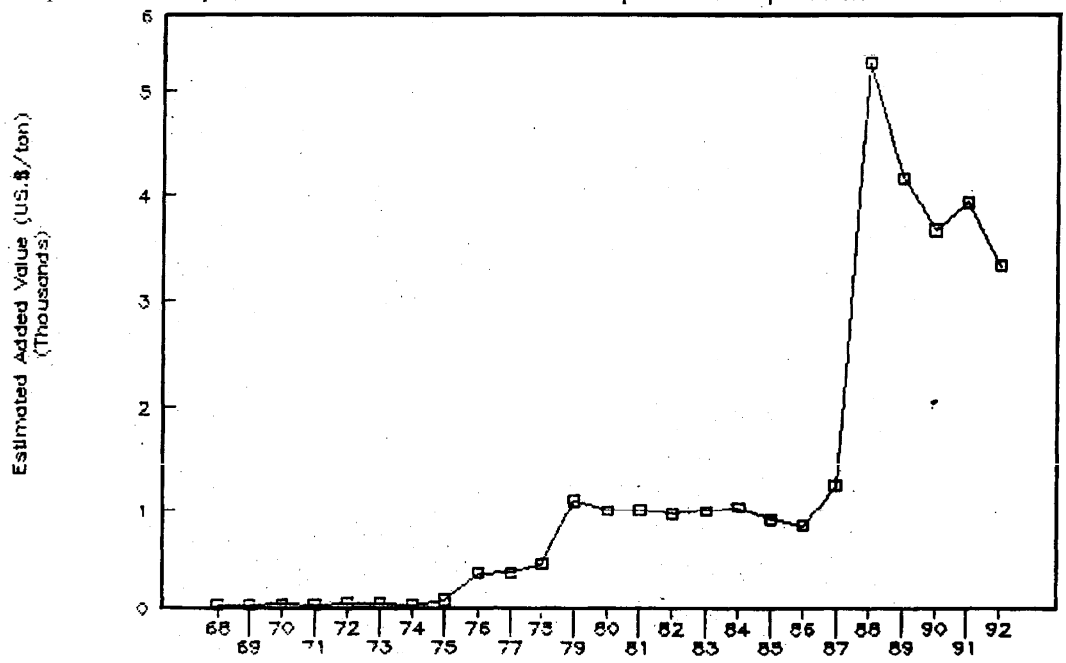


Figure 7. Est. Historical Added Value Fluct and Trends of Rattan Production, In donesia

Table 8. Added Values of Different Rattan Producls, Indonesia. 1986

No.	Product. Type	Raw Cane	W&S Cane	Semi Finished Cane	Finished Cane
1	Raw Cane	Rp 400/kg			
2	W & S Cane	12.50 %	Rp 450/kg		
3	Semi Finished Cane	100.00 % .	77.78%	Rp 800/kg	
4	Finished Cane	1.900.00%	1,677.78 %	900.00 %	Rp 8.000/kg

Note : Adjusted and re-annlysed based on Subiyanto (1986) report. p.361

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