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Technical Meeting on the Selection of
Woodworking Machinery, Vienna

19 - 23 November 1973

NEEDS AND CONDITIONS OF THE WOODWORKING INDUSTRIES 1/

OF THE PHILIPPINES

by

Horatio P. Brion

Sarmiento Industries, Inc.
Cotabato, Philippines

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**NEEDS AND CONDITIONS OF THE WOODWORKING INDUSTRIES
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SUMMARY

The woodworking industry is described in some detail following the three categories - sawmilling, kiln-drying and furniture and joinery. The number of establishments, the employees and outputs are given along with general comments on trends. The importation of secondary wood processing machinery is also examined.

The problems for each size group are discussed in some detail, with particular emphasis on labour and financing difficulties and the inability of local machinery representatives to give technical advice on lay-out and production queries and proper maintenance information. The difficulties of the medium and smaller firms to expand are explained in terms of expected net profit following mechanization and greater production.

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The industry's machinery requirements are listed as: degree of automation determination, operation and maintenance logistics, operator training; capacity of firms to acquire, maintain and support operations with adequate spare parts, i.e. finance. Such things as duty-free importation of machinery and a one-year supply of spare parts plus tax credits on consumable mill supplies are suggested for the larger firms that are or should be export oriented.

The smaller, domestic market oriented firms need more precise machinery, better surfacing and higher output, to improve their position. Multi-purpose machinery should be made available if their overall depreciation costs do not increase by more than 5% as a result of their acquisition. Suppliers can help by stocking items needed by firms of this size - thus reducing the burden on the individual.

The Government's programme to encourage local wood processing firms is described. The supply of technical managers and labourers is deemed adequate to create a healthy industry.

The position of Philippine equipment makers is discussed. Most firms make woodworking equipment as only a part of their production.

The design and technical aspects are dealt with, and it is reported that the general features are those of European and American models of 5 to 8 years ago. Lack of adequate casting facilities for massive frames is a problem, and it is reported also that the service lives are thus reduced by some 30%. Precision of bandmill carriages suffers, feed speeds are slower and control systems are less modern. The prices are, however, attractive.

Kilns are made locally but do not render sufficiently low and reliable moisture contents for export.

The manufacture of secondary processing machinery is concentrated in Manila and suburbs. Small planers, hand fed jointers, four headed moulders, drill presses, table saws and horizontal bed sanders are made by one company, while others have introduced stroke sanders, dry-type spray booths, guide frames for dove-tailing routers.

Similar comments on precision, surface quality (low number of knife marks per inch for planers) and reliability are made for these as for sawmilling equipment. Comments concern technical adaptations or shortcomings of the main types of equipment made locally.

The lack of an organized marketing programme has hindered development of this industry and the active support by the Government of the Metal Industries Development Council (MIDC) should provide a good start to improving the design and acceptance of locally made machinery for the wood industries.

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I. THE INDUSTRY

A representative picture of the woodworking industry of the Philippines may be obtained through a survey of the three major activities, sawmilling, kiln-drying and furniture and joinery, which are currently accepted as the basic processing components of the industry.

These activities have gained more attention from the Philippine government and private investors in the past few years, culminating in the passing of the Investments Incentive Act of 1967 and the Export Incentive Act of 1970, which encourage (through incentives) Philippine and foreign investors to invest and engage in selected agro-industrial endeavours, one of which is the wood-processing industry. Thus, data on the industry since 1969 are considered significant to this study, in as much as the impact of the Philippine Government programme started to lend impetus to the progress of the wood-processing industry in 1969.

A. The Philippine Sawmilling Industry

There were approximately 374 sawmills in the Philippines in 1969, with an aggregate capacity of 1,975 million board feet of sawn-lumber per year (4.658 million cu.m. lumber per year). 146 of these sawmills had capacities less than 6,000 BF (14 cu.m.) per day, while only 6 had capacities exceeding 25,000 BF (59 cu.m.) per day.

It was estimated that these sawmills were used at no more than 32% of the aggregate capacity, so that only 620.97 million board feet (1.464 million cu.m.) of sawn-lumber were produced during 1969. Of this output, 62 million BF (or 146,200 cu.m.), a little less than 10%, were exported and provided the Philippines with a revenue of \$ 9.9 million, while the balance of 90% was presumably absorbed by the domestic construction and furniture industries.

By 1970, Philippine lumber production had reached 800 million BF (1.9 million cu.m.), of which 78.79 million BF (185, 800 cu.m.), valued at \$ 9 million, were exported. The same year showed a 27% increase in volume of sawn-lumber exports but a decrease of

8.9% in value as compared to that of 1969. Once again, domestic construction and furniture industries presumably used the balance of the year's total lumber output.

In 1971 a 24% decrease in export volume of the Philippine sawn-lumber was registered as compared to 1970. Fortunately, however, the increased lumber prices in the foreign market effected a 7.8% increase in the value of the Philippine lumber exports for the year, thus helping the wood products exports (logs, lumber, plywood, etc.) to maintain its position as the premier dollar-earning industry of the Philippines.

The growth of sawmilling facilities, however, failed to match the increase in sawn-lumber output. In 1969, there were about 50 sawmills exporting lumber, of which only 13 mills exported 1,000,000 board feet (2,360 cu.m.) or more. By 1971 the total number of sawmills was barely 7% above the 1969 figure, with a significant increase both in the number of mills exporting lumber (roughly 20% increase over 1969) and the number of mills (23) exporting 1 million board feet or more.

Current trends indicate more forward integration among the mills engaged in lumber export. In Mindanao alone, there are at least 6 firms which are presently expanding their sawmilling operations to support the requirements of both lumber and wooden products (blockboard, mouldings, door jambs etc.). Apparently, this is a result of Republic Act No. 6135 passed by the Philippine Congress, which grants a number of benefits, such as incentive, to firms engaging in secondary wood-processing activities such as: duty-free importation of machinery and equipment, accelerated depreciation, tax credits of various natures, etc.

Japanese and English brand sawmills predominate in Mindanao, while Philippine-made bandmills, edgers and trimmers are used by the smaller sawmills in the Visayan Islands and Manila suburbs.

B. The Philippine Kiln-Drying Industry

Kiln-drying is a relatively new industry in the Philippines. More than five years ago, there were less than ten firms engaged in kiln-drying in the Philippines. Two of these were located in the island of Mindanao, three in the Visayan islands, and the rest were located in the city of Manila and suburbs.

Presently, however, kiln-drying has been recognized as the prime solution to stability problems presented by Philippine mahogany lumber when exposed to extra-tropical latitude atmosphere. Furthermore, domestic home-builders have lately recognized the advantages of kiln-dried lumber as a construction material.

At present, there are seven firms engaged in kiln-drying on the island of Mindanao alone, producing approximately 8.25 million board feet (19,457 cu.m.) of kiln-dried lumber per month. A recent survey in Mindanao showed that at least three more firms have plans or have actually started to erect kiln-drying facilities to give an additional combined capacity of 3 million board feet (7,075 cu.m.) of lumber per month. About 80% of these capacities are programmed for export purposes.

Another firm in the Visayan islands has recently embarked upon an expansion programme to double its kiln-drying capacity to roughly 6 million board feet (14,150 cu.m.) per month, purely export - oriented.

Other firms in the island of Cebu (major province in the Visayan Islands) have plans to or have actually started to expand their kiln-drying facilities to add an aggregate capacity of 1,500,00 board feet (3,530 cu.m.) of kiln-dried lumber per month.

No significant increase in kiln-drying capacity has been noticed in Manila and suburbs.

The trend towards the expansion of kiln-drying output is thus concentrated in the timber-rich southernmost island group of Mindanao and the nearby Visayan islands.

American and German kilns are mostly used in Mindanao-based firms, while Philippine-made kilns predominate in the Visayan islands, with only one firm (formerly American-owned) using kiln-driers of American design and manufacture.

Again, it may be noted that the incentives set by the Philippine government for firms engaging in more advanced wood products manufacture were the motive force behind accelerated growth of the Philippine kiln-drying industry during the last three years.

C. The Philippine Furniture and Joinery Industry

The Philippine furniture and joinery industry is a distinctly segmented and fragmented industry composed of working units ranging from primitive family-operated cottage-industry outfits using only hand tools, up to a few modern fully mechanized furniture plants with full conveyer facilities comparable to those in the United States and Europe. This cross-section is better summarized by the size of the labour force in each working unit. A recent survey (1970) of the industry showed that there were ten large manufacturing units employing more than 100 workers, the largest of which employed more than 600 workers. (For purposes of this study, this group of woodworking firms shall be identified as Group A). The next group, (Group B), comprising some 60 firms, employed a labour component of less than 100 but more than 10 workers. Group C, numbering 1,600 registered units, was composed of the family-operated cottage-industry units employing less than 10 workers per manufacturing unit. It was further estimated that there were another 2,500 small working units scattered all over the country, which were registered with the Philippine Department of Commerce and Industry, catering to the domestic furniture and joinery requirements of the home-building industry in places far from urban centers of population.

While approximately the same number of working units under Group C are still in operation today, our industry-wide shift in working units is reflected as follows:

- a) There are now more than 25 manufacturing units in Group A, each employing more than 100 workers;

- b) 70% of the increase in size of Group A working units is due to the establishment of the new woodworking plants under the 1970 Export Incentive Act of the Philippine Republic.

The remaining 30% were formerly Group B units which have expanded their operations to include furniture products for export as a result of the Export Incentive Act of 1970.

- c) There was also a significant 15% decrease in the number of operational firms under Group B. Upon closer investigation, it transpired that tight competition has forced a good number of Group B firms to cease operations. They could not afford to invest in more mechanized operations in order to make up for the crippling increase in raw materials costs (averaging 45% from 1970 to 1972) by reducing labour costs through the use of more modern equipment.

D. Philippine Importation of Machinery for the Secondary Wood-Processing

Table I shows the annual Philippine importation of woodworking industry equipment from 1965 to 1968. The industrial situation and past trends as discussed above are clearly corroborated by the facts shown in Table I.

Table 1

Philippine Annual Importation of Equipment,
Accessories and Spare Parts
for the Woodworking Industry
(in US\$ 1,000, FOB Value)

<u>Year</u>	<u>Sawmilling</u>	<u>Kiln-Drying</u>	<u>Woodworking and Joinery</u>	<u>Industry Total</u>
1965	\$ 1,285	\$ 57	\$ 2,669	\$ 4,041
1966	1,004	21	2,201	3,256
1967	1,438	15	2,757	4,210
1968	1,359	54	3,225	4,638
1969	2,929	136	4,180	7,245
1970	2,570	178	4,693	7,441
1971	1,908	230	7,917	10,005

Using 1965 as the base year, index = 100, the importation trend is summarized below:

Table 2

<u>Imported Equipment Group</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
Sawmilling Equipment	100	78	112	106	228	200	148
Kiln-Drying Equipment	100	24	17	62	156	205	264
Woodworking and Joinery Equipment	100	82	103	121	157	176	297
Industry Total	100	81	105	116	181	186	251

The sources of equipment, in percentage of total annual importation (FOB) are as follows:

Table 3

Countries of Origin and Corresponding Values of
Philippine Imported
Sawmilling, Kiln-Drying,
and Woodworking Equipment
(Percent of Total Annual FOB Value)

<u>Country</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
U S A	79%	31%	56%	53%	43%	39%	62%
Japan	12	11	36	11	27	27	19.6
Fed.Rep.Germany	5	2.6	2.5	16.7	7.7	11.33	6.9
U K	1.8	0.2	0.06	0.02	0.17	2.96	0.54
Switzerland	2.199	0.03	2.21	5.65	10.40	10.14	3.57
Sweden	0.001	-	0.06	10.4	4.6	7.62	0.06
Australia	-	-	1.09	2.1	0.12	0.92	1.87
Others	-	-	0.08	1.13	7.01	0.23	5.46
Total	100%	100%	100%	100%	100%	100%	100%

It is to be noted in Table III that the United States of America was, and still is, the primary source of equipment for the industry. However, its share of equipment in the Philippines shows a significant decline from 1968 onwards, with a corresponding increase in the share of other supplier countries, notably Japan, the Federal Republic of Germany and Switzerland.

II. PROBLEMS OF THE INDUSTRY

In spite of the incentives provided by the Philippine Government to encourage the growth of the sawmilling, kiln-drying and woodworking industry, the growth of the industry has been hampered by several problems which beset it from the equipment point of view. These problems, enumerated in their order of severity, are as follows:

- a) Dearth of financing sources;
- b) Comparatively low level of technological development to appreciate and adequately support operation of the modern sophisticated equipment;

- c) Short supply of adequately trained labour to operate the equipment; and
- d) Inadequate technical and sales service made available by machinery suppliers or their Philippine representatives.

These problems are discussed in the succeeding paragraphs as they affect the industry groups defined in the first few paragraphs of this paper.

A. The equipment problems of firms in Group A

To reiterate, Group A firms include those employing 100 or more workers per working unit. Potential additional members of this group come from three sources:

- a) The top 10% of Group B;
- b) Logging firms, backed by sufficient timber concessions, now engaged in sawmilling (to comply with the minimum requirements of the Philippine Government) and presently exporting logs and air-dried lumber. Faced with tough competition in the foreign log market from Indonesian and Malaysian logs, and apprehensive about the rising unit logging costs brought about by increasing labour and heavy equipment spare parts costs, these firms are now realizing that the Philippine Government has offered them a means of survival in the industry through the Investment Incentive Act of 1967 and the Exports Incentive Act of 1970, if they embark on forward integration of their activities;
- c) Agro-industrial firms engaged in the manufacture of plywood and backed up by sufficient timber concessions, which are meeting tough competition from foreign competitors, and are desirous of improving their profit pictures through the maximization of the use of their timber cuts by engaging in the woodworking industry.

It is estimated that there are now more than 25 of these firms. The implementation of their desires and plans, however, has either moved slowly or has been deferred to some future date

because:

- a) The firms in this group which have adequate financing resources find it difficult to find locally the required technical help in preparing and implementing the study which will serve as the basis for the realization of their plans for forward integration;
- b) The firms in this group which do not have existing adequate financing resources find it almost impossible to finance their plans for forward integration or expansion from local sources under the current tight credit situation in the Philippines;
- c) The firms which have found adequate financing sources are faced with the problem of competing "tooth and nail" with existing furniture firms in urban areas for little skilled labour available which is necessary to run the machines and successfully implement their plans for forward integration;
- d) The local supply of skilled woodworking labour cannot adequately meet the increasing demands of the expanding modernizing woodworking industry of the Philippines, as there are only two schools in Manila and the suburbs with limited enrollment capacities which provide their graduates with sufficient training for modern wood-processing plants. All other vocational schools are oriented towards the cottage industry where hand tools are used for furniture production;
- e) Except for a few local representatives of foreign suppliers of wood-processing equipment, potential Philippine customers are frustrated by the inability of the suppliers to provide them with adequate technical advice on the choice and lay-out of the equipment, not to say anything about the unsatisfactory level of the representatives' knowledge of the best way of using their suppliers' equipment on the production line. Furthermore, Philippine customers have most regrettably found it hard to get the suppliers' representative to provide

proper equipment maintenance services.

B. The Equipment problems of firms in Group B

The top 10% of the firms in Group B (employing more than 10 but less than 100 workers) have more or less the same problems as those in Group A.

The middle bracket of firms in Group B, numbering about 45 firms and employing between 50 and 100 workers, present a problem peculiar to themselves. Briefly, these firms may be pictured as follows:

- 1) They have a good share of the local furniture and woodprocessing market, (estimated at 20% in 1971), yet they are not yet in a position (financially and technically) to compete in the export furniture business;
- 2) Their unit-cost breakdown indicates potential cost savings which may be realized through mechnization of their operations, thus helping to increase their individual output volumes; and
- 3) These firms are desirous of expanding their operations but cannot do so as their small assets would not be readily accepted as collaterals for loans needed to finance their expansion programmes.

A representative profit picture of the firms in the middle bracket of Group B is summarised as follows, in terms of per cent of a group sales:

Gross Sales		100 %
Less: Local sales taxes		<u>2</u>
Net sales		98 %
Less: Cost of raw materials	40 %	
Cost of labour	18	
Depreciation	5	
Other overhead costs	15	
Selling costs	<u>5</u>	
Total Cost		<u>83 %</u>

Gross profit before taxes	15
Less: Income tax (35% of gross profit)	2.25
NET PROFIT	<u>12.75</u>

However, with the use of multi-purpose wood-processing machinery, this group of firms can expect a significant reduction in material wastage, increased sales owing to improved product quality, lower unit labour costs thus:

Gross sales		100 %
Less: Local sales tax		2
Net sales		<u>98 %</u>
Less: Cost of raw materials	35 %	
Cost of labour	10	
Depreciation *	6	
Other overhead costs	12	
Selling costs	<u>4</u>	
Total costs		<u>67 %</u>
Gross profit before taxes		31 %
Less: Income tax (35% of Gross Profit)		10.85
NET PROFIT		<u>20.15%</u>

NOTE: * This slight increase in depreciation costs, despite the added fixed capital costs arising from the purchase of new woodworking machinery, is based on figures obtained from two of the author's former clients, whose firms belong to the middle bracket of Group "B". The resultant expected increase in depreciation costs was small, owing to more than 25% increase in output volume.

Without mechanisation, firms in the middle group sell an average of \$ 10,000 worth of furniture each month. Based on the writer's experience with former clients in the furniture industry in Manila and suburbs, mechanisation involving the use of multi-purpose pieces of equipment worth at least \$ 30,000.00 and a

corresponding minimum outlay of \$ 7,500.00 on the improvement of building and production fixtures, production volume was increased to support a sales volume of \$ 12,750.00 per month.

Those firms in the lowest bracket of Group B employing less than 50 but more than 10 workers were found to be economically incapable of mechanization.

C. The Equipment Problems of firms in Group C

These firms, each employing less than 10 workers, like those in the lowest bracket of Group B, are neither financially nor technically in a position to mechanize as they operate without almost any overheads. The workers in these firms are usually members of the family or near relatives who reciprocate the firm owner's provision of board and lodging and the other bare necessities of life by helping in their benefactor's furniture-making activities.

III. THE INDUSTRY'S MACHINERY REQUIREMENTS FROM THE OPERATIONAL POINT OF VIEW

This problem shall also be treated with respect to the industry groupings described in previous paragraphs. The data presented in this part of the study is drawn from the writer's experience with clients over the last five years. The problem presentation shall include the following:

- a) Equipment types considered most effective for the industry bracket, including the degree of automation and conveyerization;
- b) Logistics required for the effective operation and maintenance of the machinery;
- c) Available labour skills and their ability to properly operate and maintain machinery; and
- d) The firms capacity to acquire the machinery and support its operations with spare parts and mill supplies.

A. The export-oriented group of firms

This group includes:

- 1) Firms in group A as described previously, and
- 2) The top 10% of the firms in group B.

These are the firms in the Philippine Woodworking Industry which are currently in the export business, or have the potential to gear their operations to export trade. The equipment requirements of this group will therefore be largely dictated by the type of products they intend to market abroad. Since the fundamental requisite of foreign wood products markets is volume, the advantages of local low labour cost will have to be ignored by firms in this group if they are to meet such volume requirements. Thus, the degree of mechanization in the firms in this group is sorely limited only by the envisaged volume of sales.

Although all these firms maintain offices in Manila and suburbs, some 95% of them have located their factories nearer to the supply of raw materials (logs), i.e., far from the urban centers of the Philippine population. This requires the maintenance of sufficient inventories of spare parts and mill supplies and an industry average stock of roughly two - to - three months supply, at the minimum, all the more so as all spare parts and mill supplies are imported into the Philippines. The Philippine Government through the Investment Incentive Act of 1969 and the Export Incentive Act of 1970, provides that firms registered with the Philippine Board of Investment enjoy such privileges as follow:

- a) Duty-free importation of machinery and equipment;
- b) Duty-free importation of one-year supply of spare parts if imported together with the equipment; and
- c) Tax credit on consumable mill supplies, such as all types of knives, bits and abrasives, necessary to the attainment of production targets approved by the Board of Investments.

The types of equipment needed by this group of firms are thus no different from comparable woodworking firms abroad, the degree of automation and conveyerization depending on the targeted

volume output and production of each firm.

Availability of skilled labour in these firms has become a serious problem lately, owing to their inability to attract skilled labour from its main source, i.e. the few training schools located in urban centres of the population. Furthermore, there is no formal training school for joiner/cabinetmakers. Skilled labour pirating is frequently practiced by the firms which are financially able to offer the skilled labourer more in terms of basic pay and fringe benefits. This problem, however, is not impossible to solve. The machinery suppliers can provide the training skill which can be arranged to the benefit of both machinery suppliers and user.

Any Philippine firm which applies for registration with the Board of Investments has to prove beyond reasonable doubt its ability to financially support the operations required by its registered capacity. Thus, it can be interpreted, that a secondary processing wood firm registered with the BOI has a good chance of survival and is usually in a position to shoulder the financial outlay required by automation and conveyerisation.

B. Domestic - market - oriented firms

Firms in this group are usually located near urban centres of population and their total output is sold in the domestic furniture market. The firms in this group with good mechanisation potential, are those in the middle bracket of Group B, as described in previous paragraphs.

Restricted by their small financial capabilities, these firms could engage only in limited mechanisation programmes. Thus, high-volume machinery and specialised forms of automation and conveyerisation are not within the capabilities of these firms. The equipment requirements of these firms may be gleaned from the following observations and end-products:

- a) Mediocre grade of joinery, requiring more precision cutting machines;

- b) Poor surfacing on table tops and exposed flat cabinetwork, requiring better precision planers, jointers and sanders;
- c) Low-volume output due to high labour content (in terms of man-hours) of the end-product, and
- d) Mediocre grade of finish despite the availability of good quality finishing materials.

It is estimated that less than 10% of these firms have planers and/or jointers; that about 90% have home-made saws and almost all these firms use hammers and chisels to make their mortices and tenons. Only 15% use spraying equipment, all the rest resort to brushing and ball-rubbing (french-polishing) to attain a smooth finish on their products.

Considering the foregoing conditions and restraints, it appears that this group of firms will be in a position to support a limited degree of mechanization if:

- a) Multi-purpose milling and surfacing equipment are made available to them at costs and payment terms which will effect no more than 5% increase in their depreciation costs (based on the government accepted 10 year depreciation period);
- b) Arrangements can be made whereby the level of skills in these firms can be up-graded through in-plant training schools which will impart knowledge on the use of the types of machinery suggested above;
- c) Since these firms cannot afford to finance an adequate inventory of spare parts and mill supplies, the suppliers can help by stocking the items needed by these firms. This system is deemed feasible as the secondary wood-processing units in this group are located near to urban centres where the machinery suppliers maintain their offices and stores.

IV. THE PHILIPPINE GOVERNMENT AND THE WOOD-PROCESSING INDUSTRY

As mentioned in previous paragraphs, the Philippine Government has taken concrete steps to encourage local wood-processing firms to engage in the export business. The application of these incentive grants have lately been extended to firms which are partly foreign-owned.

However, probably due to the high level of unemployment in the Philippines, the government has not yet taken steps to encourage large volume production of furniture products for domestic consumption. On the other hand, Government financing agencies have been encouraged to support cottage industry with limited loans (with liberal re-payment terms) up to a maximum ₱ 100,000 (roughly US\$ 15,000).

The Philippine Government's economic programme is thus more partial to dollar-earning firms, in an effort to preserve its foreign monetary reserves at a desirable level. Thus, it is understandable that the Philippine Government is trying hard to convince Philippine log exporters to shift to forward integration and export processed lumber products which command higher dollar earnings and are expected to keep unemployment at manageable levels.

V. THE SUPPLY OF TECHNICAL MANAGERS AND LABOURERS

Presently, there are more than 20 technical schools in the Philippines offering courses in engineering and industrial management. These schools train more than 2,500 engineers annually. Furthermore, there are about five schools offering graduate courses in business and industrial management with an output of more than 20 graduates per year. Thus, it can be asserted that there is an ample supply of technical managers to support the industrialization programme of the Philippines.

However, the principal personnel problem confronting the Philippine wood-processing industry is the adequate supply of skilled and highly-specialized labour required by any expansion programme. This is an area which concerns everybody: the Philippine Government, the wood processing firms and the machinery suppliers,

hand-in-hand with the United Nations technical assistance programme should tackle and solve immediately. It does not stand well to reason why a country, such as the Philippines, which is so rich in timber resources, is still lagging 20 to 30 years behind in wood processing technology!

VI. PHILIPPINE-MADE EQUIPMENT FOR THE WOODWORKING INDUSTRY

A. SAWMILLING EQUIPMENT

Two medium sized firms have been engaged in the manufacture of sawmilling equipment during the last ten years. Both of these firms are located in the suburbs of Manila. Lately, however, a number of smaller firms from the neighboring city of Calococan have entered the field of sawmilling equipment manufacturing starting with the fabrication of edgers and trimmers. All of these firms also manufacture equipment for industries other than the sawmilling industry.

1. Volume of Business

Accurate figures on the total value of sawmill equipment produced in the Philippines are not readily available. However, approximate figures were collated from data obtained from the following sources:

- 1) Mr. J. A. Tan, President and General Manager of J. A. Tan Machineries, Inc., Pasay City;
- 2) Officials of Mackay Machineries, Inc., and Grace Park Engineering Works, Inc., Calococan City.

These figures, combined with data from Philippine government agencies, ^{10/} gave the following estimate of annual volume:

<u>EQUIPMENT</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
Headrigs and Carriages	₱1,500,000	₱3,600,000	₱2,300,000
Band Re-Saws	875,000	2,325,000	2,200,000
Slashers, Edgers and Trimmers*	315,000	565,000	325,000
Others (includes powered conveyor)*	425,000	625,000	428,000
TOTALS	₱3,115,000	₱7,115,000	₱5,253,000

Equivalent Dollars

(US\$ 1 = ₱ 6.75) US\$461,500 US\$1,054,100 US\$ 778,200

NOTE: * These figures include pieces of equipment fabricated "insitu" by sawmill firms.

2. Design and Technical Aspects

Philippine-made head-rigs are the product of several major constraints presented by the state of Filipino metalworking technology. General design features would compare to those of American and European brands about five to eight years ago. So far no serious investment have been allocated by these manufacturers towards the design of machines which are adapted to Philippine conditions and species. Lack of adequate casting facilities prevent the construction of frames massive enough to prevent undesirable vibrations in the machine while in service. Machining facilities permit the fabrication only of medium-sized head-rigs with capacities up to 54" (1370 mm) log diameters at the maximum.

A common experience among users (mostly Chinese-owned sawmills) of Philippine-made head-rigs ^{2/} indicated 30% shorter service life under normal operating conditions as compared to similar American and Japanese pieces of equipment. The design features of Philippine-made head-rigs have not changed much during the last five years. Any improvement would be a copy or

"near-match" improvisation of similar features in foreign made bandmills.

Bandmill carriages lack the precision of American and Japanese carriages, so that cutting tolerances of 1/16" (1.59 mm) to 1/32" (0.79 mm) are attained only during the first few months' life of the carriage. "Snaky" cuts tend to be the "rule rather than the exception" after twelve months' service of the carriage. Hence, it is not odd to find imported bandmill carriages used with Philippine-made head-rigs.

Band re-saws usually are smaller editions of band head-rigs, fitted with powered serrated feed-rollers. The most common size have capacities ranging from 3" (76 mm) to 6" (152 mm) thickness x 4" (101 mm) to 10" (254 mm) width. Feed speeds are about 20% to 25% slower than comparable foreign-made machines.

Edgers usually have a maximum of three saws mounted on the same shaft, with the left and centre saw blades fixed and the right sawblade movable. Control for the movement of the right sawblade is rather antiquated as compared to foreign brands, manipulated through a system of levers located behind the feed table and giving width accuracies ranging from 1/8" (3.17 mm) to 1/2" (12.7 mm). Frame ends are usually welded channels and angle irons, and in some later models are made of cast iron.

Cut-off saws (trimmer) are usually of the pendulum type manually moved towards the operator to cut lumber and with a counterweight behind to help put the sawblade back to its original "ready/stand-by" position. Framing and supports are commonly made of angle iron. Sawblades up to 16" (406 mm) in diameter are used on these saws, and have speeds from 1,800 to 2400 RPM.

Gang slashers are usually made according to customer's specifications and use sawblades up to 24" (611 mm) in diameter. Saw arbor speeds usually are between 1800 and 2400 RPM.

3. Pricing

In view of the big difference in machine quality and specifications between Philippine-made and foreign brand sawmilling equipment, there is no sound basis for price comparison at present. However, the following figures obtained from the files of L. S. Sarmiento Co. Inc. in Davao City, will give an idea of costs for a complete set of sawmill equipment with a capacity of 10,000 Board Feet (23.6 cu.m.) of lumber per 8-hour shift.

A Philippine firm from the suburbs of Manila quoted ₱472,000 (US\$ 69,926.00) for the set of equipment, complete with motors but without the materials conveying apparatus and fixtures.

B. KILN-DRYING EQUIPMENT

Manufacture of kiln-drying equipment in the Philippines is centered in the City of Cebu and suburbs, located in the island of Cebu, which belongs to the central group of islands known as the Visayan islands. This kiln-drying equipment is basically of the hot-air convection type, single-direction air flow.

1. Volume of Business

Again, reliable figures on the volume of business for Philippine made kiln-drying equipment during the past few years are not available. Based on interview with owners of such equipment in the City of Mandawe, province of Cebu and in Davao City, and combined with data obtained from one of the manufacturers in Cebu City, two to three kiln units with 30,000 board feet (70.75 cu.m.) per charge capacity could be a realistic annual average. No reliable peso-values are available.

2. Design and Technical Aspects

Basically, Philippine-made kiln-driers are made for Philippine Equilibrium Moisture Content (EMC) conditions, 14% to 16% MC, and are not reliable when drying lumber for export purposes (8% to 10% M.C.). The equipment set consists essentially of:

- (a) Air-circulating fans fabricated from heavy gage galvanized iron or black-iron sheets, together with the driving motor, in V-belt and pulley system;
- (b) Heat exchangers and steam headers made from B.I. or GI pipes; and
- (c) Baffles to direct airflow, made from G.I. sheets or asbestos boards.

Sometimes, if the customer so desires, a second-hand boiler is included in the package deal which covers installation and trial run.

The kiln housing usually is constructed on the site and made of reinforced concrete and/or concrete hollow blocks. Air exchange between the kiln-drying chamber and the surrounding atmosphere is effected through manually controlled vents.

Temperature and humidity controls are not included in the package. Thus, where the customer cannot afford to import known brands of temperature and humidity control devices, kiln-drying operations are done merely on a trial-and error basis.

Kiln-trucks are cast in foundries located in the City of Caloocan (north of Manila) and are usually purchased by the customer separately from the kiln-drier. Kiln rails are usually of the 25 to 30 lbs per yard size and imported.

3. Pricing

Data available from the sources mentioned in II-A above showed a 200% increase in the price of Philippine-made kiln-driers from 1968 to 1971. A 30,000 BF capacity kiln (without boilers and controls) cost roughly ₱ 50,000 in 1968, while the same unit cost ₱ 110,000 in 1971 (based on figures supplied by officials of De Luxe Lumber Co., Tibungco, Davao City). No other data on prices is readily available.

C. WOODWORKING MACHINERY

The manufacture of woodworking equipment in the Philippines is concentrated in Manila and suburbs. Small size planers up to 24-inch (610 mm) width capacities, hand-fed jointers up to 6-inch (152 mm) width capacities, 6 inch (152mm) four-head planer-matchers, various sizes of drill presses, tables saws, and horizontal bed sanders are among the products of J. A. Tan Machineries and Mackay Machineries; Sigma Engineering started manufacturing stroke sanders and dry-type spray booths in 1970; while Grace Park Engineering has been producing straight knife grinders, table saws, horizontal bed sanders, drill presses and guide frames for dove-tailing routers during the last three years. The present sudden upward trend (since 1969) in the Philippines woodworking industry has provided impetus to the local manufacture of woodworking equipment. Again, it should be noted that the above-named firms manufacture equipment for industries other than the woodworking industry. Thus, in view of the small volume of the demand for Philippine-made woodworking equipment, production is carried strictly on a job order basis. There is no organized marketing activity for the machines.

1. Volume of Business

Based on available data from government agencies ^{10/} and supplemented by interviews with officials or proprietors of the firms mentioned in the preceding paragraph, a rough estimate of the volume of business for Philippine-made woodworking equipment is given below:

1969	-	₱ 650,000.00	(US\$ 92,300.00)
1970	-	₱ 900,000.00	(US\$ 133,300.00)
1971	-	₱ 1,250,000.00	(US\$ 185,185.00)

Available figures for 1972 indicate a significant increase over 1971, showing roughly ₱ 1,500,000 (US\$ 222,220.00) for the first three quarters of 1972.

2. Design and Technical Aspects

(i) Surfacers

Philippine-made planers, planer-matchers and jointers are generally characterized by low number of knife marks per inch of surfaced material, so that the resulting surface quality could not pass for finishing work without a large amount of sanding to prepare the surface for the first coat of finish. Feed Speeds of planers and planer-matchers are slow compared to European models and much slower compared to American machines. These surfacers have a maximum of four knives per head. However, three knives per head appears to be a more popular model. Precision in thickening planers is definitely inferior to known foreign brands as the mechanism to raise the table is crudely fabricated so that, oftentimes, it is seldom possible to get accuracies of $1/16''$ (1.59 mm) and almost impossible to obtain a thickness tolerance of $1/32''$ (0.79 mm) on Philippine-made surfacers. However, the surfacing characteristic of Philippine-made planer-matchers have received a high degree of acceptance among local sawmills and lumberyards producing construction items such as T and G flooring, stone-cut and V-cut sidings, mouldings, etc. Window sash and door jamb manufacturers in Taytay, Rizal, however, have shown preference for imported machinery which can give them the higher joinery precision required by the lumber product.

(ii) Saws

Only two types of saws are manufactured in smaller quantities for commercial purposes in the Philippines. These are the table saw and the pendulum type cut-off saw. These saws usually carry 10" - 12" (254 mm - 305 mm) diameter sawblades and have arbor speeds from 1800 - 2400 RPM. Work is manually fed in both saws. Work holding fixtures are usually fabricated and installed by the customer to suit the requirements of his operations.

(iii) Sanders

Stroke sanders have been patterned after foreign designs. Only single belt stroke sanders have been produced, so far. These sanders use 6" (152 mm) wide belts at speeds 3,000 feet per minute. Performance is comparable to foreign brands. So far, only five units of this model have been fabricated since 1970.

Horizontal bed sanders have a very limited commercial volume as its simplicity in design and construction makes it easily fabricated by furniture manufacturers themselves. Available figures indicate that only four units have been fabricated for commercial sale since 1970. These sanders use 10" (254 mm) belts, at the widest, and operate at belt speeds 2400 feet per minute, maximum.

(iv) Straight Knife Grinders

Only a few of these grinders have been manufactured in the Philippines. The users are furniture shops and in some cases, medium-size (5,000 to 10,000 panels per day capacity) plywood plants for grinding lathe knives. Over-all design is very similar to Japanese models and a remarkable degree of precision in grinding performance has been achieved. Sizes range from 24" (610 mm) to 96" (2438 mm) knife length capacity.

(v) Spray Booths

Dry type spray booths have been manufactured in the Philippines. The design is very close to De Vilbiss spray booths in the United States, with a few improvisations to suit Philippine conditions. At least six units, 12 ft. x 7 ft. and four units 6 ft. x 6 ft. x 7 ft. and four units 6 ft. x 6 ft. x 7 ft. have been manufactured for commercial purposes since 1970. Air velocities of up to 25 feet per minute have been attained inside the spray booths.

D. THE INDUSTRY'S PRESENT PROBLEMS, ITS POTENTIAL AND FUTURE

It can be gleaned from the preceding paragraphs that the woodworking equipment manufacturing industry of the Philippines has two major problems at present:

(i) Technological

Both in manufacturing skills and production facilities, which should be greatly improved to attain machine quality that could meet industry-wide standards; and

(ii) Marketing

Lack of an organized marketing programme prevents the industry from getting a bigger share of the Philippines market for wood-working equipment. (It is estimated that Philippine-made wood-working equipment gets less than 10% share of the total business in the Philippines). The writer feels, however, that any headway in the solution of the marketing problem can be made only if an appreciable amount of progress is attained in the solution of the industry's technological problems. The Philippine government has made a concrete step in this direction through the creation and active support of the Metal Industries Development Council (MIDC) where both government and private sectors are represented. The MIDC is expected to advise the President of the Philippines on matters pertaining to the development of the various phases of metal industry of the country. A good step for the woodworking equipment manufacturing industry, therefore, is to impress upon the MIDC the urgency of government and private support for the former's development programme, so that the government can put the industry on a higher priority level for its support. This move is deemed of paramount importance and expediency as it should be noted that the limited capital resources of the Philippines has forced the government to allocate the limited resources to sectors of the economy which are considered to deserve higher priority for more immediate benefits to the nation as a whole.

Technical skills should be improved through a more vigorous and accelerated programme of exchanges with nations more advanced

in the manufacture of woodworking equipment. It is believed that licensing agreement or joint-venture programmes between Philippine and foreign equipment manufacturers will hastily result in the improvement of Filipino technical know-how and, at the same time, lead to a better organized programme of marketing activities.

Among the various woodworking equipment lines manufactured in the Philippines so far, it appears that sawmilling equipment has attained a relatively more advanced stage of development. It is the opinion of this writer that it would give the industry a big forward push if the manufacture of sawmilling equipment is given development priority.

Secondly, as the trend of local and foreign demand for kiln-dried lumber has significantly increased during the last two years, it is believed that fabrication of kiln-drying equipment be also encouraged. This development should be concentrated more on the air circulation equipment, as the volume demand for the equipment would not support Philippine entry into the manufacture of temperature and humidity control mechanisms for kiln-driers. Again, joint-venture arrangements between Philippine and foreign manufacturing firms can help boost this programme, whereby, the air circulating components of the equipment will be manufactured in the Philippines, while the kiln design and temperature and humidity control mechanisms can be supplied by the foreign partner.


Among woodworking equipment now being manufactured by Philippine firms, it appears that surfacing equipment should be given more emphasis at present and within the next two to three years, primarily for the following reasons:

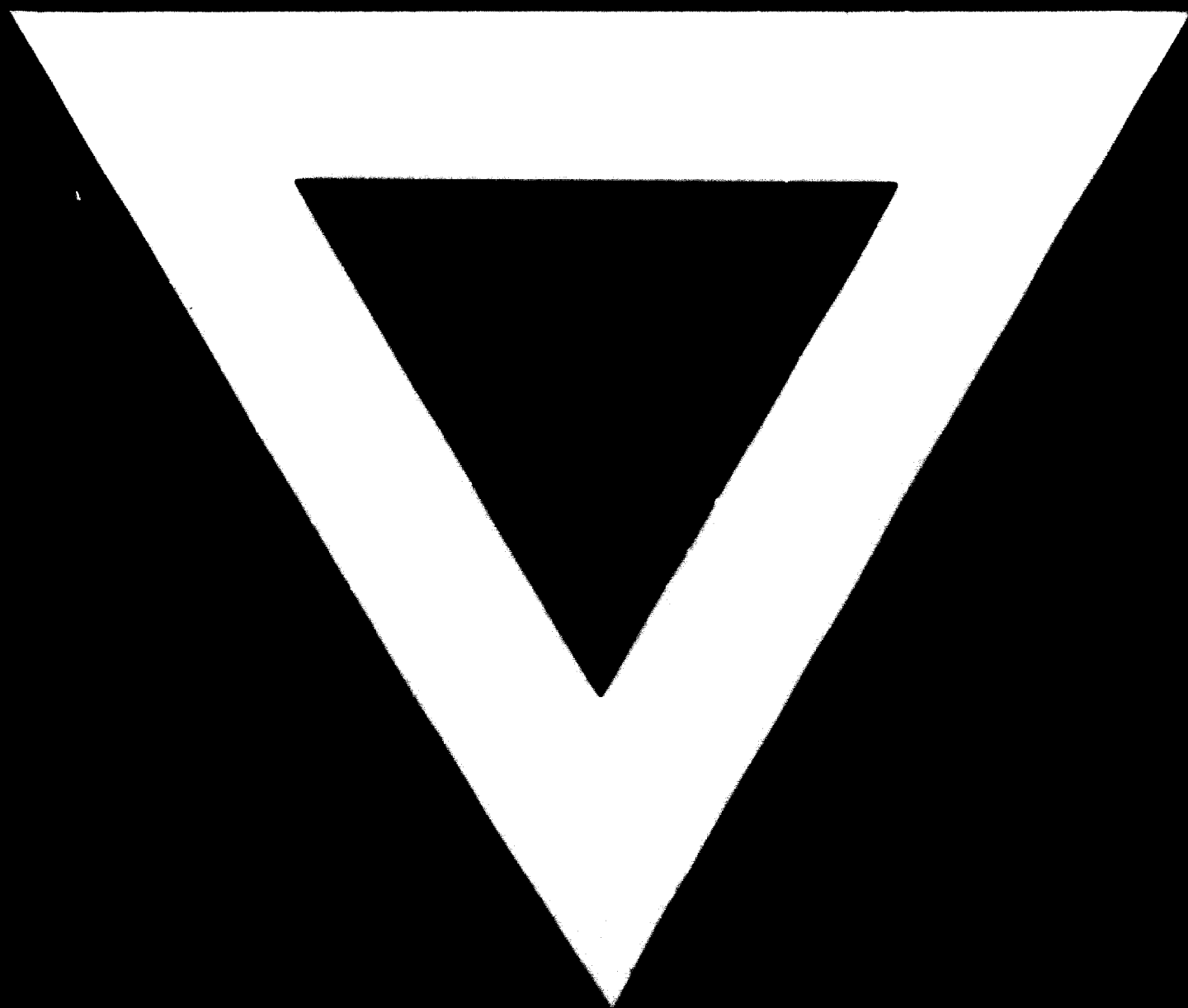
- a) Development of precision surfacing equipment takes a longer time than that for saws and drills, and requires a higher degree of technical know-how; and
- b) The present export market trend has created a heavy demand for surfacing equipment to produce door jambs, door stiles, mouldings, etc.

Thereafter, the development of more precision-oriented saw models should be encouraged.

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BIBLIOGRAPHY

1. BRION, H. P., "Report on the Philippine Kiln-Drying Industry", Sarmiento Industries, Inc. 1971 (Unpublished)
 2. BRION, H. P., COLACION, F., et al., "Reports on Plant Visits to Kiln-Drying Plants in the Visayan Islands," Sarmiento Industries, Inc., 1972 (Unpublished)
 3. CONSTANTINO, A. F., "The Wood Furniture and Wood Processing Industry in the Philippines, its Stage of Development, Problems and Future Trends," CFI Newsletter, Chamber of Furniture Industries of the Philippines, Inc., Vol. 1, Nos. 5 to 7, August to October, 1971.
 4. PIPA Lumber Statistics, 1969
 5. Registered Industrial Firms, Philippine Bureau of Commerce, 1970
 6. Report of the Department of Economic Research, 1970, Central Bank of the Philippines
 7. Report of the Department of Economic Research, 1971, Central Bank of the Philippines
 8. Reports on Equipment Importations, Philippine Bureau of Census and Statistics, 1965 to 1971.
 9. Report on the Philippine Industries, 1965, Bureau of Census and Statistics, Republic of the Philippines
 10. Report on Philippine Industries, 1971, Bureau of Census Statistics, Republic of the Philippines.
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