

A TROPICAL HARDWOOD LUMBER CONCENTRATION YARD

IN THE

SAIGON-BIEN HOA AREA

AN INVESTMENT OPPORTUNITY

IN

SOUTH VIETNAM

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## Preface

This is an investment opportunity identification study and should not be confused with a feasibility study. The following study identifies what USAID believes to be a potential investment which warrants more in-depth, detailed investigation and analysis. It is assumed that investors would make such detailed investigation prior to making a firm investment commitment.

Every effort has been made by USAID to use reliable information. Data developed in this study are believed to be accurate but USAID cannot guarantee their validity. Investors interested in implementing or otherwise acting on the information and findings contained in this study are cautioned to verify to their own satisfaction the data contained herein.

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INVESTMENT OPPORTUNITY IDENTIFICATION: TROPICAL HARDWOOD LUMBER  
CONCENTRATION YARD IN THE SAIGON-BIEN HOA AREA

1. INTRODUCTION

This is a survey report for the establishment of a tropical hardwood lumber concentration yard in the Saigon-Bien Hoa area. It discusses the forest potential of Vietnam, the availability of rough sawn hardwood lumber produced by existing small sawmills, the domestic and export markets for hardwood lumber, and the profitability prospects of a concentration yard buying and selling tropical hardwood lumber.

This study is based on the assumption that a well-established foreign firm that deals in tropical hardwood lumber will participate in the project as a joint venture with Vietnamese private capital. The foreign company would furnish the technical expertise, management, and an export market as well as equity capital.

The Vietnamese partners would be familiar with the forest resources and be able to assume operational responsibilities gradually.

This concentration yard would be export-oriented initially and later turn to the domestic market as the Vietnamese buying public accepts standard sizes and grades.

The sawmills in Vietnam operate on the custom sawn basis; if firm orders are not available, the mill does not operate. As a result, a concentration yard could, by standing ready to purchase lumber from two hundred or more small sawmills within trucking distance (100 kms), buy an estimated 60,000 cubic meters (m<sup>3</sup>) or more of export grade lumber annually that would have an estimated value of US\$4,500,000 F.O.B. Saigon.

Assuming gross sales of US\$4.5 million, the investment is projected to earn profits of \$748,000 on a total investment in yard facilities and working capital of US\$790,000.

II. SUMMARY, CONCLUSION AND RECOMMENDATIONS

SUMMARY

A. Availability of Tropical Hardwood Lumber

1. Standing Timber Reserves:

The examination of military air photos in 1967 by the Joint Development & Resources Group indicates a total of more than 12 million hectares (ha.) of forest lands. Of the twelve million ha., multi-canopy dense tropical hardwood cover 6.8 million ha., single-canopy tropical hardwood 3.2 million ha., mangrove and tram 0.6 million ha., and there is 1.1 million ha. of brush land and 0.1 million ha. of savannah type.

The bulk of the virgin forest lands are in the 17 northern provinces that make up the central highlands and the coast range. Very little merchantable timber occurs in the delta provinces but the 1.6 million ha. of dense tropical timber in the eastern region around Saigon-Bien Hoa are among the most productive and accessible.

It has been estimated by the timber experts that the eastern region of 1.6 million hectares of tropical hardwood contains from 150 to 250 cubic meters per hectare. Using the average of their estimates, the eastern region would have 320 million cubic meters of tropical hardwood timber. A list of major species of trees from which lumber is produced appears on page 2 in the Appendices.

#### B. Markets for Tropical Hardwood Lumber

South Vietnam is not a wood construction market per se. Traditionally homes are built of solid materials such as cement block and brick. Markets for any substantial increase in production must be sought in the United States, Japan, and Europe.

The high grades of many species of hardwood lumber can be competitive on the world markets assuming a realistic subsidy on exports. The lower grades will not be competitive in this form. However, cut to size, small component parts from the clear parts of low grade lumber will be competitive. A study to include this manufacturing process into the framework of the proposed concentration yard will be investigated at a later date.

Both clear hardwood lumber and "cut to size" component parts are "sought after" items in the world trade.

Assuming participation by a well-established foreign firm that deals in tropical hardwood lumber, there would be no question that the entire purchases of the proposed concentration yard could be sold abroad.

#### C. Capital Requirements

Assuming gross sales of US\$4.5 million annually, the total estimated capital requirements would be US\$790,000 with US\$521,000 for working capital, and US\$269,000 for yard equipment, facilities, transportation, office equipment, and furniture and fixtures.

#### D. Profit Prospects

Profits would vary as they are based on the volume of sales. Assuming sales of US\$4.5 million, the profits are estimated to be US\$750,000. Estimated profits are presented for three volumes of sales on page 14.

## CONCLUSIONS

Based on the data presently available and assuming the form of organization discussed in this report--a joint venture between foreign and Vietnamese interests with the foreign interest marketing the output abroad--a concentration yard in the Saigon-Bien Hoa area represents an excellent investment opportunity.

Profit levels are considered more than adequate to attract local lumbermen and experienced foreign capital.

For Vietnam, the concentration yard represents a significant opportunity to process locally produced green lumber for export. It offers an opportunity to gain valuable foreign exchange.

It also offers direct employment to approximately 40 Vietnamese and indirect employment to more than a thousand.

## RECOMMENDATIONS

1. That a copy of this study be sent abroad for wide dissemination and if interest is shown, prospective investors should be invited to come to Vietnam and meet prospective Vietnamese investors.

## III. FINDINGS OF THE STUDY

### A. Availability of Species of Hardwood Timber with Export Potential

The forests of Vietnam contain about 175 hardwood species that have commercial applications other than fuel wood. It is believed that about 50 of these species would produce merchantable export grade sawn lumber.

The timbers of Vietnam are classified into five broad categories. These are listed below with the legal production in 1969:

	<u>Cubic Meters</u>	<u>Percent</u>
Luxury	2,233	0.5
Class I	88,921	19.2
Class II	294,683	63.7
Class III	33,032	7.1
Unclassified	<u>43,850</u>	<u>9.5</u>
Total:	462,721	100.0

The actual production of saw logs was much larger. The percentages of legal harvested timber by classes does not represent the true species composition of the forests.

The Vietnamese buying public, in most cases, will not use Class III and unclassified timber for any permanent use.

These woods for the most part are light colored and not very durable. However, if lumber from these woods is freshly sawn from fresh logs and treated with a good fungicide and pesticide and air dried to 25% moisture content, it can be transported abroad in excellent condition and makes good substitutes for gums, oaks, birchs, and other low to medium density woods popular with the volume users of hardwood lumber.

At least 60% and as much as 80% of the sawlog size standing timber in the forest has commercial applications. This is a much higher percentage than normally found in tropical forests in other parts of the world.

Vietnam forests contain most of the species of timber found in other parts of South East Asia.

#### B. Price Structure

Vietnam does not have a ready cash market for standard size lumber.

Lumber is sold in the Saigon area by agents or salesmen representing the sawmill owners. These orders are usually for small amounts of custom sawn lumber of specified species. There are several small lumber yards in the Saigon area that carry stocks of lumber accumulated by sawmills sawing custom orders. This lumber is considered second-hand by the Vietnamese buying public and must be sold at a reduced price.

Current Saigon lumber prices are listed below. Each species represents the most valuable of its class.

##### Luxury

GO DO (Pahudia Cochinchinensis)	VN\$70,000 per m <sup>3</sup>
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##### 1st Class

SAO (Hopea Odorata)	VN\$32,000 per m <sup>3</sup>
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##### 2nd Class

DAU (Dipterocarpus Species)	VN\$19,000 per m <sup>3</sup>
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3rd Class & Unclassified

TAP (Vietnamese for unclassified) VN\$14,000 per m<sup>3</sup>

The GVN has announced a new rate of exchange for exports of VN\$275 for US\$1. There is also a possibility a subsidy might be added to selected species where justification of costs can be clearly shown.

The prices shown below are in U.S. dollars, using the exchange rate of VN\$275 for US\$1:

	<u>Per M<sup>3</sup></u>	<u>Per MBF</u>
Luxury	US\$254.54	US\$600.33
1st Class	116.36	274.43
2nd Class	69.09	162.94
3rd Class & Unclassified	50.90	120.04

It is possible the concentration yard could, by placing large firm orders with mill owners, purchase lumber for 25% less than the prices shown above. If this assumption is correct, the yard could purchase lumber for the following prices and many species of the different classes for less.

	<u>Per M<sup>3</sup></u>	<u>Per MBF</u>
Luxury	US\$190.90	US\$450.24
1st Class	87.27	205.82
2nd Class	51.81	122.20
3rd Class & Unclassified	38.17	90.03

No attempt has been made to set the purchase price on any particular species of lumber other than the most valuable of each class.

The yard would not be competitive on some species prized by the Vietnamese but would be competitive on most the classes, luxury, II, III and unclassified species.

The establishment of a ready cash market for large firm orders will nearly double production and lower sawmill and logging costs which should make the yard competitive on most species in the long run.

Since there are approximately 50 species with export potential and each would have several sets of specifications, no attempt has been made to establish individual selling prices. However, it is reasonable to assume the average selling price of all the exportable species would be approximately US\$75.00 per m<sup>3</sup> or US\$176.88 per BF, FOB ship Saigon, based on going world prices for similar species and grades of lumber.

### C. Existing Sawmill Facilities in Vietnam

There are 437 sawmills with 939 headrigs operating now in Vietnam, more than three-fourths of which are located within 100 kms. of the Saigon-Bien Hoa area.

This total includes about ten vertical headrigs; the balance of the sawmills are horizontal bandmills known locally as the CD-4.

The CD-4's usually have a five-foot band and can break down an 80-inch diameter log into lumber. The power is furnished by an 18 to 25 H.P. diesel engine. The CD-4 is capable of sawing accurate smooth lumber and takes only a 1/12" inch kerf.

The daily capacity of a single CD-4 headrigs is 5 m<sup>3</sup> (2,120 BF) of custom sawn lumber. Sawing standard sizes, the capacity would be 7 m<sup>3</sup> (2,968 BF).

Using the figure of 5 m<sup>3</sup> per day, the 939 headrigs have the capability of sawing 4,695 m<sup>3</sup> (1.99 million BF) daily. If orders are available, these mills would operate six days a week. Based on 5 m<sup>3</sup> per day per headrig and a 5-day week, a 48-week year, the annual capacity would be 1,126,800 m<sup>3</sup> (477 million BF).

The actual production of lumber in Vietnam is estimated to be about 700,000 m<sup>3</sup> annually. The loss of 400,000 m<sup>3</sup> of production was caused by two factors:

1. Shortage of orders.
2. Shortage of logs.

The proposed concentration yard would partially solve both these problems by standing ready to purchase export grade lumber, and by identifying selected species of Class III and Unclassified timbers that could be manufactured into export grade lumber.

Since Vietnam has never exported any timber except the finest cabinet (luxury) grade and the Vietnamese buying public will use only the most durable woods, many millions of cubic meters of Class III and Unclassified timber have been by-passed in the forests and would be easy to log.

#### D. Markets for Tropical Hardwood Lumber

It is clear that a concentration yard must depend entirely on the export market in the beginning.

This study has assumed that a foreign firm which deals in tropical hardwood lumber, participating in the project, would furnish the export market abroad and for this reason a detailed analysis is not presented.

The major problem in marketing facing the proposed yard would be the introduction of new species to the foreign trade.

It will be necessary for the manager to identify the plentiful, but unknown, species of timbers that have possibilities for large commercial applications.

Promising species could be field tested to a certain extent here, but in some cases small amounts will have to be shipped abroad for dry kiln tests and final customer acceptance.

The use of tropical hardwood lumber in the United States, Europe, and Japan has increased at a steady rate for the last 10 years and is projected to continue.

There are many applications in foreign industries that require clear hardwood lumber of above average widths which cannot be supplied by the incountry sawmill industry because of the lack of suitable timber.

There is no doubt that a knowledgeable manager could sell the entire lumber production in the United States, Europe, or Japan at a fair price.

#### E. Capital Requirements and Profit Prospects

##### 1. Capital Requirements for Buying & Selling Export Grade Air Dried Lumber:

###### Yard Facilities & Equipment:

- |   |          |
|---|----------|
| * 2 - 8 ton capacity rough terrain fork lifts | \$45,000 |
| * 2 - trucks and trailers (20 ton capacity)   | 44,000   |

3 - grading chain conveyors with dipping vat and lumber sorting chain conveyor attached	47,000
3 - double end cut off saws and attached conveyor and palletizing set up	25,000
* 1 - 40 KW diesel generator	9,000
Lighting system for yard	3,000
Fencing yard	5,000
Stacking sticks and foundations	28,000
Warehouse for dry lumber storage and supplies	45,000
Office building	10,000
Office equipment inc. furniture	<u>8,000</u>
Total:	269,000

\* These items might be purchased in-country from surplus military sources.

## 2. Site:

The purchase price of a suitable site is not included. Since the GVN recognizes the importance of exports, it is believed the GVN will lease 35 hectares of suitable land to the proposed company on a long term basis at a reasonable price. An annual estimated lease cost of US\$6,000 is included in the cost schedule.

## 3. Working Capital:

Based on:

20,000 m <sup>3</sup> annual sales	\$173,633.00
40,000 m <sup>3</sup> annual sales	347,266.00
60,000 m <sup>3</sup> annual sales	520,900.00

#### 4. Profit Prospects

Since the proposed concentration yard will be a buying and sales organization, net profits have been assumed to be 15% on gross sales, F.O.B. ship, based on buying and selling 40,000 m<sup>3</sup> (16,960,000 MBF) annually.

The fixed or non-operating costs are projected to be US\$146,399 annually.

On page No. 14, specific capital requirements and profit and loss statements have been presented for three sales volumes.

There is no variation in the fixed assets capital requirements.

A tabulation of capital requirements in three sales volumes is presented in Table I.

TABLE I

#### PROFIT PROJECTIONS, THREE VOLUMES OF SALES

Volume of Sales in m <sup>3</sup>	20,000 m <sup>3</sup>	40,000 m <sup>3</sup>	60,000 m <sup>3</sup>
Total Capital Required	\$442,633	\$616,266	\$789,900
Net Profit	152,186	450,001	748,291
Profit as Percentage of Total Sales	10.14%	15.0%	16.62%
Profit as Percentage of Total Capital	34.3%	73.0%	94.73%

COSTS SCHEDULE

<u>Administration Costs</u>	<u>Cost Per Unit Per Year</u>
Salary and allowances general manager	US\$35,000
Salary ass't general manager	7,500
Salary comptroller	6,000
Salary yard sup't	5,000
Salary chief lumber inspector	4,000
Salary office staff 2 @ 1700	3,400
Salary watch men 8 @ 500	4,000
Insurance (workmen's compensation) est.	3,000
Insurance (liability transportation fleet) est.	4,000
Legal and registration est.	3,000
Rental of site est.	6,000
<hr/>	
Total:	80,900

Depreciation Schedule

<u>Category of Asset</u>	<u>Cost</u>	<u>Expected Life in Years</u>	<u>Annual Depreciation</u>
<u>Buildings</u>	55,000	10	5,500
<u>Equipment:</u>			
2 - trucks and trailers.	44,000	3	14,666
2 - fork lifts.	45,000	3	15,000
1 - 40 KW generator.	9,000	3	3,000
3 - grading chain conveyors with dipping vat and lumber sorting conveyor.	47,000	5	9,400
3 - double end cut off saws with attached conveyor and palletizing set up.	25,000	5	5,000
Office equipment, furniture and fixtures.	8,000	5	1,600

Stacking sticks and foundations.	28,000	3	9,333
Lighting system for yard.	3,000	3	1,000
Fencing yard.	5,000	5	1,000

Total depreciation: US\$65,499

Total administration costs US\$80,900

Total non-operating costs  
(depreciation schedule) 65,499

Total overhead cost: US\$146,399

<u>Overhead Costs</u>	<u>Per M<sup>3</sup></u>	<u>Per MBF</u>
Assuming sales of 60,000 m <sup>3</sup>	US\$2.44	US\$ 5.75
" " 40,000 m <sup>3</sup>	3.66	8.63
" " 20,000 m <sup>3</sup>	7.32	17.26

<u>Operating Costs Supplies</u>	<u>Per M<sup>3</sup></u>	<u>Per MBF</u>
Pesticides and fungicides chemicals.	US\$1.00	US\$2.08
Steel strapping	1.00	2.08
Other supplies, saws, gasoline, fuel, etc.	1.00	2.08

Labor

Inspection	.50	1.04
Stacking	.50	1.04
Unstacking, trimming and palletizing	.75	1.77
Misc. labor costs	1.00	2.08
Stevedoring and port charges est.	2.25	5.31

Total operating costs: US\$8.00 US\$17.48

ESTIMATED  
PROFIT AND LOSS FORECAST

	<u>20,000 m<sup>3</sup></u>	<u>40,000 m<sup>3</sup></u>	<u>60,000 m<sup>3</sup></u>
<u>SALES</u> (Average \$75.00 m <sup>3</sup> )	1,500,000	3,000,000	4,500,000
<u>Cost of Sales</u>			
Raw Materials (Average \$52.09 per m <sup>3</sup> )	1,041,800	2,083,600	3,125,400
Fixed Costs	146,399	146,399	146,399
Operating Costs	160,000	320,000	480,000
Net Profit or Loss	151,801	450,001	748,291
Profit as % of Sales	10.14%	15.0%	16.62%
Profit as % of Capital Investment	34.3%	73.0%	94.73%

CAPITAL REQUIREMENTS

Fixed Capital	269,000	269,000	269,000
Working Capital	173,633	347,266	520,900
Total Capital Requirements:	<u>442,633</u>	<u>616,266</u>	<u>789,900</u>

## MAJOR SPECIES OF TREES IN VIETNAM FROM WHICH LUMBER IS PRODUCED

\* Showing local name, botanical name of the species, volume produced in 1941 and 1952, density of wood, a brief description of the wood and its main uses in Viet Nam.

### Class A, Luxury Woods :

These woods are in popular demand because of the unusual contrast of color in venation, distinctive fiber arrangement, beautiful figuration, pleasing aromas, hardness, and adaptability to the arts or above all the familiarity of the trade with the wood.

LOCAL NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Trac .....	<i>Dalbergia Cochinchinensis</i> ..	84,756	298,284	1,10	Rosewood ; reddish with black veins, takes beautiful polish, fine cabinet wood, in great demand.
Cam Lai ....	<i>Dalbergia bariensis</i> ....	466,156	2,772	0,97	Rosewood ; reddish violet blue with beautiful veins in black, takes high polish, fine cabinet wood, in great demand. Some times called « purple heart ».
Dang Huong . (May Doux)	<i>Pterocarpus pedatus</i> ....	1,017,072	76,320	0,78	Rosewood ; reddish brown, or bright red, veined, with pronounced aroma of roses, fine cabinet wood, in great demand.
Cam Thi ....	<i>Diospyros siamensis</i> ....	10,170	—	0,84	White wood, black veined, in great demand for inlay, interior finish, manufacture of luxurious art objets.
Son .....	<i>Melanorrhoea laccifera</i> ....	25,428	1,554	0,89	Mahogany, fine cabinet wood, inlay, purfling, interior finish. Not a true mahogany which is sweetenia family.
Mun .....	<i>Diospyros mur</i> .....	4,662	—	1,30	Black ivory (Elony) used in manufacture of fancy articles, for inlay and wood sculpture, capable of high polish. Persimmon is the only member of this family in America.
Muong .....	<i>Cassia siamea</i> ..	29,664	—	1,12	Blackish wood with yellow or brown streaks. Luxury cabinet wood also known as « Partridge wood ».
Huynh Duong	<i>Disoxylon lourei</i> .....	84,756	—	0,79	Sandal wood, high priced rare wood, yellowish brown color.

LOCAL NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Ra Huong ...	<i>Cinnamomum camphora</i> ...	14,408	—	0.80	Camphor wood highly aromatic, in demand for making luxury chests, capable of high polished greenish red with attractive figuration.
Pemou .....	<i>Fokienia hodginsii</i> .....	18,463	—	0.47	Highly perfumed wood, in demand for making high priced chests. Rose-yellow.
Samou .....	<i>Cunningamia sinensis</i> ....	30,086	—	0.45	Highly perfumed wood, in demand for making jewel boxes and chests. Rose-yellow colour.

### CLASS I WOODS

Class I category woods are characterized by their great resistance to insect and borers (carpenter ants, termites, beetles) and to decay, their high density, their strength and toughness. Most of these woods are used for durable construction.

LOCAL NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Lim .....	<i>Erythrophlaeum fordii</i> ..	11,442,060	2,925	0.90	Reddish brown wood; railway cross-ties, construction framework.
Nghien .....	<i>Pentace tonkinensis</i> .....	1,514,590	—	1.10	Reddish brown — Construction framework, railway cross-ties, carving wood.
Cam Xe .....	<i>Xylia dolabriformis</i> .....	1,313,716	196,856	1.14	Reddish brown — Construction work, wheelwright's work, boat building, railway cross-tie wood.
Ca Chac ....	<i>Shorea obtusa</i> .....	59,329	87,881	1.05	Durable reddish-brown — Construction beams and posts, wheelwright's work, boat building, railway cross-ties.
Sen .....	<i>Bassia pasquieri</i> .....	254,268	140,381	0.95	Reddish brown, construction work, cabinet, boat building.
Sao .....	<i>Hopea odorata</i> <i>Hopea dealbata</i>	4,661,560	5,507,950	0.71	Yellowish wood, turns brown when exposed to open air. Cabinet wood, railway cross-ties, boats.
Cam Lien ...	<i>Terminalia tomentosa</i> .....	—	55,968	—	—
Kien Kien ...	<i>Hopea pierrei</i> .....	1,363,724	21,200	0.87	Yellowish wood, turns brown rapidly on exposure; all kinds of construction work, cabinet work, boat building and boat mast wood.

LOCAL NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Ca Gang ...		1,144			
Go Mat ....	<i>Sindora co- chinchinensis</i>	2,246,034	249,736	0,87	Yellowish brown when fresh, turns reddish brown rapidly, takes high polish, carved and turnery wood, construction work. Suitable for antique work.
Ngo Tung ...	<i>Kateeleria</i> sp.		55,920		
Xoay .....	<i>Dialium co- chinchinensis</i>	199,177	1,892	1,15	Dark brown reddish wood. Construction and wheel- wright's works.
Lau Tau ....	<i>Vatica divers...</i>	283,933	43,254	0,97	Light yellow, turns brown on exposure, piling, naval yard wood. Durable under water.
Tau .....	<i>Vatica tonki- nensis</i> .....	1,440,852	—	0,89	Light yellow, turns brown on exposure. Same uses as Lau Tau.
Da Da .....	<i>Xylia kerrii</i> ..	220,366	8,282	0,96	Dark reddish brown, railway cross-ties, ship knees and similar sturdy construction work.
Cho Chi ....	<i>Parashorea stellata</i> .....	2,415,546	106,348	0,75	Good framing wood, cabinet work, in demand for boat building.
Vap .....	<i>Mesua ferrea</i> ...	33,902	1,611	1,05	Red colour wood, durable under water. Construction; cabinet wood.
Ca Oi .....	<i>Castanopsis in- dica</i> .....	175,869	—	0,73	Grey wood, in demand for construction work.
Dinh .....	<i>Makhamia sti- pulata</i> .....	99,588	—	0,67	Yellow wood. Cabinet wood, turnery wood.
Giol .....	<i>Talauma giol</i> ...	714,615	10,176	0,53	Light yellow wood. Cabinet work for turnery and carved work, gun stock, interior trim, flooring, school desks and furniture.
Mit .....	<i>Artocarpus in- tegrifolia</i> ...	105,945	—	0,67	Dark yellow wood, construction work, cabinet good for carv- ing and turning.
Trally .....	<i>Garginia fa- graoides</i> ....	847	—	1,01	Orange yellow wood, lustrous, durable. Construction work, fine furniture, cabinet work, railway cross-ties.
Go Do .....	<i>Pahudia co- chinchinensis</i>	1,314,141	492,391	0,80	Red wood, in great demand at present time.

LOCAL NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Bol Loi ....	Litsea vang ..	347,500	83,328	0.59	Yellow saffron coloured semihardwood. Construction frame work, cabinet work.
Binh Linh ..	Vitex pubes- cens .....	88,994	278,144	1.00	Posts and beams, yellowish; turns brown.
Sen Mu ....	Shorea cochinchinensis ...	1,483,230	176,384	0.82	Yellowish, turns brown. Construction.
Lat Hoa ....	Chukrasia tabularis .....	1,483,230	33,920	0.82	Yellowish brown, lustrous, mottled, cabinet wood, interior finish wood, carving.
Teck Gla Ti .....	Tectona grandis .....	—	848	0.65	Teak; Construction, cabinet, famous boatbuilding, wood through the world. Thoroughly combed out of accessible Viet Nam forests.

## CLASS II WOODS

This category includes wood utilized particularly in protected construction work because of their low decay resistance and for ordinary cabinet work; hard, medium heavy and cheaper than class I and luxury woods. It is in this class of wood that preservative treatment will effect great saving.

VIETNAMESE NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Dau .....	Dipterocarpus (species) ...	29,664,800	36,201,968	0.88	Yellowish to reddish wood. Covered. Construction work, joiner's work, ordinary boat building, turns and work easily.
Bang Lang ..	Lagerstroemia species .....	9,323,160	356,923	0.64	Greyish, tough, flexible, used for oars, boat gunwales, ship knees, wheelwright's works, shaped by heating. Easily polished. Nearly like American hickory only darker.
Gie .....	Quercus and Pasania species .....	3,002,130	117,866	0.88	One of the oaks. Rather flexible wood, large size trees, utilized in all work: construction, frame work, joiner work, boat building, cabinet work, flooring.
Huynh .....	Tarrieta cochinchinensis ..	244,097	707,656	0.63	Red wood with lustrous pith ray flakes in texture; works easily, cabinet and wheelwright works.

LOCAL NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Ven Voh ....	Anisoptera co- chinchinensis ..	12,713,400	2,436,685	0,61	Cream colored wood, no dif- ference between sapwood and heartwood ; framing, and boat building.
Chonau .....	Dipterocarpus tonkinensis ...	889,938	403,224	0,60	Red wood, used for frame work, gun stock, cabinet wood.
Lim Xet ....	Peltophorum ferrugineum	1,186,584	4,998	0,90	Not from large trees like many other species. Low resistance to insects.
Mo Vang Tam	Manglietia glauca et fordiana ....	1,207,773	—	0,41	High class wood, light weight and tough ; mainly used in cabinet and interior finish.
Xoan .....	Melia species Melia azade- rach .....	2,196,452	135	0,53	Rose red color, durable wood. Used as posts in ordinary house framing, and cabinet work ; « china berry » in U.S.A. south.
Xoan Moc ..	Toona febrifu- ga .....	144,085	1,851	0,45/ 0,65	Rose colored, turns mahogany red. Joiner's work and cigar box wood, aromatic. Ideal for aromatic chest wood.
Xoan Dào ..	Pygeum arbo- reum .....	1,101,828	—	0,45/ 0,55	Medium grade wood, light, fine grain, cabinet and frame work construction.
Chai .....	Shorea vulga- ris .....	173,328	776,513	0,80/ 0,93	Greyish rose colored wood with yellowish under tone. In demand for boatbuilding in framework.
Sot Bop ....	Pasania fissa ..	1,068,773	430	0,44/ 0,51	Clear grey wood. Protected frame work.
Cheo .....	Engelhardtia chrysolepis ...	1,313,718	—	0,58	Bright maroon colour, used as framework in construction.
Chieu Lieu ..	Terminalia Chebula ....	254,268	469,114	0,87	Bright maroon with interior black streaks, cabinet work.
Xoai .....	Magnifera in- dica .....		14,388		
Bang .....	Terminalia ca- tappa .....		28,832		
Ca Duoi ....	Cyanodaphne cuneata ....		5,936		
Mit Nai ....	Artocarpus hirsula .....		10,600		
Tram .....	Eugenia spe- cies .....		196,922		

VIETNAMESE NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Re .....	Cinnamomum species .....	1,144,206		0.64	Light reddish brown, strongly scented, used for trunks, chests, etc...
Sang Dao ...	Hopea ferrea ...	219,942	1,823	0.86	Yellowish brown color, dark veins. Construction cabinet work and boat building wood. « Mekong tiger wood ».
Thông (Pine) (3 needles)	Pinus khasya ...	14,832,300	19,561,340	0.61	Clear salmon colored, covered frame construction, joinery and packing; box and plank. Same uses as U.S. southern yellow pines.
Thông Mu (Pine) (2 needles)	Pinus merkusi ...	6,356,700	662,542	0.55	Light colored wood, dark red veins, lumber, packing cases and all types construction. Same uses as U.S. southern pines.
Truong .....	Pometia pin-nata .....	550,914	19,886	0.90	Brownish-red color very hard wood, difficult to work, construction work. « Sweet gum » in U.S.A. (Liquidambar).
Truong .....	Xerospermum macrophylla .....		11,448		
Nhol .....	Bischofia javanica .....	269,324	—	0.78	Red wood, covered construction work.
Viet .....	Paysonia elliptica .....		2,454,536	0.81	
Ban Xe .....	Albizia lucida .....	119,929	—	0.63	« Mimosa »; yellow wood with blackish sheen, construction work. « The fox ».
Ba Khia .....	Lophopetalum wightianum .....		10,896		
Long Muc ..	Wrightia annamensis .....	43,225	3,544	0.43	Light white wood, homogenous fine, grains. Wooden shoes, turnery, carving packing case wood. « Baby leopard ».
Cam .....	Panarium annamense .....		63,104		
Ca Duoi .....	Cynaodaphne cuneata .....	84,756	742	1.05	Very hard wood, clear red, reddish white sapwood. Posts, heavy frame, railways cross-ties. « Iron wood ».
Cay .....	Irvingia oliveri .....		7,632		
Queo .....	Mangifera fo-rida .....		53		
Ke .....	Stereospermum annamense .....	77,975	—	0.90	Durable for piling but very difficult to cut, clear chestnut colour, veined. « Live forever ».
Bo Do .....	Shorea sp. ....	51,701	30,528	0.82	Yellow-brown wood similar to sao but its resistance to insects is very much lower.
Cong .....	Calophyllum ..	1,186,584	62,243	0.61	Pale red wood, flexible; construction work wood.

### CLASS III WOODS

This category includes all wood called « white », soft and rather light. These woods are utilized in making packing-cases, framing and light temporary construction. They have low resistance to insects and decay.

VIETNAMESE NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952 IN PRESENT VIETNAM	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Cham .....	Canarium ....	3,178,350	45,368	0.55	White wood. Ordinary packing-case wood. « Box board wood ».
Vang .....	Mallotus cochinchinensis	2,839,328	—	0.40	White wood. Ordinary packing-cases, wooden shoes, match boxes. « Box board wood ».
Bo De .....	Styrax tonkinensis	5,094,259	—	0.41	Ordinary packing-cases and match boxes.
Muong Trang	Cassia tonkinensis	3,485,672	—	0.61	Yellowish white, packing-case wood.
Phay .....	Duabanga sonneratioides	1,473,059	—	0.38	Light weight, packing-case, white wood.
Rang Rang	Spatholopus orientalis	3,093,594	8,904	0.54	Yellowish white, packing-case wood.
Thau .....	Liquidambar formosana	390,301	—	0.77	Rose colored wood. Light construction work. Possible veneer and ply wood; scented. Sweet gum in U.S.A.
Sau .....	Sandoricum indicum	2,330,790	138,521	0.53	Pale mahogany color, sabots, packing-cases.
Gao .....	Adina cordifolia	381,402	95,824	0.48	Yellowish white, veneer wood.
Mo Cua ....	Alstonia scholaris	37,716	30,952	0.36	White; packing-case wood.
Sang Trang	Cophopetalum dupereanum	1,186,586	3,679	0.56	White; packing-case wood.
My .....	Lysidice rhodostegia	763,652	—	0.61	Soft wood, absorbs moisture; packing-case wood.
Sung .....	Ficus sp. ....	1,483,230	—	0.32	Packing-case wood.
Sui .....	Antiaris toxicaria	—	—	—	Packing-case; soft wood.
Gao .....	Bombax malabaricum	834,429	—	0.33	Packing-case; soft wood.
Lanh Nganh	Cratoxylon formosum	932,316	86,248	0.75	Very hard wood. Small size trees used for making charcoal.
Duoc .....	Rhizophora conjugata	174,597	—	1.08	Hard, heavy wood, medium size trees. Principal charcoal wood. « High tone » charcoal.

VIETNAMESE NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952 IN PRESENT VIETNAM	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Tram .....	Melaleuca leucadendron ..	8,094,815	523,725	0,75	Fuel wood and foundation piling.
Chuong .....	Laurus camphorata ....	na	25,440	na	
Roi .....	Garcinia ferrea	na	1,832	na	
Ten .....	Polyalthia jucunda .....	na	2,332	na	
Nhan .....	Euphora longana .....	na	388	na	
Bach Tung ..	Podocarpus imbricatus ...	na	618,072	na	
Chung Bau ..	Combretum quadrangulare .....	na	13,144	na	
Dang De ...	Adina polycephala .....	na	6,784	na	
Goi .....	Aglaiia gigantea .....	na	271,784	na	
Hau Phat ...	Cinnamomum iners .....	na	364	na	
Mop .....	Alstonia spatulata .....	na	848	na	
Mu-U .....	Callophyllum inophyllum	na	28,408	na	
Sang .....	Carallia lucida	na	665,001	na	
Sang Mau ..	Knema corticosa .....	na	287,472	na	
Truong .....	Xerospermum macrophyllum .....	na	8,480	na	
Vung .....	Careya arborea	na	1,553,113	na	
Bang .....	Bauhinia variegata .....	na	554	na	
Ban .....	Sonneratia acida .....	na	32,224	na	
Bau Nau ....	Aegle marmelos .....	na	937	na	
Bi Bai .....	Acronychia laurifolia ...	na	188	na	
Bua .....	Garcinia loureiri .....	na	72	na	
Ca Na .....	Canarium album .....	na	720	na	

VIETNAMESE NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET PRODUCED 1952 IN PRESENT VIETNAM	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Chang Chang	Elaeocarpus tomentosus ...	na	4,375	na	
Coc .....	Lumnitzera coccinea ...	na	593	na	
Cui .....	Heritiera littoralis .....	na	661	na	
Da .....	Ceriops species	na	2,120	na	
Diep .....	Caesalpinia pulcherrima	na	3,053	na	
Du .....	Pterocaria species .....	na	2,273	na	
Dua Cao ....	na	na	820	na	
Dau Heo ...	Garuga pinnata	na	9,752	na	
Dau Khau ...	Amomum cardamomum ..	na	2,968	na	
Gia .....	Excoecaria agallocha ...	na	6,360	na	
Giai Ngua ..	Swietenia macrophylla ...	na	820	na	
Gon .....	Eriodendron anfractuosum	na	6,911	na	
Keo .....	Acacia fornesiana .....	na	70	na	
Long Mang...	Pterospermum truncatolobatum .....	na	51	na	
Loi .....	Crypteronia paniculata ..	na	9,709	na	
Luong Tuong	na	na	6,784	na	
Me .....	Tamarindus indica .....	na	15,052	na	
Ngong Tau ..	Gelonium multiflorum ....	na	1,200	na	
Nhut .....	Homalium dictyoneurum...	na	2,713	na	
Quao .....	Dolichandrone rheedii ....	na	63	na	
Sam .....	Memecylon edule .....	na	33	na	
So Do .....	Dillenia aurea.	na	51	na	
So .....	Dillenia elata...	na	1,442	na	
Thach Luc ..	Xanthophyllum excelsum	na	3,023	na	
Thui .....	Parkia dongnaiensis ....	na	5,384	na	

VIETNAMESE NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1941	BOARD FEET 1952 IN PRESENT VIETNAM	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Tung .....	Tetrameles nudiflora .....	na	155,396	na	
Trom .....	Sterculia pexa.	na	225	na	
Vet .....	Bruguiera species .....	na	31,079	na	
Vong .....	na	na	136,104	na	
Leo Heo ....	na	na	5,512	na	
Mang .....	Pterospermum species .....	na	8,480	na	
Tia .....	Carallia lucida	na	9,552	na	
Dung .....	Symplocos laurina .....	na	1,310	na	
Vang .....	Sterculia species .....	na	900	na	
Coi .....	Pterocaria stenoptera ....	na	3,816	na	
Mang Mang ..	Pterospermum grew .....	na	520	na	
But .....	na	na	559,680	na	
Choi .....	Stenochloena palustris ...	na	59,380	na	
Coc Chua ...	Spondias mangifera .....	na	530	na	
Coc Gao ....	Spondias lutea.	na	2,374	na	
Chim Chim ..	Apodytes giung	na	2,320	na	
Mop .....	Erismanthus indochinensis	na	49,184	na	
Phao Lai ...	na	na	4,820	na	
Giau .....	Morus indica...	na	4,200	na	
So Dia .....	na	na	2,998	na	
Thoi .....	na	na	1,200	na	
Mung .....	na	na	21,624	na	
Ngo Dong ..	Erythrina indica .....	na	73,766	na	
Ngut .....	Gironniera sinensis .....	na	104,400	na	
No .....	na	na	16,860	na	
Sua .....	Albizzia lebbekoides .....	na	300	na	
Tim Lang ..	na	na	48,336	na	
Vo Va .....	na	na	4,664	na	
Vol .....	Sterculia lych-nophora ....	na	40,704	na	

## INFRASTRUCTURE

Vietnam is fortunate in having a much better infrastructure than most undeveloped countries.

Many good all weather roads extend throughout the country.

A small gauge railroad extends the length of Vietnam with a spur extending to Dalat in the Central highlands.

Many deep water harbors have been developed that have all of the facilities found in any harbor in the world.

A very good telephone and telegraph system has been installed.

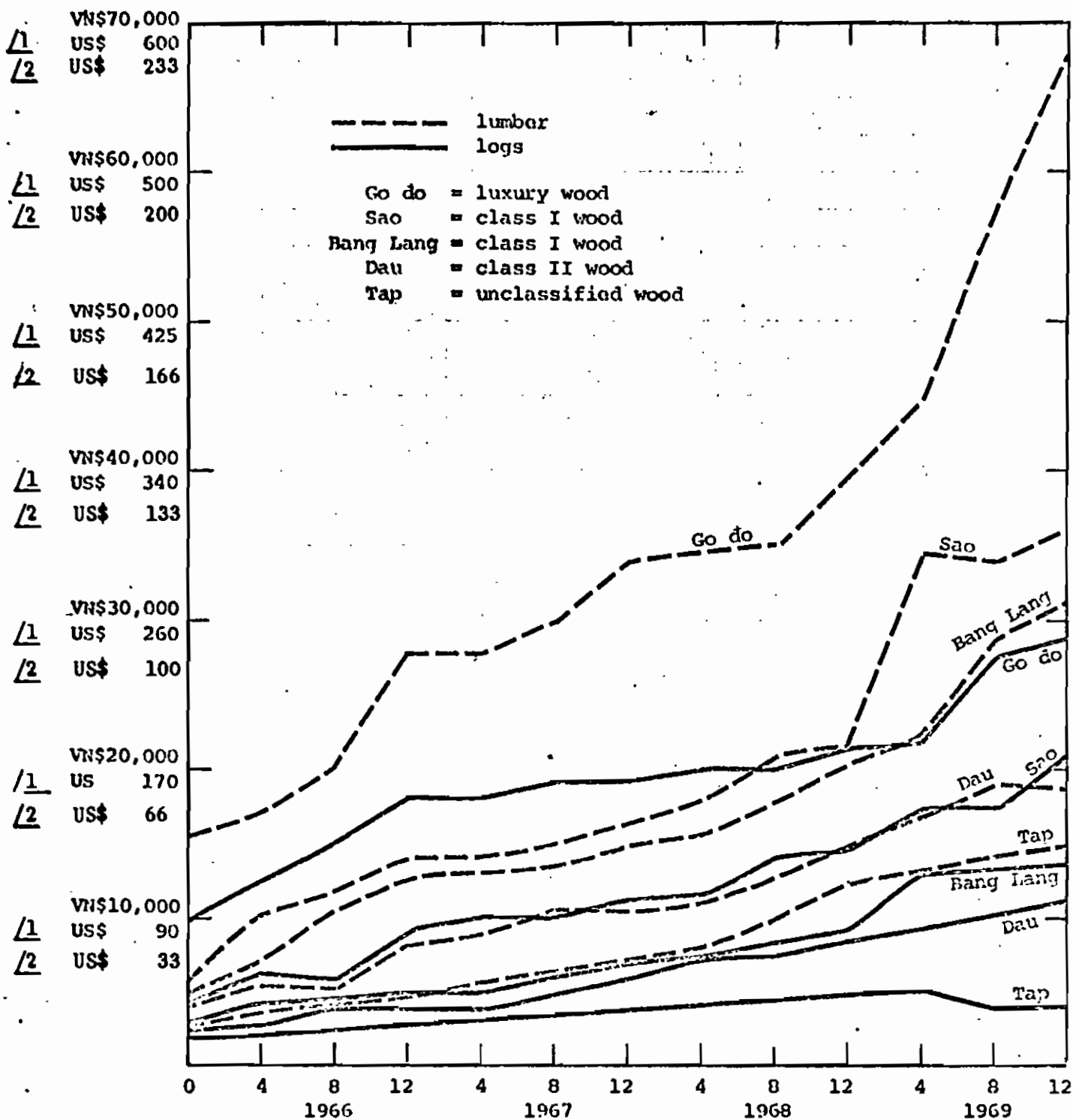
## Useful Conversion Factors <sup>1</sup>

1 cubic meter lumber	=	424 board feet <sup>2</sup>
1 cubic meter sawlogs	=	221 board feet <sup>2</sup>
4.53 cubic meters sawlogs	=	1,000 board feet
1 cubic meter unpeeled pulpwood	=	0.46 cord
2.18 cubic meters of solid volume without bark	=	1 standard cord unpeeled pulpwood
1 standard cord unpeeled pulpwood	=	77 cubic feet wood volume
1 cubic foot sawlogs	=	6.25 board feet
1 cubic meter roundwood	=	0.6 metric ton (air dry) wood volume without bark <sup>2</sup>
1 stere (German raummeter)	=	1 cubic meter of stacked roundwood or 0.276 cord <sup>2</sup>
1 cubic meter	=	35.31 cubic feet
0.028 cubic meter	=	1 cubic foot
1 hectare	=	2.471 acres
0.4047 hectare	=	1 acre
1 meter	=	39.37 inches or 3.28 feet
2.54 centimeters	=	1 inch
1 kilogram	=	2.2046 pounds
0.4536 kilogram	=	1 pound
1 liter	=	1.0567 quart
1 kilometer	=	0.62137 mile
1 mile	=	1.609347 kilometers

<sup>1</sup> From "Converting Factors and Tables of Equivalents Used in Forestry," U.S. Dept. Agri., Misc. Pub. No. 225, Rev. June 1949.

<sup>2</sup> Factor used in "FAO Yearbook of Forest Products Statistics, 1959."

Log and Lumber Prices, 1966-1970, Saigon  
(per M<sup>3</sup>)



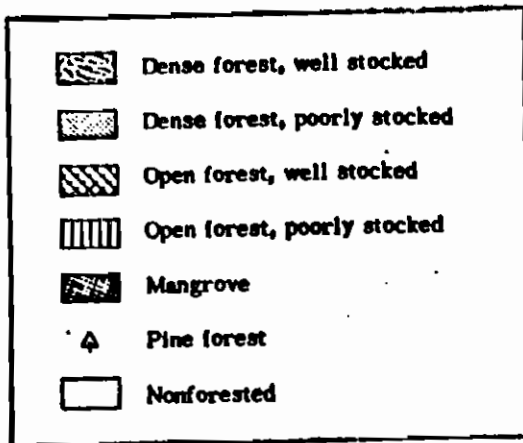
Source: Directorate of Waters and Forests

/1 Exchange rate of 118 for 1 US.

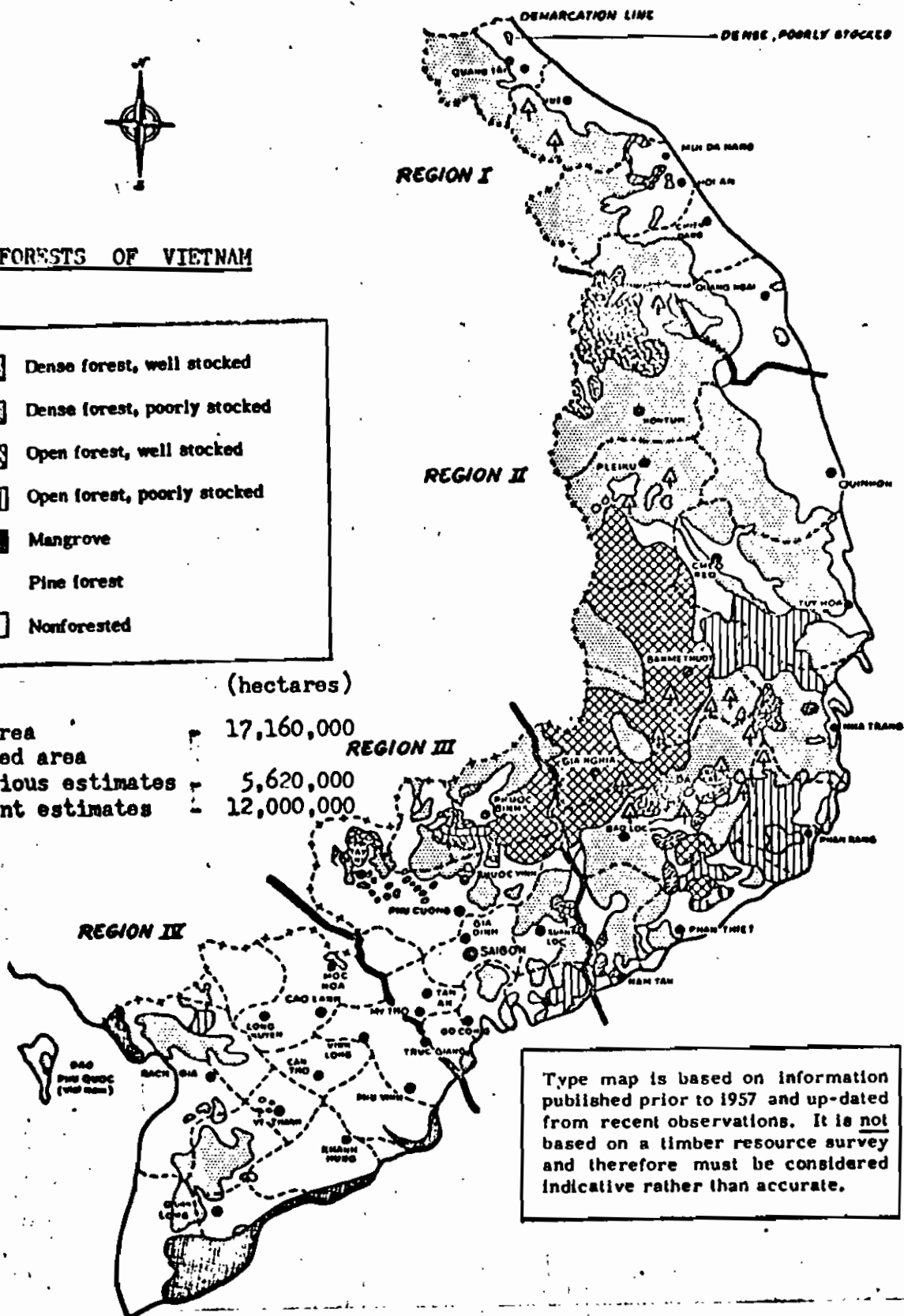
/2 Exchange rate of 300 for 1 US.



# FORESTS OF VIETNAM



Land area	(hectares)
Forested area	17,160,000
Previous estimates	5,620,000
Recent estimates	12,000,000



Type map is based on information published prior to 1957 and up-dated from recent observations. It is not based on a timber resource survey and therefore must be considered indicative rather than accurate.

FOREST PRODUCTS EXPORTS - 1967

Selected Asian Countries (1000 \$US)

<u>Country</u>	<u>Total</u>	<u>Logs + Lumber</u>	<u>Pulp + Waste paper</u>	<u>Mfg. Wood + Plywood</u>	<u>Paper and Paper board</u>
Burma	\$27,676	27,511	0	165	0
Cambodia	2,328	2,166	0	159	3
Taiwan	69,968	22,178	2,617	41,093	4,080
Hongkong	12,967	2,296	1,769	2,192	6,710
Japan	225,310	22,944	1,005	111,538	89,823
S. Korea	37,890	294	2	36,525	1,069
Laos	1,770	1,770	0	0	0
Sabah <sup>1/</sup>	84,982	84,405	0	569	8
Sarawak	48,247	44,443	0	3,803	1
W. Malaysia <sup>1/</sup>	36,397	32,811	3	2,906	677
Philippines	199,103	171,816	0	27,265	22
Singapore	35,856	19,958	398	8,163	7,337
Thailand	15,151	14,890	0	234	27
S. Vietnam	2,000	2,000	0	0	0

<sup>1/</sup>  
1966 Exports

Source - FAO - Yearbook of Forest Products, 1968

### Budget Accounts - Forestry

The 1970 budget of the Directorate of Waters and Forests is VN \$99,500,000 (US \$840,000). This is the largest budget ever approved for forestry and reflects inflationary pressures. Almost 97 percent of the budget is earmarked for salaries. This account includes the pay of Forestry employees serving in the Armed Forces who continue to receive their civilian salaries while serving in the military.

The present administration has done an outstanding job of increasing the volume of legally cut and processed timber. The 1969 receipts of the Directorate of Waters and Forests turned over to the Treasury were VN \$679,191,303 (US \$5.8 million). This sum is nearly four times the amount collected in 1967 and nearly three times the 1968 receipts. This achievement is a direct result of decentralization of authority and responsibility for making timber sales to the lowest possible level in the field plus conscientious efforts to collect taxes and fees. Credit for this effort is shared by the Director of Waters and Forests and his staff with the USAID/USDA Forestry Team.

### Budget Accounts, Directorate of Forestry, 1961-1969

Item/Year	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Expenditures	51.4	53.4	66.9	45.6	56.9	52.6	71.6	93.4	94.7	99.5
Personal Services	38.9	40.0	40.4	41.6	52.2	48.5	65.0	87.8	88.4	92.3
Equipment	4.1	4.4	4.5	4.0	3.9	4.0	5.4	5.3	4.6	6.1
Miscellaneous	8.3	8.9	21.9	-	0.7	-	1.2	0.2	1.7	1.1
Receipts (VN \$1,000,000)	149.1	181.8	199.5	145.2	156.7	143.2	129.3	237.7	679.2	—

Republic of Vietnam

LICENSED SAWMILLS - by Region and Province (1960-70)

	1960		1965		1970	
	<u>No. of Sawmills</u>	<u>No. of Headrigs</u>	<u>No. of Sawmills</u>	<u>No. of Headrigs</u>	<u>No. of Sawmills</u>	<u>No. of Headrigs</u>
TOTAL VIETNAM	347	622	414	759	436	939
Southern Region	301	437	350	614	356	672
Saigon	81	119	84	139	87	142
An Giang	22	27	31	43	34	65
Binh Duong	14	16	14	19	7	16
Gia Dinh	67	94	72	139	60	131
Long An	28	33	33	45	41	60
Long Khanh	11	23	13	43	31	72
Phong Dinh	16	23	17	31	17	28
Phuoc Tuy	23	27	23	36	12	25
Tay Ninh	29	61	41	102	59	118
Vinh Long	10	14	12	17	14	15
Central Lowlands	14	17	23	33	13	18
Binh Thuan	6	8	11	18	8	12
Khanh Hoa	8	9	12	15	5	6
Central Highlands	32	68	41	112	67	249
Darlac	8	18	11	31	15	57
Iam Dong	6	13	8	23	9	20
Pleiku	6	14	8	24	17	49
Tuyen Duc -Dalat	12	23	14	34	26	114

NOTE: Total include a few vertical band mills but most sawmills in Vietnam are the French CD-4 horizontal bandmill

SOURCE: Directorate of Waters & Forests, MLRAFD, RVN

Comparison of Selected Southeast Asian Countries

<u>Country</u>	<u>Total Land Area</u> Mill HA	<u>Perc<sup>ent</sup> Forested</u> %	<u>1966 Population</u> Mill people	<u>HA Forest Per Caput</u> HA	<u>1967 Log Production</u> 1000 M <sup>3</sup>	<u>Forest Land</u> Mill HA	<u>1968 Dom. Consumption</u> M <sup>3</sup> /1000 Caput	<u>1966 Processed Wood</u>	
								<u>Exports</u> M <sup>3</sup> /1000 Caput	<u>Imports</u> M <sup>3</sup> /1000 Caput
Philippines	29.7	40	33.5	0.35	10,184	11.9	29	1	1
Malaysia	36.3	67	9.7	1.34	12,930 <sup>1/</sup>	24.0	110	750	22
S. Korea	9.8	55	29.1	0.35	10,200 <sup>1/</sup>	5.3	30	208	17
Taiwan	3.5	62	12.8	0.18	1,061	2.3	35	360	1
Thailand	41.8	67	31.5	0.90	2,313	28.1	35	540	8
Japan	36.8	64	98.9	0.25	51,023 <sup>1/</sup>	25.1	353	860	1,225
Cambodia	17.7	75	6.5	2.00	348	13.4	24	8	0
Laos	23.6	62	2.0	7.50	107	15.0	12	12	1
S. Vietnam	17.4	70	17.1	0.70	206	12.1	11	0	4

1966 Round Wood  
Exports    Imports  
M<sup>3</sup>/1000 Caput

<sup>1/</sup>  
1966

Source - FAO Statistics, 1969

Philippines	5,882	1
Malaysia	8,190	40
S. Korea	0	1,340
Taiwan	71	692
Thailand	37	7
Japan	22	20,000
Cambodia	66	0
Laos	-	0
S. Vietnam	0	?

VEGETATIVE TYPES - South Vietnam

	17 Northern Provinces <u>1,000 ha</u>	27 Eastern & Delta Prov. <u>1,000 ha</u>	Total <u>1,000 ha</u>
Tropical hardwoods Multi-canopy	5,206	1,617	6,823
Tropical hardwoods Single-canopy	2,583	595	3,178
Pine forests	200	-	200
Mangrove and Tram	2	616	618
Brushland	1,078	22	1,100
Savannah	<u>131</u>	<u>-</u>	<u>131</u>
Total Forest Land	9,200	2,850	12,050
Dune grass & Casuarina	92	16	108
Marshland	28	818	846
Urban Area	1	3	4
Crop land	<u>1,224</u>	<u>2,525</u>	<u>3,749</u>
	10,545	6,212	16,757
Water and Unaccounted			<u>623</u>
			<u>1/</u>
		TOTAL	<u>17,380</u>

1/  
1968 Agriculture Statistical Yearbook,  
MLRAFD, GVN

Source: MACV travel difficulty overlays on AMS aerial maps. Acreage compiled  
by the Joint Development Group

ESTIMATED EXPORT POTENTIAL

PRODUCT	Joint Development Group		USAID/Forestry Team	
	Low Est.	High Est.	Goal	
	<u>Million</u>		<u>US\$ Dollars</u>	
			<u>1975</u>	<u>Potential</u>
Logs Est.	13	40	5	5
Lumber	4	16	15	25
Veneer & Plywood	16	33	40	100
Cinnamon	2	6	-	-
Pulp	8	10	-	-
Newsprint	6	10	-	-
Paper Products	7	10	-	-
Poles	-	-	3	6
Charcoal	-	-	1	2
Furniture	-	-	3	10
Rattan	-	-	1	2
	<u>\$56</u>	<u>\$125</u>	<u>\$68</u>	<u>\$150</u>