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ASSISTANCE TO THE NATIONAL AGENCY FOR EXPORT DEVELOPMENT (NAFED), MINISTRY OF TRADE, IN THE FIELD OF THE EXPORT PRODUCT ADAPTATION

SI/INS/71/003

INDONESIA

Technical report:
PRODUCTION AND MARKETING
OF BATAM FURNITURE IN INDONESIA

Prepared for the Government of Indonesia by the
United Nations Industrial Development Organization,
acting as executing agency for the
United Nations Development Programme

[redacted]

[redacted]

United Nations Development Programme

ASSISTANCE TO THE NATIONAL AGENCY FOR EXPORT DEVELOPMENT (NAFED), MINISTRY OF TRADE, IN THE FIELD OF THE EXPORT PRODUCT ADAPTATION

IS/INS/74/030

INDONESIA

Technical report: Production and marketing of rattan furniture in Indonesia

Prepared for the Government of Indonesia
by the United Nations Industrial Development Organisation,
executing agency for the United Nations Development Programme

Based on the work of Toni C. Lo, expert in rattan furniture manufacturing and marketing

United Nations Industrial Development Organisation
Vienna, 1976

Explanatory notes

References to dollars ($) are to United States dollars, unless otherwise stated.

The following exchange rates are used in the conversion of country currencies to United States dollars:

Country	Currency	Exchange rate per US dollar in 1975
Australia	Australian dollar ($A)	0.792
Hong Kong	Hong Kong dollar ($HK)	5
Indonesia	Rupiah (Rp)	415
Netherlands	guilder (f.)	2.65

A slash between dates (e.g., 1970/71) indicates a crop year, financial year or academic year.

Use of hyphen between dates (e.g., 1960-1965) indicates the full period involved, including the beginning and end years.

A full stop (.) is used to indicate decimals.

A comma (,) is used to distinguish thousands and millions.

References to tons are to metric tons, unless otherwise specified.

The following terms have been used in tables:

A dash (-) indicates that the amount is nil or negligible

Totals may not add precisely because of rounding

Besides the common abbreviations, symbols and terms, the following have been used in this report:

dia. or ∅	diameter
f.o.b.	free on board
psi	pressure per square inch
rpm	revolution per minute

CONTENTS

SUMMARY

The assignment of the expert formed a part of the project "Assistance to the National Agency for Export Development (NAFED), Ministry of Trade, in the Field of the Export Product Adaptation" (IS/INS/74/030).

The expert gives in this report a general picture of the rattan furniture industry in Indonesia. He stresses that the furniture industry is encountering internal rather than external problems and that it requires improvement in the various production aspects.

Improvements are specifically required in the areas of processing of raw rattan, utilization of proper tools, equipment and machinery, more advanced production processes, better production quality control, and suitable product designs and marketing techniques.

Based on these findings, the expert recommends various strategies in order to improve the industry so that it can contribute more to the development of the country.

INTRODUCTION

Tne project "Assistance to the National Agency for Export Development (NAFED), Ministry of Trade, in the Field of the Export Product Adaptation" (IS/INS/74/030) was approved by United Nations Development Programme (UNDP) in October 1974. NAFED was designated as government co-operating agency and the United Nations Industrial Development Organization (UNIDO) as executing agency.

The mission of the expert was from 20 September to 3 December 1975. Its purpose was to assist the manufacturers of rattan furniture in identifying product adaptations and improvements needed for meeting the foreign market requirements.

NAFED was established as part of a programme to promote Indonesian export product groups and to diversify Indonesian export markets in May 1971. The main functions of NAFED are: marketing and market research, product development, trade promotion, advisory functions and training. The Government was anxious to help manufacturers of products with export potential to adapt the products and to improve production processes and marketing and management techniques in order to meet the world market competition.

Rattan furniture is a product group with great export potential. It was decided that assistance should be given to the industry in the form of in-plant improvement and upgrading and adapting the products to foreign markets.

Rattan, or "rotan" in Indonesian, is a tropical forest product that grows, usually, in second growth forests on low and medium altitude terrains near the equator. It belongs to the plant family Palmae and is composed of the genera Calamus, Daemonorpos and Korthalsia. It grows mainly in South-East Asia and is abundant in Indonesia, the Philippines, Malaysia, and New Guinea. In Burma, Thailand, and China it is less abundant. Other parts of the world, such as India, Latin America and Africa, also have rattan, but in very small quantities.

Rattan can be classified as a versatile, multi-purpose material. Its usage varies from all types of furniture, baskets, bags, ornamental wares, mats, curtains, and many more. Rattan products have become very popular, especially in the western countries, because of rattans lasting and flexible characteristics that no other natural material has.

Rattan can be found in any forest of Indonesia, but it is concentrated mainly in Sulawesi, Sumatra, Kalimantan and the Irian Jaya islands. There are many species of rattan in this country, but the common species used in trade are known commercially as rotan manau, sega, tohiti (similar to the rattan palasan and tumalin in the Philippines).

Indonesia, with its vast forest resources, has been the biggest and steadiest supplier of raw rattan to the whole world. It can be estimated roughly that 90% of the world's supply comes from Indonesia (see annex I).
Other exporters of rattan are the Philippines, Hong Kong, and Singapore. The latter two mainly re-export the raw materials from Indonesia in semi-processed forms.

Indonesia exports 95% of its rattan in raw form (unworked)(see annex II). Only a few years ago the Government started to encourage local exporters to produce semi-processed materials such as rattan peel (skin) or inner core and finished goods such as furniture, baskets, mats etc.

Rattan is an excellent raw material for furniture. Basically, there are two types of rattan furniture - the garden or outdoor type (made mainly of unbarked rattan) and the home or interior type (mostly barked rattan or rattan core).

For many years the main producers and exporters of rattan furniture in South-East Asia have been Hong Kong, Singapore and the Philippines. Indonesia, though the major producer of raw rattan, is not yet able to compete in rattan furniture on the world market.

I. FINDINGS

A. Activities of the project (annexes III-IX)

Based on the project objective, the expert divided the work into five main areas of activities:

(a) Initial survey and visits of firms to get an over-all view of the industry itself and its supporting industries;

(b) Assessment and evaluation of the firms' needs for product improvement;

(c) Inquiring about the availability of tools, equipment and materials on the local market;

(d) Lectures and workshops for rattan furniture firms and other interested parties;

(e) Selection of firms that have future export potential or have expressed interest in upgrading their products, and provision for further individual assistance at the plant level.

The expert was able to accomplish most of these activities in six major and minor cities of Indonesia, concentrating mainly on Jakarta. These six cities were Padang and Palembang in Sumatra; Ujung Pandang (Makassar) in Sulawesi; and Surabaya, Bandung, and Jakarta in Java.

The consultant had visited and given assistance to a total of 28 firms and workshops, of which 15 were rattan furniture manufacturers and the rest were rattan raw materials producers. Five rattan furniture firms in Jakarta were later singled out by the consultant and NAFED counterparts for further extensive individual assistance.

Lectures and discussions were organized in every city (except Bandung) for government officials, rattan producers and exporters, rattan furniture manufacturers and other interested parties. The average number of participants was between 25 and 35. Two lectures, "Basic rattan furniture production operations" and "Export marketing for rattan furniture", were given at the Workshop on Rattan, Bamboo and Pandamus Products held at the Jakarta Fair, 5-7 November 1975. The lectures were followed by discussions. The Workshop was attended by 71 participants. As a guest speaker of the Rotary Club of Surabaya the consultant spoke about rattan furniture prospects in Indonesia. Furthermore, special assistance was rendered by the consultant to two firms interested in the rattan processing industry by preparing preliminary project plans for starting a rattan raw materials processing and furniture manufacturing plant.

B. Present state of the Indonesian rattan furniture industry

In Indonesia, the rattan furniture industry is very small and has just started to grow recently after many years of near stagnation. The industry is centred in Jakarta and nearby cities and towns, e.g. Bandung and Tegal Wangi. It is composed of two large firms (with about 40 workers each), approximately eight companies (with 10-20 workers each), and many backyard family-cottage workshops, mostly scattered around the main cities of Java. There are some small workshops in Palembang and Surabaya, very few in Ujung Pandang, virtually none in Padang, and possibly a few in the other cities.

Local demand (mostly by foreign residents) is good, especially in Jakarta where most shops seem to be producing to capacity. Production for most shops is concentrated on unbarked rattan furniture suited for garden or outdoor use (similar to those made in Hong Kong and Singapore). The production of colour-stained barked furniture for indoor use, which has a higher quality and value, was introduced only recently. All shops are producing mostly custom-made furniture according to the desire and specifications of each customer. So far the shops do not have any formal standard product line. Owing to the poor over-all workmanship, outmoded designs, and high selling prices of the furniture there has been no company ready or capable of exporting their rattan furniture products.

Internal problems, i.e. poor production technology and facilities, lack of financial resources, shortage of skilled framers and lack of management organization, have been the main factors hampering the progress of these companies. External factors, such as high freight or shipping rates (local and international), strict bank export financing, lack of government assistance and incentives, high port handling charges and long and "expensive" export procedures, have also been a hindrance.

Rattan raw materials

The main raw materials for rattan furniture are rattan poles, rattan peel (skin for binding and weaving) and rattan core. Rattan poles, unworked and processed, are obtained mainly from the larger rattan species such as manau and tohiti with diameters of 20 mm and above. Rattan peel and core are usually obtained from the smaller species such as sega and loonti with diameters below 20 mm.

Surveying the present raw material production centres in Sumatra and Sulawesi, the consultant found that many cutters and gatherers could not collect and handle these materials properly. As a result, 30-50% of the rattan is damaged, mostly infested with fungi stains or blue stains, by the time it reaches the production or processing centres.

There were only about four larger companies in the whole of Indonesia that had complete rattan-processing machinery and facilities to produce in quantity rattan peel and core. The rest had inadequate facilities and employed the slow traditional hand-splitting and barking of rattan. There is obviously a need for more mechanization in the raw materials processing industry. (For processing flow, see annex VI, figure II.)

From the above findings and analysis, it may be assumed that there is a shortage of quality processed materials in the domestic market; the consultant was told that higher grades of materials were exported mainly to Hong Kong and Singapore, and some to Europe. Consequently, local furniture manufacturers, especially in the Jakarta area, suffered from the high prices of better quality raw materials and, sometimes, had to buy inferior materials for furniture production.

In Jakarta, the majority of visited workshops had, on the average, good raw materials for their production. But the cottage-backyard type of workshops had very poor materials to start with. Although good materials for furniture were available, the problem was their proper use and selection for production, e.g. using better materials for natural, lacquered items and inferior ones for stained or coloured furniture.

Other raw materials

Rattan furniture workshops seemed to be using very few wooden parts for their products. Solid or veneered wood could be introduced for table tops, drawers, shelvings and cabinets. Wooden parts could be used also as additional supports and braces to strengthen the basic structure of rattan furniture.

Hardware and fastening materials were adequate and available in the local market. However, local firms are not using enough finishing nails, screws and bolts. Finishing or varnishing materials are inadequate for higher quality furniture, i.e. for barked or interior type of furniture.

Basic tools, equipment and machinery

Rattan furniture production is mostly manual. Good basic hand tools are very important and necessary for quality work. The expert observed that many workers (especially the framers) did not use the basic tools. The result was rough and inaccurate work, which lowered the quality of the finished products. Some of the tools lacking were chisels, gouges, files, L-rules, clamps, spokeshaves, hand-drills and planers.

Another important piece of equipment needed in the workshops is the working table for the framers. Not a single shop used working tables. Framers were sitting, squatting or kneeling. Producers should provide working tables for the workshops.

Supplementary power tools like electric drills, sanders, pneumatic spray guns and staplers were not available in most workshops.

Some of the larger workshops should use small machines such as radial arm saws, drill presses and round-bar vertical sanders, for cutting, drilling and sanding of rattan.

Production processes and techniques

Although rattan furniture production is mostly manual needing little machinery, the production processes and layouts should be rationalized in order to become efficient.

Production planning and control were not practised in most of the shops visited. It seemed as though everything was done at the spur of the moment with little planning, like any backyard cottage operation.

In the larger workshops production flows (see annex VI, figure I) and layouts should be set-up in order to ensure proper and smooth flow of work from one section to another and to avoid frequent delays in delivery to the customer. Production planning should be done by preparing work schedules or charts, job order sheets, full-size or scaled drawings etc. Control should be imposed at various stages of production to ensure that everything shall proceed smoothly.

Basic techniques and methods for rattan furniture production are much simpler than those for wood furniture. Many workers could put together an ordinary piece of rattan furniture, but they could not assemble well a "quality" chair. Really skilled framers with good workmanship were very few. Many workers needed further training in framing, binding and weaving techniques.

Basic jointing methods in many shops were bad; for example, braces were wrongly placed or not properly attached, nails were protruding from the joints and main joints were not concavely cut. Bindings and weavings were loose and not uniform throughout the same piece of furniture. Rattan poles had different diameters in the same piece of furniture. All these details in workmanship are valued highly by discriminating buyers and should be taken for granted in quality furniture.

Steam-bending was used by only one firm. The others were still using the traditional fire-scorching method with a kerosene blow torch. This process was very slow and lessened the bending qualities of finished parts. Direct fire heat destroyed the outer fibre or skin of the rattan which required further reworking and cleaning after bending.

Bending with saturated steam would guarantee a clean and quick way of twisting poles into many shapes like semi-circle, circle, U-bend etc. It would increase tremendously production capacity, prevent the direct burning of rattan, and thus save labour cost of re-scrapping. Furthermore, it would be more economical in the long run. The expert had given detailed instructions on how to install and operate a steam-bending production process.

Varnishing and finishing

Varnishing and finishing are the final and most important processes in the production of furniture. Proper finishing methods were not used in most of the workshops. The unbarked rattan and peel-woven furniture were finished either with a single or a double shellac application. The furniture from barked rattan was finished with a combination of shellac and some coloured pigments.

Surface preparations before shellac coatings were carelessly done; for instance, holes and cracks were not filled in, nails were not counter-sunk and filled, poles were carelessly scrapped and sanded etc. Furthermore, shellac coatings were merely brush-applied and not evenly rubbed into the furniture.

There is a lack of skilled finishers. The majority of finishers did not know even the basic rudiments of properly applying finishes to rattan, whether it be of natural or stained colour.

In the experts opinion, this area requires much improvement and assistance.

Quality control

In most cases quality was controlled by the owner of the workshop. The control was not very strict and little attention was paid to the small details. For better control of quality, frequent simple checks should be made, especially when the furniture is still in the manufacturing stages, in order to avoid difficult reworkings. Quality control in the small workshop just means more vigilance and regular checks made during the production of furniture.

Product design and marketing

The key to selling rattan furniture successfully on the local and foreign market is a good and attractive design. Although workmanship and price count a lot in the decision of the consumer to buy, the design of the furniture is decisive in successful market competition.

Product designs of rattan furniture in Indonesia are outmoded and poor copies of furniture from other countries. More research should be done by individual firms for better designs. The idea of using full-time or at least part-time or free lance designers should be seriously considered.

Because furniture companies are not yet exporting, product designs should first be tailored to the domestic demand and adjusted gradually to the export markets. The expert suggests that all designs for the export market should take into account that voluminous furniture would become uneconomical to ship because of the high freight rates of international shipping lines. The only solution to this problem is to design products that can be stacked, nested and semi- or completely knocked-down.

In order to improve efficienoy of production and marketing possibilities, producers should develop their own standard furniture lines and have catalogues and brochures.

II. CONCLUSIONS AND RECOMMENDATIONS

Indonesia has been a major supplier of raw rattan for many years. It has been covering 80-90% of the world demand. The estimated value of annual exports is $5 million. On the other hand, the value of potential annual world demand for rattan furniture is estimated at $200 million. Owing to the rapidly increasing demand, estimated at 20% annually, its value could reach $500 million annually in the next five years. In order to capture this promising export market the following measures should be taken:

1. The Department of Industries should:

(a) Plan and organize short vocational training workshops on rattan furniture production with local trainers and, preferably, with the help of foreign technicians;

(b) Set-up a pilot plant for production of rattan raw materials and rattan furniture;

(c) Work out an import-substitution plan for rattan-processing machinery in order to avoid imports. Assistance will possibly be needed for such a project.

2. The Department of Trade, specifically, NAFED should:

(a) Encourage the formation of private business associations among the rattan materials producers and furniture manufacturers in order to facilitate the exchange of information and technology;

(b) Organize seminars on furniture production and export marketing;

(c) Collect and diseminate the information about foreign markets requirements in rattan products, especially furniture;

(d) Encourage the Bandung Institute of Technology (ITB) to put the production and product designs of rattan furniture on their curriculum.

3. The Bogor Forest Products Institute should:

(a) Initiate a research programme on the treatment and utilisation of rattan;

(b) Initiate a research project on the cultivation of rattan for future use.

4. Further assistance by production experts will be needed in the following fields:

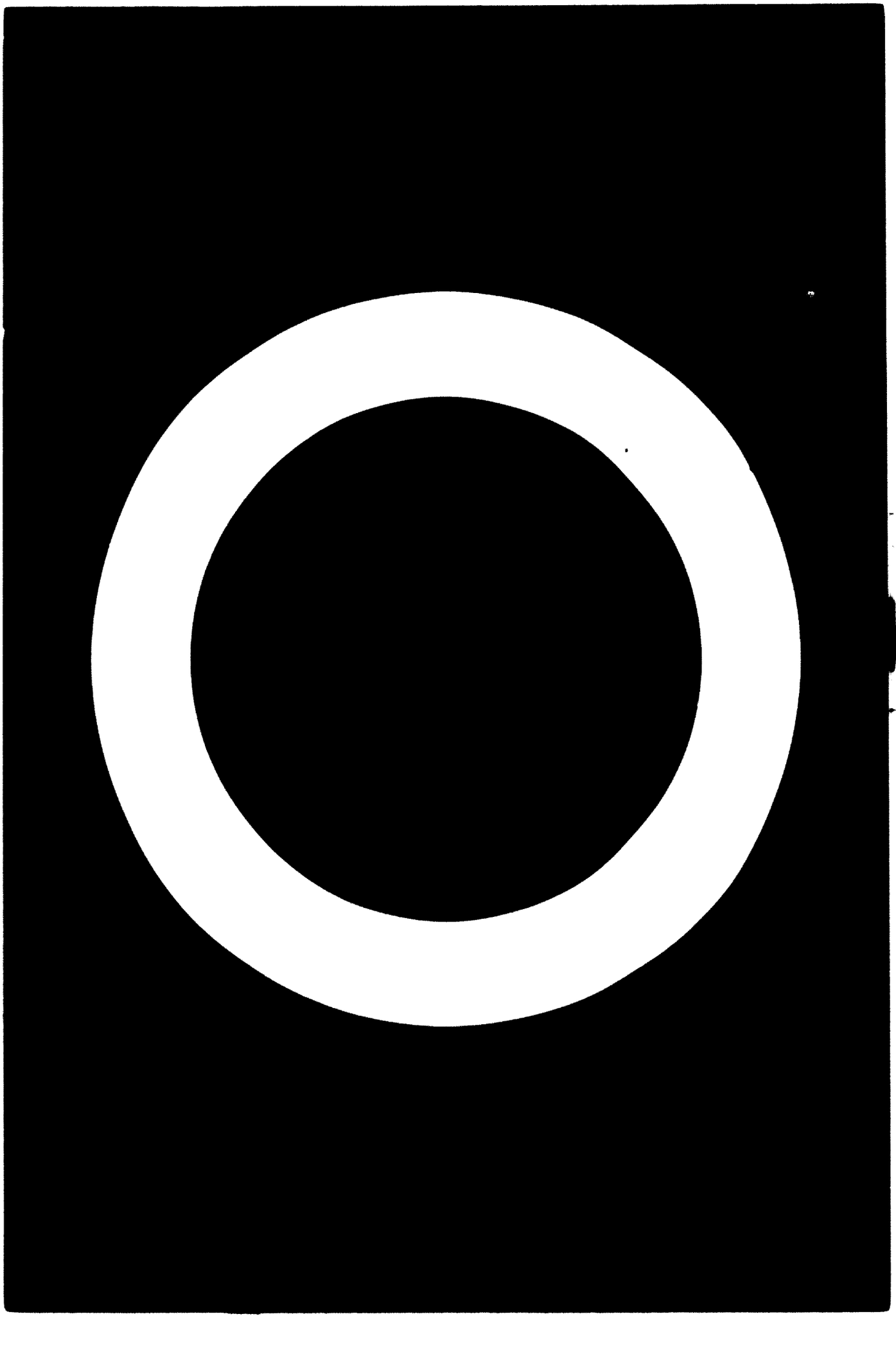
(a) Rattan raw materials processing;

(b) Furniture production and marketing;

(c) Rattan furniture finishing;

(d) Product designing.

A two or three week study tour of local staff, especially of counterparts from NAFED to Hong Kong and the Philippines, is suggested.



Annex I

INDONESIAN EXPORTS OF RAW RATTAN, BY DESTINATION, 1969-1974
(Kilograms)

Destination	1969	1970	1971	1972	1973	1974
Singapore	8,081,011	10,672,565	11,507,723	12,228,580	9,073,808	14,281,827
Hong Kong	21,962,015	23,526,377	17,190,104	29,167,245	23,895,662	28,276,477
European countries	1,018,580	1,183,655	1,460,109	1,841,547	1,901,881	3,157,344
Others	692,920	157,167	921,380	1,977,923	4,493,450	3,808,381
Total	31,754,526	35,539,764	31,079,316	45,215,295	39,364,801	49,524,029

Source: Analysed from Central Bureau of Statistics (B.P.S.) Jakarta.

Annex II

RATTAN EXPORTS IN INDONESIA, BY TYPE, 1969-1974

Type of rattan	1969		1970		1971		1972		1973		1974	
	Exports (kg)	Share in total (%)	Exports (kg)	Share in total (%)	Exports (kg)	Share in total (%)	Exports (kg)	Share in total (%)	Exports (kg)	Share in total (%)	Exports (kg)	Share in total (%)
Unsorted	31,754,526	94	35,539,764	95	31,079,316	97	45,215,295	95	39,364,801	91	49,524,029	93
Pitriet/ pitch (pitch canes)	1,518,471	5	1,576,461	4	1,004,642	3	1,501,304	3	1,749,887	4	2,387,910	4
Bark	10,000	-	256,000	1	28,348	-	271,665	1	200,031	1	398,170	1
Canes, unsorted	272,685	1	54,804	-	40,039	-	241,745	1	2,002,242	4	1,185,843	2
Total	33,555,682	100	37,427,029	100	32,152,345	100	47,230,009	100	43,316,961	100	53,495,954	100

Annex III

EXPERT'S VISITS DURING HIS STAY IN INDONESIA, 22 SEPTEMBER TO 8 DECEMBER 1975

A. Persons met

NAFED

Mr. Ahmono Suryo, Director
Mrs. Suwarmilah, Director, Craft Division
Mr. Rudy Lengkong, Assistant Director
Mr. Taga, Counterpart (Timber)
Dra. Nurleili, Counterpart (Crafts)
Mr. L. Friedrichs, Marketing Consultant to NAFED in Surabaya
Mr. Mustafa
Mr. Goen Soemartono, Counterpart

Forest Products Institute, Bogor

Mr. Harjodarsono, Director
Mr. Supriana, Chief, Wood Treatment Section
Mr. Tandiene, Chief, Wood Usage Section

Potential Investors

Mr. Ibrahim Abdulla (Jakarta)
Dr. Abdul Latief (Sarinah Jaya)a/
Mrs. Prihadi (P.T. Santi Surabaya)a/

UNDP and UNIDO

Mr. G. Kastengren, Senior industrial development field adviser
Mr. A. Decoene, Adviser for the timber industry
Mr. M. Yoffe, Marketing adviser on craft prouuots
Mr. R. Berky, UNIDO engineering expert
Mr. Maher Abou El Khair, UNIDO leather expert
Mr. K. Goldschwond, UNIDO staff member

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a/ See annex VII.

Government officials

Mr. Rustan Effendi, Exports Section, Department of Trade Representative in Palembang

Mr. Soediono Koesno, Forestry Department, Palembang

Mr. Iman Buchori, Design Direotor, Bandung Institute of Teohnology, Bandung

Mr. Kusadi, Official, Department of Trade, Surabaya

Mr. Ashi, Official, Department of Trade, Surabaya

Mr. Kamil, Official, Department of Trade, Ujung Pandang (Makassor)

Other persons

Mr. Oscar Wiederholz, Private adviser to Pulau Weh Rattan Project in Sabang, Aceh Provinoe

Dr. Simatupang (Bilateral adviser)

B. Visits to companies

Jakarta

Mande Handioraft[b/]

P. T. Salek Ltd (Indonesian Representative of San Yi Works Co. Ltd, Taiwan, manufacturers of rattan prooessing machines) [c/]

Lo Foeng Tjin [c/]

Muklas Rattan Furniture[b/]

Foo Phing Rattan Furniture Co.[b/]

A.B.C. Furniture Shop[b/]

P. T. Suara Wood and Iron Ltd

Various sidewalk shops along Jl. R. S. Fatmawati in Kebayoran Baru

P. T. Tung Sheng Workshops[b/]

Jakarta Lloyd P. T.[c/]

Various hardware and paint dealers in Jakarta-Kota

P. T. Lindeteves Indonesia

Nippon Paints Factory[c/]

Dana Paints Faotory[c/]

Barata Metal Works and Engineering P. T.[d/]

P. T. ICI Paints Indonesia[c/]

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b/ See annex IV.

c/ See annex V.

d/ See annex IX.

Kamal Furniture (P. T. Macrowood)
P. T. Arbenaya (Jakarta Branch)
C. V. Java
P. T. Jaya Cas Indonesia
P. T. Arvanaya

Palembang City

Fa. Husin Hamid Trading Co.
Toko Sumatera
Toko Ratan Jakarta
Toko Bunga Mas
P. T. Pelayaran Nusantara

Padang a/

P. T. Qinta
P. T. Atmac
P. T. Pembangunan Niaga Ltd
P. T. Arvanaya
INTRAJAYA C. V.

Bandung

Touans Rattan Furniture Workshop
Mulia Jaya Toko Mebel

Surabaya

P. T. Rotan Sari Indonesia Ltd
P. T. Santi

Ujung Pandang

Firma Mahasu
P. A. Sumber Abadi
Bandt Shell Products
C. V. Olympia
C. V. Kanebo
Johanes Lomo

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a/ See annex VIII.

Annex IV

PLANTS SELECTED FOR AN IMMEDIATE ASSISTANCE IN PRODUCT UPGRADING

Company:	Mande Handicraft and Co. 2, Jalan Pegangsaan Timur, Jakarta
Owner:	Mr. Daniel Zein
Years established:	5 years
Product line:	Bamboo and rattan products (lamp shades, basketry, furniture)
Production capacity:	Flexible
Number of workers:	Contractual workers. Number of workers depends on the size of the job (approximately 50 village workers available)

Observations and comments

Production facilities. Backyard-type workshop with owner's house used for storage, rework, final finishing or inspection of handicrafts collected from village household contractors. Workers were contracted for special jobs. No regular work force existed.

Production process. Consultant was not able to visit the village from which the workers were contracted. Judging by displayed items, the quantity and types of raw materials were of mixed or assorted grades depending on the job requirements. Chemical treatment of rattan or bamboo materials against fungi and insect borers were needed. Bamboo lamp work and designs were good but lamp shades and lamps were half-finished without lighting fixtures, sockets, supporting wireframe, electric cords and plugs. Basketry needed some improvements in workmanship and design. The furniture (unbarked rattans) was of sturdy construction, but over-all quality required much improvement. Finishing of the products was mostly poor.

Marketing. The sales were mainly to domestic market. There were a few export sample orders for lamps. The production consisted of assorted products made of rattan and bamboo, e.g. baskets, lamps, furniture, picture frames and

wall panellings. Special orders and outside jobs were accepted. There was no standard product line. The prices seemed to be reasonable and in agreement with the quality of products, although the prices of rattan furniture seemed to be slightly high. No form of promotion or advertisement existed. There was a display room but it was not presentable enough.

Management. The owner has some designing talents and seemed to be very active and innovative, though he has been trying to produce too many products at the same time. He seemed to be unsure on which products he should concentrate. He expressed much interest in exporting. He admitted there were problems concerning the quality of products and financing. He was very interested in building-up a production line of rattan furniture.

Recommendations

1. Work out objectives and plans for the workshop, taking into account the available resources.

2. If it were decided to go into export production, then the following should be done:

(a) Organize the production line and limit it to specific products in which it could excel, e.g. bamboo lamps and basketry. Expand later to other products;

(b) Set-up a workshop with regular skilled labour force and adequate tools and facilities;

(c) Improve designs and quality of work. Complete the half-finished lamps with fixtures and lamp bases, and use better raw materials;

(d) Establish a strong local market base for the products with superior products and better displays;

(e) Gradually prepare the company to enter export market with competitive products and prices.

Chemical treatment of bamboo and rattan products with 2% boric acid solution at 200°F, emersion 10 to 20 minutes, or 0.5% lindane in water, emersion 5 to 10 minutes, was suggested against insect borers.

Company:	Muklas Rattan Furniture 1-A, Jalan Martapura, Talang Betutu Ujung JAKARTA
Ownership:	Mr. Muklas
Product line:	Rattan furniture
Production capacity:	Rp 6-7 million per month (estimated)
Average sales:	Rp 6-7 million per month
Number of workers:	40-50 (approx.)
Production area:	1,000 m^2 (approx.)

Observations and comments

Production facilities. Generally, production facilities were poor and inadequate for production of quality rattan furniture. Hand tools and equipment were inoomplete and inadequate. No machinery was noticed in the workshops. The workshop sheds were built of bamboo, wood and straw and the floors were not cemented. Light was very poor and electric power supply was weak.

Production process. Framing, assembly and binding (weaving) of furniture was done in workshop No. 1 (30 km outside of Jakarta). The furniture was then transferred to workshop No. 2 in Jakarta for final clearing and finishing. Proper process flow and plant layouts did not exist.

Raw materials. Most rattan raw materials (poles, peels and cores) seemed to be of inferior quality. Hardware and fastening materials were rusty and insufficient. Finishing or varnishing materials were inadequate. In general raw materials were neither properly selected nor properly used.

Production methods. Everything was produced manually. Bending was done by hand torch. Working tables were not used. The labourers worked sitting, squatting or kneeling. They seemed to be poorly trained. Strict factory supervision and quality control were not practised.

Produot line. The furniture was produced mainly from the unbarked rattan or rattan peel. Most of the furniture was made of inferior materials, poorly constructed and unproperly finished. The furniture designs were not standardised. Many furniture pieoes were out of proportion. Binding and weaving were poorly done. Generally, the furniture was not suitable for export, although, it was good enough for the local market.

Marketing. Special custom-made orders were accepted. Catalogues were not available, but there were some albums with photographs of previous orders. The prices seemed to be a bit high for the quality of products. No form of promotion or advertisement was initiated and display room was disorganized and not presentable.

Management. The owner wanted first to improve the quality of products for the local market and was eager to co-operate with the consultant in the upgrading of his products. Later, he hoped to be able to export.

Recommendations

Objectives:

(a) To improve product quality for the domestic market;

(b) To organize production processes and improve technology;

(c) To increase production capacity.

1. Production facilities:

(a) Provide better working environment by cementing working area floors and installing proper lighting and electric power supply;

(b) Provide wooden working tables, complete with table wood bender, locker for tools, and carpenters vice, for all furniture framers and assembly men.

2. Production tools and equipments:

(a) Install steam boiler and cooker for rattan bending;

(b) Supply all labourers with proper working tools;

(c) Acquire electric powered hand tools, such as hand drills, sanders etc.;

(d) Acquire proper finishing and painting equipment, such as spray guns and compressors.

3. Production processes, techniques and standards:

(a) Improve jointing techniques by using good fastening materials, such as nails, screws, bolts and glues;

(b) Plan the flow of production process and the lay-out of workshop;

(c) Use better raw materials for production;

(d) Control the quality of production in various departments;

(e) Introduce proper finishing techniques, e.g. sanding and filling of holes, before finishing with stain, sanding sealer and top coat;

(f) Improve binding and weaving by using even and uniform materials.

4. Marketing:

(a) Standardise the produot line;

(b) Improve the arrangement and layout of the display room;

(c) Prepare a catalogue for standard lines ;

(d) Lower the prices in order to allow local people to buy more rattan furniture.

Company:	Foo Phing Rattan Furniture Shop 49, Jl. Antara, Jakarta
Ownership:	Mrs. Tjandrawati Tjahya
Years established:	30 (approx.)
Product line:	Rattan furniture
Production capacity:	Rp 3 million-4 million per month
Average sales:	Rp 3 million-4 million per month
Number of workers:	20-25 (approx.)
Production area:	250 m^2 (approx.)

Observations and comments

Production facilities. Some basic hand tools were available. Working area was very small and there was no room for expansion. Lighting, floors and ventilation seemed to be adequate.

Production process. The produotion was manual. Steam-bending was not available. Rattan raw materials used seemed to be selected properly and were, on the average, of good quality. Hardware and fastenings were adequate. Labourers seemed to be skilled, but the number of workers was small and beoause of that, frequently, the orders were not aooepted. The production work was good, except for the final finishing and painting that needed improvement.

In general, this shop seemed to have better workmanship than most firms in Jakarta.

Marketing. No standard line and catalogue existed. Selling seemed to be no problem, although prices were rather high. The firm seemed to have good chances of upgrading its products for export.

Management. The owner seemed to be interested in exports. He complained of low production capacity, nevertheless, he was not planning to increase it for the present.

Recommendations

Objectives:

(a) To improve and maintain the quality of the produots;

(b) To increase the produotion capacity.

1. Production:

(a) Expand working area;

(b) Train new young workers;

(c) Improve finishing and painting teohniques and aoquire spraying equipment;

(d) Provide working tables for assemblers and framers.

2. Marketing:

(a) Improve showroom displays and arrangements;

(b) Establish standard produot line and prepare a catalogue.

Company:	ABC Furniture Shop 12-A Jalan Veteran I. Jakarta
Ownership:	Mr. Lee
Years established:	30
Product line:	Rattan furniture
Production capacity:	Rp 2 million-3 million per month (estimated)
Average sales:	Rp 2 million-3 million per month
Number of workers:	15-20
Production area:	200-300 m^2 (approx.)

Observations and comments

Production facilities. The basic handtools were orude. Other equipment and machinery were not available. Workshop was so small that hardly anyone oould move freely.

Production process. A baokyard-type workshop with no fixed working flow or lay-out. Raw materials seemed sufficient and of good quality. Labourers seemed experienced and skilled. Production oapacity was very limited. Quality of furniture seemed to be under control. Steam bending and finishing/painting operations were laoking in produotion process.

Product line. Furniture, mostly rattan-peel or core woven, was of sturdy construction. Barked rattan furniture was poorly finished and stained. Designs were outmoded and limited. In general, workmanship required much upgrading.

Management. The owner seemed not to be interested in expanding produotion oapacity. He was aware of the need for quality improvement, especially in the produotion of barked rattan furniture.

Company:	P. T. Tung Sheng 61, Jalan Antara, Jakarta
Years established:	28 (approx.)
Product line:	Rattan furniture
Produotion capacity:	Rp 6 million-7 million per month (estimated)
Average sales:	Rp 6 million-7 million per month
Number of workers:	50-60 (approx.)
Production area:	1,000 m^2 (approx.)

Observations and comments

Production facilities. The produotion facilities were poor and scattered among different job sites in different buildings (4 small house workshops). The basio hand tools of most labourers were incomplete and primitive.

No machinery was seen. The working areas were small, considering the large volume of production, resulting in chaos and disorganisation. Lighting and ventilation were poor.

Production process. The workshops were scattered around Jakarta and each shop seemed to be independent with their own specific job. The produced furniture was completely assembled and ready for varnishing and finishing. The process flow and plant layout were disorganized.

Raw materials. Most rattan raw materials were of good quality. Better quality was selected for first-class jobs and stained furniture. Hardware and fastening materials were adequate. However, finishing and varnishing materials seemed to be inadequate.

Production methods. All the work was done manually with hand tools. Bending was done by hand toroh. Working tables were not used and the labourers performed their tasks on the floor. Only some labourers were skilled. The quality of the furniture varied between the workshops. No formal quality control check in the workshops existed and work supervision seemed to be relaxed. Bindings and weavings were good. The biggest problem seemed to be finishing and varnishing.

Product line. The furniture was mainly wicker furniture made of unbarked rattan core and peel. Some furniture made of barked rattan was also produced. The furniture was of good sturdy construction made of average quality materials. The designs were not standardized. Generally, the products were good but they needed upgrading in processing, finishing and adaptation (design and sizes) to meet export market demands.

Marketing. No standard furniture line was produced and all kinds of jobs were accepted. The catalogues were not available, but there were photographs of previous work. The prices were a bit high for the domestic market. The prices quoted for export, though high compared to those of competing countries, were subject to negotiation. The firm has exported some sample orders in the past but this did not lead to any repeat orders.

Management. The owner has expressed interest in improving his products and preparing his company for export. The consultant discussed various strategies for upgrading of the products, first, for the local market and later, for the export market.

Recommendations

Objectives:

(a) To upgrade the quality of products;

(b) To increase production capacity.

1. Production facilities:

(a) Consolidate the production in one or two spacious working areas or factories;

(b) Provide better working environment by better lighting, lavatories etc.

2. Production tools and equipment:

(a) Provide all framers with working tables;

(b) Install a rattan steam boiler and cooker for bending ;

(c) Supply the workers with proper working tools, such as curved chiesels, spokes-shave etc.;

(d) Acquire electric powered tools, such as hand drills, sanders etc.;

(e) Acquire proper finishing and painting equipments.

3. Production process, techniques and standards:

(a) Plan a new factory with an appropriate process flow and lay-out;

(b) Introduce steam-bending process immediately;

(c) Improve present production quality control;

(d) Retrain the workers in finishing techniques.

4. Marketing:

(a) Provide a better sales staff;

(b) Select a standardised product line;

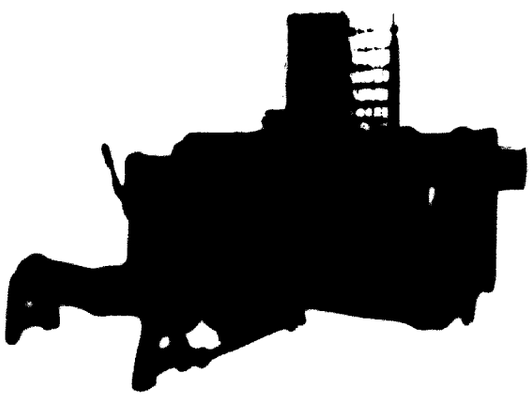
(c) Prepare a catalogue of the company's products;

(d) Improve and rearrange the display room.

Annex V

COMPANIES CATERING TO THE RATTAN FURNITURE INDUSTRY

A. Rattan processing machines[1]



WEAVING RATTAN WEAVING MACHINE

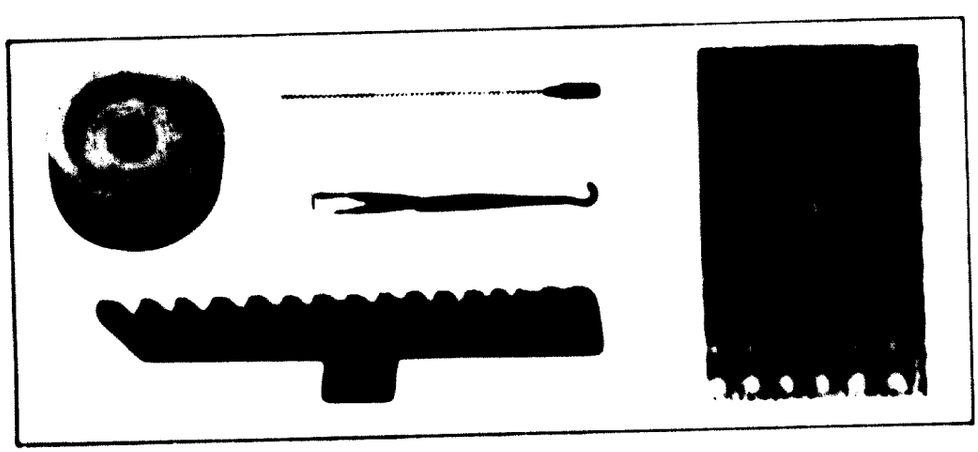
- To weave rattan skin and or slice into a rattan sheet.

SPECIFICATION OF MACHINE

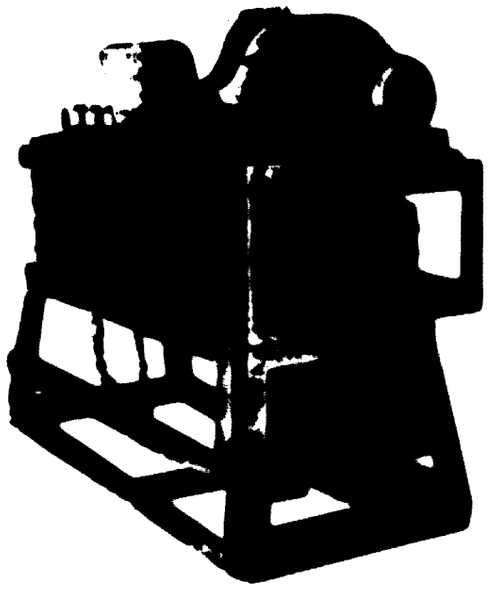
Type	SR 1 - 24	S.t 1 - 36
Capacity 8 hr	25,000 - 30,000 Sqft	25,000 - 30,000 Sqft
Horse power	3 HP	5 HP
Size (L × W × H) m/m	2,500 × 1,500 × 1,300	3,500 × 2,000 × 1,600
Weight	1500 kg	2300 kg
Accessories included		
Motor	220V - 380V, 3 phase 50 & 60c	220V - 380V, 3 phase, 4 pole 50 & 60c
Rattan Winding wheel	100 pcs	100 pcs
Wheel hooks	100 pcs	100 pcs

SPECIFICATION OF PRODUCTS

Rattan Sheet	Width of Rattan Required	Width of Rattan Sheet	Length of Rattan Sheet
¼" Mesh	2 1 mm	12", 14", 16", 18", 20", 22", 24", 26", 28", 30", 32", 34", 36"	50
⅜", ½", 1	3 mm 3.5 mm	"	"
Dense	2.5, 3, 3.5, 4, 4.5, 5 (mm)	"	"



[1] Producer: Sanyi Iron Works Co., Ltd. Distributor: Agency P. T. Salak Ltd., Jakarta.



RATTAN SPLITTING MACHINE

To split rattan into rattan skin and rattan core.

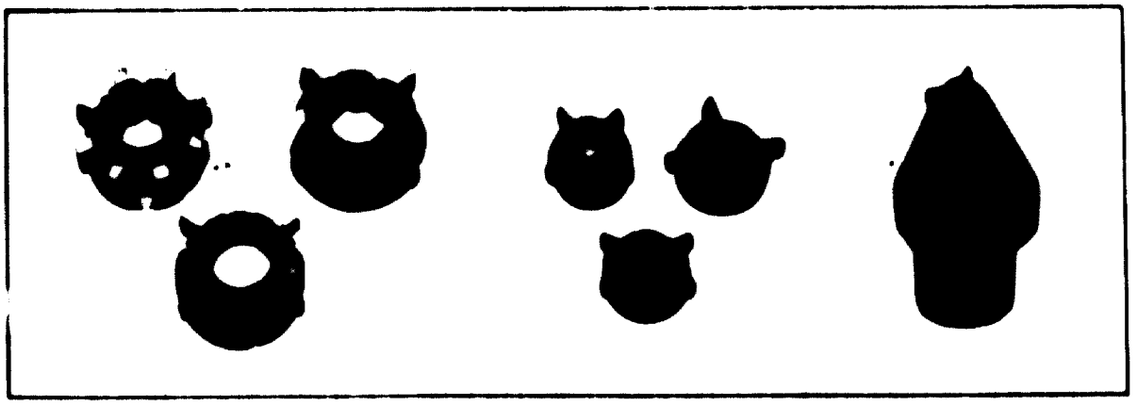
Splitted Rattan Peel: 1.75mm~6.5mm width
Splitted Rattan Core: 1.75mm~11mm ϕ

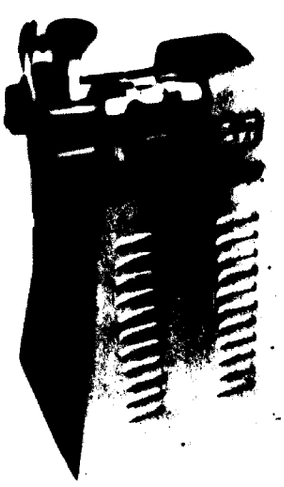
SPECIFICATION

Type	11 pair	9 pair	7 pair	5 pair	Small 5 pair
Capacity/8 hr	1500~1800kgs	980~1200kgs	460~480 kgs	380~460 kgs	280~300 kgs
Horse power	10 HP	7½ HP	5 HP	3 HP	2 HP
Size: L × W × H m/m	2300×1200×1000	1500×1000×900	1300×1000×900	1000×1000×900	600×600×950
Weight	1500 kgs	950 kgs	650 kgs	550 kgs	400 kgs
Diameter of rattan	10~25 ϕ m	7~16 ϕ m	6~9 m ϕ	5~8 mm ϕ	2.5~5 ϕ m

ACCESSORIES INCLUDE

Fixed clip	10~25 m ϕ each 1 pcs	7~16 m ϕ each 1 pcs	6~9 m ϕ each 1 pcs	5~8 m ϕ each 1 pcs	2.5~5 m ϕ each 1 pcs
Fixed middle conducting	11, 13, 15, 17, 19, 21 23, 25 each 5 pcs	7, 9, 11, 13, 15, 17 each 4 pcs	7, 9, 11 each 3 pcs	5, 7, 9 each 2 pcs	3, 5, 7 each 2 pcs
Iron roller	10~25 m each 10 pcs	7~16 m each 8 pcs	6~9 m each 6 pcs	5~8 m each 4 pcs	2.5~5 m each 4 pcs
Cutter Cutter clip Rubber roller Blower Fan	To be charged separately				





SR-3A

To speel rattan skin, which were split by splitting machine, into thin slices.

SR-3B

This type of machine has two functions together which are:
1) to trim rattan into thin slices.
2) to trim two edges of rattan peel into uniform width.

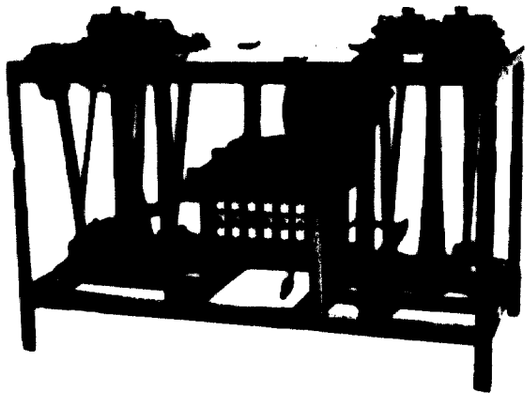
SPECIFICATION

Type	SR-3-A	SR-3-B
Horse Power	1 HP	1 HP
Capacity/8 Hr	30 Kgs	20 Kgs
Size: L × W × H	600 × 500 × 1000mm	600 × 700 × 1100mm
Weight	80Kgs	100 Kgs

ACCESSORIES INCLUDED:

Motor: 220V & 380V, 3 Phase, 4 Pole. 50 & 60C	
Iron Roller: 3.0, 3.5, 4.5 mm each 1 pcs.	

RATTAN CONNECTING MACHIN

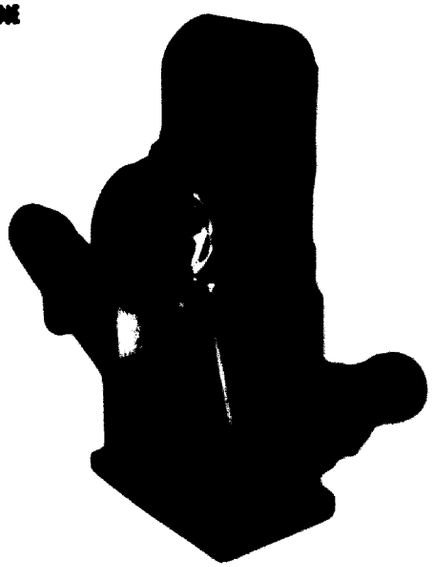


To connect rattan skin slices for purposes of weaving.

SPECIFICATION

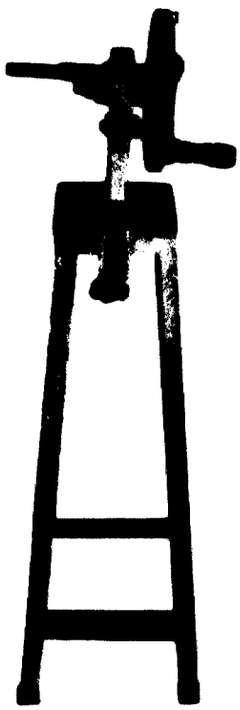
Type:	SR-4
Capacity/8 Hr	30 Kgs
Horse Power	¼ HP
Transformer	1.5 Kw
Motor	220V & 380V, 3 phase, 4 pole, 50 & 60C
Size: L × W × H	1500 × 700 × 1000 mm
Weight	150 Kgs

SURFACE BALLING MACHINE



To grind the rattan surface until without any coarse spots, ready for use in furniture.

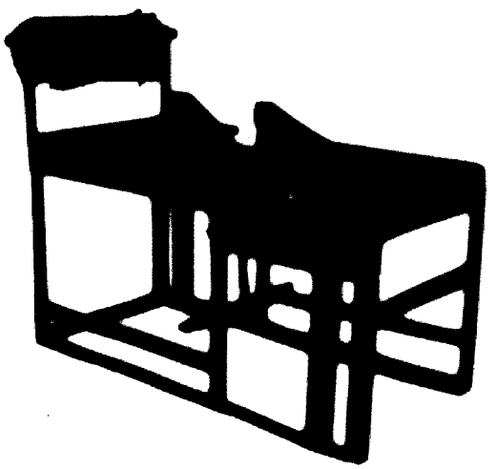
Horse power: Machine: 2 HP.
Blower: ½ HP.
Motor: 220V & 380V, 3 phase, 4 pole, 50 & 60c.



RATTAN WINDING MACHINE

To wind up the connected rattan skin & slices, ready for weaving.

FLOWER TABLE



Used solely for slices, on this table, to be interstitched into the desired and designed rattan sheet.

B. Wholesaler for rattan peel, core and poles b/

Findings

1. Production centres of rattan raw materials

Main production centres for rattan peel, core, poles are the following:

(a) In Sumatra, Padang, Palembang and Lampung;

(b) In Java, Semarang and Surabaya;

(c) In Kalimantan, Banjarmasin, Samarinda, Balikpapan and Pontianak;

(d) In Celebes, Ujung Pandang.

Better quality rattan, especially manau variety is found in West Sumatra.

2. Flow of raw materials to manufacturers

(a) Production centres supply directly or indirectly to manufacturers in Jakarta;

(b) Production centres export raw materials directly to Hong Kong and Singapore. The materials are then re-exported to the United States and European countries. However, more Indonesian firms are trying to export directly to importing countries, by passing the intermediaries at Hong Kong and Singapore.

3. Common types of rattan collected for production

(a) Rotan sega

(b) Rotan manau

(c) Rotan jermasin

(d) Rotan tohiti

(e) Rotan loonti

4. Selling prices of rattan at Jakarta

(a) Rattan poles (with skin)

Specifications: Class A and B; $3\frac{1}{2}$ meters long

Size: below 2 cm ø Rp 200 per kg or Rp 60 per piece
about 3-4 cm ø Rp 170 per kg or Rp 510 per piece

(b) Rattan peel (or split)

Specifications: Class A and B sulphur-bleached

Class A Rp 600 to Rp 700 per kg

Class B Rp 400 to Rp 500 per kg

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b/ Lo Poeng Tjin, Co., Jakarta.

(o) Rattan core

Class A sulphur-bleached (sulphur Rp 75 per kg)

Size: 2 mm ø Rp 400 per kg
4 mm ø Rp 550 per kg

5. Skinned rattan poles prices in Jakarta (from Mande's Handicrafts):

Class A and B assorted (manau variety) about $3\frac{1}{2}$ meters long:

Diameter (mm)	Price per piece (Rp)
40-45	400
30-40	300
20-30	225

6. Present export prices

Export prices (f.o.b.) for 100 kg rattan (tohiti variety) with skin, in dollars are:

Grade	10 to 18 mm ø	18 to 24 mm ø	24 to 30 mm ø
A	33	39	45
B	26	31	37
C	22	27	33
D	20	24	26
E	18	22	24

Jermasin, class A/B, size 10 to 16 mm ø $30
Water rattan, class A/B, size 10 to 16 mm ø $28
Manau sulawesi, class A/B, size 32 to 44 mm ø $40

Comparisons and conclusions

1. Based on the above findings, domestic prices in Jakarta of manau rattan poles (30-45 mm ø) are found to be quite high compared to Manila prices. In Jakarta, the prices from rattan poles (grades A and B, 3.5 m long, 30 mm ø and above unbarked) were $0.95 to $1.32 per pole. In Manila the prices were $0.60 to $0.85 per pole (grades A and B, 4 m long, 30 mm ø and above, barked). Possible causes for the high prices in Jakarta are high inter-islands freight rates and handling fees.

2. Export prices of manau rattan in Indonesia seem to be higher than in the Philippines, approximately, $1.20 versus $0.85. Comparing the present prices at Jakarta and at Manila, we can see that Manila has better prices for big rattan poles (called palagan and similar to manau in Indonesia).

3. On the other hand, the smaller rattan varieties, especially rattan sega with 8 to 20 mm ∅, are of better quality and cheaper at Jakarta than at Manila, approximately, $0.10 compared to $0.18 per piece (grade A/B, 8 to 20 mm ∅, 4 m long, unskinned). Their by-products are consequently cheaper at Jakarta than at Manila. The approximate prices are:

Rattan splits (sega) $1.45 per kg (class A) compared to $4 per kg at Manila

Rattan core (sega) $1.08 per kg (class A, 4 mm ∅) compared to $2.80 per kg at Manila

Indonesian export prioes are not available for sega and its by-products. The Philippines is not exporting this type of material owing to its scarcity.

4. In general, the consultant observed that the Philippine rattan poles (palasan variety) seem to be of better quality than the Indonesian rattan poles (manau variety), while the smaller varieties of rattan (sega) are superior in Indonesia.

C. Paint industry[9/]

The main paint producers in Indonesia are:

P. T. Nippon Paints, Antjol Barat I/A5/C, Jakarta-Kota
P. T. Dana Paints Indonesia, Jl. Pemuda, Pulogadung, Jatinegara
I. C. I. Paints, Jakarta Fair Grounds, Jakarta

The paint industry in Indonesia is mostly ooncentrating on exterior and interior paints and allied materials for houses, buildings, ships and automobiles.

So far, the furniture industry, as a market, has been negleoted oompared to other industries. Therefore, the oonsultant found a very limited ohoice of finishing materials for furniture. Aside from the products of the above companies, there are available on the market some oolour pigments in powder form (name unknown) ready for mixing with aloohol for staining rattan furniture. The stained rattan could be finished further by nitro-cellulose-based sanding

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9/ P. T. Nippon Paints, Jakarta-Kotes; P. T. Dana Paints Indonesia, Pulogadung, Jatinegara; I.C.I. Paints, Jakarta.

sealers and clear top-lacquer which are available locally but hardly utilized here by the rattan firms.

This latter method seems to be most economical, easier to apply, and of a high enough quality for the consumers. The consultant found the following locally produced paints to be adequate:

1. Pinotex, alkyd wood preservative paint (produced by Dana Paints Indonesia)

2. Timber Glow, epoxy finish reinforced with polyurethane alkyd (produced by I.C.I. Paints)

3. "Melamic 1200 clear", acid cured, two component amino alkyd paint (produced by Nippon Paint)

D. Shipping rates[d/]

Outward conference freight rates from Indonesian main ports for rattan raw materials, baskets, and furniture as of September 1975 are shown below:

To United States of America (main ports)

	Unit	Freight rates ($)	
		East coast	West coast
Bundled weight	ton	318.00	-
Rattan cane	ton	308.00	-
Rattan baskets	m^3	143.75	120.00
Rattan furniture	m^3	124.25	100.50
Rattan materials	ton	-	302.25
Handicrafts	ton/m^3	184.75	187.00/137.50

Above rates are subject to a 15% surcharge (inclusive currency adjustment and bunker surcharges).

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d/ Jakarta Lloyd.

To Australia (Sydney, Melbourne and Adelaide)

	Unit	Freight rate ($A)
Rattan raw materials	ton	113.50
Furniture (unspecified-c.q. rattan)	m^3	29.50
Handicraft (incl. rattan baskets, wood carvings)	m^3	39.75

A surcharge of $3.95/$m^3$ for bunker charges and a 7% currency adjustment should be added to the rates. The above base rates were increased by 26% on 1 October 1975.

To Japan (main ports)

	Unit	Freight rate ($)
Rattan raw materials		
Straight	ton	62.50
Bent	ton	79.75
Core	ton	62.50
Rattan furniture	ton/m^3	46.75
Handicrafts (general)	kg/m^3	36.50

To Europe (main ports)

	Unit	Freight rate (f.)
Rattan raw materials	ton/m^3	557/ton
Rattan furniture	ton/m^3	143/m^3
Handicrafts	ton/m^3	(varied classification)

A surcharge of 18.1% for bunker charges and currency adjustment should be added.

Comments

In Indonesia the freight rates for rattan furniture are much higher than in other Asian ports. For example, the rates in Hong Kong are 40-50% and those in the Philippines 15-30% cheaper than in Indonesia. Generally, high freight rates are mainly caused by inadequeate port and handling facilities in Indonesia.

Annex VI

OUTLINES OF THE LECTURES GIVEN BY THE EXPERT AT THE WORKSHOP ON RATTAN, BAMBOO AND PANDANUS PRODUCTS, HELD AT THE JAKARTA FAIR, 5-7 NOVEMBER 1975

I. Basic Rattan Furniture Production Operations

A. Description of production process - overview (see figure I)

Rattan furniture manufacturing is basically handwork with little mechanisation. A new worker is usually trained in the rudiments during a minimum three-month in-plant apprenticeship.

The following steps are generally involved in the manufacture of rattan furniture:

(a) Chemical treatment of rattan. Rattan poles are brought into the factory in four-metre lengths and are dipped into a solution of 0.5% of lindane or dieldrin in water for at least three minutes and then dried.

(b) Sorting. After the treating process, rattan poles are set out for grading. The pieces are classified according to species, diameter and quality. The diameter is always measured on the small end. Poles are then stored.

(c) Cutting. Poles are selected for specific jobs and then cut into convenient lengths.

(d) Sanding. Poles are sanded smooth and cleaned before sending to the steam and assembly work.

(e) Steaming and bending. Parts requiring bending are steam-heated in a tank with saturated steam operated by a boiler at about 212°F for about 20-30 minutes. Then parts are immediately bent and formed into different shapes and patterns called for by various designs. (Boilers can be operated with either firewood, kerosene or crude oil as fuel.).

(f) Assembly. After the moulded parts have cooled off, the craftsmen assemble them into different furniture items using nails, screws, glue etc.

(g) Binding and weaving. All main members of joints are then tightly bound with rattan peels or flat core. Some minor joints have to be bound in order to cover the gaps or for decorative purposes.

(h) Carpentry woodworking. All finished frames that require woodwork are passed on to the carpentry section for woodworking. Carpenters also prepare the table tops required for the tables.

(i) Finishing. After final sanding and cleaning of the furniture items, they are stained with the desired colour. By this process the quality of furniture is revealed most to customers and thus is an important part of the production process.

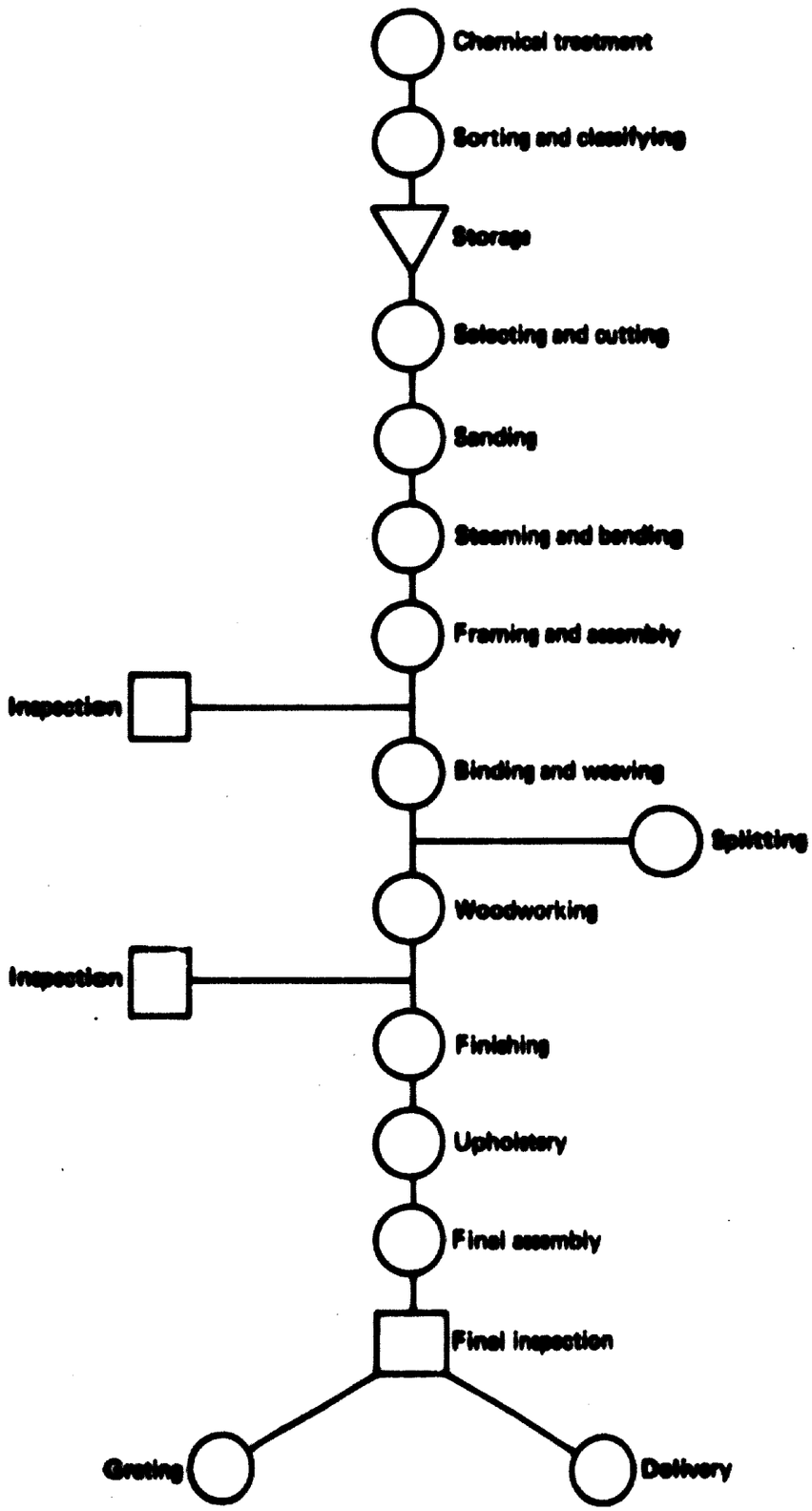


Figure I. Rattan furniture manufacturing process flow

(j) Final assembly. All cushions and upholstery are simultaneously prepared to link up with the frames in the final assembly of the furniture pieces. Table tops are attached to tables and handles are fixed on doors and drawers. Final inspection is made and then all are ready for delivery or packing.

B. Materials preparation

Rattan poles processing (see figure II)

Processing rattan poles as a raw material for furniture production is very important in order to have available good grades of poles for the furniture manufacturers. Rattan poles are usually processed in or near the sources of rattan or the forests. The following steps are usually practiced by the cutters of the raw poles:

(a) Forest cutting. All raw poles are cut into about four metres lengths for easy handling and transportation. They are then transported to the depot area for processing.

(b) Denoding and scraping. All poles are denoded and scraped of the outer covering or skin.

(c) Fungicide treatment. Within 15 days after cutting and scraping, poles must be dip-treated by a fungicide - Dowicide G (sodium pentachlorophenate) 7 lb per 100 gallons of water - for at least two minutes. The fungicide prevents infection of the raw poles.

(d) Solar drying. After chemical treatment, all poles must be sun-dried immediately at vertical position for about 10-15 days to a moisture content of about 20% (moisture content equals the difference between the first weight and last weight multiplied by 100).

(e) Second scraping. After drying, the poles are scraped for the second time for purposes of classifying.

(f) Classifying. The poles are then classified and graded into classes A, B, C and rejects.

(g) Straightening and bundling (optional-insectioide treatment). All poles are straightened and then bundled together into 15-20 per bundle. Sometimes, they are further treated against borers before bundling and storing, especially if they are for export. They are then inspected and stored ready for delivery to manufacturers.

Rattan peel processing

(a) Cleaning. Upon the receipt of smaller varieties of rattan from the collectors or cutters, the bundle should be broken up and the rattan cleaned. The pieces are soaked in water for four or five hours until the pieces become soft. The pieces should then be straightened and rubbed with a rough cloth dubbed with moist sand. This will remove the dirt and give the pieces a brighter appearance.

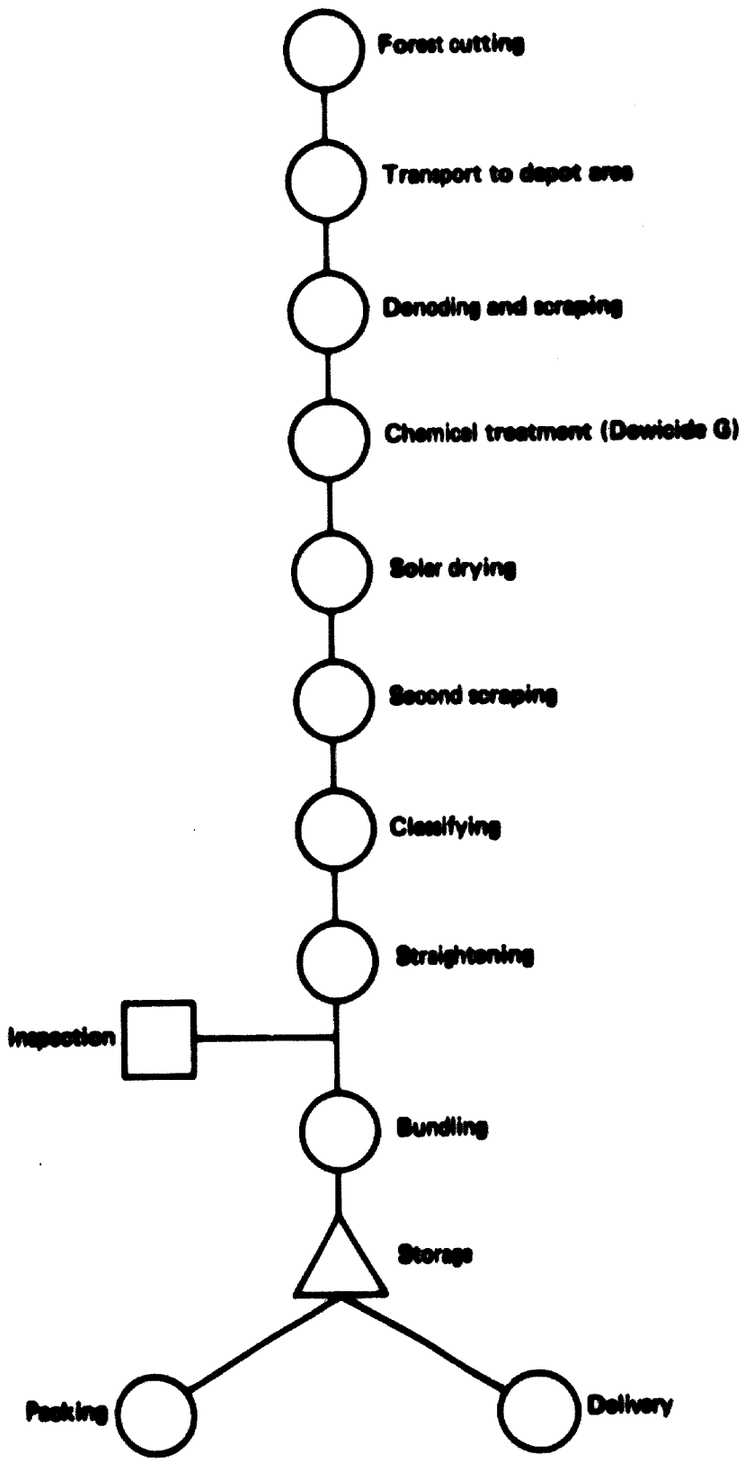


Figure II. Rattan pole-processing flow

(b) Dehusking or scaling. After cleaning the rattan, dehusk the outermost skin by pulling it through three wheels, placed horisontally flat in a straight line a few inches apart from each other, then wipe clean again.

(c) Denoding. All nodes are denoded or removed by a sharp cutting knife in circular motion.

(d) Bleaching. After scaling or dehusking and denoding the skin, the rattan is placed in an enclosed room or chamber with no ventilation, and sulphur fumes are used to bleach the outer skin of the rattan and further whiten the colour (alternative bleaching - hydrogen peroxide 50% and ammonia water 28%).

(e) Splitting and trimming. Rattan is then split and trimmed into rattan peel strips (sizes 2-10 mm) with a splitting device or machine for use in binding and weaving of furniture pieces. They are then again rounded by a steel plate with sharp holes. The inner core is again split into flat core peel strips or into round wicks core for weaving and binding.

(f) Final inspection and bundling. This is done when the rattan is ready for delivery or factory use.

II. Export marketing for rattan furniture

A. Definition of terms

Rattan. A generic term that applies to the various species of tropical climbing palms composing the genera Calamus, Daemonorops, and Korthalsia of the family Palmae (manau rattan in Indonesia and palasan in Philipines).

Rattan furniture. Any furniture made of rattan poles (barked and unbarked), peel (skin) or/and core.

B. Market for rattan furniture

Generally, the market for rattan furniture can be divided into two segments as follows:

(a) Garden outdoor type mostly made of unbarked rattan and rattan peel woven, suited for outdoor use;

(b) Home indoor type mostly of barked rattan and wicker or core woven (natural or stained/painted) for indoor use.

C. Market demand for and supply of rattan furniture

Demand

Demand for rattan furniture has been increasing in the past five years especially in foreign markets. A rough estimate of what the market demand is at present is given below:

1. Rattan furniture exports (estimate as of 1974)

Country or area	Value f.o.b. (million dollars)
Hong Kong	10.0 (see exhibit 1)
Philippines	3.0 (see exhibit 3)
Singapore/Malaysia	0.5
Others	0.5
Total	14.0

2. Rattan raw materials exports (as of 1974)

Country	Value f.o.b. (million dollars)
Philippines	1.5
Indonesia	3.5 (see exhibit 2)
Total	5.0

To estimate the value of potential furniture exports, multiply the value of raw material exports by seven (average value added factor) and add to this figure the value of furniture exports.

$5 million x 7 = $35 million
$14 million
Potential furniture exports = $49 million

To estimate the value of potential demand of export market, multiply the above figure by four (factor to arrive at the selling price in foreign markets).

Value of potential demand is $49 million x 4 = $196 million

In conclusion, the value of the total demand potential (including the local demand) could come to about $200 million. At an estimated average annual growth of 20%, the value of potential demand could reach about $500.0 million in five years time.

Major markets for rattan furniture are (in ranking order): Australia, Canada, Europe, Japan and the United States.

Supply

Present suppliers of rattan furniture are mainly Hong Kong and the Philippines. Other sources are Malaysia and Singapore. China could become a major supplier soon.

The Philippines is currently concentrating on the indoor home type of furniture, while the other countries are producing mainly the traditional garden type.

Other manufacturers are the furniture companies in the foreign countries such as the Federal Republic of Germany, Italy, the United States, Scandinavia and some East European countries (Bulgaria, Poland etc.). They import their materials mainly from Indonesia and the Philippines, and make both indoor and outdoor rattan furniture.

D. Rattan consumer profile

A brief look at the foreign rattan consumer is important for a successful export-marketing programme of rattan furniture. The following characteristics are generally of interest:

(a) The buying decision - who decides what furniture to buy;

(b) Buying motives - why one buys rattan furniture;

(c) Buying preferences - how one buys furniture.

Based on the experiences of rattan furniture firms, the above questions can be answered generally as follows:

(a) Buying decision. This is generally a joint husband and wife decision. However, the initial inquiries and shopping are usually done by the housewife. Thus, although most buying decisions for furniture are made jointly, the housewife as the homemaker is most important in the final decision.

(b) Buying motives. There are two main types of motivation among consumers buying rattan products.

Social motives:

(i) Rest and recreation - rattan furniture is comfortable, informal and casual;

(ii) Curiosity - it attracts the foreigners' attention because it is unique and exotic;

(iii) Pride - it appeals to the artistic taste and expresses the friendly traits of its owner.

Economic motives:

(i) Lower cost - it is durable and thus cheaper in the long run;

(ii) Easy handling - it is not heavy and easy to move around.

(c) Buying preferences. A characteristic of the more discriminating consumer is his buying preference. He pays most of his attention to the quality standards of the manufacturer and, consequently, workmanship stands out, aesthetic appeal or design comes second, followed by price and company prestige.

E. Export marketing factors

1. Product pricing

Pricing for export by the producer is the most important factor in selling to foreign markets.

(a) Two approaches to pricing are:

Cost-plus approach
Market approach

(b) Costing factors are:

Ex-factory price
Allowance for export promotion
Export packing
Brokerage fees and expenses
Financing charges

(c) Common types of price quotation are:

c.i.f. = cost, insurance, freight
c. and f. = cost and freight
f.o.b. = free on board

2. Tariffs of different countries

Importing countries usually charge the following tariffs on rattan furniture:

Australia	15% ad valorem
Canada	20% ad valorem
Japan	Free/Quota (15% above quota)
United States	16% ad valorem
EEC	Free/Quota (8% above quota)

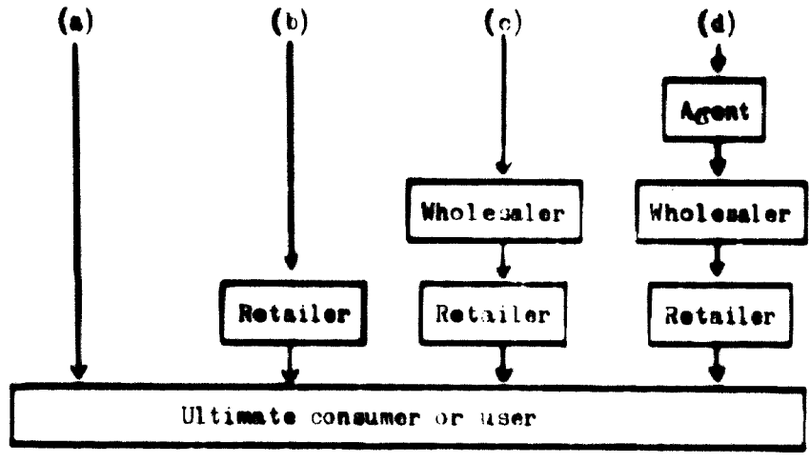
3. Landed costs for importers

These costs are calculated mainly by the following factors: buying price, freight and insurance, tariff/import taxes, brokerage and handling and miscellaneous expenses.

4. Mode of payment

Bank drafts and checks, letter of credit and documents against documents.

5. **Export channels**



6. **Export shipping**

Conference freight rates as of July 1975:

Destination	Origin: Philippines (all prices per m^3)	Origin: Indonesia (all prices per m^3)
Canada and United States		
East coast	$58.00	$142.90
West coast	$50.60	$115.08
Australia	$A 35.00	$A 44.00
EEC	$62.00	$72.70
Japan	$26.00	$55.00

(Above prices are not exact, but are only for comparison)

7. **Export promotion**

Some forms of export promotion are:

Brochure or catalogue with price lists and information

Display room

Listings in local and foreign directories/publications

Trade fairs and exhibitions participation

Through local banks, chambers of commerce

Through foreign trade associations or country's official commercial or trade attaché in foreign countries.

Exhibit 1

Annual exports of rattan furniture from Hong Kong

Year	Value, f.o.b. (million $HK)
1968	17
1969	23
1970	28
1971	20
1972	33
1973	15
1974	50

Exhibit 2

Annual export of rattan materials from Indonesia

Year	Quantity (kg)	Value, f.o.b. ($)
1970	37,427,029	1,009,264
1971	32,152,345	789,497
1972	47,230,009	1,527,664
1973	43,316,966	1,639,700
1974	53,495,950	3,498,561

Exhibit 3

Annual exports of rattan furniture from Philippines

Year	Quantity (pieces)	Value ($)
1969	59,346	624,071
1970	81,595	857,272
1971	87,625	948,159
1972	140,944	1,063,160
1973	241,581	1,787,558
1974 (Jan.-Oct.)	152,043	2,432,178

Annual exports of rattan poles from Philippines

Year	Quantity (pieces)	Value ($)
1969	1,786,135	538,837
1970	2,008,334	607,464
1971	1,930,304	568,850
1972	2,873,726	835,353
1973	2,251,231	753,724
1974 (Jan.-Oct.)	1,485,117	844,725

Major countries importing rattan furniture from the Philippines by rank (as of 1972)

1. United States of America
2. Australia
3. Japan
4. Federal Republic of Germany
5. Other European countries
6. Canada

Annex VII

ESTIMATED REQUIREMENTS FOR PROJECTED
RATTAN PROCESSING AND FURNITURE MANUFACTURING PLANTS

A. Indonesian product centre, P. T. Sarwah Jaya

Production capacity (estimated maximum daily capacity, 8-hours operation)

(a) Raw materials:

Split rattan or peel: 1,250 kg

Rattan poles (milled and sanded): 1,500 units

Rattan core: 300 kg

(b) Furniture:
(based on 10 skilled framers)

Chairs, dining: 80-100 units

Machinery requirements

1. Processing of raw materials

1 Splitting machine, 9-pair # SR-2 (P.T. Salak), with blower

1 Splitting machine, 5-pair # SR-2, with blower

1 Splitting machine, small 5-pair # SR-2, with blower

4 Trimming machines, # SR-2

2 Rattan surface milling machines, # SR-5, with blower

2. Manufacturing

1 Circular saw, 8-9 in. dia. Saw blade (3/4 hp-motor), table mounted

1 Steam boiler, 5 hp, 60 psi max. working pressure, complete with water level gauge, pressure gauge, safety value, pipes, release value (either oil-fired or furnace-fired type)

1 Rattan cooker, 22 in. dia. x 15 ft. long, made of ordinary drums, welded in straight line, on wooden or steel stand

1 Rattan cooker, small 22 in. dia. x 6 ft. long (same specifications)

1 Drill press, bench type $\frac{1}{2}$ in. chuck capacity, spindle speed 1,960-2,350 rpm (motor: $\frac{1}{4}$ hp, 1,720 rpm, 3-phase)

10 Hand torches (kerosene-fired or LPG-fired)

10 Working tables, wooden 40 in. wide x 10 ft. long x 2 in. thick, 27 in. high

1 Steam working table (for jigs and wood moulds), wooden construction 40 in. wide x 10 ft. long x 2 in. thick, 27 in. high

1 Rattan bender or coiler, wooden construction, 9 in. dia. x 8 ft. long wooden cylindrical coiler, with manually operated handle, wooden stand, plus one 9 in. dia. meter x 8 ft. long wooden coiler and one 12 in. dia. x 8 ft. long wooden coiler

3. Binding

3-4 Pneumatic staplers, portable type

1 Air compressor (powerful enough for 3-4 units pneumatic staplers) complete with air hose, fittings and pipes (3-5 hp induction motor)

4. Varnishing

1 Air compressor (powerful enough for 4-6 units spray guns) complete with air hose fittings and pipe system (5 hp induction motor)

4 Spray guns, 1 litre capacity

2 Exhaust fans, axial type, 16 in. dia. or bigger, 5 blade, directly attached to $\frac{1}{4}$ hp motors

1 Electric portable sander (for table tops)

Manpower requirements

Technicians		2
Machine operators:	Rattan processing	12
	Steaming operations	2
	Other machines	2
Furniture workers:	Framers	10
	Weavers	5
	Binders	5
	Varnishers	20
Supervisors		3
Production or plant managers		1
Assistant plant manager		1
Other labourers		10
Total		73

Factory area requirements

Approximately 4,000-5,000 m^2 working and storage area.

Raw materials requirements (for 30-days production)

30,000 units rattan poles, manau variety, 30-40 mm ø
30 tons rattan poles, assorted sizes sega variety - 10-25 mm ø
Raw materials for furniture, basketry and other handicrafts

Capital requirements (for machines, equipment and working capital only)

1. Machines (rough estimate)

	Dollars
Processing	14,000 (excluding import taxes)
Manufacturing	8,000
Total	22,000

2. Capital (rough estimate for one month)

	Dollars
Raw materials	50,000
Factory salaries (average $4/day)	8,760
Overhead and miscellaneous expenses and supplies	20,000
Total	78,760

Total initial project cost, excluding plant building and land, $100,760.

Suggested suppliers of machines

Sato Bamboo and Rattan Machinery Works Co. Ltd. Omiya Saitama, Japan San Yi Iron Works Co. Ltd 146, Ta Yeong Street, Taiwan	Rattan Processing Machine
Sanyo Trading Co. Ltd. P.O. Box No. 98, Gifu, Japan	Woodworking and Sanding
Johann Friedrich Behrens, Metalwarenfabrik, D-207 Ahrensburg, Federal Republic of Germany	Pneumatic Tools and Equipment

B. P. T. Santi, Surabaya

Production capacity (estimated daily capacity, 8-hours operation)

(a) Raw materials:

Rattan cane webbings, 24 in. wide: 600 ft^2

Rattan peel: 300 kg

Rattan core: 200 kg

(b) Furniture:

Chairs, dining: 30-50 units

Machinery requirements

1. Processing of raw materials

(a) Cane webbing:

1 Rattan webbing machine, 24 in. width

1 Rattan connecting machine

2 Rattan winding machines

4 Flower tables

12 Rattan webbing hooks

(b) Rattan peel and core:

1 Rattan splitting machine, with blower (9-pairs)

1 Rattan splitting machine, with blower (5-pairs)

3 Rattan trimming machines (more for maximum capacity)

2. Rattan furniture production

1 Steam boiler, 5 hp, 60 psi maximum working pressure, complete with water level gauge, pressure gauge, safety valve, pipes, release valve (either oil-fired or furnace-fired type)

1 Rattan cooker, 22 in. dia., 24 ft. long, made of ordinary oil drums, welded in straight line, mounted on wooden or steel stand

1 Bending table with wooden jigs (wooden)

1 Coil-bending stand (wooden)

6 Working tables, wooden 40 in. x 10 ft. x 27 in.

5 Hand torches (kerosene-fired or LPG-fired)

1 Electric hand drill

1 Air compressor, 2-3 hp

2 Spray guns, complete with hose and fittings

1 Exhaust fan (for finishing area)

3. Other facilities

Treatment pool, soaking pool, sulphurisation chamber. (Various hand tools, supplied by the workers.)

Initial manpower requirements

Technician	1
Machine operators:	
Rattan processing	9
Rattan webbing	9
Steaming operations	2
Furniture workers:	
Framers	8
Binders and weavers	4
Varnishers	10
Other labourers	10
Production supervisors	3
Production manager	1
Assistant production manager	1
Total	58

Raw materials requirements (for 30-days operations)

10,000 units, rattan poles, assorted sizes, manau variety, 25-40 mm

10 tons, rattan poles, assorted sizes, sega variety, 8-20 mm

Initial capital requirements (rough estimate)

1. Machinery and equipment

	Dollars
Processing machines (P. T. Salek quotation)	12,500
Manufaoturing equipment (Philippine quotation)	12,000
Total	24,500

2. Working capital

	Dollars
Raw materials	20,000
Factory salaries (average $4 per day)	6,960
Overhead and miscellaneous expenses	20,000
Total	46,960

Total initial project cost (excluding land and building), $71,460

Plant area requirements

Approximately 2,000-3,000 m^2 working and storage area and some vacant area for further expansion.

Suggested suppliers of machines

P. T. Salek, Indonesian representative for Taiwan Rattan Machineries

Remen Co., 9-2nd Floor, Alley 6 Lane 18, Nanking W. Rd., Taipei, Taiwan

Sato Bamboo and Rattan Machinery Co. Ltd., Omiya, Saitama, Japan,
distributed by: Meiji Sangyo Co., No. 2, 2-Chome, Shi-ba-Tamura-Cho,
Minato-ku, Tokyo, Japan

Takayashi Rattan Machinery,
Distributed by: Namura Overseas Enterprises Co. Ltd., Namura Bldg.,
1-1 Ohtemachi, 2-Chome, Chiyoda-ku, Tokyo, Japan

Annex VIII

EXPORT POTENTIALS OF RAW MATERIALS AND FURNITURE FROM PALEMBANG AND PADANG

Visit to Palembang (Oct. 15-18)

The export potential of rattan raw material and furniture from Palembang seemed to be rather poor mainly because the producers did not have the right quality and quantity of products to meet the demand of the export markets. The quality of raw material was mostly poor and the rattan furniture (made of unbarked manau poles), though of sturdy construction and made from better quality materials, was too poorly designed and finished. Furthermore, there are only a few producers of rattan materials and furniture manufacturers, with very limited capacities. There was only one exporter of raw materials and none of furniture. Other barriers, such as lack of sufficient capital, shortage of skilled manpower, and high local and international freight rates also diminished the export potentials of rattan furniture.

The expert suggested that raw material producers should improve their methods of harvesting, and processing rattan with proper care and selection.

Visit to Padang (Oct. 19-22)

Padang has great possibilities for the expansion of the exports of rattan materials owing to the fact that the producers use proper processing methods and have sufficient facilities and funds. However, only one company could process rattan splits and cores (from sega) of sufficient quality and in sufficient quantity for export. The rest were producing only manau rattan barked and unbarked mainly because of lack of production know-how and machinery. The rattan furniture was not produced because there was no local demand for it and, consequently, there was total lack of production skills and technology. Most exporters/producers were relatively new to the rattan business (2-3 years) and not ready to go into furniture production.

The consultant encouraged the present rattan exporters/producers, firstly, to expand production capacities, especially of barked rattan poles, since the market for such poles is increasing. Secondly, to go into the production of rattan splits and cores for furniture production. And lastly, to integrate furniture making into their production for export.

In conclusion, the export potential of rattan furniture from Palembang and Padang are poor at present. However, Palembang seemed to have better chances of developing its rattan furniture industry, since it has the materials and basic labour skills. Only financial resources are lacking. Padang, on the other hand, has the materials and financial resources, but no basic labour skills.

With the expected progress of the country's economy and infrastructures, with the guidance and assistance of the government export agencies, and with the initiative and ingenuity of the private business sector, the export potential of rattan furniture from Sumatra should take a gradual turn towards a better and brighter future.

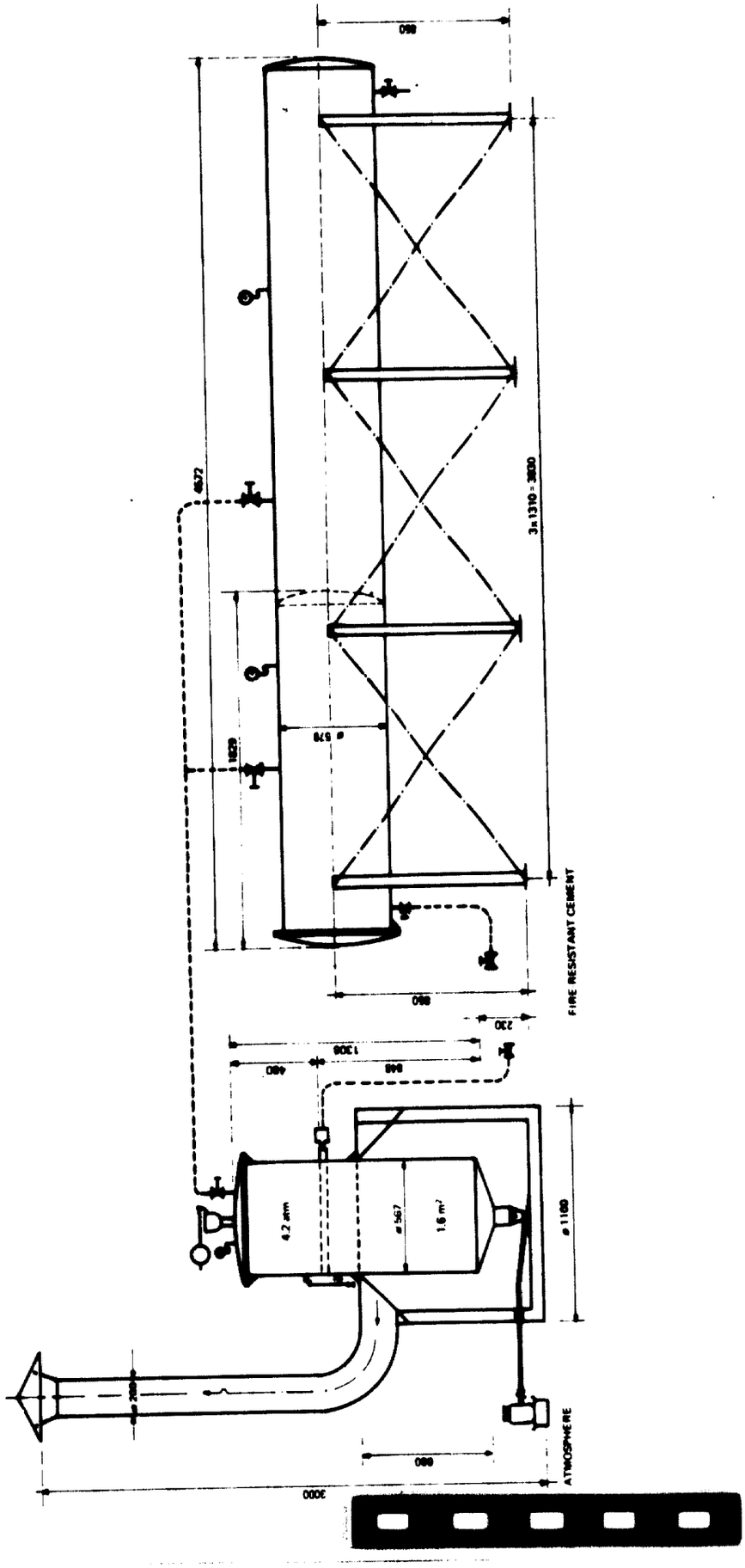
Annex II

A DESIGN FOR A LOCALLY PRODUCED RATTAN COOKER AND BOILER

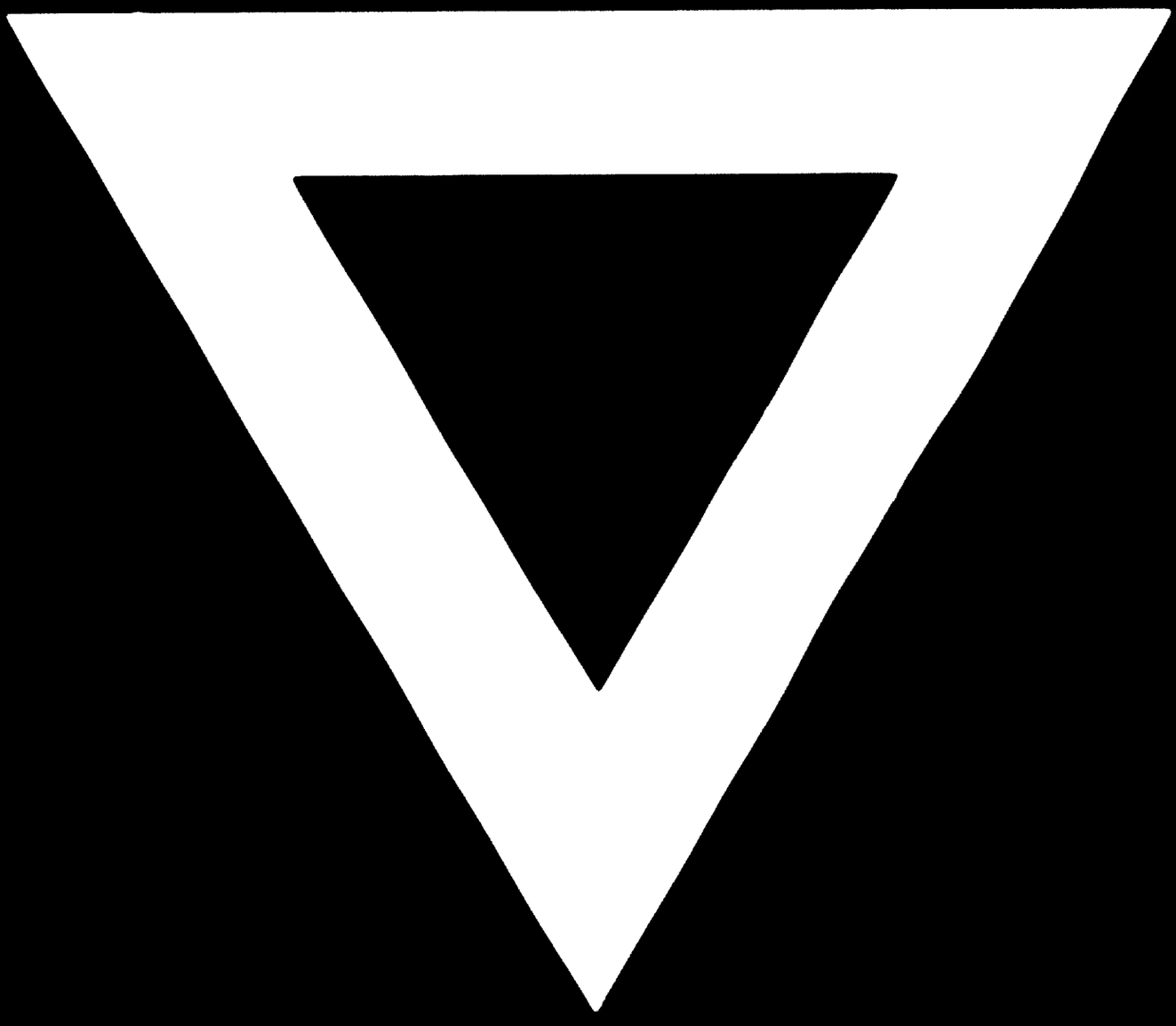
The consultant designed the attached rattan cooker cum boiler unit and interested a local firm (Messrs. Barata Metalworks and Engineering P. T. (Ltd) of Jalan Kapetan P. Tendean 14, Kebayoran Timur, Jakarta) to produce it.

The cooker should be made from welded mild steel plate, and mounted on a steel frame. The boiler should be made from special boiler plate and have a maximum working pressure of 60 psi and be equipped with a water level gauge, a pressure gauge, a safety valve, a release valve and be mounted on a steel frame lined with fire bricks.

The price quoted (in November 1975) for this unit, including tax, delivered and installed in Jakarta was Rp 3,500,000.


FIRE RESISTANT CEMENT
ATMOSPHERE
4.2 atm
1.6 m³
3000

C-273



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