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REPORT OF TRAVEL TO REPUBLIC OF THE PHILIPPINES (March 1973)

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Report of Travel to Republic of the Philippines

March 1973

By

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Authority

The trip was made under a Participating Agency Service Agreement between the Agency for International Development and the Forest Service, U.S. Department of Agriculture. The PASA Control No. is TA(AJ)2-73. The PASA was approved for AID on November 29, 1972, and for U.S.D.A. on December 13, 1972.

Background

The Agency for International Development has, over an extended period, been concerned with the practice, in many tropical countries, of concentrating on a relatively limited number of species for exploitation. Such limited exploitation not only limits the resource base from which developing countries can enter into international commerce, but it also limits the possibilities for furnishing the amenities to their own populations.

An expanded resource base could, in addition, reduce the necessity for imports and thus ease the problems of balances of trade. For example, if newsprint is imported, establishment of newsprint manufacture from their own resources would be helpful.

Recognizing these problems, USAID asked the Forest Service in 1965 to look at this problem in Latin America, with emphasis on the Amazon area--probably the greatest, relatively untapped forest resource in the world. This resulted in recommendations, contained in the report "Projected AID Research Program on Improved Forest Products Utilization in Latin America," for establishment of research programs in several locations. In large part, the recommendations were based on the concept that one of the principal deterrents to increased utilization was a lack of knowledge of the characteristics of many species in the resource and thus of their potential for utilization.

¹Maintained at Madison, Wis., in cooperation with the University of Wisconsin.

The proposals for Latin America were never implemented but, in 1971, a new proposal was developed, along the same lines, to cover the three principal tropical areas of the world--Latin America, Africa, and Southeast Asia. During the review of this proposal, questions were raised as to the validity of the basic concept. That is, is the lack of knowledge of characteristics the primary deterrent to increased use of "secondary" species, or are there other factors which are equally important or perhaps more important?

To get at the answer to this question, the PASA mentioned earlier was set up and the Forest Products Laboratory was given responsibility for the project. One phase of the project involved travel to selected countries for on-the-ground discussion of limiting factors. The trip to the Philippines was undertaken under this phase. The Philippines were chosen as representative of Southeast Asia. Travel to additional countries in the area was not possible because of limitations on time and funds.

Objective of Travel

The basic objective of the travel was, thus, to gather information from knowledgeable people in the Philippines as to the factors which control the choice of species to be explored.

General Comments

Itinerary

The Forest Products Research and Industries Development Commission (FORPRIDECOM) of the Philippines was asked to develop an itinerary for my visit because of their detailed knowledge of the forest industries of the country. The detailed itinerary is shown in Appendix A.

Some modifications had to be made to this itinerary for a variety of reasons. For example, the schedule for March 18 called for a plant visit at Parang, Cotabato. We were advised not to make this visit because of the activities of Moslem insurgents in the area. Instead, we spent the weekend in Davao in discussions with personnel of Alcantara and Sons and a visit to the Sarmiento plant in Davao. Some other changes had to be made because of absence of key personnel or because of canceled airline flights.

Principal Contacts

As indicated by the itinerary, a large number of contacts were made. The principal contacts are listed in Appendix B.

Acknowledgments

Special acknowledgment must go to FORPRIDECOM for a successful trip. As indicated earlier, they developed contacts and prepared an itinerary. Commissioner Francisco N. Tamolang made arrangements with many of the leaders of the wood industries, e.g., Philippine Chamber of Wood Industries and Philippine Lumber and Plywood Manufacturers' Association, for meetings to get a cross section of their views on the problem of "secondary" species. Beyond that, however, they set up a seminar, with presentations by their top staff, describing research on "secondary" species and presenting views on potentials for use. The assembled papers will be a valuable reference source.

In addition, arrangements were made for Dr. Faustino Francia, in charge of the office of one associate commissioner, to accompany me at all times, including field travel. I feel especially indebted to Dr. Francia for his unflinching patience in all situations.

Thanks are due also to the Nasipit Lumber Company and the Paper Industries Corporation of the Philippines for their kindness in furnishing lodging and meals in the absence of other accommodations and for the time spent with me by their staff in plant and forest visits.

Dr. Filiberto Pollisco of the Philippine Council for Agricultural Research (PCAR) accompanied us on our travels away from Manila. He and PCAR rate thanks for this courtesy.

General Observations

A few general observations may help to set the stage for later discussions.

Extent of Forests

The report "1972 Philippine Forestry Statistics," published by the Forest Economics Division of the Bureau of Forestry, states that some 52 percent of the land area of the Philippines is covered with forests. This percentage varies greatly with region, Palawan reportedly having 90 percent of its land area covered by forests, Mindanao with 60 percent, and other areas with lesser percentages. Certainly those areas of Mindanao which I visited are heavily forested, based on the view from the air and from the ground.

Of a total of 30 million hectares in the Philippines, the dipterocarp forest, commercially important, occupies some 13.4 million hectares, or nearly 45 percent of the land area and about 85 percent of the forested area. The importance of this type is thus evident.

The dipterocarp type is classified into old-growth, young-growth, and reproduction-brush stands, with 1.244 billion, 422 million, and 87 million cubic meters of standing timber. The old-growth forest thus represents about 71 percent of the standing timber of this type and is that which is presently being operated, with the other forests being planned for second

and third cuts. In the old-growth forest, some 517 million cubic meters are reported as of merchantable size (55 cm. or larger).

Other types (mangrove and pine) represent minor percentages of the forest.

At no point did I get a consistent view of the importance of "secondary" species in the forest resource. One company estimated that on the order of 80 percent was in the Philippine mahoganies, perhaps 10 to 15 percent in the apitong type, with the rest in miscellaneous species. I would suspect that this varies from region to region and that their estimate is typical of their concession. However, it may indicate the general framework of the forest. Another source indicates that about 75 percent of the forest is made up of Philippine mahogany and other important species. Miscellaneous species become prominent only after the area has been logged over.

Typically, according to my informants, the "secondary" species are scattered and nowhere represent pure stands. That is, the forest is essentially heterogeneous. In notes prepared for me, estimates range from 100 to 500 species in any forest area.

Concessions

I was told that essentially all of the forested area is owned by the government, and that the timber companies operate on concessions of 1, 4, or 25 years. Obviously, large companies who are to make substantial investments must operate under one of the longer concessions. They apparently have the opportunity to renew for a second 25 years.

The Bureau of Forestry maintains strict control over the operations of the concessions. Violations of Bureau regulations are subject to fines.

Cutting Practices

In general, only selective cutting is permitted, with cutting being restricted to trees 40 cm. and larger. In practice, the minimum diameter being cut is on the order of 50 to 60 cm. The trees to be cut are marked by Bureau of Forestry personnel. Some 15 percent of the personnel of the Bureau of Forestry are classified as tree markers (1972 Forestry Statistics).

The objective of the Bureau of Forestry is to conserve trees to assure a future resource. Thus, they generally restrict cutting to about 40 percent of the volume, leaving about 60 percent for reproduction and to grow to larger size. They are, obviously, also concerned with the possibility of damage to the residual stand during logging operations and their regulations are strict on this point. During one tour in the forest, we observed the felling of a mahogany tree and it was obvious that the fellers were using great care to fell the tree in such a direction that damage would be minimal.

Clear-cutting is permitted only along the right-of-way for logging roads, at landings, and along cableways. In one instance, we were informed that

a special license had been granted for clear-cutting a distance of 300 meters to each side of the right-of-way. This was to provide pulpwood materials for the pulp mill and an area for planting to fast-growing species on a certain cutting-rotation scheme.

The larger logs are brought in to the mill site on the first go-around. At one concession (Paper Industries Corporation of the Philippines, PICOP), the company was yarding smaller logs on a second go-around, apparently for their pulp mill. After this, independent loggers are free to collect what is left and bring them to the mill which will purchase them. Another company indicated that they do no salvage logging.

Planting

Roadside cuts, landings, and cableways were observed to be planted at what appeared to be a rather short interval after operation. For example, raw slopes from road building all seemed to have seedlings set out.

In large part, the species used for such planting seemed to be relatively fast-growing species which would be suitable for pulp. The species most often mentioned as being used for this purpose was bagras (Eucalyptus deglupta). Another apparently rather commonly planted is Moluccan sau (Albizia falcata).

Plantations of a variety of species were observed. These included Caribbean pine, teak, true mahogany, and balsa. In only one place did I see a plantation of Philippine mahogany. I was told that the natural reproduction of the mahoganies was good and that planting was not considered necessary.

Considerable experimentation by the companies was going on as to handling of plantations. Proper spacing, thinning practices, and the like were being studied.

Nurseries

The two companies which we visited (Nasipit, PICO) both maintained large nurseries for production of their planting stock. A variety of species were being produced, but emphasis seemed to be on Moluccan sau and bagras. Both companies had developed, after considerable experimentation, techniques to assure good growth and to insure high production. Selected "mother trees" were being utilized as seed sources to insure good quality.

Philippine Species

Frequently mentioned in discussions was the fact that the Philippines has something like 3,500 species. A note by F. R. Lopez of FORPRIDECOM states that there are 3,897 tree species, of which 3,592 are indigenous and 305 introduced. Approximately the same numbers of species are mentioned in "Lexicon of Philippine Trees," by F. M. Salvosa. He states that this number is likely to be reduced when the flora of Southeast Asia is completely known.

Lopez further states that 2,820 species are small trees (3-30 cm. dia. and 2-5 m. high), 761 are medium sized (30-40 cm. dia. and 5-15 m. high), and 361 are large (40 cm. dia. and above and over 15 m. high). Thus a large proportion of the trees are of such size as to be of little commercial value except perhaps for pulp. Of this number, only 264 are considered important and less than 100 are reported as "commercial."

Lopez considers that only 264 can be botanically identified to species. The balance (nearly 93 percent) can be identified as to family and sometimes to genus, but hardly to species. This obviously creates difficulty in any attempt to establish a good inventory.

He points out, further, that the "secondary" species which should be considered to be of potential commercial importance have not been established. He lists 30 species as possibilities but points out that they vary considerably in size and abundance.

A comprehensive paper by Monsalud and Tamolang, "General Information on Philippine Hardwoods," suggests some 34 species which they consider will be commercially important in the next few years. Although the two lists (Lopez, Monsalud, and Tamolang) correspond in large part, there are some exceptions. This suggests the need for a concerted effort to identify potentially important species as a base for research efforts and for industry development. This point is stressed by Lopez in his note.

Terminology

The terms "weed species," "miscellaneous species," and the like were used at various times to describe the species under consideration. During various discussions, objections were raised to the use of such terms and to the term "secondary." Each of them carries the connotation of inferiority which may or may not be true. That is, some of these species, although not of commercial importance, may have excellent qualities for specific uses.

We should, therefore, consider the use of another term in describing the species under consideration. The same question arose during the World Conference on the Use of Wood in Housing (Vancouver, Canada, 1971) and the term "under-utilized" was suggested. I believe that this is a more suitable term.

The Species "Toog"

As an example of the point mentioned above, a species called "toog" (Combretodendron quadrialatum) was pointed out to me in many of the forest areas. This is a large, straight-boled, tall tree which has characteristically been left in the forest because its wood dulls cutting tools rapidly and has adverse seasoning characteristics.

Research at FORPRIDECOM established the conditions under which it could be made into high-quality veneer, as well as proper seasoning techniques. It

is now being made into plywood and plans are underway for marketing it under the name "Philippine rosewood."

Thus, a species which was formerly a "weed" tree has become one for which there is a demand. While there appear to be substantial quantities of this in the forest, the long-term supply seems to be in question. A number of foresters with whom I talked stated that they have never seen seedlings or saplings of this species and thus the manner in which it reproduces is in question and in need of study if this species is to be important well into the future.

Inventory Practices

It became evident from many discussions that there is, for obvious reasons, an obsession with the dipterocarp species and especially with the various species which are classed as Philippine mahogany. As a consequence, I was told that the inventories made by the Bureau of Forestry give detailed information on only a relatively few species with everything else classified under "miscellaneous species." In part, this reflects the importance, both in proportion of the stand and in value, of the dipterocarps. In part, however, it reflects also the lack of botanical knowledge mentioned earlier and thus difficulty in identifying species for inventory purposes.

In any event, it is a strong deterrent to use of many species. All companies apparently rely on inventories made by the Bureau of Forestry and do not make their own. Dr. Francia and others commented on the fact that, from time to time when they report research results which point to the utility of a species, industry comes back to them with the question "Where can we get it?" and they are unable to respond.

This question came up repeatedly and at least one company indicated the intention of instituting their own inventory on their concession. Discussions with several offices of the Bureau of Forestry indicated that they recognized the problem and that they should revise their inventory procedure.

Governmental Control

Some aspects of governmental control rose from time to time. Principally, these were:

(1) Limitations on size to be cut. As mentioned earlier, the minimum diameter which may be felled (except on rights-of-way and the like) is 40 cm. In view of the fact that some "secondary" species do not reach this size, their utilization could be severely hampered unless there is a change in regulations or special licenses are granted.

(2) Definition of allowable cut. The Bureau of Forestry establishes an allowable cut for each concession. If "secondary" species or logging residue are hauled, these are counted into their allowable and reduce the amount of the more valuable species which may be brought to the mill. Thus, the concessionaire is inclined to bring into the mill only the more valuable species which will yield him the greatest profit. Certainly this practice

does not encourage increased utilization through use of residues nor the development of uses for "secondary" species.

Log Export

The previously mentioned "1972 Forestry Statistics" reports log exports continually increasing in percentage of log production from 1956 to 1972. In 1971-72, for example, 83.4 percent of log production was exported as logs. Although log export had been mentioned from time to time as important, I was surprised to find the percentage as high as was reported by the Bureau of Forestry.

The importance of this may be further emphasized by the fact that log exports for FY 1971-72 had a value of \$173,253,202 as compared with a value for lumber export of only \$9,095,758.

However, the Philippine Government has decreed that the export of logs will be reduced at such a rate that, by about 1975, there will be no export of logs. This step, obviously, is intended to increase intracountry conversion and thus to spur the economy.

In my view, it might have two effects. First, if log production is maintained additional capital investment will be required to provide conversion facilities. Second, it could reduce the possibility of utilizing "secondary" species. That is, if greater quantities of the more valuable species are available for conversion, there will be less incentive to extract and use the less valuable species.

Industrial Practice

At one plywood plant, we were shown plywood overlaid with paper and printed in perhaps a dozen different patterns, none resembling Philippine mahogany. It was reported that a large proportion of their production consists of overlaid plywood. A question was raised as to why it would not be possible to use at least a face veneer beneath the overlay of a species other than mahogany, reserving the mahogany for unoverlaid panels. The response was that this would disrupt their production too much. It was not clear whether this was an off-the-cuff response or whether they had previously considered this possibility. They tried species other than Philippine mahogany which necessitated different lathe settings and drying arrangements. Besides, they encountered insect infestation problems with sapwood veneer from miscellaneous species.

In more general discussions of the possible use of "secondary" species, little evidence of interest in their use was expressed. Basically, this related to the possible disruption of large-scale production. However, one off-hand remark may be of interest. One of the staff commented that they are obtaining yields of only about 45 percent from Philippine mahogany, so why should they bother with additional species.

This same attitude had been reflected during an interview with the Bureau of Forestry. One official stated that industry would not look ahead and would not become interested in "secondary" species until they couldn't obtain their favorite species.

He reported also that the tendency was to go for export rather than local usage in order to get foreign exchange. In this connection, he indicated that generally about 2 percent of production was going to local usage, with the balance to export.

On the other side of the coin, we observed, in one plant, the production of "blockboard" and flooring from plant residues. Short lengths were being edge-glued to produce panels from which such things as drawer sides and bottoms could be manufactured. Extremely small pieces, perhaps 1 inch by 6 inches by 1/4 inch thick, were being assembled into flooring panels of the parquet type. Thus, efforts are being made to utilize plant residues.

Logging Methods

An official of the Bureau of Forestry commented that, if secondary species were to be more fully utilized, he felt that logging practices would have to be modified. That is, to reduce damage, the "secondary" species would have to be extracted first, then the primary species.

Special Industry Problems

During one discussion, mention was made of practical problems for which the industry needs solutions. Only one was specifically mentioned. A proportion of apitong logs are "sinkers." During transport, therefore, they may lose as much as 40 percent. There is, however, no way in which they can sort them out ahead of time. Thus, they feel that they badly need a method for identifying "sinker" logs of apitong to reduce losses.

Effect of Technical Knowledge on Utilization

I was unable to elicit an overall specific response to this question. However, time after time, the discussions ended up on the note that regardless of other obstacles which exist and might be overcome, promotion of a species for a specific use or uses was possible only with a knowledge of its potential which in turn depended upon a knowledge of its technical and processing characteristics.

Most frequent reference was made to the case of toog, which was formerly left in the forest and is now in demand. In fact, the prospective demand is great enough to cause concern over the reliability of supply, as indicated in an earlier comment.

One individual stressed the importance, as he saw it, of compilations of data on "secondary" species. He suggested inclusion of data on properties,

uses, and appearance--including illustrations in color. In such a compilation or elsewhere, he suggested comparisons with Philippine mahogany. That is, what is "like" Philippine mahogany and might be used in place of it.

Research Programs

FORPRIDECOM has a going research program which includes work on "secondary" species. This covers all aspects from anatomical and identification studies through to use in pulp and paper. They already have considerable data which point to potential uses. A question was raised on several occasions as to whether their efforts were being directed toward the right species. That is, they should have knowledge of which species are most abundant and of sizes to offer potential and concentrate on these. While it did not come out clearly, I certainly had the impression that this is not necessarily the basis for their choice. In fact, one of their top staff members stated several times that they needed guidance from industry as to the species which should be studied.

Dr. Pollisco, Director, Forestry Research Division, Philippine Council for Agricultural Research, has developed "An Integrated National Forestry Research Program for the Philippines." This program was developed by a team representing all aspects of forestry. FORPRIDECOM had a hand in this, with several staff members on the team. The opening statement in the section on utilization indicates the importance of research:

"Research on forest products and industry development is the tool by which more effective utilization of forest products might be accomplished and by which the wood-based and other forest-products industries can be developed and assisted in the most profitable way."

Later on, the report states "Much of the difficulty encountered with wood in use can be attributed directly to ignorance or misinformation due to a dearth, or general unavailability, of up-to-date and accurate information regarding many scientific facts concerning wood." While this is contained in the section on wood science, the comment seems to be applicable to other aspects as well. The priority areas delineated cover the full range from anatomical characteristics through process and product development. The importance attached to forest products utilization research is indicated by the proposed budget of 9,270,328 pesos (roughly \$1,400,000) for FY 1973-74. The proposed budget for a 7-year period is roughly eight times this amount.

PCAR itself will not engage in research. Research projects will be undertaken by institutions and agencies with research capabilities with PCAR in a monitoring role. The objectives will be relevance, excellence, and cooperation. Research projects which do not meet these objectives will not be approved; all projects supported by the Government will be screened by the Council.

Available Information on "Secondary" Species

The notes prepared for me by the FORPRIDECOM staff detail at least some of the data already available on "secondary" species. However, even allowing for the fact that these notes were meant to be illustrative rather than all-inclusive, it seems apparent that results are not available for all potentially important species.

Perhaps the most comprehensive compilation of available data and potential uses is that by Monsalud and Tamolang in the June and July, 1969, issues of the Philippine Lumberman and already referred to. It covers not only physical, mechanical, and chemical properties, but other important aspects such as figure, color, silica inclusions, machinability, treatability, seasoning characteristics, and the like. It finishes with a list of suggested uses.

Dr. F. S. Pollisco has for some years been working on a "Compilation of Strength and Related Properties of Philippine Woods." During my visit, he provided me with a preliminary copy. It is now in press, but he did not indicate when it would be generally available.

While the title indicates an emphasis on strength properties, it provides, as well, a great deal of information on other characteristics such as density, durability, resistance to insects, potential uses, color, grain characteristics, supply (in broad terms), and distribution. It does not limit itself to "secondary" species.

Shifting Agriculture

Shifting agriculture or "kaingin making" is a problem everywhere in the Philippines. Typically, a family will go into the forest, cut down and burn off a small area, plant it to crops and farm it for a short time, and move on to do the same elsewhere. While this is illegal, efforts to stop it have been largely unproductive. As mentioned elsewhere, some of the companies are making efforts to relocate the kaingin makers and to teach them more productive methods.

Potential Uses

A wide variety of uses have been projected for the "secondary" species. Monsalud and Tamolang have indicated some 25 possibilities ranging from small-scale uses such as bobbins, spindles, and shuttles, bowling pins, carving and sculpture, toothpicks, and the like to high-grade paneling and millwork, structural timbers, and furniture and cabinetry.

Use in pulp and paper products is already important, with at least one company using mill residues and logging residues. P. V. Bawagan, of FORPRIDECOM, in a note prepared for my visit, has shown that a variety of pulps may be prepared from Philippine species. These vary in their characteristics but suggest that a variety of papers may be made from them. The prevalence of short-fibered species poses problems, but blending can undoubtedly overcome this problem.

General

I believe that two general comments may be in order.

First, I was impressed by the devotion to their jobs of all professional personnel, governmental and industrial, with whom I came in contact. Each viewed his job with sincerity and an apparent determination to make things better for his country. While I am not a forester, and thus perhaps not competent to judge them, a broad general competence seemed evident to me.

Second, while most of my contact was with two companies, I was impressed by their social consciousness. For example, one company was building a town complete with housing, schools, and sanitary facilities for minorities. They furnished materials for the houses and helped the individuals to build the houses, thus giving them useful training. They had established breeding centers for swine and poultry and were to give "seed" stock of each to each family. They would, in addition, furnish planting stock for gardens and teach the people to raise crops. They were, also, planning to assist the people in acquiring land.

Admittedly, this is not altogether an altruistic effort, for the people involved have largely been engaged in roving agriculture, burning off an area in the forest, farming it for a couple of years, and moving on to clear a new area. It will, nevertheless, give these people a more stable and a better life.

Factors Influencing Species Utilization

The preceding observations have mentioned some of the factors which influence the utilization of "secondary" species. The more important factors will be summarized here.

Number of Species

The existence of more than 3,500 species, of which less than 100 are commercially important, certainly imposes a problem when one is considering how the other 3,400 might be used. However, as was mentioned earlier, a large proportion of these may be quickly eliminated. For example, it has been estimated that not more than about 250 have potential importance. It is highly likely that study will reveal that a relatively few would, from all standpoints, qualify as having potential. One estimate places the number at 30. Thus, while the large number of species is a factor, it does not seem to be an insoluble problem.

Inability to Identify Trees

The lack of the botanical knowledge to permit identification in the forest cannot help but create problems. Without this knowledge, errors can be made in selection of trees for felling. More importantly, however, this

lack can be a serious deterrent to establishment of accurate and meaningful inventories of secondary species.

Abundance and Dispersion of Species

Relatively little, except in general terms, seems to be known about the abundance of any of the "secondary" species. Most of them thrive together with the predominant commercial species and thus are thinly spread over the forests. It has been estimated that, in any sizable tract, up to 500 species will occur. Both of these inter-related factors will, obviously, have a deterrent effect on the utilization of "secondary" species.

Inventory Practices and Information

As discussed earlier, inventory practices of the Bureau of Forestry are such that knowledge of the location, quantities, and size distribution of that part of the resource represented by the "secondary" species is totally inadequate. In my opinion, this is one of the primary deterrents to the increased use of additional species. Removal of this deterrent will require a fundamental change in practices of the Bureau, institution of inventories by concessionaires, or both. To some degree, ability to institute changes will depend on improved ability to identify trees in the forest which, in turn, depend on improved knowledge in dendrology, and the preparation of dendrology manuals for field use.

Industry Practices

Much of the industry is attuned to the use of Philippine mahogany and a few other species. Their practices reflect this and, to some degree, they are reluctant to disrupt their procedures to accommodate other species. While some can visualize the problems ahead, all need to have their attention brought increasingly to the potential of additional species. In part, their reluctance to change is based on the heterogeneity of the resource and lack of knowledge of abundance and location. Improved inventory will have an effect on this aspect.

Governmental Control

Inability to cut trees below 40 cm. in diameter, and methods of applying allowable cut limitations, were mentioned as two factors inhibiting the use of secondary species. Both of these aspects of regulation appear to inhibit the increased use of "secondary" species.

Knowledge of Properties

Substantial information is currently available on the properties and the technology for use of "secondary" species. It would appear that it is not complete in all aspects on those species already studied nor is it clear that all species with potential have been studied. A thorough review of available and needed knowledge is required.

Areas of Potential Research

Two areas seem to stand out as requiring additional research:

- (1) That related to improvement in inventory; and
 - (2) That related to the industrial utilization of "secondary" species.
- This suggests, at least with respect to the Philippines:

- (1) To provide an improved base for inventory.
 - (a) A compilation, from industry and Bureau of Forestry sources, of those species (even though they cannot be precisely identified botanically) which occur in sufficient quantity and size to have potential for utilization.
 - (b) Develop the information needed to permit their identification in the forest by survey personnel.
 - (c) Preparation of dendrology manuals for field use.
- (2) To provide a technological base for utilization.
 - (a) In connection with the above, summarize the species which have potential. Here, it is anticipated that, though it may not be possible to identify them botanically, it is probable that they can be segregated sufficiently to permit adequate collection of samples for study.
 - (b) Summarize information already available to indicate gaps in needed knowledge and to indicate those species devoid of information.
 - (c) Undertake a carefully planned program of research on the technical and technological characteristics needed for utilization. Great care must be exercised in setting up the research program. That is, the impulse to routinely run everything through all phases of research must be stifled. Rather, we would suggest a multi-stage approach:
 - (i) Screening evaluations to provide basic indicators of potential uses such as density, color, figure, silica content, shrinkage characteristics, and the like; and
 - (ii) More comprehensive evaluations of basic properties and of processing characteristics directly related to prospective uses. Parallel to these, precise botanical information should be procured to insure that species relations are known.

Summary

While there is some tendency to discount the need for increased reliance on "secondary" species, I believe that, in general, it is becoming recognized that this is true. Certainly it was apparent to the governmental people with whom I came in contact and to some extent to industrial people.

The most commonly mentioned deficiency was the lack of thorough knowledge of the resource. Without exception, however, all were in agreement that technical and technological knowledge was basic to increased utilization. Efforts to improve both of these aspects appears important.

Admittedly, the sampling of views was limited. I believe, however, that it represents a fair view of the situation in the Philippines. How fair a view it represents of other areas, such as the less-industrialized areas such as Indonesia, may be open to question. It is likely, however, that conditions are similar in other areas of Southeast Asia.

Appendix A

Itinerary of MR. ALAN D. FREAS

March 11, 1973 (Sunday)

- 6:00 A.M. - Arrival at MIA, PAL Flight 101
(Rest and sleep in Manila)

March 12, 1973 (Monday)

- 7:30 A.M. - Departure for Los Baños, Laguna
9:30 A.M. - Arrival at Forest Products
Research and Industries Develop-
ment Commission (FORPRIDECOM)
- Conference with FORPRIDECOM
Staff and tour of laboratories
3:30 P.M. - Conference with Staff of the
UP College of Forestry and
PCAR
(Sleep in Los Baños, Laguna)

March 13, 1973 (Tuesday)

- 7:00 A.M. - Departure for Manila
9:30 A.M. - Call on and meeting with
Director Jose Viado and staff
of the Bureau of Forest Dev.
12:00 Noon - Call on and meeting with
Regent Florencio Tamesis, Gen.
Manager, Nasipit Lumber Co., Inc.
3:30 P.M. - Call on and meeting with Forester
Nicolas P. Lansigan, Vice President
Paper Industries Corporation of
the Philippines
(Return to and sleep in Los Baños)

March 14, 1973 (Wednesday)

- 7:00 A.M. - Departure for Manila
8:30 A.M. - Meeting with USAID officials,
American Embassy
10:00 A.M. - Call on and meeting with Mr. Jose
de la Rosa, President, and mem-
bers of Philippine Chamber of
Wood Industries (PCWI)
3:30 P.M. - Call on and meeting with
Mr. Renato Arevalo, President,
and members of the Philippine
Lumber & Plywood Manufacturers'
Association (PLPMA)
(Return to and sleep in Los Baños)

March 15, 1973 (Thursday)

- 4:30 A.M. - Departure for Manila Domestic
Airport
6:20 A.M. - Departure for Mactan Airport

- more -

March 15, 1973 (Thursday)

- 8:40 A.M. - Arrival in Butuan and departure for Nasipit, Agusan
- Conference with NALCO officials; tour of Nasipit Complex
- 3:30 P.M. - Departure for Tuñgao, Agusan (Rest and sleep in Tuñgao)

March 16, 1973 (Friday)

- 7:00 A.M. - Visit to NALCO's forest nurseries, forest plantations, and logging operations.
- 3:30 P.M. - Departure for Nasipit, Agusan (Rest and sleep in Nasipit)

March 17, 1973 (Saturday)

- 9:00 A.M. - Depart Butuan for Mactan
- 1:20 P.M. - Depart Mactan for Davao
- 2:40 P.M. - Conference with officials of Bureau of Forest Development; meeting with Mr. Conrado Alcantara and visit to Alcantara and Sons wood-processing plants (Rest and sleep in Davao)

March 18, 1973 (Sunday)

- 11:05 A.M. - Leave Davao for Cotabato
- 11:45 A.M. - Arrive at Cotabato and depart for Sarmiento Industries, Parang, Cotabato
- Conference with Sarmiento Industries officials and tour of Sarmiento complex (Sleep in Parang, Cotabato)

March 19, 1973 (Monday)

- 1:20 P.M. - Leave Cotabato for Davao
- 2:20 P.M. - Leave Davao for Bislig
- 2:55 P.M. - Arrive at Bislig
- Conference with PICOP officials, visit PICOP complex (Sleep in Bislig)

March 20, 1973 (Tuesday)

- Visit Bislig's forest nurseries, forest plantations, and logging operations
- Visit plywood, and other wood-products mills (Sleep in Bislig)

March 21, 1973 (Wednesday)

- 10:10 A.M. - Leave Bislig for Davao
- 1:25 P.M. - Leave Davao for Manila
- 3:55 P.M. - Arrive in Manila and depart
for Los Baños, Laguna
(Sleep in Los Baños, Laguna)

March 22, 1973 (Thursday)

- 8:30 A.M. - Conference with FORPRIDECOM
Staff

- 10:00 A.M. - Departure for Manila

- Meeting with Forester Maximo
J. Sagrado, Weyerhaeuser(Phil.),
Inc.

- Meeting with Mr. Sixto Roxas,
Economic Development Foundation,
Makati, Rizal
(Sleep in Manila)

March 23, 1973 (Friday)

(O P E N)

FCF:ah

Appendix B

Principal Contacts

FORPRIDECOM

Francisco N. Tamolang, Commissioner
Rodrigo R. Valbuena, O.I.C., Office of Deputy Commissioner
Faustino C. Francia, O.I.C., Office of Associate Commissioner
for Forest Products Industries Development Institute
Mario A. Eusebio, O.I.C., Office of Associate Commissioner
for Forest Products Research Institute
F. R. Lopez, Wood Technology Service
Joaquin O. Siopongo, Timber Physics and Engineering Service
P. V. Bawagan, Chemical Investigations Service
F. R. Siriban, Wood Preservation Service
Exequiel V. Mendoza, Wood Processing and Utilization Service
Enrique C. Amio, Technological Assistance and Training Service
Arturo A. Pablo, Industries Development Service
C. A. Linsangan, Industries Development Service

Bureau of Forest Development

Jose Viado, Director
Juan A. Utleg, O.I.C., Planning and Administration
Bernardo C. Agaloos, O.I.C., Forest Protection and Utilization
Fortunato S. Arcangel, O.I.C., Working Unit Plans Section
Napoleon B. Dalangin, Forestry Supervisor, Economics
Edmundo Cortes, Field Operations

Nasipit Lumber Co., Inc.

Florencio Tamesis, General Manager (Manila)
Jesus Natonton, Assistant Field Manager (Nasipit, Agusan)
Democrito L. Dagondon, General Superintendent (Tungao, Agusan)
Arsenio Pineda, Logging Superintendent (Tungao, Agusan)
Felipe Abraham, Forester (Tungao, Agusan)

A. Soriano and Company

Leonardo D. Angeles
Felix O. Chinte
Ronaldo P. Abilla
Gabriel R. Formoso
Simeon DeJesus

Philippine Chamber of Wood Industries

Jose de la Rosa, President
Ernesto F. Sanvictores, Executive Vice President

Philippine Lumber and Plywood Manufacturers Association

Renato Arevalo, President
Benjamin Sanvictores, Vice President

Alcantara and Sons

Nick Alcantara, President
Romy Traspe, Vice President, Operations
Sammy Bautista, Director for Forest Products Development
and Facilities Planning
Salvador Paspe, Staff of Division Manager, Logging
Cris Harder, Head, Operation Planning and Control
Cris Talingting, Head, Quality Control

Sarmiento Industries

T. P. Contreras, Vice President
Florentino Celeste
Luis Lopez

Regional Office, Bureau of Forestry, Davao

Elisio Capili, Regional Director
Modesto Canape, Forest Supervisor

Paper Industries Corporation of the Philippines

Guillermo Misa, General Manager
Eulogio Tagudar, Head, Forestry Department
Natalio Micu, Assistant Head, Forestry Department
Dominator Faustino, Jr., Agro-Forestry
Roberto Dormendo, Forest Protection

Weyerhaeuser Company (Philippines)

Maximo J. Sagrado, Forester

Philippine Council for Agricultural Research

Filiberto S. Pollisco, Director, Forestry Division

College of Forestry, University of the Philippines

Celso P. Lantican, Professor of Forestry
E. Bello, Chairman, Department of Wood Science and Technology
E. O. Domingo, Assistant Professor of Forestry

USAID Mission (Manila)

Frank W. Sheppard, Assistant Director, Agricultural Development
William Larson, Division of Capital Development
H. L. Baker, Electrical Engineering Advisor
Leonard Anton, Consultant