September 14, 1972

PROPOSED PLAN OF WORK, FORESTRY SUB-SECTOR EXPORT
DEMAND ANALYSIS, TAIWAN, HONG KONG, KOREA, AND JAPAN
For Vietnam AID Mission/ADCCA/E
Pio/T Industrial Development
Export promotion by ERS/USDA

This is a continuation of a study started in Singapore for the purpose of determining the opportunity for profitably marketing Vietnam's hardwood timber resource either as logs or manufactured products. Specific attention has been directed to the feasibility of exporting logs, lumber, plywood, veneer, wood chips, and furniture.

The market studies are but one phase of a total effort to develop the most effective program for managing and utilizing the forest resource so as to achieve the optimum combination of short and long range benefits in terms of industrial development, employment, foreign exchange and environmental protection. The three other essential requirements for sound development are:

1. Completion of a detailed forest inventory followed by a long-range timber management plan.

2. Development of a sound silvicultural program to assure a continued flow of desirable timber.

3. Completion of a thorough analysis of the ninety or more species of hardwood in Vietnam to determine their suitability for utilization followed by an aggressive effort to promote utilization of the less well known species in the interest of balanced utilization and minimization of high grading.

The forestry staff of the USAID mission in Vietnam has for some time been planning a timber inventory of the 5½ million hectares of forest land in Vietnam. Actual field work cannot get underway until hostilities cease or it is feasible to detach military personnel to protect field crews.

The foresters in Vietnam are devoting attention to the problem of silvicultural management. One of the specialists from the United States has, for example, been assigned to help develop a tree planting program. Nevertheless, in the long-run the most critical weakness in the development of the forest resource probably will be the lack of knowledge about silviculture, a common problem in the tropics.

Little or nothing is known about the physical characteristics of the wood of many species. For this reason a particularly high priority should be attached to obtaining and disseminating information on wood properties as they relate to the economics and feasibility of utilization.

Scope of the demand analysis

As in the Singapore study the market analysis in the several countries to be visited will attempt to develop and augment information relating to five aspects of the demand situation.

1. Present and long-range demand for timber products throughout the world.

2. Supply-demand trends in the Far East as indicators of the potential demand for timber from Vietnam and other countries seeking to penetrate world hardwood markets.

3. The nature of the market opportunity for timber, logs, lumber, plywood, veneer, furniture in and from the countries studied.

4. Characteristics of the timber industry in each country from the standpoint of how it operates: i.e. market practices, prices, quality standards, freight rates.

5. Public and industrial institutions that have been developed in the furtherance of the timber business.

Sources of information

The market intelligence sought will be obtained mainly from five types of sources in the several countries:

1. International agencies with interests in the forestry and timber manufacturing fields. These include the Food and Agriculture Office of United Nations, the U. S. Agency for International Development and the Asian Development Bank.

2. Published and unpublished statistics of timber product production, exports and imports.

3. Government officials with policy positions relating to industrial development in general and timber industry development in particular.

4. Timber trade associations.

5. Private concerns engaged in logging, log buying, timber product manufacturing, timber product exporting and importing, and timber product transportation.

Information to be gathered

In each of the countries visited the following information will be gathered when pertinent.

1. Growth and development of the timber industry with particular reference to changes in its nature--such as a shift from sawmilling to plywood manufacturing.

2. Volume and value of production, exports and imports of logs, lumber, plywood, veneer, and possibly furniture by significant categories such as types of products and species.

3. Product prices in 1971 and 1972 and trends in prices during recent years.

4. Institutional features that have developed to strengthen or protect the timber product industries such as trade associations, quality standards, regulatory processes and financial aids.

5. Market requirements, limitations and constraints.

6. Industry practices that affect costs and completion

7. Government policies.

8. Transportation costs. Particular attention should be paid to the international log market in the Far East and the relationship of log transportation costs to the long range outlook for industrial development in the various countries.

Proposed Additional Market Export Potential Studies

Countries: Taiwan and Hong Kong--In addition, a side trip to the Philippines may be required.

Time: It is proposed that field work in these markets be initiated in December and completed by the end of January 1973. A total of approximately 6 to 8 work weeks will be required.

Personnel: One professional employee will conduct the field work. However, the contracting for certain data may be necessary for obtaining data requirements.

Countries: Korea and Japan--The Japanese market in particular is large and complex which demands special attention as an outlet for forestry products.

Time: It is proposed that field work in these markets be started in March and completed in April 1973. A total time in the field of about 7 work weeks will be required with prescribed levels of personnel resources.

Personnel: Three USDA employees from the Forest Service will be utilized to conduct the field work, one of which will be a senior grade employee. Also certain data may be purchased where this is the most feasible and practical means of acquiring them.

A TROPICAL HARDWOOD LUMBER CONCENTRATION YARD

IN THE

NINH HOA AREA MR 2

AN INVESTMENT OPPORTUNITY

IN

SOUTH VIETNAM

Prepared by

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REPUBLIC OF 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 NINH HOA AREA NR II

I. INTRODUCTION

This is a survey report for the establishment of a tropical hardwood lumber concentration yard in the Ninh 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 eighty or more small sawmills within trucking distance (100 kms), buy an estimated 40,000 cubic meters (m^3) or more of export grade lumber annually that would have an estimated value of US$2,800,000 F.O.B. Ninh Hoa.

Assuming gross sales of US$2.8 million, the investment is projected to earn profits of $400,000 on a total investment in yard facilities and working capital of US$616,000.

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$2.8 million annually, the total estimated capital requirements would be US$616,000 with US$347,000 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$2.8 million, the profits are estimated to be US$400,000. Estimated profits are presented for three volumes of sales on page 12.

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 Ninh 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:

	Cubic Meters	Percent
Luxury	2,288	0.5
Class I	88,921	19.2
Class II	294,683	63.7
Class III	33,032	7.1
Unclassified	43,850	9.5
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 in 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, birches, 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 and Nha Trang 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 secondhand 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^3

1st Class

SAO (Hopea Odorata)	VN$32,000 per m^3

2nd Class

DAU (Dipterocarpus Species)	VN$19,000 per m^3

3rd Class & Unclassified

TAP (Vietnamese for unclassified) VN$14,000 per m^3

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:

	Per M^3	Per MBF
Luxury	US$284.54	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.

	Per M^3	Per MBF
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, I, II 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^3 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.

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^3 (2,120BF) of custom sawn lumber. Sawing standard sizes, the capacity would be 7 m^3 (2,968 BF).

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

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

1. Shortage of orders.

2. Shortage of logs.

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

Since Vietnam has never exported any timber except the finest (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 will 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

* 4 - 8 ton capacity rough terrain fork lifts $45,00

* 2 - trucks and trailers (20 ton capacity, [illegible],00

	3 - grading chain conveyors with diping 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	3,000
	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^3 annual sales	$173,633.00
40,000 m^3 annual sales	347,266.00
60,000 m^3 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 m³ (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 m³	20,000 m³	40,000 m³	60,000 m³
Total Capital Required	$442,638	$615,288	$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%	94.78%

COSTS SCHEDULE

Administration Costs		Cost Per Unit Per Year
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
	Total:	80,900

Depreciation Schedule

Category of Asset	Cost	Expected Life in Years	Annual Depreciation
Buildings	55,000	10	5,500
Equipment:			
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

Overhead Costs	Per M^3	Per MBF
Assuming sales of 60,000 m^3	US$2.44	US$ 5.75
" " 40,000 m^3	3.66	8.63
" " 20,000 m^3	7.32	17.26

Operating Costs Supplies	Per M^3	Per MBF
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 palletising	.75	1.77
Misc. labor costs	1.00	2.08
Stevedoring and port charges est.	2.25	5.31
Total operating costs:	US$9.00	US$17.48

ESTIMATED PROFIT AND LOSS FORECAST

	20,000 m^3	40,000 m^3	60,000 m^3
SALES (Average $75.00 m^3)	1,500,000	3,000,000	4,500,000
Cost of Sales			
Raw Materials (Average $52.09 per m^3)	1,041,800	2,083,600	3,125,400
Fixed Costs	166,399	166,399	166,399
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%	94.78%
CAPITAL REQUIREMENTS			
Fixed Capital	269,000	269,000	269,000
Working Capital	173,633	347,266	520,900
Total Capital Requirements:	442,633	616,266	789,900

IND:WEPierce/pnh

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 veneation, 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	Dalbergia Cochinchinensis	84,756	298,284	1,10	**Rosewood ; reddish with black veins, takes beautiful polish; fine cabinet wood, in great demand.**
Cam Lai	Dalbergia bariensis	466 158	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)	Pterocarpus pedatus	1,017,072	76,320	0,76	**Rosewood : reddish brown, or bright red, veined, with pronounced aroma of roses, fine cabinet wood, in great demand.**
Cam Thi	Diospyros siamensis	18,170	—	0,84	**White wood, black veined, in great demand for inlay, interior finish, manufacture of luxurious art objets.**
Son	Melanorrhaes laccifera	25,426	1,854	0,89	**Mahogany, fine cabinet wood, inlay, purfling interior finish. Not a true mahogany which is swietenia family.**
Mun	Diospyros mun	4,862	—	1,30	**Black ivory (Ebony), 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	Cassia siamea	29,664	—	1,13	**Blackish wood with yellow or brown streaks. Luxury cabinet wood also known as « Partridge wood »**
[illegible] Duong	Disoxylon loureiri	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	Cinnamonum camphora	14,400	—	0.80	Camphor wood highly aromatic, in demand for making luxury chests, capable of high polished greenish red with attracture figuration
Pemou	Fokenia hodginsii	18,463	—	0 47	Highly perfumed wood in demand for making high priced chests Rose-yellow
Samou	Cunningamia sinensis	30,000	—	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	Erythrophlaeum fordii ..	11,442,000	3,000	0,90	Reddish brown wood ; railway cross-ties, construction framework.
Nghien	Pentace tonkinensis	1,514,590	—	1.10	Reedish brown — Construction framework, railway cross-ties, carving wood
Cam Xe .	Xylia dolabriformis	1,313,718	38,856	1 14	Reddish brown — Construction work, wheelwright's work boat building, railway cross-tie wood
Ca Chac	Shorea obtusa	80,330	87,881	1 85	Durable reddish-brown — Construction beams and posts, wheelwright's work, boat building, railway cross-ties
Sen	Bassia pasquieri	254,208	140,381	0,90	Reddish brown construction work, cabinet, boat building.
Sao	Hopea odorata Hopea dealbata	4,861,800	5,507,950	0.71	Yellowish wood, turns brown when exposed to open air. Cabinet wood, railway cross-ties, boats.
Cam Lien	Terminalia tomentosa ...		56,000		
Kien Kien	Hopea pierre.	1,363,734	21,300	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	Sindora cochinchinensis	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	Kateeleria sp		55,920		
Xoay	Dialum cochinchinensis	199,177	1,892	1,15	Dark brown reddish wood. Construction and wheelwright's works.
Lau Tau	Vatica divers...	283,933	43,284	0,97	Light yellow, turns brown on exposure, piling, naval yard wood. Durable under water.
Tau	Vatica tonkinensis	1,440,852	—	0,99	Light yellow, turns brown on exposure. Same uses as Lau Tau.
Da Da	Xylia kerrii	220,366	8,262	0,96	Dark reddish brown, railway cross-ties, ship knees and similar sturdy construction work.
Cho Chi	Parashorea stellata	2,415,546	166,348	0,75	Good framing wood, cabinet work, in demand for boat building.
Vap	Mesua ferrea	33,902	1,811	1,05	Red colour wood, durable under water. Construction ; cabinet wood.
C. Oi	Castanopsis indica	175,869	—	0,73	Grey wood, in demand for construction work
Dinh	Makhamia stipulata	99,588	—	0,67	Yellow wood. Cabinet wood, turnery wood.
Gioi	Talauma gioi	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	Artocarpus integrifolia	105,945	—	0,87	Dark yellow wood, construction work, cabinet good for carving and turning
Trai-v	Garginia fagraoides	847	—	1,01	Orange yellow wood, lustrous, durable. Construction work, fine furniture, cabinet work, railway cross-ties
Go Do	Pahudia cochinchinensis	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 1953	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Bui Loi	Litsea vang	347,500	82,328	0,58	Yellow saffron coloured semihardwood. Construction frame work, cabinet work
Binh Linh	Vitex pubescens	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	33,930	0.82	Yellowish brown, lustrous mottled, cabinet wood, interior finish wood, carving
Teck Gia 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 particulary 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 1953	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Dau	Dipterocarpus (species)	29,664,600	36,201,988	0,66	Yellowish to reddish wood. Covered. Construction work, joiner's work, ordinary boat building, turns and work easily
Bang Lang	Lagerstroemia species	8,323,100	356,923	0,94	Greyish, tough, flexible, used for oars, boat gunwales, ship knees, wheelwright's works shaped by heating. Easily polished. Nearly like American hickory only darker
Gio	Quercus and Pasania species	3,992,150	117,866	0,00	One of the oaks. Rather flexible wood, large size trees, utilised in all work: construction, frame work, joiner work, boat building, cabinet work, flooring
Sinh	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 1958	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Ven Ven	Anisoptera cochinchinensis	12,713,400	2,436,685	0.61	Cream colored wood, no difference between sapwood and heartwood ; framing, and boat building.
Chonau	Dipterocarpus tonkinensis	889,838	403,224	0,60	Red wood, used for frame work, gun stock, cabinet wood
Lim Xet	Peltophorum ferrugineum	1,186,364	4,000	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 azaderach	2,196,452	135	0,53	Rose red color, durable wood Used as posts in ordinary house framing, and cabinet work ; « china berry » in USA south.
Xoan Moc	Toona febrifuga	144,885	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 arboreum	1,101,838	—	0,45/ 0,55	Medium grade wood, light, fine grain, cabinet and frame work construction.
Chai	Shorea vulgaris	173,326	776,513	0,80/ 0,93	Greyish rose colored wood with yellowish under tone. In demand for boatbuilding in framework.
Soi Bop	Pasania fissa	1,068,773	430	0 44/ 0,51	Clear grey wood. Protected frame work.
Cheo	Engelhardtia chrysolepis	1,313,718	—	0,56	Bright maroon colour used as framework in construction
Chieu Lieu	Terminalia Chebula	254,268	460,114	0,87	Bright maroon with interior black streaks, cabinet work
Xoa.	Magnifera indica		14,388		
Bang	Terminalia catappa		28,832		
Ca Duoi	Cyanodaphne cuneata		5,936		
Mit Nai	Artocarpus hirsula		10,000		
Tram	Eugenia species		166,922		

VIETNAMESE NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1961	BOARD FEET PRODUCED 1953	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	1 923	0.86	Yellowish brown color dark veins Construction cabinet work and boat building wood « Mekong tiger wood »
Thong (Pine) (3 needles)	Pinus khasya	14.832,300	19 561.240	0.61	Clear salmon colored, covered frame construction, joinery and packing box and plank Same uses as U S southern yellow pines.
Thong Mu (Pine) (2 needles)	Pinus merkusii	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 pinnata	550.914	19.896	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		
Nho.	Bischofia javanica	269 524	—	0.76	Red wood, covered construction work.
[illegible]	Payena elliptica		2,484,336	0.81	
Ban Xe	Albizzia lucida	119 929	—	0.63	« Mimosa » ; yellow wood with blackwish sheen, construction work. « The fox »
Ba Khia	Lophopetalum wightianum		19,896		
[illegible] Muc	Wrightia annamensis	43.225	3.544	0 43	Light white wood, homogenous fine, grains. Wooden shoes turnery, carving packing case wood. « Baby leopard »
[illegible]am	Parashorea annamensis		83.104		
Ca Duoi	Cynaodaphne cuneata	84,756	742	1.05	Very hard wood, clear red reddish white sapwood Post heavy frame, railways crossties. « Iron wood »
Cay	Irvingia oliveri		7,632		
Xoai	Mangifera foetida		53		
[illegible]	Stereospermum annamense	77,975	—	0.90	Durable for piling but very difficult to cut, clear chestnut colour, veined « Love forever »
Re Da	Shorea sp	51 701	30,528	0 82	Yellow-brown wood similar to sao but its resistance to insects is very much lower
[illegible]	[illegible]	1 187 584	92 243	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 FREE-DEPT VIETNAM	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Chani	Canarium ..	3,178,260	45,300	0,55	White wood. Ordinary packing-case wood. « Box board wood ».
Vang	Mallotus cochinchinensis .	2,830,230	—	0,40	White wood Ordinary packing-cases, wooden shoes, match boxes. « Box board wood ».
Bo De	Styrax tonkinensis .. .	3,894,200	—	2,41	Ordinary packing-cases and match boxes.
Muong Trang	Cassia tonkinensis	3,488,672		0,61	Yellowish white, packing-case wood.
Phay .	Duabanga sonneratioides ...	1,472,000	—	0,38	Light weight, packing-case, white wood.
Rang Rang .	Spatholopus orientalis .	3,003,504	5,904	0,54	Yellowish white, packing-case wood.
Thau	Liquidamber formosana .	300,201	—	0,77	Base colored wood. Light construction work. Possible veneer and ply wood; scented. Sweet gum in U.S.A.
Sau	Sandoricum indicum	2,330,700	138,631	0,53	Pale mahogany color, sabots. packing-cases.
Gao	Adina cordifolia ..	301,403	88,000	0,40	Yellowish white, veneer wood.
Mo Cua .	Alstonia scholaris	97,710	30,003	0,36	White ; packing-case wood.
Sang Trang.	Cophopetalum duperreanum	1,186,206	2,070	0,56	White ; packing-case wood.
My	Lysidice rhodostegia ...	703,003	—	0,61	Soft wood, absorbs moisture ; packing-case wood
Sung	Ficus sp.	1,403,230	—	0,33	Packing-case wood.
Sui	Antiaris toxicaria				Packing-case ; soft wood.
Gao	Bombax malabaricum	534,430	—	0,30	Packing-case ; soft wood.
Lanh Ngann.	Craioxylon formosum ..	302,310	90,000	0,76	Very hard wood. Small size trees used for making charcoal.
Duoc	Rhizophora conjugata ...	174,007	—	1,06	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	9,894,815	582,725	0,75	Fuel wood and foundation piling.
Chuong	Laurus camphorata	na	28,440	na	
Rai	Garcinia ferrea	na	1,885	na	
Ten	Polyalthia jucunda	na	2,332	na	
Nhan	Euphora longana	na	388	na	
Bach Tung	Podocarpus imbricatus	na	616,672	na	
Chung Bau	Combretum quadrangulare	na	13,144	na	
Dang De	Adina polycephala	na	6,784	na	
Goi	Aglaia gigantea	na	271,794	na	
Hau Phat	Cinnamomum inera	na	384	na	
Mop	Alstonia spathulata	na	848	na	
Mu-U	Calophylum inophyllum	na	28,488	na	
Sang	Carallia lucida	na	688,888	na	
Sang Mau	Knema corticosa	na	387,472	na	
Truong	Xerospermum macrophyllum	na	8,888	na	
Vung	Careya arborea	na	1,888,113	na	
Bang	Bauhinia variegata	na	884	na	
Ban	Sonneratia acida	na	28,884	na	
Bau Nau	Aegle marmelos	na	887	na	
Bi Bai	Acronychia laurifolia	na	186	na	
Bua	Garcinia loureiri	na	78	na	
Ca Na	Canarium album	na	738	na	

VIETNAMESE NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1961	BOARD FEET PRODUCED 1958 IN FOREST VIETNAM	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Chang Chang	Elaeocarpus tomentosus ...	na	4,375	na	
Coc	Lumnitzera coccinea	na	353	na	
Cui	Heritiera littoralis	na	881	na	
Da	Ceriops species	na	2,120	na	
Diep	Caesalpinia pulcherrima	na	3,003	na	
Du	Pterocarpus species	na	2,272	na	
Dua Cao	na	na	880	na	
Dau Heo ...	Garuga pinnata	na	8,788	na	
Dau Khau ...	Amomum cardamomum ..	na	3,003	na	
Gia	Excoecaria agallocha ...	na	6,300	na	
Giai Ngua ..	Swietiena macrophylla ...	na	880	na	
Gon	Eriodendron anfractuosum	na	6,611	na	
Keo	Acacia farnesiana	na	70	na	
Long Mang...	Pterospermum truncatolobatum	na	81	na	
Lei	Crypteronia paniculata ..	na	8,700	na	
Luong Tuong	na	na	6,704	na	
Me	Tamarindus indica	na	10,000	na	
Ngung Tau ..	Gelonium multiflorum	na	1,300	na	
Nhut	Nomalium dictyoneurum ..	na	2,713	na	
Quao	Dolichandrone rheedii	na	60	na	
Sem	Memecylon edule	na	30	na	
So De	Dillenia aurea	na	81	na	
So	Dillenia alata...	na	1,440	na	
Thach Luc ..	Xanthophyllum cmolenum	na	8,000	na	
Thui	Parkia dongnaiensis	na	8,304	na	

VIETNAMESE NAME	SCIENTIFIC NAME	BOARD FEET PRODUCED 1961	BOARD FEET 1952 IN PRESENT VIETNAM	DENSITY	BRIEF DESCRIPTION AND MAIN USES OF WOOD IN VIETNAM
Tung	Tetrameles nudiflora	na	186,396	na	
Trom	Sterculia pexa	na	225	na	
Vet	Bruguiera species	na	31,970	na	
Vong	na	na	126,164	na	
Leo Heo	na	na	5,513	na	
Mang	Pterospermum species	na	8,480	na	
Tha	Carallia lucida	na	8,882	na	
Dung	Symplocos laurina	na	1,316	na	
Vang	Sterculia species	na	900	na	
Coi	Pterocaria stenoptera	na	3,816	na	
Mang Mang	Pterospermum grew	na	530	na	
But	na	na	560,000	na	
Choai	Stenochloena palustris	na	80,000	na	
Coc Chua	Spondias mangiferra	na	530	na	
Coc Gao	Spondias lutea	na	2,374	na	
Chim Chim	Apodytes giang	na	2,000	na	
Mop	Erismanthus indochinensis	na	40,184	na	
Phao Lai	na	na	4,820	na	
Giau	Morus indica	na	4,000	na	
So Dia	na	na	2,000	na	
Thoai	na	na	1,000	na	
Mung	na	na	21,604	na	
Ngo Dong	Erythrina indica	na	73,706	na	
Ngut	Gironniera sinensis	na	104,000	na	
No	na	na	16,000	na	
Sua	Albizzia lebbekoides	na	300	na	
Tim Lang	na	na	40,320	na	
Vo Va	na	na	4,004	na	
Voi	Sterculia lychnophora	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 [1]

1 cubic meter lumber	=	424 board feet [2]
1 cubic meter sawlogs	=	221 board feet [2]
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 [2]
1 stere (German raummeter)	=	1 cubic meter of stacked roundwood or 0.276 cord [2]
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

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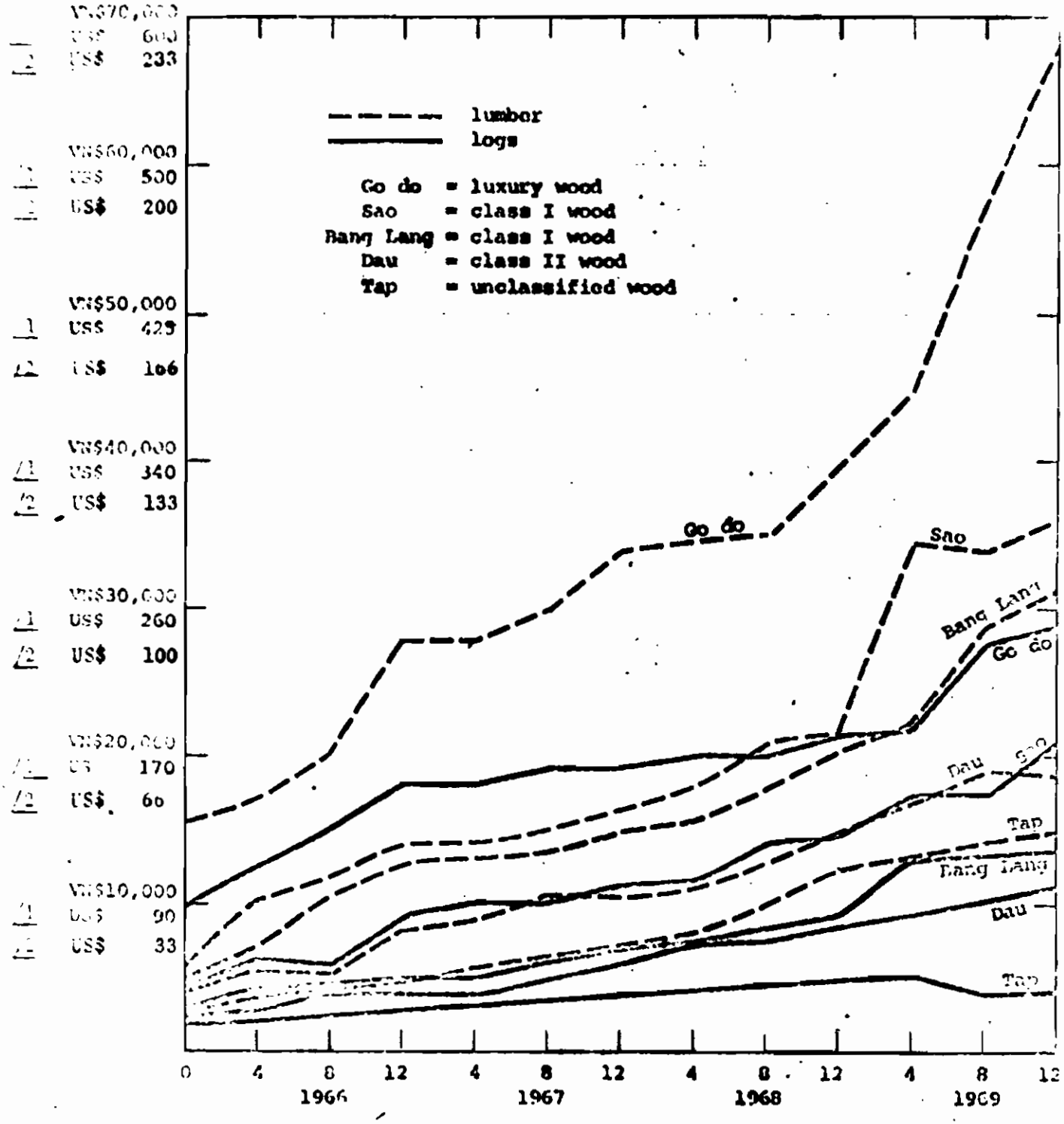
[1] From "Converting Factors and Tables of Equivalents Used in Forestry," U.S. Dept. Agri., Misc. Pub. No. 225, Rev. June 1949.

[2] Factor used in "FAO Yearbook of Forest Products Statistics, 1959."

Log and Lumber Prices, 1966-1970, Saigon

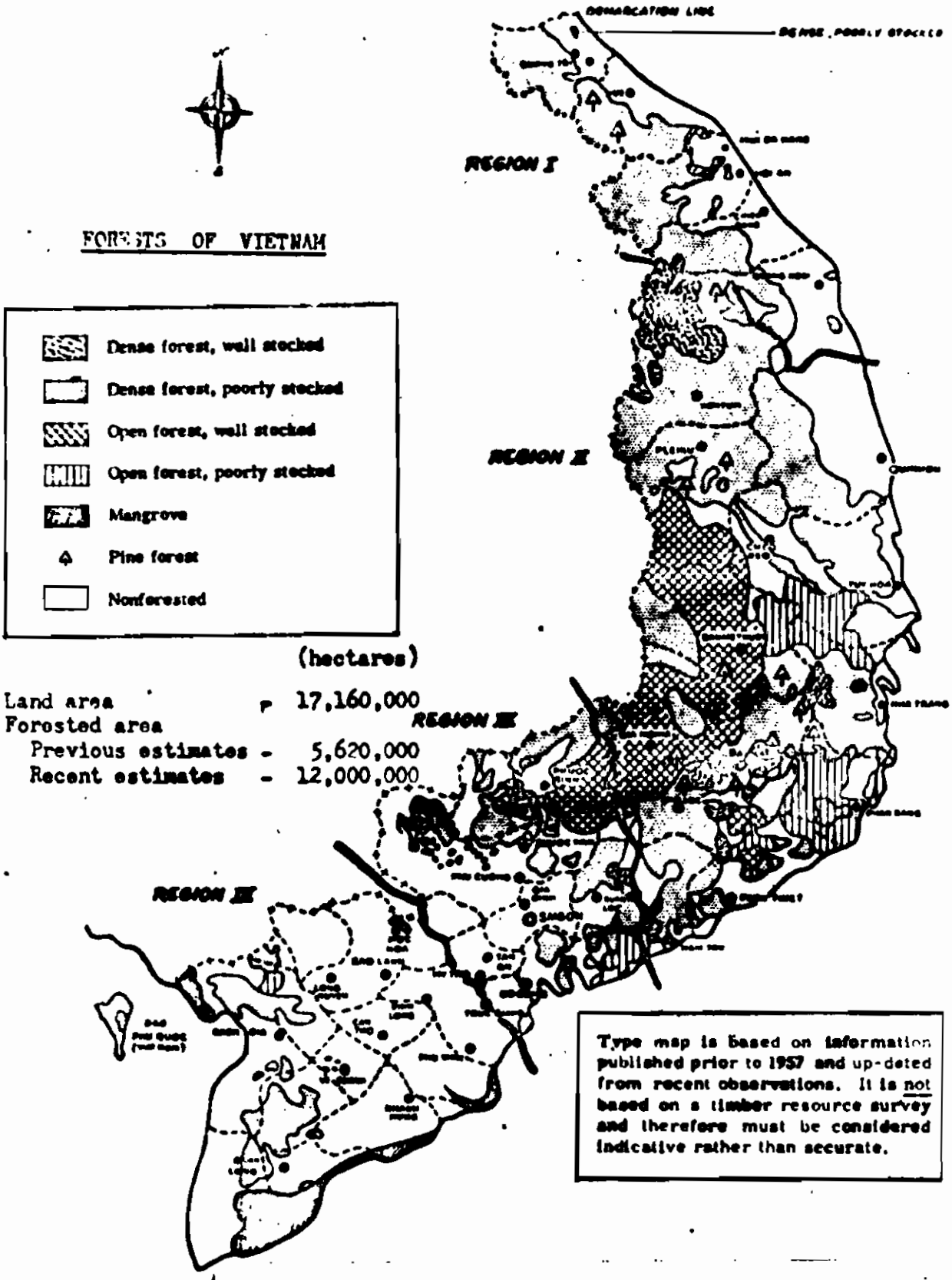
(per M^3)



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

- Dense forest, well stocked
- Dense forest, poorly stocked
- Open forest, well stocked
- Open forest, poorly stocked
- Mangrove
- Pine forest
- Nonforested

(hectares)

Land area	17,160,000
Forested area	
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 Countires (1000 $US)

Country	Total	Logs + Lumber	Pulp + Waste paper	Mfg. Wood + Plywood	Paper and Paper board
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 1/	84,982	84,405	0	569	8
Sarawak	48,247	44,443	0	3,803	1
W. Malaysia 1/	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

1/ 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 (in $1,000)	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	
	No. of Sawmills	No. of Headrigs	No. of Sawmills	No. of Headrigs	No. of Sawmills	No. of Headrigs
TOTAL VIETNAM	347	622	414	759	436	9[illegible]
Southern Region	301	437	350	614	356	672
Saigon	81	119	84	139	87	1[illegible]
An Giang	22	27	31	43	34	6[illegible]
Binh Duong	14	16	14	19	7	1[illegible]
Gia Dinh	67	94	72	139	60	1[illegible]
Long An	28	38	33	45	41	6[illegible]
Long Khanh	11	23	18	48	31	7[illegible]
Phong Dinh	16	23	17	31	17	2[illegible]
Phuoc Tuy	23	27	23	36	12	2[illegible]
Tay Ninh	29	61	41	102	59	116
Vinh Long	10	14	12	17	14	1[illegible]
Central Lowlands	14	17	23	33	13	18
Binh Thuan	6	8	11	18	8	12
Khanh Hoa	8	9	12	15	5	[illegible]
Central Highlands	32	68	41	112	67	24[illegible]
Darlac	8	18	11	31	15	[illegible]
Lam Dong	6	13	8	23	9	[illegible]
Pleiku	6	14	8	24	17	[illegible]
Tuyen Duc -Dalat	12	23	14	34	26	[illegible]

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 Data in Countries

Country	Total Land Area Mill HA	Percent Forested %	1968 Population Mill people	HA Forest Per Capita HA	1967 Log Production 1000 M³	Forest Land Mill HA	1968 Dom. Consumption M³/1000 Capita	1968 Plywood Exports M³	1968 Plywood Imports M³
Philippines	29.7	40	33.5	0.35	10,184	11.9	29	1	
Malaysia	36.3	67	9.7	1.34	12,930[1/]	24.0	110	750	2
S. Korea	9.8	55	29.1	0.35	10,200[1/]	5.3	30	208	1
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[1/]	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

1/ 1966

Source - FAO Statistics, 1969

	1966 Roundwood Exports M³/1000 Cap
Philippines	5,382
Malaysia	8,190
S. Korea	0
Taiwan	71
Thailand	37
Japan	[illegible]
Cambodia	[illegible]
Laos	-
S. Vietnam	[illegible]

VEGETATIVE TYPES - South Vietnam

	17 Northern Provinces 1,000 ha	27 Eastern & Delta Prov. 1,000 ha	Total 1,000 ha
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	131	-	131
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 [illegible]	1,224	2,525	3,749
	10,545	6,212	16,757
Water and Unaccounted			623 1/
		TOTAL	17,380

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 Goal	
	Low Est.	High Est.		
	Million		US$ Dollars	
			1975	Potential
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
	$56	$125	$68	$150

...ntonments. A Cantonment Forester
...ld be similar to a Regional Forester
...the United States.

The National Headquarters for the Direc-
...te of Waters and Forests is Saigon.

Most provinces have one or more District
Forestry Headquarters.