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## RESOURCES

### Botany

Rattan palm is common name used to any of numerous species of climbing palms, native to tropical forest regions of Eurasia, especially of the East Indies. Rattan palms have long, slender stems that maintain an almost uniform diameter throughout their length. The stem grows as long as 182 m (600 ft). The cortical, or outer, portion of the stem is extremely hard and durable, meanwhile the medullary, or inner, portion is softer and somewhat porous. The stems are cut at the base of the plant and are



Figure 1. Clusters of Sega rattan (*Calamus caecius*) in Central Kalimantan



Figure 2. Seeds of *Calamus caecius*

pulled free of other plants by which the climbing palms are supported; the leaves and tendrils are then removed, and the stems are cut into certain lengths based on order. Whole sections of rattan stem are used in making cane furniture; long, thin strips of the cortical layer of the stem are used in making wicker furniture and chair seats, mats, baskets, cords, and twine. The seed is oval-to-round shape with coarse seed coat.

Scientific classification of rattan plant is as follows. Rattan palms belong to the genera *Calamus*, *Daemonorops*, *Korthalsia*, *Plectocomia*, *Plesterania*, *Myrialepsis*, and many others. Nearly 600 species of rattan, representing 13 genera, are found throughout the Tropics. Rattans are most abundantly in Asia and the western Pacific, in a diverse range of forest types, and at elevations from 0-2900 meters above sea level (Dransfield 1986). Of the 300 species in seven genera documented in Indonesia, approximately 100 occur in Kalimantan (Alrasyid 1980; Dransfield 1984).



Figure 3. Clusters of Lambang rattan (*Calamus diepenhorstii*)

ITTO-MOF Project's survey involving various sources found that more than 400 species grow in Indonesia. They are of genera *Calamus* (272 species), *Daemonorops* (83 species), *Korthalsia* (33 species), *Ceratolobus* (7 species), *Plectocomia* (7 species), *Plectocomiopsis* (2 species), *Myrialepis* (2 species), *Plesterania* (1 species), *Comera* (1 species), as depicted by Table 1.

Table 1. The number of rattan species found in the world and Indonesia at two different periods

Genera	Before 2007		2007	
	In the World	In South East Asia	In Indonesia	In Indonesia *)
<i>Calamus</i>		333		272
<i>Daemonorops</i>		122		83
<i>Korthalsia</i>		30		33
<i>Plectocomia</i>		10		7
<i>Ceratolobus</i>		6		7
<i>Plectocomiopsis</i>		10		2
<i>Myrialepis</i>		2		2
<i>Calospatha</i>		2		-
<i>Bejandia</i>		1		-
<i>Plesterania</i>				1
<i>Comera</i>				1
Total	600	516	312	408

\*) ITTO-MOF Sustainable Rattan Production and Utilization through Involvement of Smallholders and Industry (2007), processed.

About 265 species of rattan are classified as lesser-known species (*Krisdianto, Jasni and Sri Rulliaty, 2007 in The Possibility of Lesser-known Species Promotion*). A far larger number is found with addition of other findings, to some 322 species which include those classified as lesser value or non-valuable or non-commercial.

In trade world, rattan is categorized into small-diameter and large-diameter (Ø) rattan. Small-diameter rattans, by a high percentage, dominate Indonesia rattan population. The most important small-diameter rattan is Sega (*Calamus caecius*), and for large-diameter are Manau (*Calamus manan*), Semambu (*Calamus scipionum*), Batang (*Calamus zollingeri*), Tohiti (*Calamus inops*), Tarompu (*Calamus sp.*) among others.



Figure 4. Shoot of *Manau* rattan (*Calamus manan*)

### How rattan roles in people economy

The venture of rattan stems from the following four components:

- Rattan cultivation;
- rattan cutting;
- rattan collection (cutting in natural forest);

- rattan trade; and
- rattan processing (industries).

Unquestionably, particularly in Kalimantan, rattan extraction has created multiplier effects in economy.

Rattan cultivation is the activities of planting, maintenance, cutting, and selling raw rattan people or smallholder company do. Actually, working in planting alone is not considered as important source of income to village people. Rather, it is an 'investment' farmers made, and it is managed by farmers themselves to generate future earn.

Rattan cutting, collecting from natural forest the villagers do, is a complement for those having small parcel of rattan farm or not having it.



Indonesia Geography

Rattan collection as described by *Peluso, Nancy Lee* is summarized as follows (*Case Study, Rattan Industries in East Kalimantan, Indonesia, 2007*). Collector works in partnership with shopkeeper for financing rattan collecting venture in the form of food supplies and other goods, in return of selling all their rattan to the shopkeeper. It helps collectors as a solution to financial constraints they confront. A shopkeeper is actually a higher-collector or trader that is as well termed as sub-district collector (*FT Link Consultant–SHK Kaltim*). This relationship is not always rapacious or totally detrimental to the welfare of the collectors. Collectors benefit the arrangement, long-term, with shopkeepers, which is beyond the rattan agreement itself. In this arrangement some shopkeepers pay medical expenses of collector and families or provide labour opportunities to other members of the family and even the collectors when collection is not profitable. Though, the relationship implies as well a disadvantage to collectors. In theory, collectors need only repay their debt equivalent in rattan. However, if they sell the surplus to a different shopkeeper or to other sides, they risk their creditor's refusal to supply future rattan collection work. Along with this, the shopkeeper also benefits from easy access to the labour of his clients and their

families. Later, as collectors' needs for cash, to pay school fees for children and to purchase goods in stores down river increases, client-patron relationships are currently being replaced by cash transactions. As a whole, however, the presence of trader benefits local people, it creates job in transportation, initial processing, small retail of supplies, and others.

In this regard, economic benefit of rattan venture to people is generated in rattan processing, semi-finished rattan processing, crafts and furniture manufacture. For 2005 it is reported that some 84,000 people work in the processing industry (including sub-contractor) with additional one million people whose income related to rattan processing.

### The extent and distribution of rattan resources

Today, about 90% of rattan harvest comes from natural forests (in Sumatra, Kalimantan, and Sulawesi) and 10 % from cultivation. In the natural forests rattan is found in almost all six categories of forest function, i.e. protection forest, conservation forest, production forest, limited production forest, and conversion production forest.

Rattans are found in almost all provinces in Indonesia. However, there is no single representative data with respects to its distribution on regions and the species. In this situation, ITTO-MOF Project consider some 7.905 million hectares of rattan potency distributed in three areas which currently supply rattan, i.e. Kalimantan, Sumatera, and Sulawesi areas (Table 2).

Further, the available potency and the annual allowable cut (AAC) of each species in each of three areas is presented in appendix 2, 3, and 4 respectively. For commercial and local-commercial in Sumatera areas, the recommended annual allowable cut is or 12,987 ton-dry per year for commercial and local-commercial species. Meanwhile, for Kalimantan areas, the recommended AAC is 18,316 ton-dry per year, and for Sulawesi 54,244 ton-dry per year. Overall the country, they total 85,547 ton-dry per year for the three areas.

*Table 2. Area size of natural-forest rattan in present production*

Area	Area (mill ha)	Commercial and local-commercial potency (ton-dry per year)
Sumatera	2.461	12,987
Kalimantan	2.931	18,316
Sulawesi	2.512	54,244
Total	7.905	85,547

*Source: ITTO-MOF Sustainable Rattan Production and Utilization Through Involvement of Smallholders and Industry (2007)*

How many species of rattan that actually have commercial value is slightly different among researchers and practitioners, the difference stems firstly on different definition on commercial. A researcher defines that rattan locally used by the people is considered commercial-local, while others do not classified so. Secondly, the great variation of species found in

their sources and in the market. Compilation to data documented by ITTO-MOF Project (which includes those commercial-local) and other sources results in the number 46 for commercials and 15 for locally-commercial (see appendix 1).

Table 3. Characteristics of some commercial rattan species

Species	Habit	Maturity (year)	Diameter category	Water Content	Remark
<i>Calamus caesioides</i>	Cluster	10	Small	50%	Commercial
<i>Calamus flabellatus</i>	Cluster	15	Small	40%	Commercial
<i>Calamus flabelloides</i>	Cluster	7	Small	60%	Commercial
<i>Calamus spp. 13</i>	Cluster	15	Small	40%	Commercial
<i>Calamus spp. 14</i>	Cluster	15	Small	60%	Commercial
<i>Calamus dienpenhorstii</i>	Cluster	25	Large	40%	Commercial
<i>Calamus inops</i>	Soliter	25	Large	40%	Commercial
<i>Calamus manan</i>	Soliter	25	Large	40%	Commercial
<i>Korthalsia flagellaris</i>		20	Large	40%	Commercial
<i>Calamus javensis</i>	Cluster	10	Small	60%	Commercial, local
<i>Calamus laevigathus</i>	Soliter	15	Small	40%	Commercial, local
<i>Calamus spp. 10</i>	Soliter	15	Small	40%	Commercial, local
<i>Calamus spp. 11</i>	Cluster	15	Small	40%	Commercial, local
<i>Daemonorops burkianus</i>	Cluster	15	Small	40%	Commercial, local
<i>Daemonorops draco</i>	Cluster	15	Small	40%	Commercial, local
<i>Korthalsia scaphigera</i>	Cluster	10	Small	60%	Commercial, local
<i>Plectocomia spp. 1</i>	Cluster	20		40%	Commercial, local
<i>Calamus excilllis</i>		10	Small	40%	Commercial, local

Source: ITTO-MOF Sustainable Rattan Production and Utilization through Involvement of Smallholders and Industry (2007)

## MANAGEMENT

### Overview of rattan resources ownership

Rattan resources, which include lands and the plant, can be divided simply into natural forest-rattan resources and planted-rattan resources.

As for most provinces in Kalimantan, Sulawesi, and Sumatera, legal status or ownership of rattan lands has been crucial to rattan farmers. Though rattan farmers remain as the recognized owners of rattan lands, as time changes, farmers demand a certainty of their land ownership status. To *Dayak* people, for example, rattan plays roles in almost all aspects of life. Beside relied on as income source, rattan is considered of having cultural and spiritual value, as in rattan farm for married endowment. From this fact, logically there are rattan lands owned by the people.

There is no representative data on the size of each of the two rattan resources. However, it is generally known that most of the rattan resources in Indonesia belong to natural forest rattan. An NGO expects that in Katingan District alone (out of 11 districts in Central Kalimantan) rattan farm covers 325,000 hectares which does not specify the area size that are owned by the people.

### Management to rattan resources

Information on the management of rattan resources by the people has been very limited. However, man-made rattan plantation are found in Central Kalimantan, Java, East Kalimantan, South Kalimantan, South East Sulawesi, North Sulawesi,

Riau, and West Sumatera, totals to 118,802 hectares (Nasendi, 1996; Januminro, 2001) with the species *Calamus caesius*, *Calamus trachycoleus*, and *Calamus manan* for Kalimantan area. Meanwhile, in Sulawesi people plants *Calamus inops*, *Daemonosrops robustus*, and *Calamus caesius*; and in Sumatera are *Calamus manan* and *Calamus caesius*. (See Table 4.)

Table 4. Plantation rattan in some areas of Indonesia

Province	Plantation area (ha)	Species
Central Kalimantan	70,000	<i>Calamus manan</i> , <i>Calamus caesius</i> , <i>Calamus trachycoleus</i>
Java	37,412	<i>Calamus manan</i> , <i>Calamus caesius</i> , <i>Calamus trachycoleus</i>
East Kalimantan	11,000	<i>Calamus manan</i> , <i>Calamus caesius</i> , <i>Calamus trachycoleus</i>
South Kalimantan	200	<i>Calamus caesius</i> , <i>Calamus trachycoleus</i>
South East Sulawesi (Kendari)	120	<i>Calamus inops</i>
Riau	30	<i>Calamus manan</i> .
North Sulawesi (Manado)	30	<i>Calamus inops</i> , <i>D. robustus</i> , <i>Calamus caesius</i>
West Sumatera	10	<i>Calamus manan</i> , <i>Calamus caesius</i>
Total	118,802	

Sources: Nasendi (1996); Januminro (2001)

In particular in Central Kalimantan, implied from the extensive rattan farm distribution and the area size of ownership, it is obvious that people make rattan planting. A survey reports that in Katingan District alone, more than 51% of Katingan households have rattan farms. And, that 42% of household in Katingan has been planting rattan during the last three years. Maintenance to the rattan plantation by each owner is made though it is of minimum. Recent policy of local government that positions rattan as the commodity of merit contributes to current expansion of rattan planting. Among local government policies is the *Program of Planting One Million Manau* adopted by Katingan District. If assumed that the other 10 districts in Central Kalimantan to be similar with Katingan, then a rattan area size of 3 mill hectares is expected for the whole Central Kalimantan province.

Comply with the environment requirements rattan planting can use unproductive natural forests which is vastly available throughout Kalimantan, Sulawesi, Sumatera, and other islands.



Figure 5. Newly logged-over forest available for rattan planting

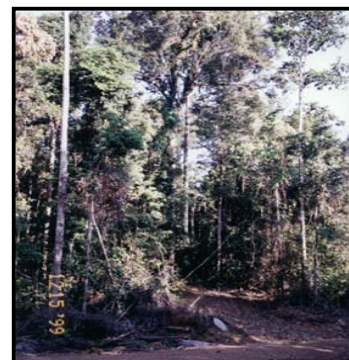


Figure 6. Old logged-over forest available for rattan planting

## HARVESTING

### Method currently applied

Rattan is harvested when the stems are sufficiently mature, i.e. when the thorn and leaf have broken or peeled off, most of the stems unwrapped, and no more sheath and leaves dried up.

Rattan collection technique currently applied by collectors and farmers is as follows. The collector uses a machete (knife) to cut the rattan and remove the sheath. Collectors use a hook-like knife tied to the end of a long straight cane or piece of bamboo to isolate climbing rattan and pull on the rattan stems until they fall. This method is applied both to rattan in natural forest and in plantations. They are then bundled in packs approximately 28 kilograms each, and air-dried (i.e., folding 4-6 meter lengths in half). For some varieties, the outer coating on the stems are removed by wrapping the rattan around a tree trunk and rubbing it, or by washing the canes with sand at the river's edge. The rattan is then transported to first stage processing center.

Rattan from natural forest has a large diameter and length of over 50 meters, this rattan stem produces only of 30 to 40 percents in length. The stem is pulled out as long as possibly without sweeping of frond or thorn. Then let rattan in the forest for days/weeks until frond leaf and thorn become dry so that is easy to cleaned. The rattan stems are cleaned-cleared of the leaves and thorns are cut off in accordance with the desired sizes. Usually the stems are cut into lengths of 3.10-4.10 m length and then about 10-20 stems are bound. Finally, the rattans are carried to the forest border as in West Sumatra and transported to gathering site using boat or to processing site as in Central Kalimantan.

At gathering place, collectors buy the rattan from all farmers and or rattan small collector. After preprocessing, the rattan is transported to town using truck or with boat. The harvesting of rattan is accompanied with waste that can reach 12.6-12.5 percents when using the traditional method. With the aid of specific tool called "tirfor" and "ilir" such waste can be decreased to 4.1-11.1 percent. Meanwhile, the waste generated during the transportation can reach 5-10 percents (*Sinaga, 1986*).

The location of plantation rattans, currently only small-diameter rattan species as *Irit* and *sega*, is usually near the river bank. It is meant to make harvesting easy and not necessitate a great number of workers (i.e. merely 1-2 persons). Harvesting activities of rattan usually carried out by villagers residing close to the forest or plantation areas. The work involves in search and selection of mature stem, harvesting, binding, transportation to the market point and maintenance of clump, pruning trees whose canopy covers the rattan plants. The age of the harvested rattans which have been known is limited for cultivated rattans among them are *irit* (*Calamus trachicoleus*), *manau* (*Calamus manan* Miq), *pulut merah* (*Calamus inpar*), and *taman* (*Calamus caesius*). Rattan with small diameter like *irit* and *taman* are collected at 6-8 years old. Usually rattan harvest is conducted using a selective cutting method that is only mature rattan is to be taken. Readily rattan, its thorn and leaf are cleaned by beating using one side of big knife. Cleaned rattan stem is cut around 1 meter from ground with big knife / axe or daggers. Trimming at 1 meter from the ground is meant to give a chance to grow new bud. Next step is to cut the top portion of stem which stick at



climbed tree using bamboo pole mounted with knife at the top. or climbing all the way up the tree and cut. Further, the bottom of the rattan stem is pulled out and cut as long as required. At the same time of pulling out the stem, thorn and frond is removed. This method is used for the harvesting of rattan small diameter. The first harvesting yields in seven years old will produce 7 ton fresh rattan per ha (density is 100 clumps/ha), and further harvesting produces 8 tons per ha (*Menon. 1979; Alrasyid. 1980; Sumarna dan Kosasih. 1997*).

Results of rattan harvested that correspond to the desired stem length will be cut, sorted on the basis of class (i.e. end and middle portions of rattan stem), cleaned from the sticking dirt (i.e. leaves, sheath, and thorns). Rattan stems in a particular sorted are bundled together and loaded into the small boats or collected at the river bank.

Weather condition affect harvest greatly, in a way, very wet weather causes difficulty in transportation and completeness of rattan cane drying. In turn, the poor weather condition would lower rattan quality and price.

### **Manual method**

This method, along with mechanical method, is documented in ITTO-MOF technical report, and summarized as the followings.

#### **Cutting the stem**

Stem is cut at rattan stump or base by knife (*parang*) to free the stem from the clump. The length of cut from stump base upward varies following rattan diameter. For small-diameter rattan it is from 0.5 to 1.5 meters, while for three large-diameter is about 1.5 to 2.0 meters. The left-over stump is normally used for walking stick.

#### **Pulling the stem**

For most small-diameter rattans with short leaves and cirri or flagella, the stem is pulled using small-short-hooked thorns. This method is easier compared with the large size rattans, which have larger and stronger hooked thorns. The direction of pulling is very important, not in the opposite bending direction of the stem.

#### **Freeing the rattan from the tree canopy**

A common practice in manual harvesting is to have one or two men climb to adjacent trees and cut flagella and petiole to free the stem from tree canopy. The climber can also climb rattan stems that are clean of leaf-sheaths.

### **Mechanical method**

#### ***Harvesting large-diameter rattan***

There is no sophisticated method for harvesting large-diameter canes of rattan in mechanical technique. One method is by dragging rattan plant using a four-wheel drive vehicle or a tripod and winch.

***Using four wheel drive vehicle***

Study carried by FRM (Forest Research Management): the cut rattan stem was dragged towards a four wheel drive vehicle. The stem tied to the rear of the vehicle with a string chain and dragged using low gear. Dragging rattan using a four wheel drive is a much faster method compared with the conventional method. This method can be practiced in undulating flats or the area close the access roads for large diameter canes such as *Manau*, *Tohiti*, *Batang* or others and it is not effective for small diameter canes.

***Using tripod and winch***

Harvesting using tripod and winch has been tried by Indonesian researcher in West Java and South Sulawesi. The equipment reduced waste to 4.7 % (West Java) and 11.1 % (South Sulawesi) by using tripod and 5.4 % (West Java) by using lie. Along with this, the number of worker is reduced from five to three, but time of operation is longer, which is not effective for small diameter canes.

***Harvesting small-diameter rattan from plantation***

Harvest of small diameter rattan in plantation is more easier compared with those that grown in natural forests since the supporting trees height is normally not more than 20 meters, trees canopy arrange not too dense through trimming, workers easy to trace rattan stems direction, leaf-sheath shorter, cirrus and flagella with short thorn is not tightly on the branches, and workers have enough space to move.

**LOCAL FARMERS**

As described previously, little is reported on farmers' activity with regards to rattan planting and replanting. Rather, some researchers do in-depth study on harvest-collecting and processing, and some others on the venture. Discussion on local farmers in this section depicts farmers' position in the whole venture of rattan.

The distant location of rattan sources, or farmers, from the costumer has led to a situation that local farmers require intermediate traders as they have the ability to deliver raw rattans to large-scale traders or factory. Therefore, the presence of intermediate traders in trade activities is natural. In this regard, rattan trade is different with timber trade. In timber logs are delivered from forest concession area with the whole trade chains held by the concession holder organization. To this unique rattan trade many have wrong view on the lengthy rattan trade chains, and envisage a direct slashing to the trade chains. In fact, current rattan trade develops as a result of interaction process among the performers, they are mutually dependent. It means that as long as rattan first producer does not have the ability, in terms of capital, etc., to deliver the product up to the trader or factory, then intermediate traders will take their role. Nevertheless, selling raw rattan to the factory for rattan farmer is not realistic in current farmer capacity.

One possible way for the farmer to advance their benefit is to process raw rattan into half-finished product (washed & sulfured) in which in current arrangement the

added value is gained by traders or processors. The rationale of on-location processing is keep rattan quality by protecting it from fungi attack.

Trade activities in source areas relates to the market of end-product, end-product demand. That is, farmers would cut rattan if there is a definite demand for it. At times when demand for raw rattan falls, farmer/cutter would shift to other jobs; and working in timber cutting normally is the most available. In the case demand for rattan rises, the increases of raw rattan price and farmer/cutter's income are not obvious.

In Kalimantan areas the number of farmers that cling their living on rattan are large, they sell their rattan to traders which then bring them to Banjarmasin to fill the demand of local manufacturers in Banjarmasin, Surabaya, Cirebon, Semarang, Yogyakarta or export. Clearly, they outnumber the traders, and the amount of raw rattan they produce is larger than the trader can absorb. The raw rattan produced for the whole country totals 250,000-300,000 ton per year, meanwhile the whole number of rattan manufacturers absorb some 150,000 tons. So, in this view trader is in the advantageous position.

## RATTAN PROCESSING

Generally, rattan processing consists of (1) initial or first-stage processing, (2) specialized processing. Meanwhile, processing or preparation just after wet rattans in hand of collectors is not included in this book. Figure 5 to follow depicts a diagram for a complete processing of small-

and large-diameter rattan canes.



Figure 7. Process of boiling raw rattan (initial processing) at a small-scale company in South Sumatera

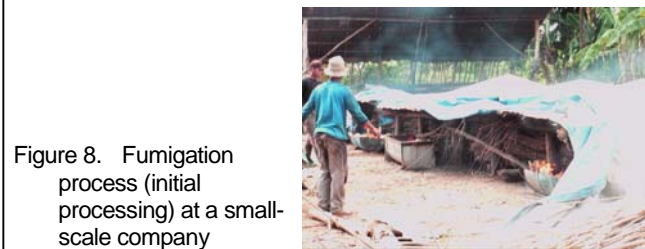


Figure 8. Fumigation process (initial processing) at a small-scale company

### Initial processing

After received from trader, raw rattan are washed, sand is used along with water. The cleaned rattans are then air-dried on racks. Depending on rattan size, degree of dryness upon arrival, and weather conditions at processing center, this stage takes 7 to 14 days (*Peluso, 2007*). Following this, rattans are separated according to their diameter size, small- and large-diameter. Next is further treatment for each diameter-size of cane.

### Small-diameter

Small-diameter canes are then smoked in sulfur-burning



Figure 9. Rattan boiling installation at larger company (initial processing)

cabinets, sheltered from rain, for at least 12 to 24 hours. Next step is to bleach rattan with sulfur. These processes are aimed to preserve the rattan, for releasing the best color, and protecting rattan against pests and diseases such as fungi.

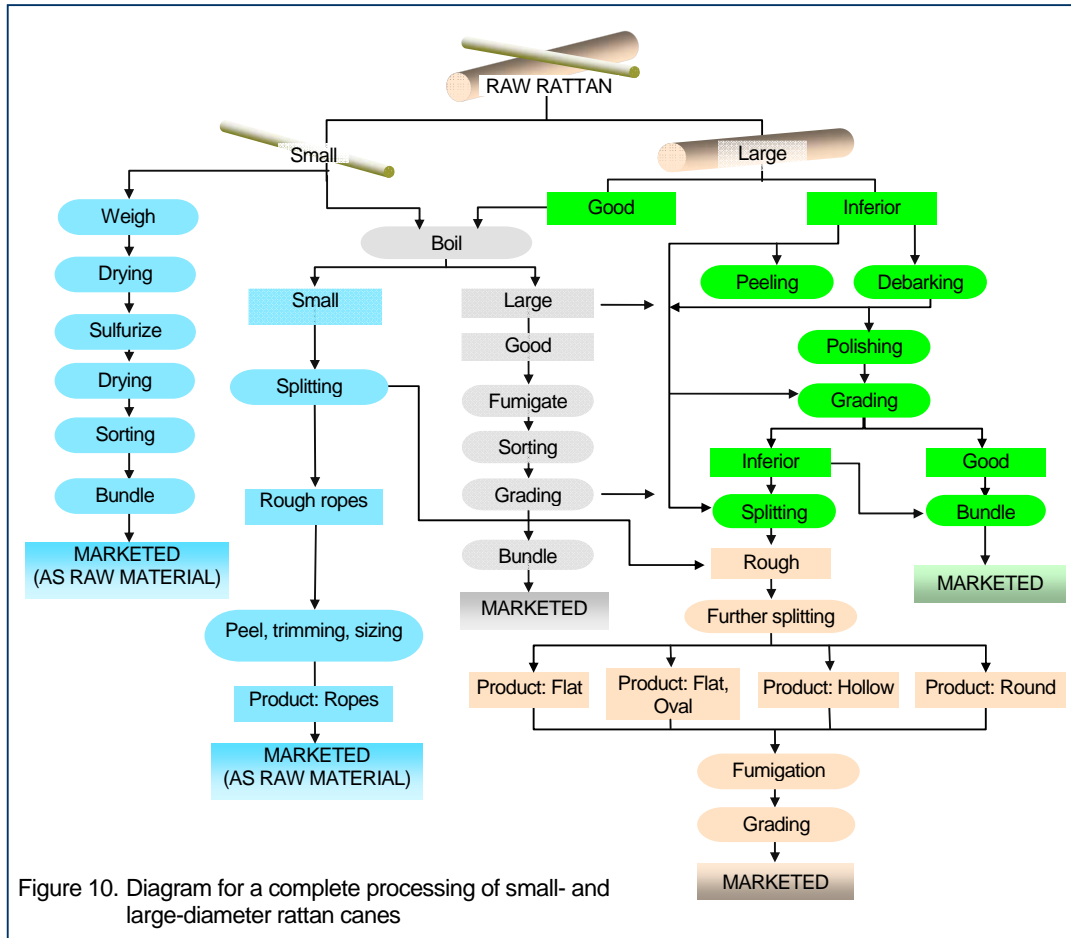
### **Large-diameter**

Larger canes are boiled in a mixture of diesel oil, kerosene, and other ingredients for 20 to 60 minutes. Afterward, they are stacked at a slant or rubbed with sawdust to remove excess oil;

and air-dried for 5 to 14 days in an upright position. Large canes are sometimes bleached. As in small rattan, these processes are intended to preserve the rattan, releasing the best color of rattan, and protect it against pests and diseases. The diesel treatment is applied to eliminate waxy components of canes. The canes are finally sorted out according to their size before final sale to wholesalers and retailers.

This process that includes washing and sulfuring, and polishing produces W&S rattan as semi-finished product.

A complete rattan processing, of small- and large-diameter, is illustrated in the following Figure 10.



### Specialized processing

Specialized processing is to produce *peel* and *pith* as raw material for local handicraft, rattan carpets, mats, and others. The canes are cut (normally into 3 meter length) before sanding, sulfurizing, and drying process. The 3-meter length canes are then split, either manually or using machines. Splitting machines reduce wastage, allowing the use of both the pith and the peel, whereas manual splitting generally results in the loss of most of the pith. Depending on the thickness of the rattan, a piece will be cut in two to eight strips, 2.5-3.0 mm wide. Protruding nodes are carefully removed.

Establishing this specialized processing requires large amounts of capital for which local people rarely can afford, especially for financing splitting machines. There are a lot to be handled by institutional program if value added of rattan for local communities is to generate.

## RATTAN FURNITURE

Rattan is such in its mechanical and physical properties that make it superb to wood as far as furniture. An extraordinary character of rattan not present in wood is the bending strength or elasticity. The ITTO-Indonesia Project expert finds that this character is influenced by the level of Silica, Celulosa, Lignin, and extractive materials in combination. Most importantly is the content of Silica extractive materials in rattan, as the best bending property of rattan happens in rattan cane with lowest Silica content.

Furniture company and crafter used various rattan products, as canes with washed and sulfured treatment, further-processed by polished, and fitrit (pith) and core that are split by machined. Rattan furniture includes chair seats, furniture set, lazy seat, garden seat, wicker furniture. To a high amount, rattan furniture is produced by manufacturers in Cirebon, a town 230 kilometers east of Jakarta. It is complemented by other manufacturers in Banjarmasin, Surabaya area, Yogyakarta area, and Semarang area. In Cirebon alone about 1,500 rattan companies are there, both large and small. Rattan furniture industry is huge in providing job to the people. For Cirebon, as many reports of NGOs and research institution the business has prospered the people.



Figure 8. Furniture making involving huge number of people in Cirebon



Figure 9. Chair seat types of a manufacturer company

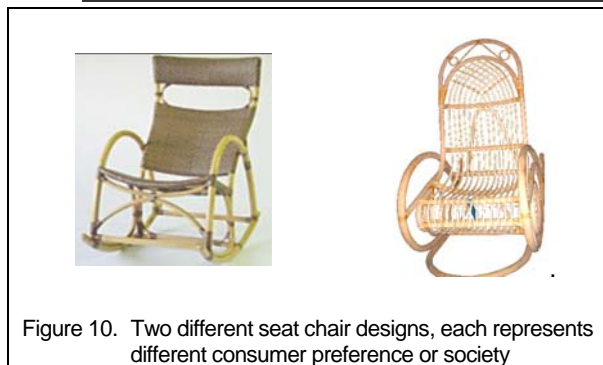


Figure 10. Two different seat chair designs, each represents different consumer preference or society



Figure 11. Guest-room furniture set

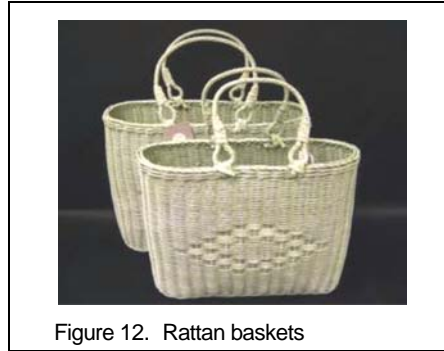


Figure 12. Rattan baskets

## TRADE

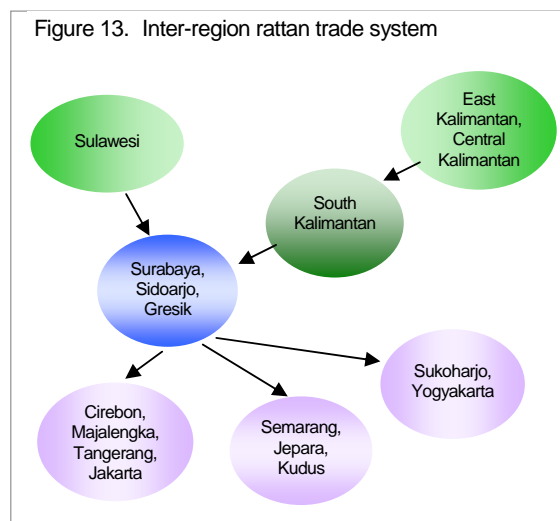
### Trade chain

Typically, local rattan trade chain in Kalimantan areas begins at collectors that buy rattan from farmers, and ended at traders. (see Figure 11). In East Kalimantan, the presence of shopkeepers in the business is typical. In rattan collection they supply food supplies and other materials needed by rattan collectors as described earlier in this book.

People living surrounding forest and local entrepreneurs have collected and traded in non-timber forest products as important sources of revenue since long time ago, and traded on world markets since at least the fifth century (Wolters, 1967). Most products were exported as raw product, without processing treatment. The sources of these products are almost all parts of Indonesia lands. Various non-timber forest products from Kalimantan have been supplying the country.

Exports of non-timber forest products have continued to expand rapidly since 1980s. In this increasing value of NTFP exports the increasing percentage of rattan exports, semi- or fully processed plays a significant role along with higher world prices on raw materials. For rattan product, East Kalimantan which grows almost 100 rattan species, is important, it makes up 50% of total rattan exports from Indonesia (Nancy

*Lee Peluso, 2007 in Rattan Industries in East Kalimantan, Indonesia*).



Currently, rattans coming from East- and Central Kalimantan are traded to South Kalimantan with international port at Banjarmasin. Hence, South Kalimantan is prominent as the first chain in trading of Kalimantan rattans as Sega, Irit, Taman, Lacak, Pulut, etc. In East Kalimantan, dominating the trade are Sega (*Calamus caesius*), Manau (*C. manan*), Irit (*C. trachycoleus*), and Semambu (*C. scipionum*)..

From South Kalimantan the commodity are traded to Surabaya-Sidoarjo-Gresik, one of rattan industry centers in Jawa Island. Beside as the market of raw Kalimantan rattans, Surabaya is market point for Sulawesi rattans such as Tohiti (*Calamus inops*), Batang (*Calamus zolingeri*), Tarompu (*Calamus sp.*), Andaru (*Calamus sp.*), Jermasin (*Calamus leijocaulis*), Buyung (*Calamus optimus*), etc. From Surabaya, they are traded to centers of rattan industry producing finished products, i.e. Cirebon, Majalengka, Tangerang, Jakarta, Semarang, Jepara, Kudus (Central Jawa), Sukoharjo, and Yogyakarta.

In Banjarmasin and Amuntai, rattan trade involves large- and small trader, large- and small enterprise, and home industry or crafters. Inter-island trade of raw material rattan from Surabaya to Banjarmasin is enabled by the relatively short and high frequency of sea transportation between the two rattan-centers.

What sorts of rattan traded locally and export in general are the same, i.e. semi-finished-raw material and final products. Export of carpet, mat, and meubeler begins in Banjarmasin port, along with semi-finished rattan, and 'washed and sulfured' rattan.

Surabaya, along with Sidoarjo and Gresik is the place of furniture producers for export, beside as the first outlet for trade to manufacturers in Jawa and export of half-finished rattans. General representation of trade activities in Surabaya and relation with other areas is outlined in figure 3. Beside, from Kalimantan areas raw rattans in Surabaya come from Sulawesi as well.

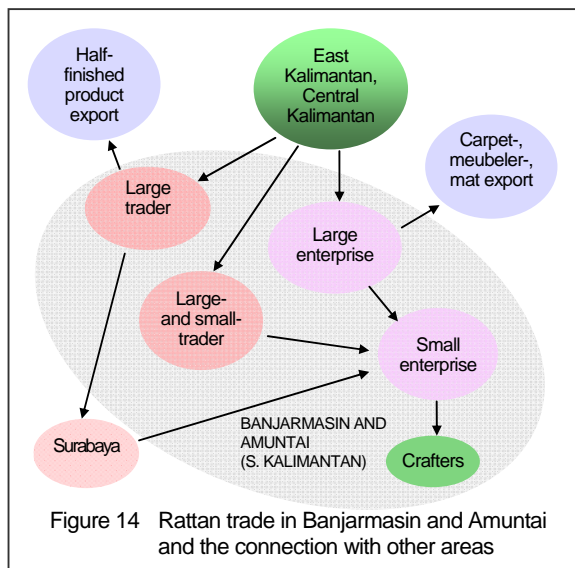


Figure 14 Rattan trade in Banjarmasin and Amuntai and the connection with other areas

Rattan products from Cirebon are mainly furniture, it is mainly for export. Parts of raw material for Cirebon come from Surabaya and other parts those directly acquired by large Cirebon trader agency position in Banjarmasin. Cirebon manufacturers produce about 70% of total country furniture products. Figure 4 shows general representation of trade in Surabaya and relation with other areas.

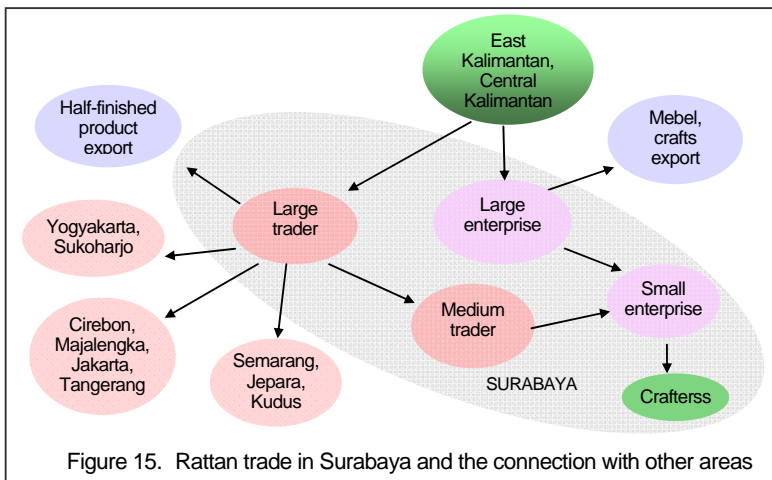


Figure 15. Rattan trade in Surabaya and the connection with other areas



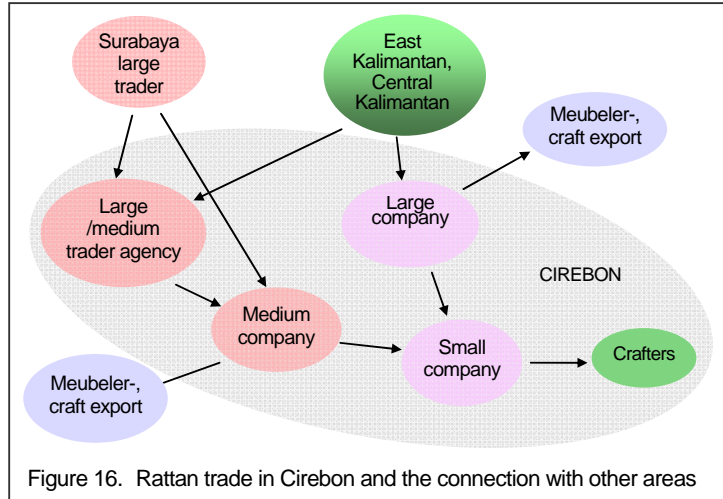


Figure 16. Rattan trade in Cirebon and the connection with other areas

Trade relationship of the three industrial centers is outlined as follows:

- Banjarmasin: supplies raw rattans (wet- and dry condition, *asalan* rattan), and half-finished to demand centers Surabaya, Cirebon and export market;
- Surabaya: supplies raw rattans (dry condition, *asalan* rattan), and half-finished to demand centers Cirebon and other demand centers. Besides, it supplies end-product rattans to places in Jawa and export market;
- Cirebon: demand center raw rattans (dry condition, *asalan* rattan), and half-finished. Along with this, it supplies end-product (the majority furniture) to places in Jawa and export market.

Year to year export of semi-finished rattan canes persistently increased, as shown by Table 6 for 1999 to 2003. The same happened for finished products, furniture, handicraft, baskets, etc., except for 2003 (Table 5). The decreased export volume decline is triggered to some extent by the increased price of semi-finished rattans at 2003. Meanwhile export of rattan furniture from Cirebon during 1997–2003 is illustrated in Table 7. Further, the price for those commodities are as in Table 8.

Table 5. End-products rattan export from East Jawa during 1999-2003

Year	Volume (tons)
2000	16,810
2001	16,970
2002	12,410
2003	4,120

Table 6. Semi-finished rattan export from East Jawa during 1999-2003

Year	Volume (tons)
1999	777.4
2000	4,998.50
2001	12,710.40
2002	11,787.10
2003	44,360.20

Table 7. Export value of rattan furniture from Cirebon during 1997–2003

Year	Value of furniture export (Rp.000)	Increase (%)
1997	608,223,142	
1998	726,548,560	19%
1999	735,676,500	1%
2000	780,323,940	6%
2001	794,483,690	2%
2002	814,072,084	2%
2003	944,421,678	16%

Table 8. Price range of ten rattan types most demanded by furniture companies and crafters

Rattan name	Finishing	Price range at trader (Rp/kg)	Price range at enterprise (Rp/kg)
Kubu soft	Washed, sulfured	4,000–5,000	6,000–7,000
Lambang	Washed, sulfured	4,000–5,000	6,000–7,000
Batang (Lelu/Moa)	Polished	7,000–8,000	9,000–10,000
Kubu	Washed, sulfured	3,500–4,500	5,500–6,500
Kubu Soft	Washed, sulfured	3,500–5,000	5,500–7,000
Lacak	Washed, sulfured	7,000–9,000	9,000–11,000
Kubu	Washed, sulfured	3,500–4,500	5,500–6,500
Lambang	Fitrit	11,000–13,000	13,000–15,000
Sega (sokaq)	Washed, sulfured	4,000–5,000	6,000–7,000
Kubu Soft	Washed, sulfured	4,000–5,000	6,000–7,000

For year 2001 to 2005 furniture, crafts, and half-finished rattan product export volume and value for the country is shown in Table 9 with a decreasing trends for craft products.

Table 9. Indonesia rattan products export volume and value of during 2001–2005

Tahun	Furniture		Crafts		Half- finished rattan	
	Tons	Value US \$	Tons	Value US \$	Tons	Value US \$
2001	96,956	236,117,849	21,378	56,922,033	24,116	13,844,480
2002	111,695	251,632,138	22,609	53,886,877	22,999	13,692,736
2003	115,867	269,154,148	22,682	45,904,025	32,746	20,588,536
2004	119,868	298,083,671	14,851	33,865,076	34,795	23,050,888
2005	113,450	313,910,463	11,528	25,272,678	19,795	16,513,932

### Grading of rattan product

As mentioned earlier in this book, in trade rattans are grouped or classified into two generic categories, small- and large-diameter rattan. Different user of rattan (furniture-, mat-, craft industry, trader, etc.) imposes different diameter classification in grouping rattan into these two categories. Certainly, there is a

single more widely-accepted classification. One differentiates small-diameter to large-diameter by diameter less than 18 millimeters and from 18 mms up, respectively. Meanwhile, the other classifies small- and large-diameter by  $\varnothing$  2 to 12 millimeters and  $\varnothing$  larger than 12 millimeters. In this regard, a standardized classification required to apply by all business interests is not only illogical but also will not work in real world. However, the idea of standardized grading is aimed to avoid harm of stakeholders in the business by providing correct information on the product.

### Grading large-diameter rattan

Rattan grading applies to rattan product at different stage of sell or trade or processing, i.e. at collector, at first washing, at regency buyer (market), at provincial buyer, at post-processing (frying, brushing, secondary washing, fumigation). Grading for polished rattan is another one that is accepted by market and applies.

As normally in manufacturing process or industry, the closer the material to the end process or to end-costumer, the more requirements and specifications imposed to the product is.

### Grading at collector stage

This grading applies to the trade chain of 'farmer-collector'. The grade is simply based on diameter size for 4-meter length of cane, as depicted in the following Table 10.

Table 10. Rattan grading at collector stage

Grade	Diameter size (cm)	Length (cm)	Requirement
A	>3.5	400	Mostly straight and smooth
B	3–3.5	400	Half-straight and smooth
C	2.5–3	400	Black spot along the cane
D	<2.5	400	

### Grading after washing-stage

After first washing of rattan, the sell by collector to trader uses grading to separate rattan canes into large, big, and small category of 4-meter length, as described in Table 11.

Table 11. Rattan grading after initial wash

Category	Diameter size (cm)	Length (cm)
Large	>4.1	400
Large	3.6–4.0	400
Big	3–3.5	400
Large	2.5–3	400
Small	<2.5	400

## Grading at regency market

Table 12. Rattan grading at (district) regency market

Grade	Diameter size (cm)	Length (cm)
A	>3	400
B	2.5–2.9	400
C	1.8–2.5	400
D	<1.8	400

## Grading at provincial market

Table 13. Rattan grading at provincial market

Grade	Weight of 4-meter cane (kgs)	Expected percentage
A	2.75–3	60
B	1.5	25
C	0.80	15

## Grading 'large' cane

Table 14. Grading of large cane after processing

Grade	Physical appearance of cane surface
AB	Straight stem, whitish yellow in color, clean and bright, mature enough, without defect either natural or occurred during processing.
B3	Straight stem, whitish yellow in color, clean and bright, mature enough, tolerable defect 25 cm from the top-end or from the bottom of the cane maximally 10 %
C	Reddish yellow in color, less bright and permitted defect maximally 25 %, tolerable defect include damage in joints, bluish color behind the bark caused by blue stain.
D	Reddish yellow in color, not bright and permitted defect maximally 30 %, tolerable defect include damage in joints, surface of the bark, blue stain.
Reject L	Cannot be used naturally due to the bark is damaged in skinning process, but can still be produced for polish rattan. Tolerable defect s include scratches, bark peeling off, wrinkles, whitish color in the bottom of joints

## Grading 'big' cane

Table 15. Other grading of big diameter cane

Grade	Diameter class (mm)	Criteria
1	>40	Straight poles, ivory to brownish in color, allowable defects maximally 5 % with no cracks borer holes or twist mature stem
2	35–39	Creamy in color, allowable defects at 25 cm length from both end of the pole between 6-15 %
3	30–34	Light brown to reddish in color, allowable defects (as worm holes and blue stain) at 25 cm length from both end of the pole between 6-15 %
4	25–29	Reddish to black in color, more than 25 % surface defect including swollen nodes, blue stain, scorch, marks, worn holes and scratches
5	18–24	Immature stem, light in weight, heavily defects including twisted, cracked, split and imperfect cutting, shrunken

## Grading polished cane

Table 16. Grading of polished rattan

Grade	Sanding size in mesh	Physical appearance of rattan surface
AB	220-240	Clean surface and with in color, without any defect
B3	150-180	White in color and clean enough, defects, as red or brown lines on fiber, maximum 10 %
C	80-120	Reddish white in color, defects, as red or brown lines on fiber, maximum 20 %

## Grading small-diameter rattan

For small-diameter rattan cane a product called W&S rattan is common in trade, abbreviation for washed and sulfured. Actually, the process to get W&S from raw rattan involves not just washing and sulfuring, rather it involves:

- cleaning raw rattan with of unwanted materials (i.e. leaves, thorns, and defective stems);
- scrubbed or polished with sawdust or coconut bust, cut into standard length or as demanded by buyers;
- sun-air drying; and
- smoke (sulfuring) process; the process will generate a yellow rattan surface and resistant to fungi attack.

The quality of this product type is determined by two factors, the surface color and diameter. It is common to have five categories of quality based on these factors, as described in the following Table 17.

Table 17. Grading system for *Irit* and *Taman* cane based on diameter at regency level

Grade	Diameter size (mm)
Koboo/jahab A	8-11
Koboo II	4-8
Soft I (B)	8-11
Soft II (B)	4-6
Tiger/uitschort	--



Figure 17. Rejected furnitures due to uncompiled design (subject to copyright)

## Some problems in rattan trade and industry

Rattan furniture industry is somewhat unique in nature as most of the industries do not make furniture design themselves rather they produce furniture based on design ordered by oversea buyers. This is called as contract implies a lower economic value received by manufacturer compared with own-designed products. The worst is

when the ordered design cannot be fulfilled precisely by the contractor (manufacturer); it ends up in rejected furniture without the right of the contractor

(and sub-contractor) to sell to other party. So, design of rattan furniture has been crucial in rattan industry of Indonesia. A Japanese expert states that if Indonesia, which produces 85 percent of the world's rattan, could generate its own designs, it would control the world's rattan market.

Despite the fact that rattan trade has been significant to people economy (especially Kalimantan and Sulawesi areas) very small income from rattan goes local farmers. To many farmers the income only fulfills their subsistence need. Somewhat the same situation is persisting in rattan trade where local community trader is in a weak position in front of other trader group. Lack of capital, limited access to financing institution, lack of infrastructures to access remote areas are the main constraints hinder local trader opportunity in advancing the business.

Local entrepreneur are unable to keep their investments in rattan going. Foreign shipping costs for machinery, finished goods or supplies to serve the labor market, are much higher to East Kalimantan than to Java. Moreover, freight-on-board (F.O.B.) charges are much higher from Indonesia than from Singapore or Hong Kong. These higher costs are among disadvantages for Indonesian manufacturers in advancing in export trade. The higher shipping costs is has been one of problems in securing higher profits from international rattan trade.

One report mentions that in 1970s approximately 60% of Indonesia raw rattans are traded to processing and manufacturing industries in Hong Kong and 20% to Singapore. Entrepreneurs in both of these countries make huge profits from re-exporting raw rattan or assembling and exporting furniture and handicrafts. The value of Indonesian raw rattan, sulfur-treated, and re-exported from Hong Kong in 1970 was 24 to 28 times the amount received by the Indonesian exporter of washed, dried, and sulfur-treated rattan cane.

In 1979 the government sought to limit the export for low value-added raw rattan through an official ban on the export of unwashed and unsulfurred rattans. However, Hong Kong traders continue to bring in higher profits by re-cleaning, re-sorting and manufacturing rattan peel and pith for re-export.

Attention needs to be given to the low level of value-added manufacturing which has shaped Indonesia's rattan industry since Indonesia has a great deal to gain from value-added manufacturing of this forest product.

With regard to government policy, it seems that more attention has been devoted to policy in regulating rattan trade. Meanwhile, there has not been a policy that deals with rattan resources directly. (For discussion on rattan development policy, see ITTO-MOF publications entitle *Rattan Inventory and Standing Stock*, *Rattan Cultivation*, and for rattan trade policy *Indonesia Rattan Trade, Raw Material Rattan Trade, Completion Report*).

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## **Appendix 1. Rattan species of Indonesia**



## **Appendix 2. Rattan standing stock in Sumatera natural forest**

### **Appendix 3. Rattan standing stock in Kalimantan natural forest**

## **Appendix 4. Rattan standing stock in Sulawesi natural forest**