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SEMI-ANNUAL REPORTS ON FORESTRY AND LAND USE TECHNICAL  
ADVISORY SERVICES RENDERED TO THE CENTRAL SELVA RESOURCES  
MANAGEMENT PROJECT, PALCAZU VALLEY, PERU BETWEEN FEBRUARY  
1984 AND JULY 1987

By:

The Tropical Science Center, San Jose, Costa Rica

Under:

USAID Contract No. 527-0240-C-00-4013-00 Dated February 1,  
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First Semi-Annual Report on Forestry Technical  
Advisory Services rendered to the Proyecto  
Especial Pichis-Palcazu (PEPP) by the Tropical  
Science Center under AID Contract 527-0240-C-  
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## 1.0 Introduction

The following is a report on forestry technical assistance and advisory services provided to the Proyecto Especial Pichis-Palcazu, in the Palcazu Valley sub-project, between the effective date of the contract and the 31st of July, 1984, a six-month period. During this period, technical advisory services were rendered by specialists in the following fields: general forestry (coordination), natural forest management, forest industrial engineering, tropical dendrology, land use ecology, land capability classification, forest inventory, logging and road construction engineering, and draft animals, for a total of 16 man-months of services.

## 1.1 Organization and Recruitment

The first month and a half (February 1-March 15) was devoted to organization, recruitment of personnel, and development of a work plan in the San José, Costa Rica offices of the Tropical Science Center. At the close of this first phase, contracts for services had been signed by the General Forester/Chief-of-Party (Joseph A. Tosi, Jr.), the Natural Forest Management Specialist (Robert Simeone), the Forest Industrial Engineer (Michael Krones), and the Tropical Dendrologist (Gary Hartshorn). Negotiations for services were underway and later completed for the posts of Land Use Ecologist (Joseph Tosi), Land Capability Specialist (Rafael Bolaños), Draft Animal Specialist (William Cordero), and Logging Engineer (William Aspinall). Candidates for the posts of Forest Products and Marketing Specialist (Henry Greub), Forest Inventory Specialist (John Roper), and Wood Preservation Specialist (Guillermo Gonzalez) had been approached and, except for Roper, negotiations except for final contracting had been completed by the close of the semester. In early June, Roper turned down the final salary offer made by the Contracting Officer of AID and a search for a substitute for the post of Forest In-

ventory Expert was begun. In July, Wm. Aspinall agreed to take this assignment as well as that of Logging and Forest Road Construction Engineer, and a contract will probably be concluded with him in August.

### 1.2 Work Plan

In mid-February, Robert Simeone, the long-term advisor in Natural Forest Management, was mobilized to San José for a four-week briefing period. During this period he reviewed project documentation and assisted the General Forester and Chief-of-Party in preparing the (tentative) four-year Work Plan for the forestry technical assistance team.

In early March, both long-term advisors (Simeone, Krones), the Chief-of-Party, the dendrologist, and the land capability specialist met in the San José offices to formulate strategies for the technical assistance. The work plan and operational schedule is based upon the conclusions reached in these meetings which also set the precedent for regular weekly planning meetings of the advisory staff in Iscozacin.

### 1.3 Establishment of Technical Advisors at Iscozacin Duty Station

On March 16, the General Forester and the Natural Forest Management Specialist travelled to Peru and, after a short briefing period in the AID and PEPP administrative offices in Lima, continued on to the duty station at Iscozacin, Cerro de Pasco. They were followed, on May '4, by the Forest Industrial Engineer, on May 25 by the Tropical Dendrologist, on June 15 by the Land Use Ecologist and the Land Use Capability Specialist, on June 29 by the Logging Engineer, and July 13, by the Draft Animal Specialist. Work dates during the six-month period are as follows:

Specialist	Work Period(s)	Total Time:Man-Months
General Forester, Chief-of-Party (J.Tosi)	Feb. 20-April 13 May 17, 25	1.75 .10
Natural Forest Management (R. Simeone)	Feb. 20-July 31	5.55
Forest Industrial Engineer (M. Krones)	May 1-June 30	2.00

Tropical Dendrologist (G. Hartshorn)	May 25-July 13	1.50
Land Use Ecologist (J. Tosi)	June 15-July 31	1.50
Land Capability Specialist (R. Bolaños)	June 1-July 31	2.00
Logging Engineer (Wm. Aspinall)	June 29-July 31	1.10
Draft Animal Specialist (Wm. Cordero)	July 13-July 31	.50
8-----TOTAL-----		15.80

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On arrival in Iscozacín, advisors were confronted with a serious and yet-to-be solved problem of accommodations. There had been no prior planning for either housing or for office facilities for this staff or for the national (PEPP) forestry team itself. Inasmuch as both the long-term advisors, the natural forest management specialist and the forest industrial engineer were accompanied by their families, this failure to foresee and to take appropriate action in regard to basic housing needs was especially detrimental to prompt and effective initiation of full-scale advisory activities. The further total absence of any office space, coupled with the incessant heavy rains and the absence, at the outset, of Forestry Unit counterpart personnel, was a further impediment to a rapid start-up of field and training activities.

#### 1.4 Orientation of Forestry Unit Counterpart (PEPP) Personnel

At the time of arrival of the first members of the technical assistance team in Iscozacín, the Forestry Unit had no assigned personnel. The head of the "Distrito Forestal", Ing. Luis Chuquichaico, was acting head of this unit but, lacking subordinate personnel, the unit was, for all practical purposes, totally inoperative. It had no equipment or transport, no offices or other work space other than a small area for a nursery shared with the agronomic unit, and no professional personnel, technicians or laborers. A first priority for the TA team, therefore, was to push for the rectification of these deficiencies.

In May, a very small temporary office , minimal office furniture, and one secretary were assigned at the Iscozacín base camp. This was followed, later in the month by the contracting of some of the forestry unit personnel by the Project. Four professional foresters were engaged for the central technical unit at Iscozacín, and one each, respectively, for the posts established at Puerto Mairo and Laguna. Additionally, three technicians and six workers including outboard motorists were hired. These professionals were for the most part inexperienced, recent graduates of one or another forestry school (La Molina, Iquitos, Huanuco). With the exception of the one Iquitos graduate, none had ever lived or worked in the Selva previously, and were totally unacquainted with natural tropical forests.

A major deficiency, still to be corrected at the time of this report and five months after the arrival of the forestry advisory team from AID, is the lack of a senior professional forester with experience in moist tropical forests to be the chief of the Forestry Unit. Although Ing. Chuqui-chaico continues on as acting head, the situation is totally unsatisfactory as he is taking time from his job as head of a Forest District which is also undermanned and needs his full-time attention. As a consequence, he does neither job adequately and the unit morale as well as effectiveness continues to suffer.

Shortly after arrival, advisory team members undertook to provide elementary orientation to Project personnel with respect to the forestry component of the Project. This orientation included informal, person-to-person as well as formal presentations of the forestry plan to both Project personnel in general, at Iscozacín, and subsequently, when they finally arrived on the job, to the newly hired unit personnel. On April 9, the Chief-of-Party, Dr. Tosi, gave a two-hour talk to all Project personnel at the "Primer Seminario Informativo sobre Actualización y Conocimiento del Programa de Desarrollo Rural--Palcazu" held at Iscozacín. The talk was entitled "Proyecciones para el Desarrollo de la Producción Forestal en el Valle del Palcazu". It was followed by a discussion session and opened the way for a better understanding of the forestry aspects of the development plan for the valley. Prior to this talk, the forestry project had been grossly misunderstood by virtually every person in the project, including the profes-

signals, largely due to absence of any Forestry Unit personnel to explain it to them.

In mid-May, forestry professionals and technicians hired in Lima by PEPP finally arrived in Iscozacin. Under the leadership of the long-term advisor in Natural Forest Management and the dendrologist, this personnel was screened for ability and interests and individuals assigned to specific jobs within the first-year's operational plan. Group and individual training followed immediately and continued, on an in-service basis, through the remainder of the semester. The following tentative assignments were made:

PEPP Professional(s)	TA Advisor	Field of Activity
(To be hired)	General Forester J. Tosi	Leadership & coordination of forestry unit
Wm. Torrejón M.	Natural Forest Management Expert R. Simeone	Natural Forest Management Plans: Demonstration plots, Forest Credit, Talks and Courses for Forest Operators, Preparation of Educational Material
Nora Carillo G.	Forest Industrial Engineer M. Kronos	Wood technology and wood industrial processing; Conversion plant engineering, Wood preservation, Wood drying, Training operators
Berardo Ulloa Z.	Tropical Dendrology Expert G. Hartshorn	Forest tree identification, Seed tree selection, Key to forest trees, Common Names, Herbarium & Arboretum
(To be hired)	Forest Inventory Expert Wm. Aspinall	Forest inventories: Development of inventory system, Design of continuous inventory procedures, Volume tables, Stand and growth studies
Daniel Remigio M.	Logging and Road Engineering Expert Wm. Aspinall	Design of forest extraction system: Logging roads layout, Forest harvesting procedures and equipment, Road maintenance coordination, Equipment specifications, training operators

(To be hired)	Draft Animal Specialist Wm. Cordero	Forest products logging using oxen: Design of techniques, Program training and care of animals, Training operators
(To be hired)	Forest Products and Marketing Expert H. Greub	Design product evaluation and marketing component: Analyze national and international markets for products, Coordinate in plant design, Achieve quality control and product standards
Nora Carillo G.	Wood Preservation Specialist G. Gonzalez	Design, install, and supervise operation of wood preserving plant
All Project Staff in PEPP	Land Use Ecologist J. Tosi	Advise PEPP on application of principles of land use ecology to project and development in the Palcazu Valley
Catastral Office Iscozacin	Land Capability Specialist R. Bolaños	Design, apply, and revise a system of continuous land use inventory consistent with land capability

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The above listing of assignments of professional personnel indicates that there are presently a greater number of AID technical assistance advisors for the Forestry Unit than professional counterparts in the Forestry Unit itself. Particularly vexing is the absence of a unit-leader. It is presumed that PEPP will fill this post with a competent person in the immediate future with top priority. Additionally, there is urgency for the employing of professionals to fill the counterpart posts of forest inventory and forest products and marketing, and a technician for draft animals. Also, an additional engineer is needed for the forest industrial development post.

Evaluation of the capabilities of professionals currently employed, following approximately two months of joint work with the respective TA advisors from AID, indicates that all have a great deal to learn, even as professional foresters. On the positive side, all are young, enthusiastic, fairly bright, and mostly willing to learn.

In addition to the professional counterpart staff, the project envisions employing roughly two non-professional technicians for each specialty as well as two or more laborers in each division. Only three technicians have been employed to date, a situation requiring immediate remedy inasmuch as training by technical advisors must be directed to professionals and technicians as a team from the outset if project forestry goals are to be achieved.

At least two men employed as laborers because of lack of any formal education but working as skilled tree identifiers (J. Quijano, C. Mateo) should be raised immediately to status of technician (see First Report: G. Hartshorn).

## 2.0 Status of Work under the Contract

The following section covers the highlights of activity by each specialist who worked on the project during the first six month period of the contract.

### 2.1 General Forester/Chief-of-Party/Land Use Ecologist

Although the bulk of this specialist's time was spent in Peru, a total of 21 work days, the greater part in February and early March, was spent in San José, Costa Rica and dedicated to the selection, recruitment, and briefing of specialists to be included in the team of forestry and land capability advisors contracted for the project. During this period, also, the requisite work plan was developed.

In mid-March, the Chief-of-Party (then in his capacity as General Forester), travelled to Peru in company with the long-term specialist in forest management. Specific objectives were to (a) orient and direct forestry technical assistance activities with the objective of optimum use of project area forest resources, taking into account the social, economic, and ecological factors within the context of sustained-yield; (b) coordinate closely with PEPP personnel and the AID staff, especially in the initial planning and implementation phase for the forestry component of the Project, with special emphasis on (c) the preparation of a management plan for forest production from natural forests which would complement associated agricultural/livestock and agroforestry systems to be developed within the Palcazu Valley.

Prior to departure for Iscozacín, a week was spent in Lima to establish liaison and coordination with the PEPP central office, AID staff, and other cooperating institutions, including the Canadian International Development Agency forestry program and ONERN. In late March, enroute to Iscozacín, a further week was spent in field visits to the Oxapampa sub-project (as described below under activities of the long-term advisor in natural forest management). In both Oxapampa and Villarica, the specialist met with the local associations of loggers and lumbermen, in order to fully inform them on the forestry components of the Palcazu Project.

At the Iscozacín base, steps were taken to inform the subproject Director of the work plan and program for the forestry technical assistance advisors and get his cooperation in such vital matters as housing and office space, equipment and work materials, and counterpart forestry personnel. Visits were made to project activities in agriculture and cattle in company with TA advisors and PEPP professional staff in these fields, with concentration on integration of forestry and agriculture for proposed agroforestry programs. Native communities were visited and steps initiated to inform both comuneros and old-time colonists in the valley of the forestry program. Catastral office personnel were also interviewed and their program of land capability classification evaluated provisionally for subsequent action in this respect, carried out both prior to and during the second official work period of the specialist (as Land Use Ecologist) in June-July.

At the time of the first work period at Iscozacín in late March and April, the following major problems were encountered:

- 1/ Crowded and unsatisfactory lodgings for both short and long-term technical advisors;
- 2/ Total absence of office space, equipment, and personnel for the Forestry Unit, both TA advisors and PEPP counterpart personnel;
- 3/ Equipment for field work; none ordered or delivered;
- 4/ Forest District headquarters understaffed and under-equipped. District Forester substituting for Forestry Unit chief to detriment of his own program;
- 5/ Forestry Unit without substantial staffing or competent chief;

6/ Widespread misunderstanding of the objectives, scope, scientific rationale, or proposed program for forestry within the overall context of the project: considerable resentment amongst agronomy and livestock technicians as well as catastral-land titling staff with respect to the comparatively large budget for the Forestry Unit;

7/ Land titling program based upon a new land capability map rather than the original JRB map on which project design is based: new map being prepared by Catastral Unit heavily biased to agricultural land uses for valley area ignoring ecological realities upon which capability classification should be based.

Considerable time and effort during the first work period by this advisor was of necessity devoted to the resolution of these major problems.

With respect to housing for advisors, a plan was drawn up and work begun using contract funds for the construction of a large rustic residence which would house both the long-term advisor in natural forest management and the short-term advisors in residence in Iscozacin at any one time. Work on this building was virtually completed by the end of the semester.

With the full support of the Project Director, plans were drawn and work begun on an office for the forestry staff. Provisionally, a small office was created in the old headquarters building, a secretary assigned, and some office furniture supplied.

Equipment needs were evaluated and lists were supplied to the Project office for action on purchase. No supplies or equipment had been delivered, however, by the end of the semester. Using contract funds, some very vital items for forest inventory and land capability classification were ordered directly through the Tropical Science Center, San José office. Most equipment and supplies were still in critically short supply at the close of the semester. Unless PEPP administration can solve the equipment problems shortly, progress on the work and operational plan will be seriously delayed.

Given the fact that no professional personnel had been engaged for the Forestry Unit, a request was made to PEPP through its forestry coordinator

in Lima that all applications for these posts be made available for review and comment by the technical advisors prior to hiring. This request was not honored. In early May, <sup>six</sup> recent forestry graduates without tropical forest experience or training arrived in Iscozacin to begin their work. Still to be hired at the close of the semester are the Unit Chief, two more professionals, and several technicians and workers.

The original ignorance and misunderstanding of the forestry component of the Project by Project non-forestry personnel was largely corrected through both formal and informal presentations by the Chief-of-Party and the Natural Forest Management Specialist in Iscozacin. In Lima, presentations were made at INADE, ONERN, and at a seminar on PEPP forestry projects in mid-June.

The land titling problem was first evaluated by a comparison of the "new" capability map with the JRB and the ONERN maps, once field copies were supplied by the Catastral Unit and reduced to scale in the San José offices of the Tropical Science Center. Given the very significant disparities in these maps, a written report was rendered to the Project Manager of AID. Consultations with PEPP officials led to a tentative solution, still to be acted upon officially, that the original ONERN capability map be the official basis for land titling in the valley (see, also, Report by R. Bolaños). This entire land capability map issue, being vital to the entire forestry program as defined in the Project Paper and the Contract with PEPP, occupied a disproportionate but necessary part of the specialist's time during his second visit to the project, in the capacity of Land Use Ecologist, in the period of June-July.

In early July, the specialist attended the seminar on the Amazon Wood Industry Crisis, held in Iquitos.

## 2.2 Natural Forest Management

The long-term advisor in natural forest management, Robert Simeone, began his work in the valley in late March and will be continuously engaged there for a full three years. His duties include advising PEPP forestry staff on the development, management, and coordination of the forestry com-

ponent of the project, on the preparation of a forest management plan for production forests based on systematic clear-cutting and natural regeneration, training forest operators, owners, and technicians, and managers in the natural forest management system to be applied in the valley, and coordinating forest management activities and operations with those in logging and extraction, agroforestry, agriculture, livestock, and wood industrial processing. A good start was made on these tasks during the semester, as detailed in his report (see appended List of Specialist Reports).

Prior to the arrival of the TA team in Peru, an Operational Plan for 1984, Forestry, was developed by the PEPP forestry coordinator in Lima and written up in final form by the acting Forestry Unit head in Iscozacin. The specialist reviewed this plan and found it to have been based upon a total lack of understanding of the forestry project as presented in the Project Paper and financed under the terms of the contract between AID and PEPP. Work was undertaken, therefore, towards its restructuring, including rescheduling of the budget. Given the failure to have assigned a chief for the Forestry Unit, however, work on Forestry Operational Plan for 1985 has been delayed.

Much of the specialist's time during the May-July period was spent in the field. Efforts were concentrated upon reconnaissance of the forests in the areas to be opened up first by the new highway (Loma Linda to Iscozacin) and in contacting and orienting the native communities and colonists to the realities of the project with the objective of obtaining their active participation as well as collaboration therein. Visits were made to the native communities of San Pedro de Pichinaz, Santa Rosa de Pichinaz, Loma Linda/Laguna, Shiringamazu, Alto Iscozacin, 7 de Junio, Buenos Aires, Villa America, and Santa Rosa de Chuchurras. At each community, personal contacts were made with community leaders, one or more talks were given to the assembled comuneros, community forests were visited and appraised, and land capability was evaluated in terms of lands available per family for agriculture and for forestry. A separate report was prepared for each of these visits.

Visits were also made to the forests of some of the old-time colonists of the valley. Similar steps were taken, on an individual basis, to acquaint these very influential people with the forestry development plan and to elicit

their cooperation and participation. Plans were made with one forestry-conscious colonist to prepare a management plan for his 60-hectare forest reserve. This reserve may become one of the demonstration forests for the first industrial unit.

Finally, near the close of the semester, the natural forest management specialist, in company with the dendrologist, the forest inventory specialist, and the land capability specialist and their counterparts, travelled to Pto. Mairo for a week's visit to the local forestry reserve area to provide back-up counselling to the forester assigned to the Rural Development Center there, and to see, first-hand, some of the problems in land use, land titling, and settlement control being experienced in an area where new colonists from down-river are the predominant inhabitants. On the basis of this visit, plans are being formulated for a development strategy in forestry, including a forest management plan for the forest reserve area, in this section of the valley where no road exists or is in immediate prospect.

### 2.3 Forest Industrial Engineering

The Forest Industrial Engineer, Michael Krones, will be working as a short term advisor over a five month period in 1984. In 1985 at some time, he will return to the project for a continuous period of two years as the long-term advisor in this key specialty. He began work with the project in May, remaining through the end of June, and will return in August for another three months. During his first year, Mr. Krones will design a model (or models) for the wood manufacturing industrial complexes to be established in the Palcazu Valley, including recommended locations and land requirements, specifications for equipment and budget, staffing and training, recommend appropriate manufacturing processes, and prepare plans and organizational layouts for these plants.

The specialist spent his first two months in this period evaluating the possibilities for forest industrial development in the valley. He studied the existing industry both within the valley and in the nearby, upstream manufacturing centers of Cacazu, Villarica, La Merced, and Oxapampa. Within the valley, he accompanied other forest management team members in visits to several of the native communities, where he became aware of native community interest

in becoming owner-operators of one or more of the manufacturing centers to be established under Project auspices. The hydroelectric potential of the nearby watersheds was determined to be of major interest as a power source for industry and, in Lima, he made contacts for the evaluation of the hydropower potential of several streams near possible conversion plant sites.

In Lima, the specialist visited a number of institutions directly related to the forest industries, especially the Instituto de Normas Técnicas--ITINTEC--(for standards applicable to wood products) and the Forestry Faculty of the Agrarian University at La Molina, Department of Forest Industries (to obtain their collaboration in wood testing and results of published studies relevant to products that might be elaborated from the woods in the valley.

Upon his return to Iscozacín from the field visits and Lima, the specialist initiated training for his counterparts and began organizing the collection of wood samples from on-going forest clearing operations. These samples will be prepared for laboratory examination and for inclusion in the permanent wood collection of the Project.

Starts were also made on the plant design problem, assuming a high percentage of total wood volume in high-density, strong, attractive and figured durable woods, as indicated by the wood collections and preliminary dendrological results.

#### 2.4 Dendrology

As a short-term advisor, the tropical dendrologist, G. Hartshorn, is scheduled to be engaged for roughly one and a half months per year over the life of the project. He began his work in the first semester. Prior to departure for Peru, he compiled a master list of all common names known from Bosque Nacional Alexander Von Humboldt, forest inventories in the Palcazu Valley (ONERN, La Molina, and J. Galvan), plus the short list of scientific names prepared for the JRB study by R. Foster.

The specific responsibilities for the dendrologist are to (a) identify and classify, botanically and by utilization category, tree species in Palcazu forest production zones, (b) identify and classify tree seedlings and saplings

in natural regeneration, (c) train forest operators, PEPP technical staff, and owners in accurate field identification of trees, saplings, and seedlings, and (d) supervise and participate in the preparation of a local key to the trees in native forests of the Palcazu lowlands.

Because this was the first of at least four trips scheduled in the work plan, he emphasized the compilation of common tree names used in the valley. He also evaluated "materos" or practical tree identifiers, collected botanical specimens, collaborated with the forest industrial engineer in starting the collection of wood samples, assisted the forest management specialist in assessing candidate production forests, participated in several meetings with AID and PEPP staff and advisors, assisted AID visitors to the Palcazu valley, evaluated the PEPP Forest Reserve for establishing an arboretum and left recommendations for the dendrology team to carry over in the next few months.

Approximately 450 common names of trees were compiled during the six weeks in the field. A list of local tree names was typed and left with the Forestry Unit. Of those trees actually seen by the specialist, family and scientific name is included in the tree list. Virtually all trees seen were identified to the family and many have been identified to genus, while some include species. Local names used in the Palcazu Valley are the most unusual the specialist has encountered in widespread studies throughout the Amazon basin. Local names are further complicated by different names in the Amuesha language.

During his first visit, the specialist evaluated the tree identification abilities of four materos or local tree identifiers. Because many of the local names apparently differ from the south to the north in the valley itself, standardization of names is urgently needed for the Palcazu valley. A start in this direction is proposed through a short course in tree identification proposed for the second semester (November) in which all forestry personnel of the project would participate.

The scientific name of a tree is essential in order to assess the substantial literature on wood properties and uses. Because common names in the valley are quite unusual, it is considered even more critical that their scientific names be accurately determined. Most tree species can be determined only by collecting fertile material and sending these botanical specimens to

major herbaria. A start on this work was made during this semester. Approximately 75 different botanical specimens, most of which were fertile, were collected, dried, and sent out for identification. The specialist also designed two wooden herbarium cabinets to be constructed in the carpentry shop for storage of a small reference collection of botanical specimens of valley trees to be kept in the Forestry Unit headquarters in Iscozacin.

The small forest reserve area within the land area property of the Project headquarters at Iscozacin was the object of study by the Forestry Unit during this semester. The dendrologist surveyed this area to determine its suitability for an arboretum or collection of living sample trees. He determined that it was generally too steep and degraded by past cutting to serve well in this capacity. Some privately-owned lands nearby were recommended for an arboretum instead.

In company with the land capability expert, the natural forest management specialist, and the forest inventory specialist, he surveyed the Iscozacin base camp watershed which lies partly within this reserve, to determine land use, water quality, and hydrological function. It was determined that about 70 percent of the watershed is currently utilized as pasture for cattle, is steep, overgrazed, and badly eroded, and that steps should be taken immediately to acquire control over the entire watershed, eliminate grazing activity, and if possible, reforest the most degraded parts. A special report was rendered on this problem.

Finally, among his recommendations, the specialist noted time budgeted for dendrology under the TSC contract with AID will be totally insufficient to fulfill the assigned responsibilities. A doubling of time is recommended.

## 2.5 Land Capability Classification

Land use is a fundamental consideration for the development of the Palcazu Valley. A major objective of the development plan is to achieve maximum sustainable production from each ecologically-distinctive area therein. Because forestry was determined to be the most permanently efficient production option for a large part of the valley land in the environmental assessment (JRB Study, 1981), technical assistance in land use ecology and land capability classification was assigned to the forestry advisory team.

Land use ecology and land capability assessment are two closely related fields of specialization. Both a land use ecologist and a land capability specialist are participating in the project as short-term advisors. In practice, the General Forester/Chief-of-Party is also acting as land use ecologist, while Ing. Rafael Bolaños is serving as land capability specialist. Activities in land use ecology were initiated in April, with the specialist's review of the land capability map being drawn by the Catastral Unit at Iscozacín. Copies of this map at 1:10,000 scale were delivered in late May and, in early June, the land capability specialist with the part-time collaboration of the land use ecologist, reduced this map to a scale of 1:100,000 and prepared a transparent overlay to the JRB land capability map (Tosi) of 1981. A similar comparison was made of this new and unorthodox map and the ONERN land capability/soils map of 1981. In July, at the insistence of Dr. Howard Clark who was called in as an independent arbiter on land classification, the three maps were entered into the Geographic Information System computer at ONERN and quantitative areal comparisons were ordered. Delivery was not completed in this semester but a report by Clark supported the arguments (in memoranda and reports by Tosi and by Bolaños) that the Catastral Unit map was overtly biased in favor of agricultural land use rather than forestry in the valley.

From mid-June to early August, the land capability specialist was in the field in the Palcazu valley. Much of this time was spent in the field in company with the mapping teams from Catastral Unit, in evaluation of their field procedures. These procedures and applications of the official classification were determined to be inappropriate. Crews lacked basic field equipment for the work, failed to use the most recent and detailed ecological map of the valley, failed to use the regulation classification in the approved, standard manner, and were overtly biased to getting as much agricultural land as possible for titling purposes.

This problem was taken to the Director of PEPP by AID officials in late July and had not been satisfactorily resolved at the end of that month. The Tropical Science Center technical advisors recommend the application of the JRB land capability map of 1981, inasmuch as it is the only map of the three in review that takes the ecology of the valley into account. If the ONERN

map is declared official, the advisors recommend that the Catastral Unit under the guidance of the land use ecologist and land capability specialist revise that map by applying the 1981 detailed life zone map of the valley prepared by the JRB consultants. A revised ONERN map would be closely similar to the JRB land capability map.

Between the 18th and 20th of August, inclusive, the land use ecologist and the land capability specialist, together, offered an intensive short course in land capability classification based on the Integrated Ecological System devised by Tosi. This course, which included both theory and field practice, was given for the Forest Unit technicians but was also attended by personnel from the Catastral Unit, and the Agricultural and Livestock Unit.

One of the principal responsibilities of the land capability specialist is to provide technical advice to the national technicians from the Catastral Unit, when they conduct the continuous land use inventory under a special agreement with PEPP. The purpose of the inventory is to monitor (and correct) the relation between actual land use and land capability in the valley area. At the time of the specialist's visit, however, work had not begun or been planned for the continuous inventory, nor had necessary field equipment been ordered. It is vitally urgent that the Project incentivate and facilitate work on the continuous land use inventory if undesirable land use patterns are not to emerge in the valley to frustrate sound development initiatives. For instance, it was noted that at Laguna, native comuneros complain of the usurpation of their best food crop lands on river terraces for the planting of cacao under Project auspices, or for pasture, forcing them to clear high forest in hilly forest production grade lands for for food production. Elsewhere, at Pto. Mairo, new colonists are being allotted small areas for agriculture in forest class lands. The specialist will return to the project as soon as steps are taken to implement the plan for continuous land use inventory, for which he is the advisor. Meanwhile, there is nothing more that he can accomplish.

## 2.6 Logging and Road Design

The advisor in logging and forest road construction engineering arrived at the end of June to begin this phase of the work on the project. It has been presumed that by the time of his arrival another specialist, the forest inventory expert, would have been on the job and in a position to work toge-

ther with him in establishing a data base for logging and extraction, and that the first management area would have been delineated. Unfortunately, the forest inventory candidate would not accept the salary offer approved by the Contracting Officer and did not, therefore, arrive as planned.

The solution to the above-noted impasse was to give the forest inventory job to Wm. Aspinall, already contracted as the logging engineer, as both are short-term posts and he is equally-qualified in both fields of specialization.

As logging engineer, Mr. Aspinall will assist PEPP in the design of logging and extraction systems consonant with the ecological conditions of the area as well as sound economic principles. He will also assist with the design, construction, and maintenance systems for secondary roads which will be implanted in each management block for the extraction of forest products and delivery of these to the conversion plants. In line with these requirements, he will set specifications for forest harvesting and road construction and maintenance equipment. He will work closely with both the road maintenance engineer of the Project and the draft animal specialist.

During the first month of his participation, the combined forest inventory expert/logging and road construction engineer was briefed on and became personally familiar, through field visits, with the more specific nature of the project and the ground and social conditions of the area, and was able to design the first inventory activities for the area between Laguna and Shiringamazu, and lay down specifications for equipment and supplies to be purchased for inventory, logging, road haul, road construction, and road maintenance. A complete report on his activities are expected during the second semester.

## 2.7 Draft Animal Specialist

As a complement to the system of harvesting forest products, the project plan envisions the employment of draft animals, preferably oxen. The purpose is both socio-economic and ecological: draft animals are an "appropriate technology" for introduction and acceptance in a primitive society with little capital resource other than standing timber, and they will be far less destructive of the environment than mechanical equipment under the prevailing environmental conditions.

A draft animal specialist will provide technological information to the project in the specialized field of logging and extraction of forest products in the management blocks. He will work closely with the logging engineer (Wm. Aspinall) in devising appropriate extraction systems using oxen, and train PEPP personnel, forest operators, and others to care for, train, and employ draft animals in the forest.

The draft animal specialist contracted for this project, W. Cordero, is a trained forester and logging engineer with specialized experience in animal logging, a traditional practice in his native Costa Rica. This specialist arrived to begin work in the project in mid-July and will render his first report on accomplishments in the second quarter.

### 3.0 Plans for Ensuing Period

#### 3.1 Operational Plan for 1985

The preparation of this plan has top priority, yet must be held in abeyance until such time as a Chief-of-Unit has been engaged by PEPP and begins work with the Forestry Unit.

#### 3.2 Operational Plan for 1984

This plan will be revised immediately to conform more closely with the natural forest management strategy outlined in the Project Paper.

#### 3.3 First Management Unit

Work will be completed on plans for the first forest management unit, to be located in the Laguna-Shiringamazu area. Exploratory work in this area has indicated that some 4500 hectares of virgin timberland are available on native community and some colono lands to supply raw material for a full-scale conversion plant. Search for an appropriate site for this plant are to begin in August, along the projected route for the new highway, as are exploratory inventories of timber stocks on the natural forests of this general area.

#### 3.4 Forest Products and Marketing Studies

A short-term specialist in the field of forest products and marketing has been engaged and will begin work in October. He will survey comparative

market potential for wood products from the Palcazu in both national and international markets, which information will be used in planning product lines and specializations from the conversion plants to be established in the valley.

### 3.5 Equipment Lists and Purchases

Work will continue on defining equipment needs, especially needs for heavy equipment for forest road construction and maintenance, logging, and transport of forest raw materials to the mill site. Equipment needed for specific conversion plants will also be identified and orders placed, when appropriate, through PEPP.

### 3.6 Training and Extension

In-services training of counterpart personnel, and forestry extension activities will be an important part of the activities of all advisors during this coming semester. Native community members from Laguna, Loma Linda, and Shiringamazu will be organized into special work teams through on-going arrangements with community leaders, for field training in the strip clear-cutting method of forest harvesting proposed by the Project. A training area, probably in the forest of Shiringamazu community, will be established for the above purpose. Another training forest will be established in the property of one of the German colonists, Mr. Luis Frantzen, who is actively cooperating with the project.

### 3.7 Draft Animal Selection and Training

Work will be on selection of suitable animals for training as work oxen, and on training PEPP personnel in animal training and care.

### 3.8 Dendrology

The dendrology specialist will return for additional work in tree identification during this semester. Work will focus on scientific species identifications of trees having significant market potential, and upon expansion of the staff of skilled materos. A short course in dendrology for all personnel of the unit will be conducted.

### 3.9 Continuous Land Use Inventory and Land Capability Classification

It is proposed that work be continued in these two related areas of spe-

cialization. The activity is only tentative, at this time however, because PEPP has failed to make a formal pronouncement on the official land capability map for titling, and on suggested up-dating of the ONERN land capability map based upon the revised (1981) life zone map for the valley. PEPP has also failed to get the Catastral Unit moving on the continuous land use inventory, for which they have been contracted. It is possible that these problems will be resolved shortly and that work can begin as needed on actual land use and capability classification. If such does occur in this semester, then TSC will bring the land capability and land use ecology specialists back to the valley to provide the necessary advisory services to the Catastral Unit.

4.0 Partial List of Specialist Reports During the First Semester, 1984

<u>TSC Report No.</u>	<u>Title</u>	<u>Author</u>
01-84	Work Plan 1984	Tosi, Simeone
02-84	Field Trip to Oxapampa, Huanabamba, Villa Rica, Cacazu, and Pichinaz; March 27-30, 1984	Tosi, Simeone
(03-84)	Pros and Cons, from a Forest Management Perspective of the Proposed Change of the Carretera Marginal from Crossing the Rio Iscozacín at Pan de Azucar, etc.	Simeone
04-84	Viaje a las CCNN Loma Linda y Pto. Laguna; 24 a 26 de abril, 1984	Simeone
05-84	Viaje a CN Alto Iscozacín; 28 a 29 de mayo y 10 de junio, 1984	Simeone
06-84	Viaje a CN 7 de Junio; 5 a 7 de junio, 1984	Simeone
Memo	PEPP/Catastro y Titulación Land Capability Survey--Palcazu Valley	Tosi
(006/E)	Resumen informativo del Ingeniero M. Krones, Asesor en Industrias Forestales	Krones
Memo	Visita a la CN 7 de Junio con grupo de Catastro	Bolaños
009-S	Reconocimiento de la Cuenca de la Quebrada Alcantarilla, Iscozacín, Palcazu	Hartshorn, Bolaños, Simeone y Aspinall

011-E	Dendrology Consultant's First Report, Palcazu Valley, Peru	Hartshorn
---	Nombres Locales de los Arboles del Palcazu, Peru; agosto 1984	Hartshorn
014-C	Capacidad de Uso de la Tierra: Pro- yecto Palcazu; Informe de Labores	Bolaños
015/84	Half-Year Report: Natural Forest Ma- nagement Palcazu Valley February-July 1984	Simeone
Memo	Report on attendance at Forum "Crisis de la Industria Maderera de la Amazo- nia Peruana: Alternativas de Solución"	Tosi
016-A	First Semi-Annual Report on Forestry Technical Advisory Services Rendered to the Proyecto Especial Pichis-Pal- cazu (PEPP) by the Tropical Science Center under AID Contract No. 527- 0240-C-00-4013-00, dated Feb. 1, 1984	Tosi

Second Semi-Annual Report on Forestry Technical  
Advisory Services rendered to the Proyecto  
Especial Pichis-Palcazu (PEPP) by the Tropical  
Science Center under AID Contract No.  
527-0240-C-00-4013-00 dated Feb. 1, 1984

1.0 Introduction

The following is a report on forestry technical assistance and advisory services provided to the Proyecto Especial Pichis-Palcazu, in the Palcazu Valley sub-project, between August 1, 1984 and the 31st of January, 1985, a six-month period and the second half of the first year under the Contract. During this period, technical advisory services were rendered by specialists in the following fields: general forestry (coordination), natural forest management, forest industrial engineering, tropical dendrology, land use ecology, land capability classification, forest inventory, forest products and marketing, wood preservation, and draft animal logging, for a total of 20.45 man-months of services.

1.1 Organization and Administration: San José Office

During the months of August and early September, the General Forester and Chief-of-Party undertook the preparation of the first semester reports (in English and Spanish) on the forestry technical assistance as well as an English-language report on Personnel and Expenditures. During this period also, first field reports by advisors were reviewed and discussed (Simeone, Hartshorn, Krones, Aspinall, Cordero, Bolaños, Tosi) while new advisors Henry Greub (Forest Products and Marketing) and Guillermo González (Wood Preservation) were briefed in preparation for their first visits to the project. All advisors were de-briefed in December upon their return from Peru.

1.2 Organization and Administration: Iscozacín Duty Station

During the first semester, as reported previously, the long-term advisor in natural forest management, Robert Simeone, arrived at the Iscozacín

duty station along with his wife Teresa. During this first year, Robert was the only permanently-resident forester under the AID/TSC contract and, as such, acted as representative for the advisory group as a whole. Teresa Simeone assisted in both organization and administration activities for the TSC advisory group--first, on a voluntary basis and, late in the year, after receiving contracting officer approval, on a paid-service basis. In addition to their official advisory activities, the Simeones designed, contracted, and supervised the construction of a rustic rural residence for themselves, neither private rental or project housing being available in Iscozacin. This dwelling was essentially finished in October and a room was separated therein as a temporary office and library for the advisory staff. Specific duties and activities of the Simeones are detailed in subsequent sections of this report.

1.3 Technical Advisory Services: Level-of-Effort

A total of 20.45 man-months of technical assistance were provided by the TSC staff during this semester, as follows:

Specialist	Work Period	Total Time:Man-Months
General Forester/Chief-of-Party (J. Tosi)	(Aug.1-Sept.10)* Oct.11-31	(1.75)* 0.67
Natural Forest Management Specialist (R. Simeone)	Aug.1,1984- Jan.31,1985	6.0
Forest Industrial Engineer (M. Kronos)	Aug.10-Nov.9	3.0
Tropical Dendrologist (G. Hartshorn)	Nov.20-Dec.14	0.79
Land Use Ecologist (J. Tosi)	Nov.1-23	0.80
Draft Animal Specialist (W. Cordero)	Aug.1-Sept.4	1.15
Land Capability Specialist (R. Bolaños)	Aug.1-8	0.29

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Forest Inventory Specialist (w. Aspinall)	Aug.1-Dec.14	4.50
Forest Products and Marketing Specialist (H. Greub)	Oct.5-Dec.21, 24, 26	2.58
Wood Preservation Specialist (G. González)	Dec.1-21	0.71
<hr/>		
10 Specialist.....		20.45 man-months
Average monthly level-of-effort.....		3.42 man-months
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● Unremunerated: not included in total level-of-effort.		
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During this semester, short-term advisors were plagued by a problem of accommodations. Neither adequate personal quarters nor office space was yet available in the project compound of PEPP, the camp being overcrowded with personnel at the administrative level, laborers, and the like. Generally, PEPP administration having failed to recognize the forestry-emphasis of the Palcazu Valley project, did not foresee and make necessary provisions for the heavy influx of AID advisors in this field.

#### 1.4 Orientation and Training: Forestry Unit Counterpart Personnel

At the time of arrival of the first members of the technical assistance team in Iscozacín (March 1984), the Forestry Unit had no assigned personnel. The head of the "Distrito Forestal", Ing. Luis Chuquichaico, was also acting head of the Forestry Unit but, lacking subordinate personnel, the unit was, for all practical purposes, totally inoperative. It had no equipment or transport, no offices or other work space other than a small area for a nursery shared with the agronomic unit, and no professional personnel, technicians or laborers.

In May, a very small temporary office, minimal office furniture, and one secretary had been assigned to the unit at the Iscozacín base camp. This was followed, later in the month, by the contracting of a few of the proposed forestry unit personnel. Four graduate foresters were engaged for the central technical unit at Iscozacín, and one each, respectively, for the CDP posts established at Puerto Mairo and Laguna. The professionals

were all inexperienced, recent graduates of one or another forestry school (La Molina, Iquitos, Huanuco). With the exception of the one Iquitos graduate, none had ever lived or worked in the Selva previously, and were totally unacquainted with natural tropical forests.

A major deficiency, however, and the one contributing most to the persistence of the others, was the failure of the project to engage a senior professional forester with experience in moist tropical forests to be the chief of the Forestry Unit. Although Ing. Chuquichaico continued on as acting head through the second semester, the situation was totally unsatisfactory as he was taking time from his job as head of a Forest District which was both undermanned and needed his full-time attention. As a consequence, he did neither job adequately and the Forestry Unit morale as well as effectiveness continued to suffer until the end of the year.

Within the limitations imposed by this situation, advisory team members undertook to provide elementary orientation to Project personnel with respect to the forestry component of the Project. This orientation included informal, person-to-person as well as formal presentations of the forestry plan to both Project personnel in general, at Iscozacín, and to the newly-hired Forestry Unit personnel.

Individual specialists having been assigned national counterparts from amongst the newly-hired professionals, training continued upon a man-to-man basis. However, the effectiveness of this training was seriously hampered by the scarcity of counterparts and by some personnel turnover during the semester. For instance, a single counterpart had to be shared by the tropical dendrologist and the forest inventory specialist, another by the forest industrial engineer, the forest products and marketing specialist, and the wood preservation specialist, and a third by the natural forest management specialist and the draft animal specialist. As a consequence, counterparts were overloaded with work and unable to give full attention to any given field. There were, on average, double the number of advisors as of Peruvian forester counterparts. Oftentimes, when a short-term advisor left the Project, the counterpart person shifted to another advisor, abandoning the work initiated previously: there was a minimum of organization and supervision due to the absence of a regular Forestry Unit leader.

Training was further jeopardized by the virtual absence of the most minimal technical equipment for field work, the lack of adequate office space, drafting equipment, supplies, or secretaries, and by an indifferent, unresponsive, and not infrequently resistant Project administration. Field work was limited by both budget insufficiencies and such administrative difficulties as obtaining local transportation and per diem for national counterparts on a timely basis, again attributable to the lack of a positive commitment to the forestry component of the project by Project administration. The foregoing is understandable because, in the first three years of Project existence, and almost two years since the signing of the agreement between PEPP and AID, an agreement based upon the Project Paper, there had been no attempt on the part of AID to make sure that the Project leadership understood the philosophy, ecological rationale, and natural resources management goals of the project as set forth in the Project Paper. Neither that document nor its predecessor, the JRB Report, indeed, had ever been translated into Spanish nor circulated amongst project technicians. Inasmuch as almost two years elapsed between the signing of the agreement between AID and PEPP and the contracting of the forestry and land use technical assistance team, it is understandable why the Project simply went ahead on the basis of their own traditional understanding of what constituted a High Selva colonization and development project.

Following the arrival of the TA team in forestry in Iscozacín, nearly a year was spent in attempting to reverse this trend, to reorient the thinking of PEPP principals as to the resources management emphasis underlying AID technical and financial support of the project. When the team arrived, all key Project personnel were confused as to the need for the large financial and TA component for forestry. Key personnel were actively moving to sabotage forestry and to rebudget to further agriculture and a traditional approach to forestry, with tree planting based upon nursery-raised stock following a liquidation harvest of the standing old-growth (virgin) forest on all lands, including extensive areas suitable only for forestry. This same mentality underlay Project initiatives to re-classify land use capability in the valley, in the mistaken belief that most of the land would be suitable for agricultural colonization. This land re-classification further hampered efforts by the advisory team to institute the natu-

ral forest management and forest industrial development systems as set forth in the Project Paper and in the AID/TSC Contract for this technical assistance.

As of November 1, 1984, the following Forestry Unit professionals were assigned as counterparts to the TSC TA team members:

PEPP Professional(s)	TA Advisor	Field of Activity
Unit Chief (To be hired)	General Forester (J. Tosi)	Leadership and coordination of forestry unit
Wm. Torrejón M.	Natural Forest Management Expert (R. Simeone)	Natural Forest Management Plans: Demonstration plots, Forest Credit, Talks and Courses for Forest Operators, Preparation of Educational Material
Nora Carillo G.	Forest Industrial Engineer (M.Krones)	Wood Technology and wood industrial processing; Conversion Plant Engineering, wood preservation, wood drying, training operators
Berardo Ulloa Z.	Tropical Dendrology Expert (G. Hartshorn)	Forest tree identification, seed tree selection, key to forest trees, common names, Herbarium and Arboretum
(To be hired) (Berardo Ulloa Z.)	Forest Inventory Expert (W. Aspinall)	Forest inventories: Development of inventory system, Design of continuous inventory procedures, volume tables, stand and growth studies
Celso A. Ratachi V.	Logging and Road Engineering Expert (W. Aspinall)	Design of forest extraction system: Logging roads layout, forest harvesting procedures and equipment, road maintenance coordination, equipment specification, training operators
(To be hired) (W. Torrejón)	Draft Animal Specialist (W. Cordero)	Forest products logging using oxen: Design of techniques, program training and care of animals, training operators

(To be hired) (Nora Carillo G.)	Forest Products and Marketing Expert (H. Greub)	Design product evaluation and marketing component: Analyze national and inter- national markets for pro- ducts, coordinate in plant design, achieve quality con- trol and product standards
(To be hired) (Nora Carillo G.)	Wood Preservation Specialist (G. González)	Design, install, and super- vise operation of wood pre- serving plant
All Project Staff in PEPP	Land Use Ecologist (J. Tosi)	Advise PEPP on application of principles of land use ecology to project and de- velopment in the Palcazu Valley
Catastral Office Iscozacin (To be assigned)	Land Capability Spe- cialist (R. Bolaños)	Design, apply, and revise a system of continuous land use inventory consistent with land use capability, train Forestry Unit Extensionists in land capability classifi- cation.

The above listing illustrates the serious deficiency of national counterpart, professional personnel, in the Forestry Unit at Iscozacin during the second half of 1984. Although great pressure was put on PEPP to fill the post of Unit Leader and to provide the staff contemplated in the Project Paper (some 21 professionals and 35 non-professionals), steps to do so were only initiated in late November and had not been completed at the close of the first year of the TSC contract.

Evaluation of the capabilities of professionals currently employed, following approximately eight months of joint work with the respective TA advisors from AID, indicates that all have a great deal to learn, even as professional foresters. On the positive side, all are young, enthusiastic, fairly bright, and mostly willing to learn.

## 2.0 Status of Work under the Contract

The following section covers the highlights of activity by each specialist who worked on the project during the second six-month period of the contract.

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2.1 General Forester/Chief-of-Party/Land Use Ecologist (Dr. Joseph A. Tosi Jr.)

In addition to time spent in administration of the project and report writing in the San José office (see 1.1) in August and September, this specialist worked in Peru between October 11 and November 23. Approximately half of this time was devoted to coordination of forestry activities by the TA team with the Project, and with AID, and half to problems associated with land utilization ecology, land use capability classification, and titling in the valley.

General Forestry activities centered on (1) correction of problems engendered by diversion of the original resources management objectives of the project and lack of commitment to forestry and correct land use, (2) elaboration of a contingency plan to get forest management and production activities started in the southern end of the valley, principally with the native communities, and (3) evaluation of the wood industrial production potential for the valley.

Between October 22 and 30, the specialist participated in the first trip of experts to survey the Peruvian wood industrial plants and operations in the Sierra and Selva, acting as coordinator of this trip in which the forest industrial engineer, the forest products and marketing expert, the Peruvian counterpart in these two fields, and the logging and road construction specialist all participated. In the course of this survey, which took the team to Huancayo, Huanuco, Tingo María, Aguaytía, Bosque Nacional A. von Humboldt, Pucallpa, and Iquitos, a two-hour conference on the forest management system was delivered to staff at the CENFOR Forest Experiment Station headquarters at Km. 4 in Pucallpa. The findings of this survey are detailed in the technical reports rendered by H. Greub and M. Kroenes.

In Iscozacín and elsewhere in the Palcazu Valley, the specialist worked with both the forestry TA team and the national counterparts on (1) project development planning, (2) an operational plan and budget for 1985, (3) forest inventory design, (4) forestry extension and training proposals, (5) design for a Forest Unit office in Iscozacín, (6) coordination with agro-forestry activities of the Agriculture and Livestock Unit, (7) forest management design for native communities, (8) evaluation of timbers from

valley collections, (9) select and program equipment needs and purchases for Forestry Unit, for logging and road construction, and for chainsaw rental service, (10) evaluation of land use capability classification of the Palcazu Valley prepared by DRF of Ministry of Agriculture under Agreement with PEPP.

In Lima, appreciable time was spent in administrative, logistical, financial, and technical representation of the TSC forestry and land use technical advisory group before the heads of the various Divisions of AID responsible for the Project and before APODESA, INADE, and ONERN, these last in reference to land use ecology, continuous land use inventory, land use capability classification, and land titling in the Palcazu Valley. A series of memorandums and reports to the Project Manager, AID, detailed the problems related to land titling which are critical to execution of the AID-supported resources management project in the Palcazu Valley. This problem, detailed in the first semester report, had not been resolved by the close of the second semester, despite the intervention of the Director of AID.

## 2.2 Natural Forest Management (R. Simeone)

As a long-term advisor posted to the project for a period of three years, the natural forest management specialist acts, in the absence of the Chief-of-Party, as general coordinator of the TSC team and as its representative before the Project Director, other key technicians, and Project administration.

He was present in his post, except for short periods on consultation in Lima, continuously during the semester. Because no qualified professional had been appointed to leadership of the Forestry Development Unit, an inordinate amount of his time was spent in promotion of the unit's physical infrastructure, logistics, and administration, working directly and in collaboration with the acting chief of the unit (L. Chuquichaico), national counterpart technicians, and the Project leadership in Iscozacín. A complete report of his activities for the year was presented (TSC-041-C) on the 17th of January, 1985, and is appended. The principal activities of the semester were the following:

1) Meetings with the major colonists of the valley, especially those expressing interest in the forestry program. This group included the members of the Wood Manufacturer's Association of Palcazu, many of whom own and operate small circular sawmills and purchase logs from the native communities.

2) Meetings with counterpart personnel and other Project technicians to inform and discuss the natural forest management system proposed by the TA advisors and outlined in the Project Paper. Important themes were (a) long and short term forestry work plan, (b) ecological theory of natural forest regeneration and growth, (c) personal orientation of individual counterparts in their specialized function within the overall program of integrated development.

3) Technical lectures on natural forest management for sustained yield, natural forest management in Paraguay, management of forest nursery soil using compost, and safe management of pesticides.

4) First training courses for native Indian community members (Shiringamazu) in use and maintenance of chainsaws and techniques for felling, bucking, and rip-sawing logs with the chainsaw.

5) Planning, coordinating, and promoting the extraction and processing of valuable timbers in the new highway right-of-way through community lands.

6) Participation in the Project program of forestry extension and training of all forest owners (colonists and native comuneros) of the Valley.

7) Continuation of the orientation and training of Peruvian forester counterparts.

8) Design of a system of organizing and classifying forest management units in the valley.

9) Selection of sites for the establishment of two demonstration strips for the strip clear-cutting system.

10) Participation in a trip to visit other forestry projects on the Central Selva Project.

11) Participation in the review of Curriculum Vitae and interviewing of final selection candidates for counterpart posts in the Forestry Development Unit.

In general, the specialist completed four out of five goals originally set for the first year: (a) the establishment of a basic infrastructure for work and housing, (b) orientation of his counterparts in the system of natural forest management proposed, (c) reconnaissance of the forests of Sector I of the valley, and (d) coordination of the TA team of advisors in the Forestry Development Unit. The fifth goal, demonstration of the strip-system of clearcutting could not be undertaken, but prerequisite steps to initiate same were completed and this demonstration will be a major priority for the first semester of 1985.

### 2.3 Forest Industrial Engineer (Ing. M. Kronos)

The Forest Industrial Engineer worked as a short-term advisor over a five-month period in 1984. In 1985 at some time, he will return to the project for a continuous period of two years as the long-term advisor in this same key specialty. He began work with the project in May, 1984, remaining through the end of June, and returned in August for a further three months. During his first year, Mr. Kronos designed a model plant for the wood manufacturing industrial complexes to be established in the Palcazu Valley, including recommended location for the first plant, land requirements, specifications for equipment and budget, staffing and training, appropriate manufacturing processes, and plans and organizational layouts for these plants.

The specialist spent his first two months in this period evaluating the possibilities for forest industrial development in the valley. He studied existing industry both within the Valley and in the nearby upstream manufacturing centers of Cacazu, Villarica, La Merced, and Oxapampa. Within the valley, he accompanied other forest management team members in visits to several of the native communities, where he became aware of the native community interest in becoming owner-operators of one or more of the manufacturing centers to be established under Project auspices. The hydroelectric potential of the nearby watersheds

was determined to be of major interest as a power source for industry and, in Lima, he made arrangements for the evaluation of the hydropower potential of several streams near possible conversion plant sites in Sector I. A report on hydroelectric potential on these sites was completed in the second semester and submitted to AID by Ing. Hernán Bustamante, hydrology assessor.

In the latter part of October, the specialist accompanied the team of wood products advisors on a field trip to visit and evaluate the present wood industry and markets in the Sierra and Selva, his observations being considered in the final presentation of a plant design appropriate to the timbers of the tropical moist forest.

A full technical report (TSC-013-C) dated October 1984 was presented. This report, entitled "Primer Informe sobre Especificaciones Técnicas y Ubicación de las Plantas Industrializadoras de Productos Forestales para el Valle del Palcazu", covers his recommendations in detail and was the basis for meetings with AID officers interested in structuring a forest industrial credit line through the Banco Industrial for parties interested in establishing wood production facilities in the valley. The report also contains a section outlining a plan for the first half of 1985 necessary to attain the objectives in the industrial sector of the project.

#### 2.4 Tropical Forest Dendrology (G. Hartshorn)

This specialist participated as a short-term advisor in two phases during this semester. The first was a four-day work session in the herbarium of the Missouri Botanical Garden in St. Louis, Missouri where he worked on the identification of trees collected in the Palcazu Valley (scientific names). While there, he discussed Palcazu tree families with specialists and gave an evening lecture on the TSC forestry component that stimulated considerable interest and questions. Determinations of scientific names, made there, are included in the revised list of local tree names appended to his final report for the semester (TSC-039-E).

Between the time of his departure in mid-July and his return in November, (for a 24-day stay), his counterpart was switched to forest inventory. One of the serious consequences of the loss of the counterpart

was that the acting chief of the Forestry Development Unit would not permit the materos to go out collecting on their own (despite their capability to do so). Thus, the dendrology component did not take advantage of the dry-season felling of forest, nor the felling of trees along the road right-of-way. The failure to collect during the dry season of August-September deprived the project of hundreds of tree specimens (as well as wood samples) and sets back the dendrology effort by at least a year.

The dendrology effort continued to be hampered, also, by the lack of equipment (especially kerosine heaters) requested in July. The consultant left instructions and design plans for the construction of two herbarium cabinets, but they were not contracted by the Project. Similarly, essentially nothing was done by PEPP to obtain the recommended area for the arboretum.

The first revision (appended) of the list of local names of trees in the Palcazu Valley now contains about 500 common names. Names listed on the field sheets for the forest inventories in Shiringamazu and along part of the road construction were discussed and corrected on field sheets during this second visit.

Because of a PEPP directive to drastically reduce boat trips and cutting off all per diem for project personnel, the specialist restricted collecting efforts to the Iscozacin area. He was surprised to find an abundance of tree species in flower or fruit. Fertile specimens were collected from 35 tree species: almost all are primary forest species.

The dendrologist followed up on his recommendation to establish an arboretum on Paulino Yantas' land. Cueva planned to meet with the owner to arrange the transfer of land to PEPP. The area recommended for the arboretum was inspected to see if there is sufficient area to include one or two demonstration strips. There appears to be sufficient primary forest: however, the proximity of young secondary forest might overwhelm the demonstration strips with seeds of pioneer species.

The dendrologist, in company with the natural forest management specialist, the forest inventory specialist, and the two materos, undertook a week's visit to other forestry projects of the Central Selva Project. Principal objectives were to see the silvicultural research underway at the COTESU Project at Quebrada Dantas and at the Von Humboldt National Forest. A visit was made to the small herbarium and xyloteca at Von Humboldt and the specialist reviewed, while there, the tree specimen collection, making several determinations and corrections. While at Von Humboldt, also, a two-year-old strip clear-cut area was observed where copious natural regeneration of valuable tree species gave elaborate testimony to the feasibility of this system, to be introduced into the Palcazu Valley.

A number of important recommendations are included in the dendrology specialist's report. These relate to the arboretum, herbarium, and xyloteca, counterpart personnel for dendrology, additional materos and a tree-climber, equipment purchases, and a short course in tropical dendrology for all F.D.U. personnel. Additionally, it was noted that the projected level-of-effort in dendrology, at a total of six man-months over four years, is too little to fulfill the assigned responsibilities. A doubling of this time is recommended.

## 2.5 Forest Inventory (Wm. Aspinall)

Twelve total man-months of effort are scheduled in forest inventory for the TSC advisory team. Forest Engineer William Aspinall is filling this post as well as that of Logging and Road Design Engineer. He worked in the latter category in the months of July and August and in forest inventory continuously thereafter to the 14th of December. His report, entitled "Informe sobre la Primera Visita al Proyecto Especial Pichis-Palcazu como Especialista en Extracción y Caminos Forestales e Inventario Forestal" (TSC-033-C) was delivered at the close of December 1984. This report details his activities during a continuous period of 159 days with the Project.

The major tasks for the forest inventory specialist are the following:

1) Assist PEPP to develop a system for taking periodic and permanent inventories of the production forests and naturally regenerating forests of the Palcazu.

2) Work with PEPP technicians to classify Palcazu production forests by productivity type and to perform periodic and permanent inventory by species and volume of the several forest types, both for mature stands and for regenerating stands.

3) Assist other team members in developing forest management plans for each type of production forest.

4) Train forest technicians to design and perform periodic and permanent inventory in Palcazu production forests.

A good start was made on these tasks in the second semester of 1984. The specialist was already familiarized with the conditions in the valley and an integrated working team member. A counterpart in logging and road layout, trained in July, resigned in August and was not replaced until October (for logging only). For this reason, the counterpart in dendrology was assigned to work in inventory (abandoning dendrology) and has been assigned permanently to this specialty.

During early reconnaissance of the forested land in the southern half of the valley, a diversity of forest types were observed and, at the suggestion of the land use ecologist, it was determined that these types could best be related to variations in climate, landforms, soils, and drainage within the valley. A stratification of forest types will be made, for both inventory and management purposes, upon an ecological (physical-environmental) basis.

Three inventories were completed during the semester:

1) Shiringamazu-Puerto Herrera (Rio Iscozacín)--Axis of the Carretera Marginal - Revisión Final.

2) Dos parcelas demostrativas en Native Community Shiringamazu ( $F_1$  and  $F_2$  land use capability class lands - production forestry). Preliminary Report.

3) Forest on farm of Luis Frantzen Egg. Field work completed.

These three inventories served to train counterpart personnel and workers in techniques and methodology of inventory. A flow diagram is presented in the specialist's report showing inventory methodology proposed for the Palcazu Valley, by phases. For lack of necessary counterparts, tools, and materials, this design could not be implemented during the semester.

A work plan for 1985 was also prepared in collaboration with the one Peruvian counterpart. This plan presumes that PEPP will obtain, in a timely manner, the equipment and materials, including aerial photographs, requested by the Forestry Development Unit in the first semester of 1984, and counterpart professionals, and field assistants, and the office and laboratory, including drafting facilities needed, in the Forestry Unit offices as designed and proposed for construction in mid-1984.

## 2.6 Land Capability Classification (R. Bolaños)

Land use is a fundamental consideration for the development of the Palcazu Valley. A major objective of the development plan is to achieve maximum sustainable production from each ecologically-distinctive area therein. Because forestry was determined to be the most permanently efficient production option for a large part of the valley land in the environmental assessment (JRB Study, 1981), technical assistance in land use ecology and land capability classification was assigned to the forestry advisory team.

Land use ecology and land capability assessment are two closely related fields. Both a land use ecologist and a land capability specialist are participating in the project as short-term advisors. In practice, the General Forester/Chief-of-Party is also acting as land use ecologist, while Ing. Rafael Bolaños is serving as land capability specialist. Activities in land use ecology were initiated in April 1984, with the land use ecologist's review of the land capability map being drawn by the Catastral Unit at Iscozacín. Copies of this map at 1:10,000

scale were delivered in late May and, in early June, the land capability specialist with the part-time collaboration of the land use ecologist, reduced this map to a scale of 1:100,000 and prepared a transparent overlay to the JRB land capability map (Tosi) of 1981. A similar comparison was made of this new and unorthodox map and the ONERN land capability/soils map of 1981. In July, the three maps were entered into the Geographic Information System computer at ONERN and quantitative aerial comparisons were ordered. Comparisons made on this machine support reports by H. Clark, Tosi, and Bolaños that the Catastral Unit map is overtly biased in favor of agricultural land use rather than forestry in the valley.

From mid-June to August 8, the land capability specialist was in the field in the Palcazu Valley. Much of this time was spent in the company of mapping team members from Catastral Unit, in observation and evaluation of their field procedures. These procedures and applications of the official classification were determined to be inappropriate. Crews lacked basic field equipment for the work, failed to use the most recent and detailed ecological map of the valley, failed to use the regulation classification in the approved, standard manner, and were overtly biased to getting as much agricultural land as possible for titling purposes, according to the specialists' reports (TSC-014-C; TSC-000-84).

This problem was taken to the Director of PEPP by AID officials in late July and had not been satisfactorily resolved at the end of January 1985. The Tropical Science Center technical advisors recommend that land titling be based upon an updated version of the ONERN map of 1981, revised to take the true ecology of the valley into account. If the ONERN map is declared official, the advisors recommend that the Catastral Unit under the guidance of the land use ecologist and land capability specialist revise that map by applying the 1981 detailed life zone map of the valley prepared by the JRB consultants. A revised ONERN map would be closely similar to the JRB land capability map.

One of the principal responsibilities of the land capability specialist is to provide technical training to the national technicians from the Catastral Unit, when they conduct the continuous land use inventory under a special agreement with PEPP. The purpose of the inven-

tory is to monitor (and correct) the relation between actual land use and land capability in the valley area. At no time during the semester, however, had work been started or been planned for the continuous inventory, nor had necessary equipment been ordered. It is vitally urgent that the Project incentivate and facilitate work on the continuous land use inventory if undesirable land use patterns are not to emerge in the valley to frustrate sound development initiatives. For instance, it was noted that at Laguna, native comuneros complain of the usurpation of their best food crop lands on river terraces for the planting of cacao under Project auspices, or for pasture, forcing them to clear high forest in hilly forest production grade lands for food production. Elsewhere, at Pto. Mairo, new colonists are being allotted small areas for agriculture in forest class lands. The land use capability specialist will return to the project as soon as a decision is made on the "official" land capability map and steps are taken to implement the plan for continuous land use inventory, for which he is the advisor.

## 2.7 Draft Animal Specialist (Wm. Cordero)

As a complement to the system of harvesting forest products, the project plan envisions the employment of draft animals, preferably oxen. The purpose is both socio-economic and ecological: draft animals are an "appropriate technology" for introduction and acceptance in a primitive society with little capital resource other than standing timber, and they will be far less destructive of the environment than mechanical equipment under the prevailing environmental conditions.

The draft animal specialist is providing information and training in the specialized field of draft animal selection, training, and use. He will, in addition, introduce the light-weight ox-cart to the valley as an appropriate technology for transport of forest and farm products. Plans for the construction of a light "mountain wagon" type ox-cart are being drawn in San José, Costa Rica from observed handcraft industries. These plans will be made available as a basis for the promotion of the construction of these carts in the Palcazu Valley.

The draft animal specialist arrived at the Project in mid-July (late first semester), and terminated his work in September. During this first

work period, he became acquainted with the conditions in the valley: existing problems, human and physical resources available, logistics of working within the Project, availability of animals, and general characteristics of the animal population and its potential food supply. On the basis of his observations, he prepared a full report with pertinent instructions and diagrams for the selection and training of oxen, care and attention that should be given them, and general rules for the extraction of timber employing their labour. Yokes were brought in from Costa Rica as prototypes for local fabrication. The folders and manuals that were prepared (TSC-015-C; Memorandum No. 009-84-TSC-AID; TSC-019-C; Memorandum No. 007-INADE-6218/UDF; Memorandum No. 009-84-TSC-AID; Memorandum No. 005-84-TSC-AID; Memorandum No. 17-84-INADE-6218/OCE; TSC-016-C; Consultant's Report entitled "Informe sobre la Primera Visita al Proyecto Palcazu como Especialista en Animales de Tiro") have been aggregated in a single volume and are attached as an Annex to this report. They constitute an impressive document of appreciable direct value to the promotion of this technology.

## 2.8 Forest Products and Marketing (H. Greub)

The specialist in this field made his first visit to the project during this second semester, arriving on October 5 and leaving on the 21st of December. From Dec. 1 to 21, he worked directly with the wood preservation specialist (see 2.9).

During his stay in Peru, the specialist made a comprehensive and remarkably complete survey of the Peruvian wood industries, national and international markets, transport system, and consumption of wood products. A final report (TSC-036-C) summarizes the findings of this survey and is appended as an Annex to this report. This report concludes that an excellent national market exists for a great variety of timber species and wood products, and that an international market can be developed for the higher quality timbers. Problems of a technical, economic, and socio-political nature plague the present industry in the country, but the Project forest development plan and proposed industrial structure is designed to overcome the obstacles these problems present as regards the economic de-

velopment of the Palcazu Valley itself. Specific product lines appear to offer great promise for high-yield industries in the valley. These products include chemically-treated telephone poles, agricultural stakes and fence posts, railroad ties, construction timbers, box wood, decorative plywood, and charcoal. For the international market, a secondary manufacturing line is recommended: furniture woods, prefabricated structures, and laminated decorative timbers, decorative veneer, and tool handles. The specialist recommends, however, that industries in the valley should first develop a highly competitive position (in terms of quality, variety of products, and the like) in the national market and only move into international trade in specific high quality lines once this position is developed.

## 2.9 Wood Preservation (G. González)

The Wood Preservation Specialist made his first visit to the Project between December 1 and 21, 1984, working in close collaboration with the Forest Products and Marketing Expert. As a short-term advisor with a projected total of only three man-months over four years, he concentrated his scarce time in establishing the bases for a wood preservation program in the forest industries in the valley. These bases are presented in formal detail in his first report (TSC-038-C), entitled "Primer Informe Provisional sobre Preservación de la Madera en el Proyecto Palcazu: Desarrollo de Recursos de la Selva Central del Peru". This report was delivered in January 1985 and is attached as an Annex to this report.

According to this report, wood preservation is an essential and high priority component for economic development of the timber resources of the valley. This is because a very large percentage of the timbers present in its forests are subject to attack by both wood-destroying fungi and by a variety of insect pests, particularly in Coastal and in Selva use-areas. Wood must be protected from attack starting in the forest soon after cutting, in log-yard storage, after milling, and finally when prepared for end-use. Potential products requiring end-use preservative treatment are telephone poles, agricultural stakes and posts, sleepers, bridge and heavy construction timbers, fruit and vegetable containers, and general carpentry woods.

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The report indicates that the national market for the majority of these products, and the highest prices paid, calls for their preservative treatment. The present situation with respect to wood preservation in the country is examined and found to be faulty, opening very attractive economic prospects for properly equipped and operated plants. The report concludes with an examination of preservative treatment systems and chemical options in treatment. It concludes that the treatment of green wood with total diffusion of CCA compounds using the PRES-CAP or SLURRY-SEAL processes is the most recommendable option. These systems are described in detail and production costs estimated. Given preservative treatment, virtually all species in the Palcazu forests will have a high economic potential and guaranteed place in the national market.

### 3.0 Plans for Ensuing Period

At the very close of the second semester (end of first year of the TSC/AID contract), the Proyecto Especial Pichis-Palcazu finally began to move on support of the forestry component of the Palcazu Project. A qualified chief of the Forestry Development Unit had been identified and approached with an offer of employment and almost 100 candidates had been screened and eight hired to fill many of the previously unfilled posts within this unit. An Operational Plan for 1985, drawn up and submitted to AID by the Project was reviewed and found lacking, and revision of this plan in the light of the newly-expanded capabilities of the F.D.U. will be a necessary priority activity for the first month of the second year of work.

Activities and working plans of the advisors in forestry and land use, for the second year of the contract, are based on the following assumptions:

- 1) That PEPP will provide the personnel and leadership for the F.D.U. as set forth in the Project Paper;
- 2) That PEPP will provide opportune logistical support and the equipment requested by the F.D.U. in 1984 as necessary to implement the forestry and land use plans;

3) That a decision be made by the GOP (PEPP, INADE) to support sound development of valley lands through a land capability map and titling program which honestly reflects the economic opportunity inherent in the ecology of this valley;

4) That AID will provide grant or loan funds needed to institute the forest industrial development of the valley.

### 3.1 Natural Forest Management

The principal or major activities in the field of natural forest management for the third semester under the contract are expected to be the following:

1) Establishment of trial (research) and demonstration clear-cut strips in old-growth forests near Iscozacin.

2) Elaboration of maps showing management compartments, blocks, and units for sustained-yield production of wood products in Sector I of the valley.

3) In coordination with the forest inventory group, conduct of a detailed reconnaissance survey of Sector I, with systematic inventories at the level of compartments and silvicultural reconnaissance at the level of management blocks.

4) Preparation of management plans for the production forests of the native communities and interested colonists in Sector I of the valley.

5) Locate and plan the infrastructure of the training forests.

6) Initiate training, by groups of interested operator-owners, in the system of natural forest management proposed by the project, in the training forests.

7) Organize and coordinate vertically-integrated economic production of forest products by strip clear-cutting of wood in selected areas of the Shiringamazu native community forest (coordination of activities with specialists and counterparts in logging and extraction, oxen-logging, forest industries, forest products and marketing, and wood preservation.

### 3.2 Forest Industries, Forest Products and Marketing, Wood Preservation

Forest industrial development in the valley now depends upon the availability of funds for purchase of equipment, placement, and start-up of the conversion plant(s) designed by the forest industrial engineer (2.3). However, PEPP has not yet met the Conditions Precedent for the placement of some three and one-half million dollars in forest industrial credit in the Banco Industrial in San Ramón, nor has an organizational model or models for ownership of industry been devised. It is expected, therefore, that one of the priority activities in 1985 for the forest industrial engineer, who is scheduled to begin with the project in May 1985 as a long-term advisor for two years, will be to assist PEPP in meeting the Conditions Precedent for the placing of this credit for forest industrial development.

Because a long hiatus in time is expected between the time credit actually becomes available and equipment is acquired by qualified lenders for the installation of the first conversion plant, forest industrial development of the valley and, by implication, initiation of forest management and production activities there, could only be started were a much smaller amount of money, hopefully in grant funds, to be available for the purchase and installation of light-weight portable wood-sawing and preservation equipment. Assuming that a financial arrangement could be worked out through AID, the industrial engineer and his counterpart would then be involved directly in acquisition, installation, operation, and training of native community members with this equipment.

The concept involved is simple. Native community members (Shirigamazu) would be assisted in forming a producer's cooperative for wood production and sales. The equipment would be purchased for them by a private voluntary organization, and donated (or loaned) under a formal agreement binding the cooperative and its community members to production of forest raw material under the forest management system designed by the Project. The cooperative would receive direct assistance from the Project (F.D.U.) in all aspects of the system of forest management, exploitation, and wood processing and sales, in terms of training of its people to fill posts and perform the greater part of the work related to admi-

nistration and operation of the business. Some higher-level technical and administrative personnel would necessarily be employed from outside the community, but control and ownership would be invested in the community and earnings would be distributed to members of the cooperative. It is proposed that a large part of the earnings be plowed back into the business for the acquisition of additional equipment. Once formed and operating, the cooperative would qualify for industrial credit in forestry under the AID loan and the original investment might (one option) be repaid from this credit and utilized by the project to start up a second cooperative, and so on down the valley.

A third activity in forest industry which may become part of the program in 1985 will be promotion of a "STAKE cattle feed" production plant and integration of such a plant with the forest industry on the one hand and the cattle producers of the valley on the other. This possibility will be explored by the General Forester and the advisors in Forest Industrial Engineering and Forest Products. "Stake" is a steam-hydrolyzed wood product similar to silage made from hardwood chips. Its introduction would revolutionize the meat production system in the valley while simultaneously maximizing sustainable fodder production using forests rather than pastures on the poorer (F) lands.

### 3.3 Forest Inventory and Logging Road Layout

Work programmed for this sector will be dependent upon the purchase and introduction into the valley of forest inventory tools, drafting materials, and aerial photographs ordered almost nine months ago, as well as a suitable working area (new office). Again, work in logging will be contingent upon the acquisition and delivery of equipment and machinery ordered for training in felling and extraction, and for road construction and maintenance. It is assumed that these logistical matters will be expedited by PEPP and AID now that there is a full recognition of the important place of forestry in the overall development program for the valley.

In forest inventory, plans include the following:

- 1) Complete report on forest inventory (and management plan) for the forest of colonist Luis Frantzen Egg.
- 2) Photo-interpretation of forests in Sector I.
- 3) Field inventory of forests on F land in Sector I.
- 4) Location and sampling of permanent inventory plots, Sector I.

Criteria to be used for forest classification include, principally, (a) physiography or land form, (b) life zone, (c) stand density, (d) stand vigor. A site or physiographic name will probably be derived for each distinctive forest type in the valley.

In logging, the section will work in conjunction with the draft animal expert who also has a separate program for the preparation of animals. The logging plan includes the following:

- 1) Organize and give one or more courses in chainsaw use and maintenance for beginners. Project extension and promotion personnel will also take this course.

- 2) Aerial photographic interpretation of valley lands will be undertaken to demarcate topographic variations and drainage and a network of permanent secondary roads for logging in managements compartments will be laid out on a provisional basis. These routes will subsequently be explored and adjusted by ground survey.

- 3) Selection of a site and construction of shops and offices for the heavy road construction equipment (probably near the close of 1985).

- 4) An extension bulletin will be prepared on the theme of logging with oxen.

- 5) Two demonstration plots using the strip clear-cutting system will be logged, probably on lands of the Shiringamazu Native Community. If funds are available for the creation of a production cooperative (3.2), regular logging will be extended to first-year strips as set out by the management plan and this logging will be used for its training functions under the forest management program. Demonstration plots have been pre-inventoried and inventory will be compared with actual production, by species, on a 100 percent measurement basis.

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### 3.4 Dendrology

Plans for 1985 include two visits by the specialist. The first and shorter visit, programmed for two weeks in April, involves training of new counterpart personnel of the F.D.U. and establishment of collection procedures and seedling sampling methods for the first demonstration clear-cut strips.

The second visit in the month of August will concentrate on verification of materials gathered by the counterparts and "materos" in the interim period, establishment of a herbarium in the new offices, start on work in the arboretum on Yantas' land, and a training course in dendrology for all F.D.U. personnel, including extension personnel and promoters.

### 3.5 Draft Animal Program

The program for 1985 involves the participation of the advisor for a six-week period starting around the first of May. It assumes that a full-time counterpart, logistical and administrative support, and collaboration requested from other units and offices of PEPP, as requested, will be made available by PEPP. It further presupposes that PEPP will make available, no later than February 1985, the credit to be offered operators for the acquisition and equipping of oxen suitable for training. The principal goals to be pursued are the following:

- 1) Promotion and introduction of oxen as work animals in the native communities and colonist farms located to the south of the Rio Iscozacín.
- 2) Instruction of potential users of oxen in their care and management.
- 3) Instruction of users in techniques of logging and hauling other products with oxen.
- 4) Diffusion to people throughout the valley of the importance and economic potential of employing draft animals, especially oxen, in farm and forestry activities.

5) Introduction of implements to be used with the oxen to facilitate log extraction, and materials hayling (ox-carts).

6) Formation of a technical team trained in these techniques and in their transmission to the natives and the colonists.

A full and detailed program to achieve these objectives has been designed and is set forth in the specialist's first report (TSC-019-C), attached as an Annex to this report.

### 3.6 Land Use Ecology and Land Capability Classification

Because PEPP has failed to avail themselves of the expert opinion and advisory services for the Palcazu Valley offered by the AID advisors, and because there is presently an unresolved dispute over the acceptability of the land use capability map of the Palcazu Valley prepared for PEPP by the Catastral and Agrarian Reform Bureaus of the Ministry of Agriculture for land titling purposes, planning for activities related to rational land use planning are still seriously jeopardized.

Assuming that the ONERN land capability map of 1981 is finally and unequivocally accepted as "official" for land titling and development purposes, assistance will be needed by the Project in up-dating this map as regards its compatibility with the 1981 ecological map of the valley prepared by the JRB team, and to extend its coverage into small sections of the valley not included in the 1981 map (for lack of aerial photographic coverage at that time).

As a firm program, the land use advisors (ecology and capability specialists) propose to provide training to project farm and forestry promoters and extensionists in classification of land capability at the local level (native community lands, individual farms) as a pre-requisite to preparation of integrated or total land management plans (including maps) for these units.

Continuous land use inventory is proposed for the valley under an agreement between PEPP and the Ministry of Agriculture. It is proposed

that advisory assistance be provided by the team in this area of work if the agreement is implemented during 1985.

#### 4.0 List of Principal Specialist Reports Prepared During the Second Semester

TSC Report No.	Title	Author
TSC-012-C	Reconocimiento de la Carretera Marginal desde Nueva Aldea (Km.18) hasta Puerto Herrera (Rio Iscozacin, Km.57)	Simeone, R., Aspinall, W., Cordero, W., Bolaños, R.
TSC-013-C	Cuidados Básicos que se deben dar a los Bueyes	Cordero, W.
TSC-014-C	Primer Informe sobre Especificaciones Técnicas y Ubicación de las Plantas Industriales Procesadoras de Productos Forestales para el Valle del Palcazu	Krones, M.
TSC-015-C	Entrenamiento de Bueyes para Extracción Forestal	Cordero, W.
TSC-016-C	Informe sobre Gira de Campo a la Zona de Villa Rica y Oxapampa	Cordero, W. y Aspinall, W.
TSC-017-E/C	First Semi-Annual Report on Forestry Technical Advisory Services Rendered to PEPP	Tosi, J.
TSC-018-C	Plan de Trabajo: Agosto 1984 - Diciembre 1985, Asesoramiento del CCT	Aspinall, W., Cordero, W., Krones, M., Simeone, R.
TSC-019-C	Programa Uso de Bueyes en Extracción Forestal	Cordero, W;
TSC-020-C	Informe sobre la Primera Visita al Proyecto Palcazu como Especialista en Animales de Tiro	Cordero, W.
TSC-021-C	Inventario Forestal Valle Palcazu: Shiringamazu-Pto. Herrera-Eje de la Carretera Marginal	Aspinall, W.
TSC-023-C	Inspection and Evaluation of Forest Industrial Centers in Huancayo, Aguaytía, Pucallpa, and Iquitos	Tosi, J.

TSC-024-C	Hoja informativa sobre viaje de investigación de industrias madereras a Huancayo, Huanuco, Pucallpa, e Iquitos	Greub, H.
TSC-025-C	Folleto instructivo: Los Bosques de Producción Forestal	Simeone, R.
TSC-026-E	Pros and Cons, from a Forest Management Perspective, of the Proposed Change of the Carretera Marginal	Simeone, R.
TSC-027-C	Visita a la C.N. 7 de Junio con grupo de Catastro	Bolaños, R.
TSC-030-C	Informe Trimestral: Octubre-Diciembre 1984	Simeone, R.
TSC-033-C	Informe sobre la Primera Visita (PEPP) como Especialista en Extracción y Caminos Forestales e Inventario Forestal	Aspinall, W.
TSC-036-C	Primer Informe Preliminar sobre Productos Forestales y Mercadeo	Greub, H.
TSC-038-C	Primer Informe Provisional sobre Preservación de la Madera en el Proyecto Palcazu: Desarrollo de Recursos de la Selva Central del Peru	González, G.
TSC-039-C	Dendrology Consultant's Second Report	Hartshorn, G.
TSC-040-C	Informe de Viaje: Quebrada Dantas y Bosque Nacional Von Humboldt - Proyectos Silviculturales en la Selva Central	Simeone, R.
TSC-041-C	Informe Anual de Labores	Simeone, R.
TSC-037-C	Resumen Informativo del Especialista en Preservación de Madera del CCT	González, G.

Third Semi-Annual Report on Forestry Technical  
Advisory Services rendered to the Proyecto  
Especial Pichis-Palcazu (PEPP) by the Tropical  
Science Center under USAID Contract No. 527-  
0240-C-00-4013-00 dated February 1, 1984.

1.0 Introduction

The following is a report on forestry and land-use technical assistance and advisory services provided to the Proyecto Especial Pichis-Palcazu, Palcazu Valley Sub-project, between February 1 and July 31, 1985, a six-month period and the third half-year under the stated Contract with USAID/Peru. During this period, technical advisory services were rendered by specialists in the following fields: general forestry (project coordination), land use ecology, natural forest management, forest industrial engineering, tropical dendrology, land use capability classification, forest inventory, logging and road engineering, draft animal logging, forest products and marketing, and wood preservation, for a total of 18.2 man-months of services. Average monthly level-of-effort was 3.0 man-months.

1.1 Organization and Administration: San José, Costa Rica Office.

During the period February 9 to 18, the General Forester and Chief-of-Party undertook arrangements and planned for a workshop-seminar of all forestry and land use technical advisory staff. This seminar was held in San José offices through the week of March 4 to 9, inclusive. Additional participants were Forest Engineers C. Saito (Coordinator) and Julio Ocaña (Forestry Unit Chief, Palcazu Project) from the Pichis-Palcazu Special Project in Peru.

The seminar covered both administrative and technical aspects of the project under the AID Contract with the Tropical Science Center. Its purpose was to bring together all the advisors, the project coordinator for PEPP and the head of the counterpart team of Peruvian foresters in order to review past accomplishments, discuss problems and exchange impressions, and finally to develop a realistic program, integrated with the Operative Plan of PEPP for 1985-86, of activities and priorities for the coming twelve month period of work. Short term advisors predominate amongst the advisory group and, while all are resident in Costa Rica, all are never physically present at the project site at the

For this reason, it was decided to hold the meeting in San José headquarters during the peak of the rainy season in the Palcazu Valley and while Ing. Simeone, the only long-term advisor at that time was enroute between rest and recuperation travel and his duty post at Iscozacín.

This meeting was organized around a series of presentations of each advisor's past and projected work, discussion sessions following each presentation, and work sessions which followed for the purpose of developing a unified and harmonious work plan amongst all specialists. The meeting include presentation and discussion of the Stake Technology Systems for producing cattle feed and chemical feedstocks from wood chips and movies on forestry subjects.

In April, the Chief-of-Party spent roughly eight days in preparation of the semestral reports for the second half-year of the contract, in briefing personnel prior to departure for Peru, and in arrangements for adquisition of the two computers authorized under the contract.

#### 1.2 Organization and Administration: Iscozacín Duty Station.

Administration of advisory service activities in the Palcazu Valley was nominally in the hands of Ing. Robert Simeone, aided by his wife Teresa Simeone, during the semester. As the only long-term advisor under contract during this period, Robert was the only permanently-resident advisor representing TSC there. He undertook to coordinate both the program and relations with the Forestry Development Unit of the Project in Iscozacín and the activities of the individual short-term advisors actually present at the duty station at any given time (see Technical Advisory Services 1.3).

Under a special services contract with TSC, Mrs. Teresa Simeone provided 49 hours of coordination, bookkeeping, secretarial and librarial services during this period.

In anticipation of the planned arrival, in the 4th semester, of the second long-term advisor, Ing. Michael Krones, wood industrial engineer, for a two year period of work, approval for a contract amendment was obtained to provide funds for construction and furnishing of a second family home at the camp area, and construction was nearly completed on this house at the end of July.

Housing for advisors has improved substantially as a result of new construction and the freeing up of one of the older houses as a "guest house" by the Project administration at Iscozacin.

A major problem still exists at the camp as regards office space, secretarial services, and appropriate housing and power for the IBM computer being sent to Peru for the forestry unit's operations. More than a year ago, the project administration assured us that construction would begin immediately on the planned forestry office having space appropriate to the scale and scope of forestry within the overall project design. A plan was drawn and spped located for this building at the close of the last semester, but as of July 31, 1985, only a skeletal structure existed, without roof or flooring and the lumber for the building was lying outdoors and beginning to rot from exposure to the elements. No provision has been made for an appropriate room to house the computer, and secretarial services are still inadequate for the needs of both advisors and the counterpart Peruvian forestry staff.

### 1.3 Technical Advisory Services: Level-of-Effort

A total of 17.32 man-months of technical assistance were provided by the TSC staff during this semester, as follows:

Specialist	Work Periods		Total Man-months
	Costa Rica - Peru		
General Forester/Chief-of-Party (J. Tosi)	9-18/II 1-7/III 8-17/IV	1-8/II 19-22/II 15-31/III	2.12
Natural Forest Management Specialist (R. Simeone)	3-15/III	1-8/II (8/II-3/III)* 16/III-31/VII	6.00
Forest Industrial Engineer (M. Kroner)	4-8/III	3-31/V	1.10
Land Use Ecologist (J. Tosi)	7-14/III	25-31/V	0.47
Tropical Dendrologist (G. Hartshorn)	7-8/III	3-31/V	1.06
Land Use Capability Specialist (R. Bolaños)	4-8/III		0.23

Forest Inventory Specialist (Wm. Aspinall)	1-5/III	9-31/III 1-30/IV 1-31/V	2.90
Logging and Road Engineer (Wm. Aspinall)	6-8/III	1-30/VI 1-31/VII	2.10
Draft Animal Specialist (Wm. Cordero)	6-8/III	1-31/V 1-20/VI	1.76
Forest Products & Mktg. Specialist (H. Greub)	4-8/III		0.23
Wood Preservation Special- list (Gmo. Gonzalez)	4-8/III		0.23
Eleven specialists.....			18.20
Average monthly level-of-effort.....			3.03

\* (Rest and recuperation travel, vacation)

#### 1.4 Recruitment, Orientation and Training: Forestry Unit Counterpart Personnel

The problem reported heretofore as regards the failure of PEPP to adequately staff the Forestry Unit in Iscozacin with Peruvian foresters was partly solved at the beginning of this semester, when a total of six new professional personnel were hired to fill vacant posts. Furthermore, a qualified professional with experience in the Selva and seniority was also included amongst this new cadre. As of March 1, 1985, the following Forestry Unit professionals and sub-professionals were assigned as counterparts to the TSC TA team members:

PEPP Professionals	TA Advisor	Field-of-Activity
Ing. Forestal Julio Ocaña Unit Chief	Chief-of-Party/ General Forester (J. Tosi)	Leadership and coordination.
Ing. Mario Pariona	Natural Forest Mgt. (R. Simeone)	Management Plans; Demonstration Plots; Forest Credit; Talks & Courses for forest operators and native communities.
Ing. Forestal Nora Carillo	Wood Industrial Engineer (M. Kronos)	Wood industrial plants equipment, and processing; wood preservation

		drying and training of operators.
Ing. Forestal Elsa Mesa**	Tropical Dendrologist (G. Hartshorn)	Forest tree identification; seed tree selection; key to forest trees. training of materos; Arboretum and Herbarium; regeneration studies.
Bach. Ftal. Luis Bocanegra		
Ing. Ftal. Orlando Mau Yung	Forest Inventory Specialist (Wm Aspinall)	Forest inventories; Development fo continuous inventory system; volume tables' growth studies.
Bach. Ftal Bernardo Ulloa		
Postition vacant	Logging and Road Engineering Expert (Wm. Aspinall)	Design of wood extraction system; layout of logging trails and secondary roads; forest harvesting procedures and equipment; road maintenance coordination, equipment specifications, operator-training.
Ing. Ftal. Celso Ratachi V.	Draft Animal Specialist (Wm. Cordero)	Wood extraction employing oxen or water buffalo; training and mgt. of oxen, supervision of construction of oxen-drawn equipment.
Ing. Ftal. Narciso Reyna	Forest Products and Marketing Specialist (H. Grueb)	Design product evaluation and marketing component; Analyze national and international markets for products; coordinate in plant design; achieve quality control and product standards.
(Ing. Ftal. Nora Carillo)	Wood Preservation Specialist (G. Gonzalez)	Design, install, and supervise operation of wood preserving facilities.
To be hired	Land Use Ecologist (J. Tosi)	Advise PEPP technicians on application of ecological principles in

development of agriculture, forestry, and protection in the Palcazu Valley.

Catastral Office  
Personnel-Iscozacin

Land Use Capability  
Specialist  
(R. Bolaños)

Design, apply, and revise a system of continuous land use inventory consistent with land use capability; train Forestry Unit extensionists in land capability classification.

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\* Resigned post during semester.    \*\* On extended leave-of-absence during semester.

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There is still a serious deficiency of personnel in the Forestry Unit, including four forest engineers in extension, one in logging and roads, one assistant industrial engineer for the first conversion plant construction, and one in wood preservation, as well as numerous sub-professionals, laborers draftsmen and secretaries as projected under the Project Paper and budget.

At the end of this semester, the new personnel had been well integrated into the work of the Forestry Unit and team spirit was high and increasing. It is expected that even greater progress will be made in the coming months as the new Unit Chief comes to grasp with all the problems he inherited from the past vacancy in his post and if and when a more positive and friendly attitude develops toward the forestry component of the project within the Project Administration in the Palcazu Valley.

An essentially unresponsive and not-infrequently hostile attitude towards the Forestry Development Unit has persisted since the onset of technical advisory services by TSC to the project in 1984, under this contract. This attitude, on the part of the agronomists charged with overt project administration, has been one of mostly occult but sometimes frank opposition to both Forestry Unit and to the TSC advisory personnel, opposition manifested in obstruction and non-cooperativeness in most matters affecting the smooth functioning of the Units' activities. For instance, the aforementioned delays in hiring and staffing the Unit, the

delays in or total failure to purchase essential equipment and supplies, and the construction of all other Unit buildings for office and laboratory space except the one planned and promised for forestry.

This situation had not changed significantly at the end of July 1985, eighteen months after initiation of the TSC contract for advisory services to the project. It continues to seriously hamper and delay planned work and progress as projected under the Project Paper and the Terms of Reference of the Contract. It calls for and will require both urgent and sympathetic attention by both AID and PEPP leadership for its solution.

## 2.0 Status of Work Under the Contract

The following section highlights the activities of each TSC advisor who worked on the project during the third six-month period, February 1 to July 31, 1985. It does not cover those advisors whose only activity was participation in the planning and review seminar in San José, Costa Rica, in early March. Full details of work and activities are to be found in the individual reports of the advisors (See list of Reports and Memorandums, appended).

### 2.1 General Forester, Land Use Ecologist, Chief-of-Party (Dr. J.A. Tosi Jr.)

In addition to short periods of report-writing, personnel-briefing, seminar preparation, and matters related to acquisition of the two computers in the San José office, this specialist made four visits to Peru during the semester. Two visits in February, in the capacity of Land Use Ecologist, were short and for the express purpose of being interviewed by a Special Commission established by the Peruvian Government to investigate the quality of land capability mapping and land titling work undertaken by the Project under a contract with the Ministry of Agriculture's Bureaus of Agrarian Reform and Land Titling. On each visit, the specialist, as Chief-of-Party also convened with Project administration and technical staffs of PEPP and AID, in Lima.

On March 15, following the work-shop seminar of all technical advisors in San José, Costa Rica, the specialist travelled to Peru in his capacity as General Forester and Chief-of-Party, meeting with AID and PEPP project managers in Lima. While in Lima, briefings were given to INADE and APODESA directorships and staffs on the situation regarding land ca-

pability mapping and land titling in the valley, and the Capital Development Office of AID was given recommendations regarding forestry credit and establishment of industries in the valley. At CIPA, the specialist gave a lecture to some fifty anthropologists and sociologists on the social and economic aspects of the forest management system. Before departing at the end of the trip, he also met with and counseled the Fragile Lands Group from USAID/Washington. On March 22, he met with Henning Falkenberg, Chief of the German Federal Republic's forestry mission in San Ramon, to effect possible collaboration in plantation studies.

Between March 23 and 28, he was in Iscozacin where he reviewed forestry activities and in general coordinated with long and short term advisors present there. At this time a series of talks to native community leaders was given by him. He showed films and gave lectures on forestry development and the STAKE process to the entire project staff of the Palcazu project in Iscozacin.

In May, the specialist returned to Peru under an invitation from the CIPA and the Centre for Latin American Studies, University of Florida, to assist at the First International Seminar on Comparative Development of the Amazon. Before and after this three-day meeting, he convened with TSC technical advisors, the AID Project Manager, and officials from PEPP in matters relating to the orderly development of the project. At this time, also, an extension booklet on the natural forest management system was designed with the collaboration of Dr. Carlos Mora of CIPA and Ing. Simenoe. CIPA will illustrate and publish this booklet and TSC will pay the printing expenses.

During this semester, also, technical trip reports of short term advisors and quarterly reports of the long term advisor in natural forest management were received and reviewed in the San José office. The second semester report in English and Spanish, and the Administrative Report in English, as required by the Contract, were also prepared and rendered. Short term advisors, as is customary, were each briefed before departure and debriefed on return from their individual visits to the project site. Considerable time was devoted to evaluation of the Stake Technology Ltd. proposal to install a wood processing unit for manufacture of cattle feed as part of the wood conversion plant in the valley.

## 2.2 Natural Forest Management (R. Simeone)

At the close of this semester, the natural forest management specialist had spent almost 18 months of his contracted three years as long term advisor to the project in Iseozacin, where he also acts as general coordinator and, in the absence of the Chief-of-Party, as Acting Chief of the TSC group of advisors before the Project Director and its Administration.

During this period, the specialist was at his post except for a three week period of Rest and Recuperation Travel in February, participation in the seminar-workshop of advisors in San José, Costa Rica in early March, and short periods of consultation at AID in Lima.

Despite the change of personnel involved in the retirement of Bach. Ftal. Wm. Torrejon and his replacement by Ing. Ftal. M. Pariona, this specialist still lacks one of his projected two counterparts in natural forest management and two professionals proposed to fill posts in forestry extension. With only one full-time counterpart, work was advanced in the following major lines of activity:

1. Evaluation of the Rural Forestry Colonization Project in Von Humboldt National Forestal (Pachitea Sub-project) for which a special report was prepared: (TSC-044-C).
2. Orientation of the new Forestry Unit Director in respect to the advisory team, its program, problems, and work priorities.
3. Participation in the restructuring and revision of the Operational Plan for 1985 following announced reductions in the budget of PEPP for this year.
4. Participated in the alternative plan to establish a community forest products processing plant in Shiringamazu native community under and AID donation to an NGO beneficent organization and technical support under the project (the plan was rejected by Capital Resources Division of AID/Peru).
5. Coordination with the Centro de Investigación y Promoción Amazónica (CIPA) for the preparation and publication of a series of extension-type booklets on the natural forest management system for sustained yield of forest products.
6. Participation in the design and implementation of a program of integrated extension in coordination with the other three technical units

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of the Palcazu Development Project.

7. Participation in the elaboration of the "technology packages" to be offered through the integrated extension approach to the beneficiaries of the Project.

8. Directed the administrative steps and commercial contacts necessary to acquire the "Mighty-Mite" portable sawmill.

9. Participated in the design, location, and implementation of the first trial "strip clearcut" in high natural forest and in the planning of the special studies to be included:

- a) natural regeneration study
- b) economic feasibility analysis
- c) wood extraction study
- d) dendrological study
- e) morphological study (tree form, volume tables, etc.)
- f) physical and mechanical properties of wood in the strip.

10. Participated in the design and first data collection on sub-parcels of the continuous natural regeneration inventory in the first trial strip clear-cut at the Iscozacin Experimental Forest.

11. Completed the extraction, inventory and transformation, in situ of all the wood in trees over 10 cm. d.b.h. on the first strip clear-cut. The results of this work were being analyzed as part of an economic feasibility study by the Forestry Development Unit of the Project at the close of the semester.

12. Assisted with the administrative transactions of the Forestry Development Unit to obtain the needed capital goods for wood extraction and procession in the first experimental procession unit 1985 (portable sawmill, "Pres-Caps", oxcart, and log hauling devices).

13. In company with the forest inventory specialist and the dendrologist plus counterparts, undertook exploratory evaluations of the forest on two colono farms in the valley (Osvaldo Zender of Chuchurras, and José Palomino Roca on the Río Mugnis).

14. Coordinated the preparation of facilities for the maintenance of the Project's first two draft oxen. This included wood preparation from the first clear-cut strip, construction of a rustic stable and corral, and the planting of suitable cut forage grasses.

15. Continued the collaboration with CIPA for the preparation of a series of extension-type booklets or pamphlets on the natural forest man-

-agement systems for the high Selva as a whole.

16. Coordinated the formation of a committee charged with the preparation and implementation of an integrated natural resources management program for the Shiringamazu native community. This committee includes representatives from all technical divisions of the Project, including Sociology, Agriculture, Animal husbandry, Forestry, Credit in Species, Cataster, Titling, and Extension. The object of the committee is to exchange ideas for the development of an integrated or holistic plan of land management over a total extension of the community lands and the coordination of production on forestry lands for the creation of the first processing industry, community-owned and operated, in the valley. This plan is expected to provide a model for similar enterprises elsewhere in the high jungle of Peru.

17. In-service and formal training of Forestry Development Unit counterpart personnel and the stimulation of a strong spirit of identity and motivation for the forestry program on the part of the new technicians. Due to their growing dedication and high morale, it was possible to offset the demoralizing effect of poor project administration and lack of approval on the part of the administration for the forestry program as a whole.

In general, the natural forest management specialist completed all of the goals set for this semester in the work plan for 1985. A second trial strip clear-cut area was selected and work started on its preliminary inventory of natural regeneration.

This strip will be 50 meters in width and 200 meters in length (one full hectare) and will be used to train native community forest operators from the Shiringamaza and other nearby communities in the total clear cutting and wood processing methodology during the coming semester.

### 2.3 Forest Industrial Engineer (Ing. M. Krones)

The Forest Industrial Engineer completed his six-months contract with TSC as short-term advisor in this specialty during the semester, spending a total of 26 work days, 21 of them in Peru and five at the San José seminar. In August 1985, he is slated to return to the project under a separate contract as long term advisor for a full two years.

His principal activity during this semester was in devising an appropriate system for use of the Press-Cap Method of wood preservation treatment and in arranging for the manufacture of a set of different size Press-Caps for experimental and demonstration use in treating the woods of the second trial clear-cut strip.

#### 2.4 Tropical Forest Dendrologist (Dr. G. Hartshorn)

The consultant was in Peru for 27 days (4-31 May), of which 23 days were in the Palcazu valley. He arrived four days after the initiation of felling the first demonstration strip and spent most of his time supervising the collection of botanical specimens and wood samples as the trees were felled. He also took advantage of a new rozo by Marcial Espiritu to collect additional botanical specimens and wood samples. The consultant accompanied a Forestry Unit team on a reconnaissance visit to Fundo Rocalu owned by don José Roca Palomino along the Río Mugnis in the Lontananza valley (see TSC memo 047-85). The consultant also made a day visit to the Chaparral ranch to advise the manager on young trees to be left in pastures.

As happened last year, very little was done in dendrology during the consultant's absence from Peru. The new dendrology counterpart, Ing. For. Elsa Mesa, was in the Palcazu only for 15 days in March, before leaving for a three-month STRI fellowship in Panama. Her fellowship has just been extended for an additional three months by STRI, so she will not return to the Palcazu Project before early October. Bach. Luis Bocanegra joined the Forestry Unit in February as an assistant in dendrology. Hartshorn attempted to work with Bocanegra during May, but the latter's lack of interest, disdain for work, lies and unexcused absences forced Hartshorn to recommend that Bocanegra be fired. (see TSC memo 045-85).

Until tree felling began in May 2nd on the demonstration strip, no botanical specimens had been collected since Hartshorn's departure last December. Similarly, nothing substantive had been done to obtain Yantas' primary forest for the arboretum. With respect to dendrology equipment and supplies requested in July 1984 and again in December, none had been purchased.

Mr. Aspinall (who also occupies the post of logging and road engineering) was engaged for four and one-half months in a variety of tasks related to the 1985 Work Plan and his terms of reference. A detailed re-

-port on his activities plus three special reports on field visits and inventories, documents these activities (TSC-056-C, -055-C, and -051-C). In summary, the following were the principal achievements of the period:

1. Supervising, implementing, and coordinating the activities of the Forest Inventory Section of the Forestry Development Unit. This activity included various trips to Lima to seek out and arrange for procurement of necessary aerial photographs and base maps of the valley, drafting and aerial photographic interpretation equipment and services, and to attend coordination meetings at PEPP.

2. Field familiarization with the geography and native communities of the valley. This entailed numerous field trips as far north as the Rio Lagarto and the Rio Mazuhazo, visits to the majority of the native communities, survey of the Cerro de pasco Road, so-called , field surveys including inventories of the forests on the properties of Osvaldo Zender and "Fundo Roca Lux", and visits to various farms of small colonists for observation of forest types, soils, and related features.

3. Participation in the preparation of integrated technological "packages" for development of the community lands at Shiringamazu and design and completion of inventory of selected sections of their natural forest on F-type lands.

4. Negotiations, successfully completed, with Paulino Yantas, a local colono, to obtain permission to use for research and testing purposes, including an arboretum, on his private property adjacent to the Iscozacín station.

5. Participation in the inventory of timber and form of trees on the 0.15 hectare plot which constitutes the first of the strip clear-cut areas. Following field work and measurements in the research strip, especially the morphological measurements of all trees cut, by species.

6. Inventory of forest, following forest typing, by type, on the 120 hectare farm of Roca Palomino J. on the Rio Mugñes. Preparation of report on the inventory.

7. Accompanied by his counterparts Mau Yung and Ulloa, the Chief of the Forestry Development Unit, the draft animal specialist and his counterpart, he undertook a study trip to Ciudad Constitución, Sungarayacu, Von Humboldt National Forest, Pucallpa and Iquitos. Particular

importance is attached to the visit to the Asentamiento Rural Forestal Von Humboldt operation, which uses a somewhat forest management model and to study the internal transport system and bridges being used there as possible models for the Palcazu. At Iquitos, a visit was made to the forestry-cattle project at Jenaro Herrera for similar reasons. A full report on this trip was submitted (TSC-051-C).

8. Establishment of the research forest in the area of the arboretum at Iscozacín.

9. Reconnaissance survey of the Rio mazuhazo watershed area: reconnaissance of an area occupied by colonists rather than native communities, survey of forests and soils on non-agricultural grade lands; visit to the farms of Victor Teodoro Quispe Lazaro and Sra. Villayzan Rowe; map; conclusions; and report (TSC-055-C).

10. Coordination with other units of the Project and laboratory work on forest inventory design for the valley. Training of counterparts.

11. Revision of field work and meetings to review the implications of the existing forestry law of Peru in relation to the strip clear-cutting system proposed.

12. Localization and inventory of the second strip for experimental clear-cutting in the research forest.

13. Coordination of the contract with a consultant in Lima for the drafting of a map of forest types of the Palcazu Valley. Delay in this completion of this work, like the delay in termination of the forestry office building, has been detrimental to the fulfillment of the Work Plan for 1985 in forest inventory.

14. Exploratory inventory of the forests of Alto Iscozacín (Native community).

In general, the inventories conducted to date have been few and of small areas. This problem has resulted from a combination of factors in the overall administration of the project: (1) insufficiency of counterpart professionals and, especially, qualified tree identifiers, (2) failure to complete the promised map of forest types, (3) failure by Project Administration to purchase the necessary and requested drafting materials, supplies, and equipment for forest inventory, (4) Professed lack of money for viaticos and gasoline for outboard motors, as well as

other factors such as the delays in construction of the highway through the valley, lack of vehicles and motorbikes. The computer badly needed for inventory work, has been acquired for the project by TSC but has not been delivered yet to Iscozacin and there is neither adequate electrical power or a suitable building in which to house it when it does arrive.

Final reports on the inventories of the L. Frantezen farm and along the axis of the highway between Shiringamazú and Pto. Herrera are being prepared and will be completed shortly.

## 2.6 Land Use Ecology (J. Tosi) and Land Capability Classification (R. Bolaños)

Little progress was made in these two related fields during the semester due, essentially, to a postponement of all classification and land-titling pending delivery of a policy directive by INADE following the completion of the commission report on the land classification and titling previously undertaken by PEPP in the valley.

The land use ecologist had meetings with this commission on two occasions during the period and although its report was received by INADE in late April, no specific decision as to a possible re-classification of valley lands had been made prior to the end of the semester.

The commission report underlined significant deficiencies in the existing PEPP classification due, especially, to cartographic and methodological inconsistencies and errors on the part of technicians in charge of execution of the land capability map. It is probable that the map will be revised in the second semester of 1985, so that these advisors have postponed further activity in the Project until the necessary decisions can be made and transmitted to the Project Administration.

## 2.7 Draft Animal Specialist (W. Cordero)

Ing. Cordero worked under his contract with TSC from May 1 to June 20, assisting also for two and one-half days at the seminar-workshop in San José, in early March. His principal activities during this second period were the following:

1. From May 1 to 5, in Costa Rica: elaboration and revision of the plans for construction of an ox-cart, Costa Rican style. An industrial draftsman was contracted and plans were drawn from measurements and in-

-structions given by craftsmen at the ox-cart factory in Sarchi, Costa Rica. Such plans had never existed previously, the art having been passed on from father to son for centuries. These plans with complete instructions for woods needed, metal parts, and assembly were then taken to Peru on May 6 and work was initiated in Iscozacín and Villarica on construction of the first cart, which will be used by the Project for demonstration and experimental purposes on the trial strip clear-cuts.

2. Training of his counterpart, Ing. Celso RAtachi V. hired for the project subsequent to the sepcialist.s last visit. Ratachi had had prior experience with oxen logging in the Oxapampa area, from which he comes. He worked closely with the specialist who was very pleased with his enthusiasm, motivation, and ability to learn quickly. Training was personal and both theoretical and practical.

3. Promotion of a credit plan for the adquisition of oxen and their equipmetn by colonos and natives. A substantial amount of money is provided in the budget for this credit (\$560,000), which is to be channeled directly through the Project rather than through the Industrial Bank of Peru. Because no steps had been taken to draw up a credit plan for this purpose, the specialist brought the FDU and the Unit of Credit and Extension of the Project together and tried to get them started on the preparation of necessary regulations.

4. Promotion of a program in extension to bring the draft animal technology to practical acceptance and use by colonos and natives. The Credit and Extension Unit of the Project had not promoted either forestry or use of draft animals, despite preparation of complete set of instructive materials for this purpose in 1984. The draft animal specialist, having previously prepared the "technological package" for his specialty, approached the head of the Unit of Credit and Extension, urging him and his unit to integrate extension in all three fields, using the oxen program as an example of the utility of this integration. Oxen are not only a problem in animal management, but require (from the agronomists) production of pasture and cut-forrage, and they are use ful adjuncts to most farm operation, whether this be in agriculture or forestry.

5. Other activities in Iscozacín of this specialist included (a) construction of yokes (three sets) based on the Costa Rican model taken

to Peru in 1984, (b) a conference illustrated with slides for all Project personnel and visitors on the employment of oxen in logging, (c) preparation of a plan of equipment needs for the coming months, especially for logging with oxen, (d) selection and purchase of the first pair of oxen for the Project, (e) training of the first pair of oxen at Matsuhuazo, and (f) preparation of the counterpart for a continuation of this activity.

## 2.8 Forest Products and Marketing (H. Greub)

The specialist in this field made his second visit to the project between May 26 and June 7, a two-week period, as well as assisting at the seminar-workshop of forestry technical advisors in San José.

During this period, he completed the following projects:

1. Further investigation and updating of six-month changes in the wood-products market in Peru.
2. Updating of information (from first visit and report) on prices and price changes for wood products.
3. Updated cost data on wood product manufacture and transportation
4. Briefed possible purchasers of valley-produced wood products with respect to progress in the development of specific product lines from the Palcazu Valley.

Full details of his findings are presented in his formal report on this visit (TSC- -C) dated June 10, 1985. Some of the highlights from that report are the following:

1. With respect to the situation of six months ago, there has been a significant improvement in both the market for and the prices of wood products of national origin. Most Amazonian mills are working full-time and all the product has been sold. Price increases have been marked for sawn wood, sleepers, treated telephone poles and posts, parquet, and charcoal.
2. There is great demand for sleepers, with a market in 1985 of 500,000 units. This demand is not being met. Sleepers can be sold to a treating plant in untreated condition.
3. Nobody is currently producing treated telephone and utility poles

3. Nobody is currently producing treated telephone and utility poles and there is a great unmet demand for this product.

4. Prefabricated wooden houses are in demand and several companies are projecting entrance in to the Selva to set up production facilities for this product.

5. Log prices have not increased substantially or in proportion to price increases for sawn products. Transport costs have increased for green sawn products but not for dried or finished products such as laminate and charcoal.

In general, demand for wood products is high, national origin is preferred, and the situation is very favorable for the establishment of manufacturing facilities in the Palcazu Valley. The specialist recommends that production be started on a small scale immediately using small portable mills and pole-treatment equipment. He further recommends that the wood-working shop belonging to the Project in Isxoazacin be developed into a center for introductory production, demonstration, and training of operators in the manufacture of such items as parquet flooring, boxes, mill work, simple furniture, and oxcarts for local sale. Also that the project promote the production and sale of preserved wood products for sale both within and without the valley, depending on transportation facilities on the new highway. As soon as transport on the highway is assured, that sleepers be produced and sent out to the National Railway Corporation. Other recommendations include (a) research on suitable species for utility posts and the inscription of suitable species with ITINTEC, (b) small scale production of charcoal for local sale, and (c) to set up a small project to study the potential for making fruit and vegetable boxes in knocked-down form and their assembly by poor people in the tugurios of Lima. Finally, the specialist notes that a Peruvian counterpart for his specialty had not yet to be hired. This deficiency was solved in late June, when Ing. Narciso Reyna was contracted for this post, beginning work in July, after briefing in San José by the specialist.

## 2.9 Wood Preservation (G. Gonzalez)

This specialist spent roughly one week with the project in the San José headquarters in early February, helping prepare for a Pres-Cap demonstration at the march seminar-workshop. Portable Pres-CAP equipment

was assembled and fitted, chemicals procured, test runs made on freshly cut green poles, and in general, a good demonstration of this appropriate technology was mounted for the participants.

In March following the seminar this same Pres-Cap equipment belonging to TSC was taken to Peru as models for local manufacture of identical units to be used in the Palcazu Valley.

### 3.0 Plans for Ensuing Period

Under this heading, in the semestral report for the second six-month period of work under this contract, it was stated that successful completion of activities and working plans ofr the forestry and land use advisors for the second year under the contract were provisional on four developments all recommended by the advisors:

1) That PEPP provide the personnel and leadership for the F.D.U. as set forth in the Project Paper;

2) That PEPP provide oportune logistical support and the equipment requested by the F.D.U. in 1984 as necessary to implement the forestry and land use plans;

3) That a decision be made by the GOP (PEPP, INADE) to support sound development ofvalley lands through a land capability map and titling program which honestly reflects the economic opportunity inherent in the ecology of this valley;

4) That AID provide grant or loan funds needed to institute the forest industrial development of the valley.

Not a single one of these developmetns has taken place in full measure; the fourth, to be met by USAID, not at all.

That is to say, the advisory group, charged with promotion of the activities and objectives set forth in the Project Paper under Forestry, the specific and in Terms of Reference of their contract with USAID, continued in this the third of only witht semesters under the contract, to be unable to effectively meet their assigned obligations despite extraordinary efforts to do so. The principal problems are administrative and in decision-making at the level of project leadership, in both AID and PEPP. As noted under 2.0, the individual work plans and activities of

advisors have had to be scaled-back, postponed, or deferred in expectation of completion of the counterpart staffing, logistical support, equipment and office space procurement, to obtain a directive on land capability and titling programs from the viewpoint of sound and sustainable development and development as projected in the Project Paper, and in expectation of a decision by AID to provide funds for implementation of the first wood processing plant and forestry credit to colonos in the managed forest area.

The problem of leadership for the F.D.U. was solved during this semester. However, the problem of funding for full hiring of counterparts, laborers, procurement of equipment and supplies, logistical support for field work, termination and equipping of a forestry office building, laboratory and computer room will probably continue to plague the forestry staff, a firm decision on land classification and titling had still to be handed down at the close of the semester, and no funding is yet visible for moving ahead with the wood processing plants or forest extraction roads.

As a consequence, the advisory staff is taking a measured and cautious view of what they may really expect to accomplish in the fourth semester, or between August 1, 1985 and January 31, 1986. In a very summary form, major activities are listed below, and are fully detailed in the 1985 Work Plan and Operational Plan for the Project and as simple proposals in the individual reports of the individual specialists.

### 3.1 Natural Forest Management, Logging, and Wood Processing

1. Continue working with the C.N. Shiringamazu in respect to the forest management aspects of the integrated development plan for their lands. Presentation to community leaders the economic analysis of the wood extraction on the first trial strip clear-cut.

2. Coordinate the activities of the FDU group in respect to the second trial strip clear-cut, including the training activities of the native community and colono people in this activity.

3. Continue with the studies of natural regeneration on the two strips.

4. Study appropriate extraction techniques on the second clear-cut

5. Continue with the administrative paperwork to obtain the capital goods and logisticla support needed to complete the Work Plan for 1985.

- (a) Portable Sawmill (Mighty-Mite)
- (b) Pres-Caps
- (c) Portable charcoal kiln, steel
- (d) Ox cart
- (e) Logging cone and sledge
- (f) Four oxen
- (g) Chains and cables, hand tools

6. Promote financing and cooperation of the Shiringamazu C.N. for the establishment of the first wood processing plant in the valley, as described in the 2nd Semester Report on Forestry.

7. Prepare a management plan for the Shiringamazu community forests, to be integrated with the wood processing plant.

8. Continue the coordination with CIPA in the preparation of the extension bulletins on natural forest management.

9. Continue training of national counterpart personnel.

### 3.2 Wood Industrial Engineering

The wood industrial engineer will be developing his two-year program during this coming semester and the outlines of that program will depend essentially on decisions at AID as to the form that forestry credit and financing for the main wood conversion plants is to take. This decision has as yet to be mad in Lima, being dependent upon a study contracted to the Fundación Nacional de Desarrollo.

Meanwhile, he will probably participate in the on-site wood processing activities of the F.D.U. in the second clear-cut stip and in design of the smaller-scale processing operations at Shiringamazu under the interdisciplinary integrated community land development program.

A further activity will be the installaton of the portable sawmill if and when this is delivered to the project, and development, in conjunction wiht the forest products and marketing section, of the experimental small-industrial project at the projects woodworking shop.

### 3.3 Forest Inventory

### 3.3 Forest Inventory

The forest inventory advisor will not be undertaking active projects during the coming semester but his counterpart personnel will be engaged in specific continuing projects, which he set up in this semester.

### 3.4 Draft Animals

The draft animal specialist will be present at the project in October to supervise the first practical application of the oxen-logging technique in the second clear-cut strip. He will also assist in the selection of more young animals for training both at Iscozacin and for the native communities.

### 3.5 Dendrology

The tropical dendrologist will return to the project for a month in November-December during which period he will continue all specific lines of the program to collect, identify, and locate the ecological habitats of the forest trees in the Palcazu Valley. At this time, a one-week training course in tree identification will be given for materos, and a two-week course for forest engineers and technicians.

Work will also proceed on the organization of the arboretum and herbarium (presuming that competent counterpart personnel are hired by the Project).

### 3.6 Forest Products and Marketing

The products program is highly dependent, like that in wood industrial engineering, on a decision pending at AID as to the financing and credit program for the wood processing plants as designed by the wood industrial engineer in the second semester (1984) and described in the Project Paper. A large potential market appears to exist, especially for the type of quality products which require a large, technologically sophisticated and efficiently operated modern plant for their production. This program will therefore be held in abeyance until such time as AID comes to a decision on the matter of forestry credit through the national banking system, through some other agency, and/or a direct gift of "seed money" to fund a smaller cooperative unit in the native community of Shiringamazu.

Meanwhile, the specialist will visit the project for at least two

Meanwhile, the specialist will visit the project for at least two weeks in October-November to work with his national counterpart in setting up a limited wood products program under the Project itself, as described heretofore, on an experimental and demonstratoion basis.

A further activity of the specialist, in coloboration with the wood industrial engineer and the general forester, will be to explore more fully the economic and social feasibility of establishing the Stake Technology System for producing ruminant fodder from waste wood chips. A plant of size sufficient to produce fifty percent of the total feedlot ration for all livestock presently in the Palzaxu Valley (12-15 thursand head) would cost between one and 1.2 million dollars and could be supplied with raw material by the sustained yield (managed) output through natural growth of secondary forest on only about 1,400 hectares of forest grade land. Superficially at least, such a plant appears extremely promising also, as a means of utilizing the waste wood on the clear-cut strips (tops, small stems, defective stems, soft, white woods) rather than converting this material to charcoal.

The products specialist and the wood industrial engineer will also design and direct a project for the study of the physical and mechanical properties of the tree species encoutnered more commonly in the valley in cooperation with the dendrologist and under an arrangement with the Universidad Nacional Agraria La Molina and the U.S Forest Poducts Laboratory.

### 3.7 Wood Preservation

The specialist in this field will not visit the project during the fourth semester, as his total allotted time for the four years is only three months, about one half of which is already used up. His remaining time will be reserved for consultation related to the installation and operation of a major preserving facility at the first industrial processing plant, where and if such a plant is finally approved and financed.

Meanwhile, supervision and testing of preservation using the Pres-Cap Method on roundwood will be continued by the wood industrial engineer and the natural forest management specialist on trees to be harvested in the second trial strip clear-cut in the experimental forest at Iscozacin.

### 3.8 Land Capability Classification and Land Use Ecology

The specialists in these related fields are scheduled to spend between one and two months each at the project in the fourth semester. Hopefully, a decision will have been reached by INADE and PEPP as to the need for and focus of new capability classification work, as well as land adjudication and forest land use concessions.

Among the planned activities are (a) training of the Forest District inspectors in on-site land capability classification using the Peruvian official classification system, (b) collaboration with the members of the interdisciplinary team working for integrated development of the Shiringamazu native community lands, especially as regards the use-capability of those lands viz-a-viz the "comunero" perception of their capability based upon practical experience, and the training selected community members to classify those lands in a manner which is both technically and culturally acceptable, and (c) collaboration with Agrarian Reform and Cataster Dept: technicians in the Project in recognizing life zones in the field and in up-grading their capability to apply the official classification system for refinement of the 1:10,000 scale use-capability map.

Continuous land use inventory (actual land use) is proposed for the valley under an agreement between PEPP and the Ministry of Agriculture. Advisory assistance will be provided for this activity by the Land Use Ecologist if the agreement is finally implemented in the fourth semester.

Finally, the land use ecologist proposes to work closely with the interdisciplinary group preparing the "technological packages" for integrated farm and forest development. Emphasis will be placed on the area of mixed and sequential field and forest cropping, and agroforestry as an ecological adaptation to adverse environmental conditions.

#### 4.0 Principal Specialist Reports and Memoranda Prepared in the Third Semester

<u>TSC Report No.</u>	<u>Title</u>	<u>Author (s)</u>
Unnumbered	Second semi-annual report on forestry technical advisory services rendered to the Proyecto Especial Pishi-Palcazu (PEPP) by the Tropical Science Center under AID Contract No. 527-0240-C-00-4013-00 dated February 1, 1984	Tosi
"	(Idem. Spanish language translation)	"
"	Second semi-annual report on personnel and expenditures under the stated Contract.	"
TSC-038-C	Informe del Especialista en Preservación de Maderas	Gonzalez
TSC-039-C	2° Informe de Dendrología	Hartshorn
TSC-040-C	Informe de Viaje Quebrada Dantas y Bosque Nacional Von Humboldt - Proyectos Silviculturales en la Selva Central	Simeone
TSC-041-C	Informe Anual del Especialista en Manejo de Bosques Naturales	Simeone
TSC-042-C	Plan de la Organización y Subdivisión de Manejo y Producción Forestal en el Valle del Palcazu	Simeone
TSC-043-C	Plan Anual de Trabajo - Oct., 1984 - Oct., 1985. Primer Informe sobre Especificaciones Técnicas y Ubicación de las Plantas Industrializadores (XI-84)	Krones
TSC-044-C	Informe de Viaje. Asentamiento Rural Forestal Von Humboldt (21-IV-85)	Simeone
TSC-045-E/C	Sustained Yield Management of Natural Forests. A Synopsis of the Palcazu Development Project in the Peruvian Amazon. (21-IV-85)	Hartshorn
TSC-046-C	La dinámica de los bosques neotropicales (traducción del Inglés)	"
TSC-047-C	Resumen informativo del Ing. Ftal. Michael Krones, asesor en Industrias Forestales del C.C.T.	Krones
TSC-048-C	Informe sobre la Elaboración de los Planos de la Carreta para Bueyes	Cordero

TSC-049-C	Dendrology consultant's third report, Palcazu Valley, Peru	Hartshorn
TSC-050-C/E	Segundo informe sobre productos forestales y mercadeo (10-VI-85)	Greub
TSC-051-C	Informe de viaje de reconocimiento. Ciudad Constitución, Sungaroyacu, Von Humboldt, Pucallpa e Iquitos	Aspinall
TSC-052-C	Informe de Viaje. Alto Iscozacín "Fundo Roca Lux"	"
TSC-053-C	Informe sobre la segunda visita al Proyecto Palcazu como Especialista en Animales de Tiro.	Cordero
TSC-054-C		
TSC-055-C	Viaje de reconocimiento a Masuhazo	Aspinall
TSC-056-C	Informe sobre la segunda visita, PEPP como Especialista en Inventario Forestal (15-VI-85)	"
TSC-057-C	Informe trimestral, abril a junio 1985, del Asesor Especialista en Manejo de Bosques Naturales	Simeone

TSC Memorandum No.	Subject	Author
034-85	Proposed grant funds to native communities of Palcazu Valley for implementation of portable wood processing unit and natural forest management plan.	Simeone
035-85	Travel report. Participation in International Seminar on Comparative Development in the Amazon.	Tosi
041-85	Distribución de documentos	T. Simeone
043-85	TSC Purchase of Paulino Yantas' Primary Forest	Hartshorn
045-85	Evaluación del contraparte, Bach. L. Bocanegra	"
046-85	Determinación de las Especies Arbóreas en la F <sub>1</sub>	"
047-85	Determinación de especies arbóreas de las muestras en el Fundo Roca Lux	"

048-85	El Circo que terminó en tragedia	"
049-85	A Critique of the Bishop and Peck Report	"
051-85	Entrenamiento de bueyes	Cordero

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FOURTH SEMI-ANNUAL REPORT ON FORESTRY TECHNICAL  
ADVISORY SERVICES RENDERED TO THE PROYECTO ESPE-  
CIAL PICHIS-PALCAZU (PEPP) BY THE TROPICAL SCI-  
ENCE CENTER UNDER USAID CONTRACT No. 527-0240-C  
00-4013-00-----dated February 1, 1984.

## 1.0 INTRODUCTION

The following is a summary report on forestry and land use technical assistance and advisory services provided to the Proyecto Especial Pichis-Palcazu Sub-Project, between August 1, 1985 and January 31, 1986, the fourth of 8 total six-month periods of the subject contract with USAID/Peru. During this period, technical advisory services were rendered by specialists in the following fields; general forestry (project coordination), land use ecology, natural forest management, forest industrial engineering, tropical dendrology, land use capability classification, forest inventory, logging and road engineering, draft animal logging, and forest products and marketing, for a total of 23.08 man-months of services. Average monthly level-of-effort was 3.8 man-months.

### 1.1 ORGANIZATION AND ADMINISTRATION: SAN JOSE, COSTA RICA OFFICE

Project activities under the contract continued to be monitored and partially directed from the San José offices of the Tropical Science Center. During this semester, the required semi-annual summary report on technical assistance in English and Spanish and the administrative and financial report to AID/Lima was prepared and all short-term advisors who visited the project during this semester were briefed and debriefed and their technical reports reviewed and discussed with the Chief-of-Party.

The principal activity, however, was purely administrative and related to the procurement of a micro-computer for the San José office.

### 1.2 ORGANIZATION AND ADMINISTRATION: ISCOZACIN DUTY STATION

Day-to-day administration of forestry advisory activities in the Palcazu Valley is nominally in the hands of the long-term advisor in natural

forest management, Robert Simeone, aided by his wife Teresa Simeone. Except when the general forester and chief-of-party was actually present at the duty station, Mr. Simeone acted as coordinator and spokesperson between the AID forestry advisors, the Director, and the Head of the Forestry Development Unit of the Palcazu Valley Sub-Project. Simultaneously, he coordinated the activities of the other forestry advisors present there at any given time.

Under a special services contract with TSC, Mrs. Teresa Simeone provided 37.25 hours of coordination, bookkeeping, secretarial, and librarial services during the semester.

Administrative work for the project continued to be hampered by the lack of suitable office, laboratory, and library space. The long overdue forestry office building of the project was not completed or ready for occupancy at the end of this semester.

An IBM micro-computer system, authorized under the contract for installation by TSC in the forestry facility at Iscozacin, was received in Lima early in the semester but could not be installed or operated for lack of suitable housing and electrical supply at Iscozacin. This system was set up in a private home in Lima, tested, and found to be fully operative. It will be moved to the duty station at Iscozacin as soon as an air-conditioned room in the forestry office building under construction and a suitable power supply are readied there. This computer will greatly enhance the capability of the Forestry Development Unit and the advisors to perform their tasks.

In Iscozacin, secretarial services to be provided advisors by the Government of Peru were still inadequate through this semester and had to be supplemented by services purchased from Mrs. T. Simeone and Mrs. Suzy de Avila (Lima).

Transport within the valley is now possible on the new highway. Pickups and motorcycles to be provided to the Forestry Development Unit under the loan, were delivered at the end of this semester. A suggestion was made that a four-wheeled drive pickup be rented by TSC to afford some of the most urgent transport to the Shiringamazu area where the first operating forestry unit is to be located, but rentals are prohibitively expensive

and the TES budget does not include funds for such rentals, so the idea was abandoned, at least for the fourth semester under the contract.

Considerable administrative energy and valuable time of highly-paid technical advisors was expended on the frustrating problems of equipment procurement. Project procurement procedures are cumbersome, if improving, hampered by an unwieldy internal administrative bureaucracy in the Iscozacin, La Merced, and Lima offices of PEPP. The failure to order, or poor quality, or inadequate quantity, or great delay in receipt of essential equipment carefully described and approved by project leadership has undoubtedly reduced the effectiveness of both the technical advisors and of their national counterparts. Further and related detriment has been caused by lack of project administrative agility in the areas of local travel and per diem for national counterparts, low salaries for national technicians, and a low level of cooperation with the forestry unit by the administration of the Palcazu Valley Project in Iscozacin.

### 1.3 TECHNICAL ADVISORY SERVICES: LEVEL-OF-EFFORT

A total of 23.08 man-months of technical assistance were provided to PEPP by the TSC staff during this semester, as follows:

Specialty	W O R K P E R I O D S		TOTAL Man-Months
	Costa Rica	Peru	
General Forestry, Chief-of-Party (J. Tosi)	23/8--29/9/85	4/8--10/8, 17/8--23/8/85	1.67
Land Use Ecologist, Chief-of-Party (J. Tosi)		30/9--1/11/85	1.03
Natural Forest Management Specialist (R.Simeone)		1/8/85--31/12/86	6.00
Forest Industrial Engineer (M. Krones)		14/8/85--31/1/86	5.58
Tropical Dendrologist (G. Hartshorn)		19/11-- <sup>10</sup> 10/12/85	1.03

Land Use Capability Specialist (R. Bolaños)		23/8--25/10/85	2.07
Forest Inventory Specialist (Wm Aspinall)		1/8--15/9/85	1.50
Logging and Road Engineering Specialist (Wm Aspinall)		16/9--30/11/85	2.50
Draft Animal Specialist (Wm. Cordero)	12/10--14/85	27/9--11/10/85	0.63
Forest Products and Marketing Specialist (H. Greub)		4/11--6/12/85	1.07
10 Specialties/8 Technicians.....			23.08
Average Monthly Level-of-Effort.....			3.85
* (Includes rest and recuperation and vacation in final 5 weeks.)			

#### 1.4 RECRUITMENT, ORIENTATION, AND TRAINING OF FORESTRY UNIT COUNTERPARTS

In all three previous semestral reports, the Chief-of-Party has called attention to (1) the shortage of national counterpart professionals, sub-professionals, and administrative personnel in the Forestry Development Unit of the Palcazu Project, and (2) the essentially unresponsive and not-infrequently negative attitude of the Project administration towards the Forestry Unit, both its program and all personnel, including technical advisors. Of these two situations, neither improved significantly during the fourth semester under the contract, despite the full-time presence of the new Unit Chief, Ing. J. Ocaña.

No new or additional professional counterparts were employed during the semester, and the dendrologist, Ing. E. Mesa, continued on extended leave-of-absence until late October in detriment to the program in general.

Despite the continuing and significant lack of counterparts in wood industrial engineering, and wood preservation, these TSC advisors managed to project their assigned specialties within the Unit as a whole due to the great enthusiasm, strong motivation, high morale, and team spirit which characterized the personnel of this unit, from professionals to laborers. For those actually on duty, intensive interaction with advisors was the rule and "on the job training" produced significant results, evident in the general performance of all personnel. Training aspects of assistance by advisors is covered, individually, in the following sections of this report.

## 2.0 STATUS OF WORK UNDER THE CONTRACT

The following section highlights the activities of the advisors during the fourth semester of work under the contract, from August 1, 1985 through January 31, 1986. Unlike previous reports, in which each advisor's activities were dealt with separately, in this I am attempting to give an overview of activities as a whole relative to the terms of reference of the contract and to more specific objectives of the project as set forth in the Project Paper. It appears to be timely to sum up progress at this midway point in the work. For details on individual advisor's activities during the semester, the reader is referred to the following reports and memoranda:

- |           |   |
|-----------|---|
| TSC-058-E | Bimonthly briefing: TSC/AID, July-August, 1985, Natural Forest Management Specialist (Simeone).   |
| TSC-062-C | Informe Trimestral: Julio a Setiembre, 1985 (Simeone).  |
| TSC-063-E | Bimonthly briefing, TSC/AID, September-October, 1985, Natural Forest Management Specialist (Simeone).   |
| TSC-067-C | Informe trimestral: Octubre a Diciembre, 1985 (Simeone).  |
| TSC-069-C | Informe Anual del Especialista en Manejo de Bosques Naturales, 1985 (Simeone).  |
| TSC-085-C | Informe sobre la segunda visita al Proyecto Especial Pichis-Palcazu como Especialista en Extracción y Caminos Forestales por Ing. Wm. Aspinall. Noviembre 1985. |

MEMO-054-85-TSC Progress Report on Industry Sector (Krones).

MEMO-056-85-TSC Algunas observaciones sobre el uso de bueyes para extracción en el Palcazu hechas durante la tercera visita del asesor. (Cordero).

MEMO-062-85-TSC Bi-monthly report for September-October, 1985 (Aspinall)

MEMO-064-85-TSC Bi-monthly progress report--September-October, 1985 (Krones).

TSC-066-C Segundo Informe Técnico del Asesor en Mercadeo y Productos Forestales (Greub).

TSC-060-C Informe sobre la tercera visita al Proyecto Palcazu como especialista en animales de tiro (Cordero).

TSC-061-C Informe de labores del asesor en (Segundo Período) capacidad de uso de la tierra (Bolaños).

MEMO-S.N. Mapas por computadora para el Palcazu (Bolaños).

TSC-070-E Dendrology Consultant's Fourth Report, Palcazu Valley, Peru (Hartshorn).

## 2.1 NATURAL FOREST MANAGEMENT

It was stressed in the Project Paper (PP) that almost 50 percent of the valley lands of the Palcazu have an exclusively forest production potential due to adverse climatic and soils conditions. Ecologically and economically sound development can only be accomplished on such lands by the implementation of a sustained-yield system of forest management applied to the old growth mixed natural forest now prevailing upon them. It was proposed, furthermore, that the socially sound development of these forest production lands could best be achieved on family-sized-and-operated individual production units estimated at 60 to 80 hectares in extension under concession-in-use. The native Amuesha communities, possessing about half of the total area classed for forestry, would be dealt with upon a communal basis.

A general model for immediate, continuing, and sustainable wood production from the old-growth stands was proposed by the Tropical Science Center (1982) and incorporated into the overall development proposal for the Palcazu Valley under the title of "systematic strip

clearcutting on family-sized production modules". Regularized production from about 80 such <sup>modules</sup> (5000 hectares) aggregated in nearly-conterminous production blocks and provide with a permanent extraction road network would provide the raw material requirements of an integrated primary wood processing center, presuming that the center was designed and operated to utilize the total biomass production from each year's clearcut strips. As many as ten such centers could, theoretically, be operated on the existing forest land base in the valley.

The system provides for auto-regeneration of a forest identical to that being harvested and each family would cut and deliver the total wood volume, on about two hectares each year, providing a net income from stumpage and labor of around 7,200 U.S. dollars (local currency). The wood-processing plants and the internal transportation system would provide additional employment opportunities for the population at large.

A second production model, to be applied to white sand soils only, would involve production of rubber and high value timber species. For lack of detailed soil survey, the area and location of white sands in the valley is not known but is considered small so the first production model described would be of predominant concern for development.

Unrealistically, the Project Paper sets a five-year timetable for the execution of the overall AID-assisted development program in the valley, as well as presuming that the key to development, the new allweather highway to Pto. Mairo, would be completed on schedule. Other assumptions, now seen to be in error, relate to (a) land tenancy and titling, (b) the administrative competence and will of the Special Project to efficiently utilize budgeted funds for specified development purposes, and (c) the wisdom of funneling loan funds for the forest production units and wood processing plants through the industrial bank in La Merced. The foregoing comment is made because the Project Paper (PP) establishes the staffing, timetable, and terms of reference for the advisors in forestry and land utilization under the AID/TSC contract. At this mid-point in the contract period, it is now very evident that the complete development model for forestry as envisioned in

the PP cannot be implemented without an appreciable extension of the technical assistance as well as major alterations in the way loan monies are allocated for capital development and improvements in this field of economic production.

For the better part of 1984, the first year under the contract, little progress could be made in the implementation of the natural forest management scheme: the project's Forestry Unit was leaderless and significantly understaffed, there was no equipment or office space, and no effective cooperation by the project administration in Iscozacin was evident. TSC advisors therefore concentrated their efforts on reconnaissance studies of the forests and native community social and economic structures, and in maneuvering to obtain supplies and personnel for the Forestry Unit itself. Training of existing counterparts was also initiated in this period, continuing into the second year. Only at the close of the first year had Unit staffing been improved and temporary offices established at the duty station in Iscozacin.

#### 2.1.1. First Trial and Demonstration Strip.

In the first semester of 1985, a group of integrated natural forest management technical "packages" were designed by the Forestry Unit staff under the tutelage of the TSC advisors in general forestry ( J. Tosi ), natural forest management (R. Simeone), forest inventory and logging (Wm. Aspinall), tropical dendrology ( G. Hartshorn ), and draft animal logging (Wm. Cordero). Following intensive inventory of the standing vegetation and reproduction on the site, the first trial and demonstration strip was clear-cut upon a 0.15 hectare tract of natural forest in an experimental area rented from colonist Paulino Llantas and located near the Iscozacin camp. ( This area will eventually encompass an arboretum of identified and labeled native tree species, to be utilized for both training and scientific purposes as well as two demonstration strips, clear-cut). Work continued on this first strip into the early months of the fourth quarter, as permanent regeneration study plots and seedfall boxes were installed, physical-mechanical studies made of the wood, and the remainder of the felled biomass was measured, extracted, and processed.

In the fourth quarter, study data was analyzed, yields from this first strip determined, and a formal economic report prepared by the Forestry Unit staff ( 'Evaluación económica de la primera faja de aprovechamiento integral del bosque' , PEPP/Iscozacin, October 1985).

On this first research strip, undertaken on F<sub>1</sub> ( forest production capability ) land, only manual labor was used to fell, process, and extract the total wood volume of 36.8 cubic meters (in 97 trees), yielding 9,841 board feet of saw logs, 850 posts to be treated with wood preservative, and 1,500 kilograms of charcoal. Despite much higher than projected labor costs (due to delays in the Project's procurement of needed equipment and work lags due to the in-service training of labor force and the oxen), a net income of U.S.\$1,298.24 was obtained for the 75 x 20 meter tract, equivalent to U.S.\$8,646.27 per hectare. This high income is attributable, not so much to saw wood volumes or value but rather to a great demand for preserved posts and high volumes of the smaller-sized but tall, straight trees typical of the natural forests on the poor soils of this valley.

It needs to be emphasized, furthermore, that labor was included as an expense in calculating net income on this strip. In the original calculations of net income under the family-operated forest module (for the Project Paper), labor was projected as income rather than as a cost. Although this first trial and demonstration strip is probably too small to be representative, it does suggest that potential family income under the proposed forest-farming system may be significantly higher than originally estimated.

#### 2.1.2. Second Trial and Demonstration Strip

During the fourth semester, a second strip was clear-cut in the same general area. This strip was 50 meters in width and 100 meters in length, or 0.5 hectare in extent. Data from pre-and-post harvest measurements has as yet to be analyzed (for lack of the computer). As in the case of the first strip, certain longer-term research objectives are to be pursued on the second: in a comparison with the first 20 meter wide strip, the effect of strip width on natural regeneration, effect of bordering tree species on

natural regeneration, timber volumes and uses in relation to morphology of individual trees by species, derivation of stand and stocking tables for forest inventory and the like. However, this second strip had as its primordial objective, the in-service training of native Amuesha in the strip-clearcutting method. Some 14 trainees representing 5 different native communities were paid a laborer's salary during three months of in-service training in tree identification, the use of chainsaws, directional tree-feeling, log and pole skidding with oxen, pole preservation with Pres-Caps, and manufacture of charcoal in the forest on this strip. Furthermore, they received both orientation lectures and practical training in the overall natural forest management system. These fourteen original trainees will form the nucleus of an administrative and labor force for the first communal wood-processing center and managed natural forest to be established on the lands of Shiringamazu native community in early 1986. The training program was a great success: it demonstrated the natives' natural capability to rapidly acquire the necessary forestry skills and to take initiative in the work, as well as a decided preference for work under forest conditions. It is planned to continue this program in the cooperative forestry venture at Shiringamazu, with the progressive training of natives (and interested colonists) in order to form an expanded, skilled workforce for the development of a permanent forest industry in the valley.

In 1986, however, the emphasis on the strip clear-cuts will be on regularized wood production rather than on research. Some less formalized research will, presumably, be conducted on some of the production strips, and economic evaluations of production and production costs will be of paramount concern.

### 2.1.3. Other Training and Demonstration Activities

A major effort was mounted during this semester to utilize the ongoing operations at the two trial strips for the purpose of general public education and for the training of both counterparts and the staff of the project-at-large vis-a-vis the natural forest management system and the elementary processing of some of the wood being extracted.

Almost daily, visitors from the valley population, colonists as well as native comuneros, AID/Lima staff, foresters and other technicians from the government agencies and universities, and even a few foreign visitors, were taken to the research area to witness, first-hand, the practices being employed and their results in terms of product. All visitors were briefed on the concepts behind the natural forest management system and the advantages of sustained-yield forestry as a viable economic activity for the poorer soils of the valley.

Simultaneously, the two demonstration strips were being used daily as a basis for improvement of skills amongst both professional counterparts and other, non-professional personnel of the Forestry Development Unit. From experience in giving educational talks and demonstration visits to the sites, the advisors and their counterparts began development of a series of forestry extension materials covering the natural forest management system itself, on care and use of tools for tree-felling, on wood extraction, on on-site production of special wood products (see 2.2.), and on the care and training of draft animals used for forest work. Many of these materials will be published and made available in 1986, for general distribution in the valley.

#### 2.1.4. Wood Industries, Forest Products, and Marketing Program

Early in this semester, the long-term advisor in wood industrial engineering (M. Kroner) arrived to take up his duties in the project. This advisor had participated as a short-term advisor intermittently during the first three semesters of operation, principally in design of the wood industrial plant as set forth in the Project Paper and the terms-of-reference of the contract. However, a de facto project revision with respect to the wood industrial component of the project had been forced upon the advisory staff beginning in late 1984, due principally to the increasingly evident impossibility of harmonizing the financial aspects of a large integrated wood industrial plant under a loan arrangement with the industrial bank in La Merced and potential users of such financing, the native Amuesha communities. Another factor of importance

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in this non-formalized PP revision has been the failure to extend the highway beyond the Iscozacín river and the poor and uncertain state of the roadbed itself for transport of finished products out of the valley. Plans were therefore scrapped for the first integrated wood processing center as originally designed by M. Kroner (the plant would have cost roughly 1.8 million dollars), the Conditions Precedent for the Forest Industrial Credit were never submitted to AID by PEPP, and a new approach to the problem of wood processing had to be considered by the AID advisory group as a whole.

A modified plan evolved through a series of meetings between the forestry advisors, the advisor in anthropology, the extension group, and some other department personnel of the project. (During this semester, also, a special study was conducted on this subject by the Federación Nacional de Desarrollo under contract with USAID). This revision has neither been terminated nor formalized by AID, but, in general, the idea now is to begin with a small wood processing cooperative in the Shiringamazu community with access to the new highway and a substantial area of forest production land in virgin or only slightly altered condition under management. The plant will consist, initially, of only a small portable sawmill and a Pres-Caps unit, <sup>The latter</sup> had been acquired and set up to treat posts from the second demonstration strip where, as reported upon in a previous section, native comuneros were given intensive on-the-job training in the use of the Pres-Caps equipment for wood preservation. New Pres-Caps for the cooperative were built during the semester and the sawmill, ordered during the third semester, was reported to be leaving customs at the close of the fourth. Both sets of equipment will, apparently, be donated by the project to the native community cooperative. The organization of this cooperative had not been accomplished but efforts leading thereto were underway, at the close of the semester.

The wood industrial engineer, although a long-term advisor under a two-year contract, has as yet to be assigned a national counterpart professional with the background and experience essential to this post. Furthermore, a forester trained in wood technology and temporarily assigned

to the position (Nora Carrillo) was made acting head of the Forestry Development Unit of the project in January 1986, when the incumbent head resigned his post. Unless a new head for the unit is found and actually arrives to take over the leadership position, she will have virtually no time to act as even a temporary counterpart for wood industrial engineering.

Working closely with the wood industrial engineer are two other advisors and their counterparts: the forest products and marketing expert (H. Greub) and the wood preservation specialist (G. González). Of the two, only the first was active at the project during the fourth semester. During approximately one month at the project site and an additional week outside, assisted full-time by his new counterpart (N. Reyna), he re-evaluated the national market for wood products, paying special attention to the regional market encompassing the Palcazu Valley and the nearby valleys upstream as far as Tarma and Oxapampa. A report was prepared covering findings of the survey, which included transportation costs.

This forest products market survey concluded that the same products indicated in the previous year's survey as dominating the market continued to dominate at present and would do so into the near future:

- 1) preserved telephone and powerline posts (national)
- 2) preserved posts for grape arbors (coast)
- 3) preserved fence and agricultural posts (local and regional)
- 4) preserved railroad ties (national)
- 5) sawn and preserved wood for construction purposes (regional and local)

The first three of these products have a high per unit price and can be manufactured totally within the valley with the equipment planned for installation in the first cooperative wood processing plant; the last will require the addition of equipment for preservation of sawn lumber, while the ties can be sold green without drying or preservation to either of two private companies with special equipment for treatment.

It was recommended, therefore, that the project eventually add a Slurry-Seal system to the first processing unit for the preservation of its green lumber and railroad ties. This system, which provides for 100 percent impregnation of the wood with CCA (water soluble) type, self-fixing wood preservatives, would enable valley producers to successfully compete in the excellent market for ties and treated construction lumber, utilizing virtually all species of acceptable form and size in the natural forests of the valley. Initial steps were taken to contact the owners of the patented Slurry-Seal process (in the U.S.) and to obtain agreement for use of this new and unique procedure.

During this semester, also, the general forester, wood industries engineer, and wood marketing specialist continued efforts to interest the PEPP director and animal husbandry technicians in the advantages of installing (in the Palcazu Valley) a plant for the conversion of wood chips from forest waste into a nutritious energy food for ruminant livestock. The industrial engineer made a two-day visit to the Stake Technology demonstration plant in Minnesota immediately prior to his travel to join the project as a long-term advisor. Subsequently, he assisted the general forester (J. Tosi) in delivering an illustrated lecture to approximately 70 government officials and professionals at the Colegio de Ingenieros in Lima on this subject. A decision was made by PEPP, late in the year, to conduct a pre-feasibility study for such a plant and requesting financial and technical assistance from AID.

At the end of the semester, the wood industrial group, advisors and counterparts, were engaged in planning for a progressive increase in the size, capacity, and sophistication of the first wood processing plant, to be set up initially in Shiringamazu in March 1986. This plan would cover a three-year period.

Related to the wood industrial aspects of the project is the need to determine the physical-mechanical characteristics of the tree species occurring in the forests to be managed. A program to systematically determine wood qualities for specific uses--strength, machining characteristics, resistance to insect and fungal attack, shrinkage on drying,

density, color, and hardness, workability with hand tools, and many other such parameters--has been started and will be extended throughout the contract period. For this purpose, samples of wood taken from botanically-determined trees are to be tested in both La Molina and in the herbarium-wood collection laboratory to be set up in the forestry office building currently under construction. Hand and machine tool workability will be tested directly in the unit's new wood-working shop being set up at the close of the semester. This program will be under the advisory assistance of the wood industrial engineer, the products and marketing expert, and the dendrologist. All samples tested will be botanically vouchered and a wood identification key for the more common woods will be prepared as a necessary research aspect of the project.

## 2.2. LAND USE ECOLOGY AND LAND USE CAPABILITY CLASSIFICATION

The land use advisory group consists of two people: the land use ecologist (also Chief-of-Party), J. Tosi, and the Land Use Capability Specialist, R. Bolaños. Since the very beginning of the project, work in this general field of expertise has suffered from disinterest on the part of PEPP, at both the leadership and technical levels, in promoting ecologically sound development in the valley. The project does not have its own technical unit to encompass soils and climatic studies, land use capability classification, and land use planning, but rather has contracted certain, partially-related services with the Dirección de Catastro y Reforma Agraria of the Ministerio de Agricultura. This unit conducted a pre-titling survey between 1983 and 1985 which included a land use capability map and an actual land use map at 1:10,000 scale. These maps did not include the native communities nor was the land use capability map on which titling procedures were to be based deemed technically honest or competent in execution. These matters are covered more fully in the three previous semestral reports submitted as required under the contract. In the last of those reports, it was mentioned that a government investigatory commission looked into this mapping work in May of 1985. Their report underlined serious deficiencies in the existing PEPP Palcazu Valley land capability classification due, especially, to cartographic and methodological inconsistencies and biases on the part of

technicians in charge. INADE, consequently, halted all titling of lands in the valley pending their reclassification but did not, unfortunately, set a corrective mapping procedure in motion nor indicate a time framework for the completion of the re-mapping. Matters stood at an impasse at the beginning of this semester when the land use ecologist and the land capability classification specialist again visited the project.

Concerted and decisive action on the part of PEPP to resolve the land classification issue was not taken during the semester despite the best efforts of the advisors to put the issue into focus. The land use capability classification employed in Peru is an official one first designed in 1970 and revised in 1975. It requires responsible and well-trained technicians to be effective. The Catastral and Land Reform Unit contracted to PEPP by the Ministry of Agriculture did not meet the necessary professional standards for this work during the 1983-1985 mapping work and most continued to be employed with the unit following submission of the commission's report to INADE. A first priority, therefore, was the in-service training of the now-chastened professionals and sub-professionals of this unit. Training, in charge of the land capability specialist assisted by the land use ecologist, took two forms:

a) an intensive three-day course concentrating on both theory and methodology and (b) practical training in daily labors of detailed mapping of land capability in the lands of the Shiringamazu native community. The work was undertaken by personnel of the Catastral and Land Reform Unit under guidance of the land capability specialist and had as its objective the detailed planning of land use for integrated agricultural and forestry development of all community lands.

A major constriction on sustainable development of lands in the Palcazu Valley is the lack of scientifically sound knowledge of the relationship between the natural environment, land use capability and land-using practices, including crop, pasture, and forestry adaptations to specific physical site characteristics. Project professionals have been slow to admit that such knowledge is a prerequisite to successful development, and many plant and pasture introductory trials were attempted

by Project technicians without due consideration of either climatic or soils suitability. In a similar manner, sub-projects and "technological packages" have been designed and proposed for implementation without regard to land use capability. Agronomists, in particular, have been confident that most of the land in the valley can be farmed permanently given the right amount of fertilizer and some varietal selections. This belief was, in fact, one of the major causes of the attempt to "re-classify" land capability to show more agricultural and pasture land by the Catastral and Land Reform Unit of PEPP. Not only the project administrator but also most of its agricultural technicians are at best naive and at worst ignorant of the limitations imposed on development by natural environment in the humid and wetter tropics.

In recognition of this problem, the TSC land use advisors set out to correct it. Both formal and informal talks were given to project personnel from all units of specialization on the importance of ecology to their work. The Forest District inspectors, who inspect and give permits for both land clearing for agriculture and for timber cutting, were included in the intensive land use capability classification course given to Catastral and Land Reform Unit personnel. The land use capability specialist personally and in company with the respective advisors and national counterparts in agriculture, animal husbandry, and forestry evaluated the use capability of the sites where planting trials and other experiments were being conducted or planned, and a study was undertaken to learn the Project's real perceptions and longer-term policies with respect to land use, and to extension and development recommendations in agriculture.

### 3.0. PLANS FOR ENSUING PERIOD

In the second and third reports it was pointed out that forestry development as projected in the Project Paper and set forth in the terms of reference of the contract was contingent upon four developments recommended by the advisors. The first two of these requirements -- (1) a full complement of personnel and leadership for the Forestry Development Unit of the Project, and (2) opportune administrative and logistical

support plus delivery of the equipment needed to implement the forestry and land use plans -- were being met, if incompletely and rather halfheartedly, during the fourth semester. The latter two, however, were not met in any significant way and continue to be major obstacles to forestry development: (3) a decision by the GOP (PEPP, INADE) to support development of valley lands through a land capability map and titling program which honestly reflects the economic opportunity inherent in the natural environment of the valley, and (4) the provision, by AID, of grant or loan funds needed to institute proposed forest industrial development on a sound economic footing. Until the latter requirements are filled, the advisors will be unable to satisfactorily complete their assigned obligations under the terms of the contract.

The first of these limitations, as pointed out in the preceding section, is clearly due to a combination of both ignorance and the essentially political, short-term development objectives held by Project leadership. For this reason, the advisors will augment their efforts to teach the rationale and principles of eco-development to PEPP administrators and technicians alike while, conterminously, pushing for a decision by INADE and PEPP to establish criteria, financing, and a timetable for the execution of a valley-wide, detailed re-classification of land use capability.

Re-classification will, presumably, have to be based upon the existing GOP regulations for land capability classification. The system is fundamentally sound but requires updating and refinement. The land use ecologist has recommended to the members of the standing committee on this classification (from ONERN, Dir. Forestal y de Fauna, Dir. Reforma Agraria, Dir. Hidro.) that they sit to revise the classification, and it is probable that such a step will be taken in 1986, hopefully with his participation and advice for the climatic regimes represented in the Central Selva region of the Selva Alta. Meanwhile, it will be necessary to use the unmodified classification for detailed mapping of capability in the valley. This program should be integrated with the proposed "continuous land use inventory".

The Continuous Land Use Inventory, as set forth in the Project Paper, will show two things: (1) "how well actual land use conforms to land use capability and if non-conforming land uses are being converted to conforming ones, and (2) what kind of development services should be provided on lands used in accordance with capability, so that development services can promote the continuation and improvement of those land uses. On lands not used in accordance with capability, development services will aim at converting actual land use to conform to land use capability", (thus leading to ecologically sound and permanently prosperous economic and social development of the valley).

It was originally planned that the continuous land use inventory be started conterminously with land capability mapping of the valley. This has not been the case: in mid-1983, PEPP and AID prepared a contract to be signed with the Dirección de Catastro y Reforma Agraria for the execution of the continuous land use inventory. This contract was never signed but has recently been revived and we understand that, with luck, positive steps will be taken to execute it in 1986.

Eight months of Project Grant funds were allocated for short-term technical assistance in land use capability and actual land use to support the program. The land use capability specialist (R. Bolaños) has been unable to move positively on continuous land use inventory to date for the reasons stated, but will do so if and when the promised program is put into motion by PEPP. The continuous land use inventory program will be operated in a vacuum unless and until a detailed land use capability map is prepared (simultaneously and for matching areas-in-time) under the proposed reclassification program. The existing capability maps (JRB, ONERN, and PEPP) are all really at a reconnaissance-level in terms of detail and accuracy, despite the fact that the last of these was drawn on a base map enlarged to a scale of 1:10,000. Far greater field-data-based detail is needed in respect to the soils parameters, yet qualified soil surveyors are not upon the team of the Catastro y Reforma Agraria unit in Iscozacín and the most qualified professional and leader of this team resigned his post at the end of this semester. This entire problem, therefore, constitutes a major challenge for overall project leadership, both in Lima (AID and PEPP) and in the Palcazu

### 3.2. WOOD PRODUCTION AND WOOD PROCESSING

The Forestry Development Unit of the project demonstrated the mechanical and economic feasibility of harvesting timber under the strip clear-cutting method in 1985. The demonstration were undertaken in a research forest area under control of the unit and the trial plots are being used both for research and for training of personnel and potential users of the system. In the forthcoming fifth and sixth semesters, the third year under the contract, work will be oriented towards wood production on a commercial scale. This production will take place on an area of forest land belonging to the Shiringamazu native community and all wood will be processed in a small sawmill and wood preservation plant to be established, also on community lands, as a cooperative in which both producers and wood processors will be members.

Major activities of the advisors during the coming six months in this area of activity will be the following:

(1) Promote and assist in the formation and development of a cooperative for the production, processing, and marketing of wood cut under the strip clear-cutting method on managed natural forest.

(2) Establish and put into operation the first wood processing center in Sector I of the valley. The center will include a Mighty-Mite portable sawmill, a set of Pres-Caps for pole and post preservation, a carpentry shop, and an oven for the manufacture of charcoal. A marketing procedure will be incorporated into the processing center, the administration of which, under the cooperative, will include provisions for the purchase of raw material from the community forest area under management and the sale of manufactured products.

(3) Wood production operations will be started on some 6 hectares of the forest under a management plan being prepared for those community lands to be dedicated permanently to forest management. Operations will include some further on-the-job training of native operators in tree-felling, extraction with oxen and perhaps with mechanical winches, loading and hauling to the cooperative's processing plant, and the training of

(4) Advance work on the preparation of forest management plans for all the other native communities in Sector I of the valley.

(5) In-service training of some 80 native community members in the techniques for managing and wood production from natural forests.

(6) Continue public orientation and education programs on the nature and benefits to be delivered from production forestry on the forestry-grade lands of the valley.

(7) Continue supervision of the research work initiated in 1985 on ecology, dendrology, silviculture, and wood products and marketing.

(8) Establish permanent inventory plots and continue either the forest inventory program initiated in 1984. This work includes the preparation of base maps with forest types for the valley area and the determination, with the help of new aerial photographs, of the area in agriculture, pastures, fallow, and forest with timber volumes by species and forest type. This work will start with the Shiringamazu native community area in Sector I, continue in this sector until completed, and then be projected northwards into Sectors II, III, and IV.

(9) Begin surveys for the planning of permanent logging roads and trails within the areas to be managed permanently for timber production.

(10) Train all professional personnel in use of the new computer to be set up in the new Forestry Unit office building in Iscozacin.

(11) Establish the arboretum and label all trees.

(12) Establish the herbarium and wood collection in the new office building. Begin the wood taxonomy program.

(13) Set up and put into operation the pilot workshop for secondary products (carpentry shop) at the Iscozacin base camp.

(14) Begin preparation of a master plan for forestry development over a ten-year period in the Palcazu Valley.

(15) Prepare a series of heavily illustrated, simple-language (extension-type) booklets covering natural forest management methods, logging on strip clear-cuts, and wood processing, in cooperation with CIPA.

(16) Continue to take and analyze wood production costs and sales data for determination of economic aspects of forestry as a permanent industry for natives and colonists in the Palcazu Valley.

(17) Design an expanded, modular, integrated wood conversion plant to begin with the simple, basic plant to be established at Shiringamazu. Expansion would be progressive and last several years.

(18) Visit and maintain contact with the forestry projects in other Central Selva (PEPP) valleys. Interchange information and experiences with professionals in these programs. Begin a national information campaign using video technology.

February 25, 1986  
San José, Costa Rica

Joseph A. Tosi Jr.  
Chief-of-Party  
Tropical Science Center

FIFTH SEMI-ANNUAL REPORT ON FORESTRY TECHNICAL ADVISORY SERVICES RENDERED TO THE PROYECTO ESPECIAL PICHIS-PALCAZU BY THE TROPICAL SCIENCE CENTER UNDER CONTRACT NO. 527-0240-C - 00-4013-00 Dated February 1, 1984

1.0 INTRODUCTION

The following is a summary report on forestry and land use technical assistance and advisory services provided to the Proyecto Especial Pichis-Palcazu, Palcazu Sub-Project, between February 1 and July 31, 1986, the fifth of eight total six-months periods of the subject contract with USAID/Peru. During this period, technical advisory services were rendered in the following fields: general forestry (project coordination), land use ecology, natural forest management, forest industrial engineering, tropical dendrology, land use capability classification, forest inventory, logging and road engineering, draft animal management, and forest products and marketing, for a total of 26.71 man-months of services. Average monthly level-of-effort was 4.45 man-months.

1.1 Organization and Administration

1.1.1 San Jose, Costa Rica Office

Project activities under the contract were monitored and partially directed from the headquarters offices of the Tropical Science Center in San Jose, Costa Rica. During this semester, the required semi-annual summary report on technical assistance in Spanish and English for PEPP and AID, respectively, and the administrative and financial report to AID/Lima was prepared and all short-term advisors who visited the project during this semester were briefed and their technical reports reviewed by and discussed with the General Forester- Chief-of-Party. During the month of February, TSC headquarters assisted by several of the short-term advisors to the project (Tosi, Hartshorn, Greub, Bolaños, and Cordero), independently hosted a one-day field trip to observe Costa Rican forestry and forest products cooperatives and to observe agro-forestry activities on local farms for nine representatives of PEPP and APODESA attending an AID-funded short course on ecological principles of tropical development. Included in this group was the current Director of PEPP, Mr. Luis Llanos dela Mata, who also visited the Tropical Science Center and met with its technicians and Director. During the three week period during which the Peruvian counterpart persons were in Costa Rica attending this course, TSC also hosted a luncheon for them and a one-day major social event.

Considerable administrative effort was involved during this semester in matters relating to the procurement and installation of the IBM XT micro-computer purchased under the contract to be installed in this office. As reported in

the fourth semestral reports on personnel and expenditures, part of the original shipment was lost by Southwest Airlines enroute to Costa Rica and a lawyer had to be engaged in Dallas to seek redress for the financial loss while simultaneously TSC had to engage another agent in the U.S. to purchase, test, and ship replacements via the U.S. Embassy in San Jose. The shipment was finally delivered to TSC in May, but by the time bugs in the equipment were worked out with local technicians and software requirements met it was nearly July before the computer was fully operational. Personnel training was undertaken in this period.

### 1.1.2 Lima, Peru Offices of AID and PEPP

All TSC advisors pass through Lima enroute to the Iscozacin duty station in the Palcazu Valley. While there, they customarily visit both the Project Manager and the Coordinator in the Lima offices of AID/Peru and the Project Director of PEPP, the Coordinator, and other persons in the Lima headquarters of the Central Selva Natural Resources Management Project (PEPP) on matters relating to administration of their specialties within the overall project context. Periodic visits are also made to Lima by both short and long term advisors on the project to attend meetings called by the Project Manager, to procure supplies, deal with public agencies relating to the project, and to attend personal health and family matters. These activities are detailed in the bi-monthly reports submitted to the Project Manager in AID's Rural Development Division and to the TSC Chief-of-Party by each advisor.

### 1.1.3 Iscozacin Duty Station

During this semester, Mr. Robert Simeone, long-term advisor in natural forest management and continuously in residence at the Iscozacin headquarters station of the Palcazu Valley Development Project, acted as field team coordinator and spokesman for the TSC team of advisors before the Project Manager and the Director, administration, and forestry development units of the Project, except when the Chief-of-Party (a short term advisor) was actually present in Peru.

Under a special services contract with TSC, his wife, Mrs. Teresa Simeone, provided 33 hours of coordination, bookkeeping, secretarial, and librarial services during the semester.

At the beginning of this semester, the long-delayed forestry unit office was completed and occupied, fulfilling a long-felt need of both the Forestry Development Unit staff and of the advisors. This is a quite large building with separate rooms for each major specialty plus an air-conditioned room for the TSC computer and the herbarium, a

large meeting room also serving as a library, and administrative offices for the unit-at-large. Each technical advisor is assigned space in the room assigned to the national technicians whom he advises.

In late June, the IBM microcomputer purchased for the Iscozacin field headquarters by TSC was taken to Iscozacin by air and set up in the new room. It appears to be functional except for the UPS (uninterrupted power supply) accessory. This computer will greatly enhance the capability of the Unit and its advisors to perform their tasks. It comes at an especially critical time, with the start-up of the new forestry cooperative in Shiringamazu and of related research and survey activities. The rapid completion of the new forestry building after two years of empty promises is a concrete example of the recent dramatic turnabout in support for forestry by PEPP and by Palcazu Project direction.

Secretarial services to be provided the advisors by the GOP were still inadequate to their needs during this semester. Actually, the Forestry Development Unit has only two secretaries, and with the arrival of more national counterpart personnel and increased activities, their services were even less available than formerly. For this reason, much of the necessary secretarial work at the duty station was provided by Mrs. Teresa Simeone under her services contract with TSC.

Transport within the valley and, specifically, to the native communities in the southern third where most of the forestry development activity is taking place, is now accomplished mostly on the new highway. The FDU was provided with only one of three pickup trucks delivered, finally, in late January. This vehicle cannot possibly meet the requirements of both the national technicians and field crews and of the advisors. Therefore, in April, a request made to the Contracting Officer was approved for the temporary (four months) rental of a six-passenger, four-wheeled drive pickup under the TSC contract. Following inquiry and bids with three local rental agencies, such a vehicle was finally rented from the AVIS Car Rental Agency in Lima. This vehicle has greatly enhanced the efficiency and effectiveness of the advisors who must travel daily between Iscozacin and the new cooperative mill site and forest management area along the highway in Shiringamazu and Alto Iscozacin.

In past semestral reports, it has been emphasized that equipment procurement for the UDF has been a major source of irritation to the advisors due to excessively bureaucratic procedures inherent in PEPP administration as well as an apathetic attitude in general towards the Unit on the part of the Palcazu Project leadership and administration. This

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long-standing problem has eased considerably, particularly in the semester under consideration, due to the change in PEPP leadership as well as the evolution of a more positive attitude towards and appreciation of forestry by Project leadership in the valley. However, some problems remain. Outstanding amongst these are a continuing failure to provide timely payments of per diem and local travel money to the advisor's national counterparts for necessary field work, and to pay native's salaries promptly under the cooperative agreement.

## 1.2 TECHNICAL ADVISORY SERVICES: LEVEL-OF-EFFORT

The following table summarizes, by technical specialty, the periods of work and level-of-effort, of forestry and land use technical assistance applied to the project by TSC personnel during this fifth semester under the contract.

<u>Specialty</u> (Technician)	<u>Costa Rica</u>	<u>Peru</u>	<u>Total</u> <u>Man-months</u>
General Forester, Land-Use Ecologist, Chief-of-Party (J.Tosi)	2/1-2/27 3/22-3/31 4/14,4/16, 5/5,5/15 6/7-6/16, 6/20-6/24	2/28-3/21 5/16-6/6 6//17-6/19	3.49
Natural Forest Mgt. (R.Simeone)		2/1-7/31	6.0
Forest Industrial Engineer (M.Krones)		2/1-7/31	6.0
Tropical Dendrologist (G.Hartshorn)		2/28-3/14 5/30-6/19	1.25
Land Use Capability Specialist (R.Bolaños)		2/28-3/21 5/15-6/7	1.54
Forest Inventory Specia- list (W.Aspinall)		2/28-4/30	2.05
Logging and Road Engin- eering Specialist (W.Asp- inall)		5/1-7/31	3.0
Draft Animal Specialist (W.Cordero)		2/28-3/21 5/16-6/1 7/23-7/24	2.1
Forest Products and Marketing (H.Greub)		2/28-3/17 6/2-6/20	1.28
10 Specialties/8 Technicians.....			26.71
Average monthly level-of-effort.....			4.45

### 1.3 Recruitment, Orientation, and Training of Forestry Unit Counterparts

In all four previous reports, the Chief-of-Party has called attention to problems of recruitment of counterpart professionals, a problem engendered in large part by the lack of interest in promoting forestry and land use aspects of the project on the part of PEPP, especially the leadership in Iscozacin. Positive steps towards the resolution of this problem were taken in the fourth semester as a result of the major change in project leadership in Lima, but these steps did not have much effect until February of 1986 following the end-of-the year renewal or non-renewal of employee contracts. Real progress was apparent in this fifth semester.

In addition to some changes in administration affecting forestry activities positively, a considerable number of new and of additional personnel arrived to take up posts in the Forestry Development Unit in January-February following seasonal vacations. This personnel change included the assignment of a new Unit Chief, Ing.For. Cesar Castagne, to replace outgoing Chief, Ing.For. Julio Ocana. These new additions to the forestry staff reflect major approval of and support for the forestry program on the part of the PEPP director in Lima, an approval only grudgingly seconded by Project leadership in the Palcazu Valley.

Unfortunately,,virtually all of the new technicians turned out to be recent graduates of Sierra or Costa forestry schools with little or no experience in or knowledge of the Selva. All appeared suddenly at the duty station without previous warning: the advisors, despite a long-standing agreement with PEPP to the contrary, were not consulted in their selection. As a consequence, quality counterparts were not available for the advisors in wood industrial engineering or in wood preservation, both fields of vital importance to the success of the forestry program.

The new technicians included one person specializing in forestry research, Ing. For. Fidel Bazan, and a new post was created within the Unit to capitalize on his abilities. This post has no single, specific advisor in counterpart, but it is expected that several advisors will locate research aspects of their programs in this new research division. This would include, especially, natural forest management, forest inventory, dendrology, wood technology, and forest products and marketing. The post, if not this specific technician, could become a key one in any redesigned and extended Project for the Palcazu Valley.

Upon arrival at the duty station, all new technicians, agronomists as well as foresters, were given a very short (one week) introductory course of lectures by their

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superiors (including technical advisors) before being sent off to the CDR's in various points throughout the valley as community development (extension) advisors. The course content supposedly covered everything they needed to know about project objectives, technical and sociological content, and the like, with respect to this function.. The group included some nine foresters. Obviously, such cursory training for total greenhorns could have been of scant impact and their subsequent appearance in the villages as extension agents is reported to have been more harmful than helpful.

Although this situation still needs to be remedied, the TA staff in forestry has been far too occupied with the management-industry project (cooperative) to be able to spend needed time in the field individually with these scattered technicians. It would have been far better to have assigned them as "learners" and assistants to the regular counterparts of the TA advisors, for several weeks or months as necessary, before sending them out on such a mission, a view not shared by Project leaders at the time. It is suggested that the Project Director be asked by AID to return these technicians for re-assignment and further training before being assigned to isolated and unsupported yet critical field posts. .

## 2.0 STATUS OF WORK UNDER THE CONTRACT

The following section highlights the activities of the advisors during the fifth semester of work under this contract or from February 1 to July 31, 1986. Although each advisor's activities are dealt with seperately, only highlights are touched. Details are contained in the bi-monthly reports of long term advisors and individual trip reports and other memoranda sent to AID/Lima by short term advisors. A list of pertinent reports and memoranda follows the section on each individual specialist

### 2.1 Natural Forest Management.

The natural forest management specialist, Robert Simeone, played a key role in the negotiations leading to an agreement, signed of February 11, 1986 by PDR-Palcazu Director Ing. Jose Isla, an organizing committee representing ten native Amuesha communities in the valley, and the native Indian political arm FECONAYA. Under this agreement, which has stimulated unprecedented interest and expectations among the native comuneros, the Project will provide continuous financial and technical assistance to an ntegrated forestry enterprise set up as a managed forestry production cooperative by participating communities.

Among the "financial assistance" to be provided is a Mighty-Mite Portable Sawmill and assorted pieces of Pres-Cap Equipment for the preservative treatment of poles and posts, infrastructural costs for the installation and housing of

this equipment with associated stockpiling on land provided by the Shiringamazu native community, and all other direct costs of organization training, operation, and commercialization incurred by the cooperative in its early development stages, or up to February 1988. The contract contains a clause which gives priority to the processing of wood cut under the strip clear-cutting (strip shelterwood) system of natural forest management and upon lands formally reserved for this purpose by participating native communities.

Over the following five months of this semester, the details of the agreement were worked out and steps taken to implement the cooperative as a private commercial entity. It was seen from the outset by the advisors that equipment requirements greatly exceeded the few pieces originally acquired to be "loaned" to the cooperative, and steps were initiated to determine these needs and to insure that Project leadership as well as AID and PEPP officials understood and were willing to commit funds to their purchase. By the end of July, the cooperative had been formed with about 70 members representing eight native communities. An administrative council was elected by the members in assembly and this council has assumed managerial responsibility for the operations of the forestry business. During this same period, the cooperative's legal constitution was drawn up with the assistance of PDR-Palcazu personnel and advisors and this constitution was about ready for official registration and legal recognition by late July.

The forestry end of the integrated enterprise involves the development of management plans for some 2000-4000 hectares of forest production land in virgin condition which has been, or will be set aside exclusively on a long-term basis (by the end of 1989) by participating communities. The cooperative named a member as Field Chief and Director of Forestry Operations (E. Sanchoma, Shiringamazu Community) and he and his assistants began in-service training during this semester. The Forestry Operations staff will be responsible for all field operations, including inventory, silviculture, management plans, and supplying the processing unit with logs and poles from clear-cut strips. Road layout and construction will be part of their responsibilities as well. The principal goal for the end of 1989 will be the establishment and initiation of regular production activities on one forest block in each participating community. Eventually, it is estimated, there will be about 8500 hectares of production forest set aside and being operated in the eight communities: Shiringamazu, Alto Iscozacin, Buenos Aires, 7 de Junio, Sta Rosa de Chuchurras, San Pedro de Pichinaz, Loma Linda, Laguna, Nueva Aldea. (See, for details: TSC 071-E, TSC-079-E, TSC-089-C.

## 2.2 Forest inventory

Of twelve man-months originally budgeted for the advisor in forest inventory, almost ten had been utilized at the close of this semester. The work in this field is prerequisite to forest management planning in general and has been vigorously pursued from the beginning of the contract in 1984 by the specialist, Mr. William Aspinall. Peruvian counterpart personnel for this work was amongst the earliest assigned to the FDU and work has proceeded smoothly since early 1985 with the assignment of additional staff to inventory work in which Peruvian foresters are especially well-trained.

The compilation and analysis of inventory data, on the other hand, has been delayed first, by the lack of appropriate office and laboratory space at the field camp and, second, by further delays consequent to lack of housing for the TSC-acquired computer, its installation, and necessary prior training of inventory personnel in its use. The first of these problems was resolved early in the semester while the computer installation and start-up was only beginning in July. Nevertheless, several preliminary and draft reports on inventory were completed in this period, including the following:

- 1/ Inventory for Compartment 12 of Shiringamazu, by forest type.
- 2/ Inventory of first strip to be cut in Shiringamazu.
- 3/ Inventory of Permanent Inventory Plot established in Project Forest Reserve, Pto. Mairo.

Several reports on earlier inventories were also prepared and distributed in this period.

The inventory staff completed several other tasks during this semester. These include, especially, the determination of both Sector I and Sector II forest type areas from the maps prepared for the project under contract with the Forestry School at La Molina, field work on the inventory of Compartment 16 at Alto Iscozacín, demarcation of all native community boundaries and family unit boundaries on the forest type map, and transfer of water course locations from base map to forest type map. For further details, see the following reports and memoranda: TSC-077-C; TSC-083-C; 075-86-TSC; 070-86-TSC.

## 2.3 Tropical dendrology.

The advisor in dendrology, Dr. Gary Hartshorn, made two fairly short visits to the project during this semester. (Only six man-months are budgeted for this specialty). During the first visit which included his

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participation in the annual planning workshop of TSC advisors, he conducted a qualitative survey of tree regeneration on the first demonstration strip (10 months after clear-cutting). This first and somewhat cursory survey showed a total of 113 tree species >10 cm. tall established in the strip, or nearly double the number (68) of species > 10 cm. harvested the previous year. These results and his favorable impressions about the quality of the natural regeneration were communicated to Dr. Howard Clark, Regional Environmental Specialist of AID who has been concerned about the conservation of biological diversity under the strip clear-cutting system.

Because his original counterpart had resigned her post in February (after spending scarcely any time on post during the preceding year), Hartshorn spent part of his time on this visit searching for a competent replacement for her in Lima, where he also presented a two hour seminar on the forest management system to APODESA staff and invited guests.

The second and longer (20 days) visit was more productive inasmuch as a new and markedly more satisfactory counterpart had been hired during his absence. According to the specialist, this was the first time in two years of his efforts to get the dendrology program rolling that significant dendrology activities were accomplished between his two visits. Major advances had been made and were capitalized upon in the arboretum, the materos had increased in number and were finally permitted to operate independently in plant collecting and preservation and had added important new numbers to the collection, a new tree climber was found and hired for the unit, permitting fertile material to be acquired for the collection, and the dendrologist collaborated with advisors in wood industrial engineering and wood products and marketing for the identification and description of the valley's most important tree species to be included in a descriptive brochure being edited with the collaboration of SENATI for the eventual promotion of these woods in national and international markets.

The dendrology consultant has virtually completed the six man-months budgeted for his work under the contract at the end of this semester. Further time on his part is needed: about six weeks in the remainder of 1986, and another two in 1987. This time will have to come from a contract amendment permitting unused funds from other categories to be used. The work in dendrology is vital to the overall forest management and wood industrial-marketing aspects of the project. It was set back by initial failures to support this work on the part of PRD-Palcazu, and the original amount of time budgeted was, needless to say, inadequate to the scope-of-work under the contract.

For details, see: TSC-070-E; TSC-084-E; TSC-085-E.

#### 2.4 Logging and road engineering.

Wood extraction and forest road construction and maintenance are advised by William Aspinall, who also advises the project in the field of forest inventory. Because the combined total time allotted to these two specialties is 24 man-months, he spends a larger total time on-project than any other short-term advisor and often combines labours in the two specialties in the course of a single month's work. However blurred these activities, he calculates that more time was devoted in this semester to extraction and roads than to forest inventory: at the end of July, scarcely two man-months remained for extraction over the fourteen months remaining to PACD.

Until the middle of this semester, the wood extraction and road-building unit of the FDU was understaffed as well as under-equipped. It has been noted in previous reports that this deficiency stems from a lack of capability or, possibly, of interest, on the part of PRD-Palcazu leadership and administration. With the aforementioned change in Project attitudes towards forestry, both new and responsible personnel and some of the equipment repeatedly requested over the previous two years arrived and was put to work during this semester.

In May, an intensive short-course on use and maintenance of chainsaws was organized and conducted in Iscozacin. Approximately twenty-five persons from five native communities and some local colonists as well as PEPP personnel attended. The course was run with the assistance of the Swiss Mission at CODEFOR in Pucallpa. Participants were enthusiastic and learned techniques useful in strip clear-cutting, including directional felling with wedges.

Extraction planning for the first area to be harvested commercially in Shiringamazu and second area in Alto Iscozacin was completed during this semester, with road location surveying in coordination with the forest management division. Further activities included the leveling and gravelling of the sawmill, logyard, lumberyard, and Pres-Cap plant sites for the forestry cooperative at Shiringamazu, under special arrangements made with the Road Maintenance Pool. Details are included in the following specialist reports and memos: 070-86-TSC; 075-86-TSC; TSC-071-E; TSC-079; TSC-089-C.

#### 2.5 Draft Animal Logging.

The draft animal specialist made three visits for a total of eight weeks total time to the project during this semester. This completed his six man-months budgeted under

the contract. As in the case of the dendrologist, the allotted time has turned out to have been insufficient for the needs of the project in this field, largely due to delays in project compliance and lack of aggressive execution of the program jointly developed and agreed upon with the advisor. The advisor finds he must make return visits simply to keep the draft animal logging program moving ahead at a speed dictated by the needs of the other forestry divisions and of animal procurement, training, and health.

In March, during the first visit, a special work plan for the draft animal program of the FDU was prepared and agreed upon with the counterpart, Unit leadership, and Project direction (Informe Tecnico TSC 075-C). This plan integrates the draft animal program with the credit program, the agricultural-forestry extension program, and the animal husbandry program for the CDR's as well as with the natural forest management program itself. It indicates needed purchases in the way of livestock, food additives, harness, and logging devices (sulky, metal cones, and ox carts), and sets forth a plan for research, for immediate action, and for continuing tasks, including training of drivers, over the ensuing twelve month period.

In May, the specialist devoted most of his two week visit to reviewing compliance with the above work plan, focusing major attention on the oxen logging problems which will be occasioned when the cooperative's commercial operations begin later in the year. In July, during his last three weeks visit, priority was given to furtherance of the oxen preparation and training for the forthcoming extraction operations in Shiringamazu and Alto Iscozacin, to revising and suggesting modification in the Credit Regulations (for acquisition, training, housing, feeding, and accoutering of work oxen by natives and colonists), and in supervising the construction of the sulky and other hauling tools in the shop at Iscozacin and in a Lima machine shop.

According to the specialist, all activities have been directed in such a manner as to provide the maximum of practical training to his counterpart, Ing. Celso Ratachi V. He has recommended, furthermore, that Ratachi be granted a four-to-six week trip to Costa Rica where oxen hauling and logging is a highly developed art in order to broaden his knowledge of this specialty. To date, no action has been taken on this recommendation by either PEPP or AID.

In general, the draft animal program is proceeding satisfactorily at this date and in harmony with other, related programs, particularly forest management, wood extraction, and extension. Having already demonstrated their great utility over simple man-power for hauling tasks, the oxen are in increasing demand by both native comuneros

and small colonists in the valley, and it is expected that use will shortly be made of the now-available credit for their acquisition. The draft animal advisor has suggested to his counterpart the possibility of running a series of short, intensive short-course on draft animal techniques in different parts of the valley over the next year or two.

Details on the draft animal program are provided in the following specialist reports: TSC-075-C; TSC-076-C; TSC-082-C; and TSC-088C; TSC-071-E.

## 2.6 Wood industrial engineering.

The advisor in this post, Mr. Michael Kroner, has been on long-term status since August 1985. His achievements in the two semesters which have followed tend to run together, all leading to the procurement, design, installation, and start-up operations of the Cooperatives' integrated wood processing plant at Km.41 within the boundaries of the Shiringamazu native community. This is the first such plant to be installed in the Palcazu Valley and will eventually be totally owned and operated on a permanent basis by Amuesha native communities using only wood from their own managed natural forests.

In March, the "Mighty-Mite" portable sawmill was finally delivered and probably broke all project records by being turned over to the targeted beneficiaries the very next day. The advisor had selected this equipment as best for the job (for the price), went to Pucallpa to accept delivery and inspect the equipment, and accompanied it on its boat ride to Iscozacin. In late March, he supervised the mounting of this mill on its new site and, after testing, began training a native crew in its operation. Early production with the mill, using sound, logs of durable woods found on the ground at or near the mill site, was used to construct a building for the sawmill, another for the Pres-Cap wood preservation plant directly across the highway, and several buildings needed to house the administration and worker camp for the cooperative.

Early in this semester, it was decided that a Pres-Cap System, comprising 44-units of varying sizes and adequate to treat roundwood ranging from 2 to 14 inches in diameter, should be set up initially. The original few Project-owned Pres-caps were neither sufficient in number nor of the improved design needed for a commercial plant, so the totality of the equipment was re-designed and built in the metal-working shop of Ing. Juan Gilardi, in Lima. Ing. Gilardi collaborated closely with the advisor in both an improved design and in creating the ancillary equipment of stainless steel tanks, compressors, and pumps needed for the plant. Unfortunately, due to a medical crisis suffered by Ing. Gilardi, this equipment required the entire semester to

be finished. It will be delivered and installed early in the coming semester.

Design plans and specifications for the improved Pres-Cap System were part of the contract with Gilardi's firm and constitute a technical innovation of considerable value to tropical forestry in general.

In June-July, the Project Highway Maintenance Pool supported the necessary gravelling of about 4 hectares of work areas, log yard, and lumber yards surrounding the sawmill and the Pres-Cap plant and, under the supervision of Ing. Krones, the necessary structures were layed out and construction begun by a local contractor whose contract included the in-service training of native cooperative employees in building techniques. Also under construction in this period was the "pole-breaker", a special unit in which individual species will be tested for bending strength prior to their approval by INTINTEC for purchase by electric and telephone companies.

During this semester, after more than two years on the job, the wood industrial engineer was finally assigned a counterpart. That this was also a very competent person of his own choosing indicates how radically Project leadership's attitudes have changed since the change of government and their acceptance of forestry as a valid alternative to conventional agricultural colonization in the Palcazu Valley.

The wood industrial engineer colaborates closely with the forest products and marketing specialist, whose activities are discussed in the following section. One of his other activities has been the layout and planning for a "carpentry shop" at Iscozacin. This shop would have multiple functions as in testing the workability of new species from valley forests, preparation of wood samples for mechanical testing and for inclusion in the herbarium-wood collection, experimental design of secondary wood products, and training of valley residents in small-scale production of wood specialties for sale in national markets. During this semester, the carpentry shop building was completed and machinery inherited from camp construction days was repaired and readied for use. This shop should go into operation during the coming semester.

With plans prepared by TSC in Costa Rica based upon observations of local artisans, the advisor also supervised the building of the first "Tico-style" oxcart. This prototype will be used as a basis for extending this technology as one of the local cottage wood industries.

## 2.7 Forest products and marketing.

The short-term advisor in forest products and

marketing made two visits to the project during this semester for a total of about five weeks. During the first visit, in March, he participated in the annual work planning meeting of TSC advisors in Iscozacin and spent the remainder of his time, in company of his counterpart, in determining wood product market potentials in the grape and wine industry (preserved posts) and in the chicken industry (houses and fenced-yards) on the Coast. He also established a relationship with the Swiss Mission in SENATI, where color photographs of the most beautiful but little known timbers from the valley will be printed with accompanying descriptions of potential uses for a promotional booklet and, possibly, a calendar. An work plan projection for his counterpart was also prepared at this time.

The advisor returned to the project in June. During this visit, the more extended of the two, he conducted a survey of possible markets for wood products hand-crafted from the forests in the northern end of the valley around Puerto Mairo (not served by the new highway) and of transportation costs in general downstream by river as far as the transitable portion of the highway to Pucallpa-Lima (Central Highway). Work was continued on the wood sample descriptive sheets, and he revised the report of his counterpart on work planned and undertaken during his absence, working out a program for the continuation of this work.

Marketing is vital to the future of the new cooperative, and it is proposed that additional personnel, directly employed by the coop, be placed under this advisor as counterparts (learners). This is particularly important because the actual counterpart, Ing. N. Reyna, has had inadequate approval and hence support from PRD-Palcazu leadership (due to the extensive travel, nationally, required in this post) and may shortly resign his position.

In this period, the AID Project Manager was preparing a draft of a possible PP Amendment. TSC forestry and wood industry advisors were asked to contribute ideas on future requirements for technical assistance and infrastructure, especially to the new Amuesha forestry cooperative. This advisor collaborated with the forest products and marketing specialist and the forest management specialist in drawing up a preliminary estimate of equipment requirements for a significantly expanded and more complex wood transformation plant which included an economic profile of returns to the cooperative given such additional investment. This economic analysis, while purposely conservative, indicated a three-fold increase in the net return per hectare harvested per year, plus a four-to-five fold increase in the operable area and yearly volume of production (TSC-083-C). It was further pointed out that an expanded manufacturing plant, to be successful, would require a two-year minimal project

extension within the framework of an amended Project Agreement.

## 2.8 Wood preservation.

The advisor in wood preservation did not visit the project during this semester but will be arriving to advise on installation and start-up of the new Pres-Cap equipment in the coming semester (August-September).

Wood preservation is an economically significant area as regards the overall profitability of the forest management-wood processing system. Yet the advisor in this position has only three total man-months budgeted over the life of the present contract. It will be necessary to increase his time allotment through future contract amendments if both technical and environmental/human safety aspects of the wood preservation program of the cooperative are to be adequately dealt with.

## 2.9 Land use ecology; land use capability.

As pointed out in all previous semestral reports, AID technical assistance includes the services of two advisors: one in land use ecology (J.Tosi) and one in land use capability classification (R.Bolanos). Their assistance is provided in respect to the emphasis given in the PA and PP for ecologically rational development of all lands in the Palcazu Valley.

In the fourth semestral report (TSC-080-E), special mention was made of the continuing failure of the Project to implement programs in these closely-related fields, including (a) technically sound land capability classification and (b) the continuous land use inventory of valley lands. Yet, quoting from the cited report, "a major constriction on sustainable development of lands in the Palcazu Valley is the lack of scientifically sound knowledge of the relationship between the natural environment, land use capability, and land-using practices, including crop, pasture, and forestry adaptations to specific physical site characteristics. Project professionals have been slow to admit that such knowledge (and its application) is a prerequisite to successful development...." As of this writing, the situation remains unchanged.

Both advisors visited the project during this semester. Both have been frustrated in their efforts to implement either the letter or the spirit of their terms of reference as set forth in the contract with AID. The failure must be attributed directly to Project leadership in the PDR-Palcazu.

At the end of the third semester under this contract,

in July 1985, the Catastral and Land Titling Office of the PRD-Palcazu finished its work for the previous administration with the distribution of unregistered deeds to more than 300 private properties located in the valley, exclusive of the native community lands. Titles were handed out and untitled land was distributed through a lottery to regional applicants, including some Project personnel. This was done despite a dictate handed down by INADE that all titling be halted until land capability could be reclassified, following a GOP Commission Report indicating technical defects in the land capability classification map prepared by the above-mentioned Catastral Office of PRD-Palcazu.

Upon termination of their work, much of the relatively large staff (present under a special contract between PEPP and the Agrarian Reform Bureau of the Ministry of Agriculture in Lima) was re-assigned outside the valley, leaving a small residual staff in the land classification unit. During the third and fourth semesters of our contract, this nucleus was given training in ecology and land use capability classification by TSC advisors Tosi and Bolanos and began, anew, to map portions of the valley. Their maps showed great discrepancies with respect to earlier maps prepared by the same unit and also by ONERN, yet applied the same official Peruvian land capability classification.

In January 1986, the chief and all but one of the remaining technicians in this unit resigned their posts or did not have their employment contracts renewed. The Project director in Iscozacin, Ing. Isla, promised, however, that replacements would be hired promptly (despite the training loss which would have to be repeated). At the close of this semester, nevertheless, no personnel had yet appeared for land classification and the unit had no operative program in place. It is obvious, then, that the Project leadership is at best disinterested and at worst actively opposed to any implementation of a reclassification of land capability or of the application of related ecological principles to the overall program. In all fairness, their opposition may stem from a belief that reclassification could lead to a rescission of titles already handed out and to adverse political consequences from such a rescission.

It is of considerable importance to the project, especially if it is to be extended, that this situation be openly discussed and resolved promptly. INADE, in view of its earlier dictum on titling and registration of existing titles, would appear to have the responsibility of putting the reclassification process in motion and of setting a time limit for its completion. Under Peruvian law, lands classified as having only forest production or protection capability may not be granted title in fee simple but may be

granted in use-concession to the person in possession. Forest production lands may only be used for forestry while protection lands may not be utilized for any economic purpose which alters the native vegetation cover.

While sustainable, site-specific development in this ecologically fragile valley cannot be achieved without a major effort to bring actual land use in harmony with ecologically-determined use-capability, even Project professionals have been slow to accept this fact and many of their plant and pasture trials have actually been established upon lands which do not, categorically, fall into one or another of the three agricultural land capability classes under the official government land capability classification (which is ecologically-based). In a similar manner, CDR activities in extension have not, with the possible exception of the native communities, been designed and implemented with strict attention to ecological restraints: they utilize, in the absence of anything more reliable, the land capability map prepared by the Project between 1983 and 1985. Native community lands were, interestingly, not mapped by the project under the main titling program. Their capability has, is, or will shortly be determined by community members directly trained by the TSC land capability advisor.

Two other aspects of this problem merit mention. The first relates to the Banco Agraria and to the "Chacra Integral" program, the second to the Forest District. About the beginning of this year, the Banco Agrario set up an office to grant unsupervised farm credit. This office was located not merely in Iscozacin but right in the middle of the Project encampment, thereby legitimizing its activities as if they were part of the Project's program, which they are not. The head of this bank in Iscozacin is the same person who was formerly in overall charge of the Project's catastral and land capability mapping and land titling program. The Bank employs the land capability map of the valley which originated under his tutelage and which grossly, as I have pointed out previously, grossly overestimates the capability of valley lands for agricultural production. As a consequence, loan applicants have little difficulty in obtaining financing for the conversion of natural forests on forest production lands to cultivation or grazing. They have unregistered titles which indicate that these lands have sustainable agricultural utility and are not restricted to forestry use..

The Bank's program, while well-intentioned, could work to the disadvantage of such farmers, while simultaneously eliminating their production forestry alternative, which is sustainable. Given its probable linkage, actual or pending, to the Project's new "Chacra Integral" program, it appears essential that close coordination be achieved between the

two entities, with the Project, through a revitalized land use ecology and land capability classification program, having review and veto power over all loan applications to the Banco Agrario.. Such a step would go a long way towards achieving ecologically sound development of valley lands.

In a related situation, the Palcazu Valley Office of the District Forester, in direct charge of granting all permits for land clearing and forest harvesting, is currently forced to utilize the existing land capability map produced by the Project, or at best, to use the map produced by ONERN in 1981, which is not a great improvement over the former. In either case, the Forest District inspectors are obliged against their own best judgement many times to grant permission for forest clearing (conversion to agriculture or pasture) on lands which would have only a forest production capability if correctly mapped under the official Peruvian land capability classification system, simply because the Project-sponsored map is technically incorrect.

The failure to have implemented the land use program which was intended to insure the ecologically, hence economically (long term) healthy development of valley lands, is undoubtedly at the root of many uncertainties which have arisen in the PRD-Palcazu's overall development program. The Chacra Integral Project tends to encompass many of these uncertainties, due to its comprehensive nature. This project, based upon Schumaker's "small is beautiful" socio-economic theory, is both well-intentioned and capable of significant implementation in the valley. Success, however, will be contingent upon a more sophisticated understanding of what would constitute a "chacra integral" under the socio-economic, geographic, and above all, ecological realities of the valley.

Although the Chacra Integral design- concept has evolved considerably since it was first introduced by the PEPP Director himself in late 1985, it remains far from satisfactory as a basis for program implementation. This is due to the continuing incomprehension on the part of many Project technicians as well as of the leadership itself, of the specific ecological constraints and opportunities inherent in the natural environment of the valley -- its climates, its soils, and its natural vegetation. The definition and the interpretation of these conditions in terms that are unequivocal is the task of technically responsible and enlightened land use program. The advisors remain committed to the orientation of such a program and to the training of its personnel when and if Project leadership in the Palcazu Valley will agree to accept their assistance and to promote this essential component of the development program. (For details see TSC-082-C; Unnumbered memorandum from R. Bolanos to J. Tosi, dated 24/3/86; Comentario sobre Chacras Integrales, por R. Bolanos, 24/3/86; Fourth Semi-

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Annual Report on Forestry Technical Advisory Services by J. Tosi, 25/2/86).

### 3.0 PLANS FOR ENSUING PERIOD

Great uncertainty as to the future of the project exists at this time. The current PACD under the PA with the GOP is September 30, 1987, at most a year away. While the contract between TSC and AID is for four years, or to January 31, 1988, its effective date is also September 30, 1987. The forestry program and most importantly, the native forest management and wood production cooperative is still in its infancy and will have great trouble surviving, let alone becoming a great financial and social success story, without technical and financial assistance continuing beyond the current PACD. Details of this problem are included in recent memoranda to the Project Manager of AID (100-86-TSC; 102-86-TSC; 103-86-TSC) and need not be repeated here.

Plans for the ensuing period are currently, and realistically, based upon a view that the project will not be extended beyond the present PACD. Given this scenario, every effort will be made to give maximum assistance to the cooperative. Other aspects of the program will be downplayed so that remaining man-months of technical assistance can be concentrated on training native comuneros in the totality of the skills needed for this forestry business to survive and prosper in the future, assuming that further assistance in the way of equipment and technical advice will not be forthcoming.

Because a significant amount of the grant funding in the TSC contract with AID remains unspent, it is proposed to AID that a contract amendment provide for the use of these monies in providing more man-months in certain short-term advisor positions, especially natural forest management, dendrology, draft animals, logging and road construction, and wood industries and preservation. Simultaneously, the advisors have suggested to AID and PEPP that unspent 1986 loan funds targeted to off-shore acquisitions be used for procurement of machinery and transport-oriented equipment to increase the production capacity and efficiency of the cooperative as a business. SHOULD the last step be taken, it will be absolutely essential to increase the man-months of TA during the next two semesters under the contract.

Under this scenario, land use ecology as a separate field of technical assistance would be eliminated unless the Project reverses its present attitude in regard to it. Land use ecology and land use capability will be combined in one advisor post, utilizing the remaining time in that position to conduct training for native community persons in the classification and mapping of land capability on their own community lands. For this purpose, a series of short

courses are scheduled for October-November 1986, when the advisors return for the next visit.

The natural forest management advisor, after three full years on the job, will be ending his contract in February 1987. A short term replacement for at least three additional months is seen as essential.

Proposals for the coming months are included in foregoing discussions of the programs in forest inventory, dendrology, draft animals, and logging and road construction.

The wood processing plant at Shiringamazu will be starting regular commercial operations late in 1986. The principal factors delaying operations are late delivery of the Pres-Cap wood preservation equipment and wood preservative chemicals and the need to delay logging until this part of the plant is fully and safely operable. The wood preservation specialist plans to return to the Project shortly prior to start-up and again, when the plant is operating. An extension of his short term services is vital to the success of the cooperative since much of its early profitability depends upon the sale of preserved roundwood. Should a project extension be agreed upon, moreover, a further extension of his time will be needed, as it is proposed to incorporate the preservation of sawn timbers through the addition of a Slurry-Seal system. The engineering and establishment of this system, the first of its kind in Peru and possibly all of the Amazon, will be a coordinated effort between him, the wood industrial engineer, and the designer of the Slurry-Seal System itself.

Finally, in view of the practical, business-oriented character of the new cooperative, it is proposed to AID and PEPP that advisory services in forest business administration be provided to the cooperative over a six month period in 1987. A contract amendment in the coming semester should provide for this short-term position so that recruitment can get under way immediately.

All additional advisor time and ancillary costs thereto can be met without exceeding the contract spending limit and seem fully justified if the Project is not to be extended beyond 1987.

San Jose, Costa Rica  
September 20, 1986

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Joseph A. Tosi Jr.  
General Forester and  
Chief-of-Party

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SIXTH SEMI-ANNUAL REPORT ON FORESTRY TECHNICAL ADVISORY SERVICES RENDERED TO THE PROYECTO ESPECIAL PICHIS-PALCAZU BY THE TROPICAL SCIENCE CENTER UNDER CONTRACT NO. 527-0240-C-00-4013-00 Dated February 1, 1984

1.0 INTRODUCTION

The following is a summary report on forestry and land use technical assistance and advisory services provided to the Proyecto Especial Pichis-Palcazu (PEPP), Palcazu Sub-Project, between August 1, 1986 and January 31, 1987, the sixth of eight six-month periods of the subject contract with USAID/Peru. During this period, technical advisory services were provided by Tropical Science Center (TSC) in the following fields: general forestry (project leadership and coordination), land use ecology and land use capability classification, forest inventory, logging and forest road engineering, natural forest management, wood industrial engineering, wood preservation, forest products and marketing, and tropical dendrology for a total of 21.1 person-months of services. Average monthly level-of-effort of professional time for this period was 3.51 person months.

1.1 Organization and Administration

1.1.1 San Jose, Costa Rica Office.

Project activities under the contract were monitored and partially directed from TSC headquarters in San Jose, Costa Rica. During this semester,, the required fifth semi-annual summary reports on technical assistance in Spanish and English for PEPP and AID respectively, and the administrative and financial report to AID/Peru were prepared and all short-term advisors who visited the project during the semester were briefed before departure and their technical reports were reviewed and discussed with the Chief-of-Party/ General Forester upon their return.

Administrative effort during this semester included arrangements for advisors G. Hartshorn and R. Simeone to participate in the International Conference on Management of Tropical Humid Forests, held in San Juan, Puerto Rico between September 22 and 27. Their participation in this meeting, along with three PDR-Palcazu national counterpart technicians (Cueva, Carrillo, Vilchez), the PEPP coordinator for PDR-Palcazu (Saito), and two representatives of the Cooperativa Forestal Yanesha (Sanichona, Lazaro) had been approved by the Project Manager.

### 1.1.2 Lima, Peru Offices of AID and PEPP.

All TSC advisors pass through Lima enroute to the Iscozacin duty station in the Palcazu Valley. While in Lima, they customarily visit both the Project Manager at AID and the Director and the Project Coordinator of PEPP on matters relating to administration of their specialties within the overall project context. Periodic visits are also made to Lima by both short and long-term advisors to attend meetings called by the Project Manager, to procure supplies, deal with public agencies relating to the project, and to attend personal health and family matters. These activities are detailed in the bi-monthly reports submitted to the Project Manager in AID's Rural Development Division and to the TSC Chief-of-Party by each individual advisor.

### 1.1.3 Iscozacin Duty Station.

During this semester, Mr. Robert Simeone, long-term advisor in natural forest management and continuously in residence at the Iscozacin headquarters station of the PDR-Palcazu, acted as field team coordinator and spokesman for the TSC team of advisors before the Project Manager and the Director, Administration, and Forestry Development Unit (UDF) of the PDR-PALcazu, except when the Chief-of-Party (a short-term advisor) was actually present in Peru.

Under a special services contract with TSC, Mrs. Teresa Simeone, provided 138.25 hours of coordination, custodial, bookkeeping, secretarial, and librarial services at Iscozacin during the semester.

During this semester, a special training course in use of the micro-computer belonging to TSC/AID and set up in the recently terminated Forestry Building of the PDR-Palcazu was conducted under the overall supervision of short-term advisor in forest inventory and logging road engineering, Mr. William Aspinall. Authorization to locally contract a computer programmer-trainer was obtained from the Regional Contracting Officer and in October, Mr. Victor Manuel Recuenco Retes was selected from amongst some fifteen applicants for this task. Mr. Recuenco, under Aspinall's supervision, assisted with the accomodation of the TSC and the PEPP IBM PC computers and subsequently organized and conducted a six weeks computer training course in the months of November and December. Six foresters from the UDF, six administration persons from the PDR-Palcazu, and all TSC advisors present at the Iscozacin station at the time took this course. While in Iscozacin, Mr. Recuenco also assisted Mr. Aspinall in setting up a forest inventory program to be run on the TSC computer.

Secretarial services to be provided the advisors by the PRD-Palcazu continued to be inadequate to their expanding

needs during this quarter. The shortfall was met in part by Mrs. Teresa Simeone under her services contract with TSC and, in part, by direct use on the part of the technical advisors themselves of the new computer/printer.

Transport of the advisors and their counterparts between the Iscozin duty station and the forestry cooperative site at Shiringamazu was no problem during this semester. With the approval of the Regional Contracting Officer, a four-wheel-drive pickup was rented from the AVIS agency in Lima continuously to mid-December, at which time the road became impassable due to heavy rains. The availability of this vehicle greatly enhanced the efficiency and effectiveness of the advisors. In fact, their work would have been virtually impossible without it.

One major impediment to progress during this semester has been the virtual absence of effective funding for the PDR-Palcazu and, as a result, for the UDF and its support of the budding Yanesha Forestry Cooperative. This lack of funding appears to have been the root cause of a series of more direct difficulties in opportunely and efficiently implementing forestry activities in the Project: (a) failure to hire professional counterpart personnel in the key positions of wood industrial engineering and wood preservation, (b) the restaffing and operation of the Land Use and Catastral Unit, (c) the fabrication in Lima and delivery of essential processing equipment for the wood preservation plant, (d) completion of the wood preservation plant buildings at the Coop and of the carpentry shop at Iscozacin, and (e) completion of the sawmill, log yard, and drying facilities at Shiringamazu. This was particularly regrettable because all of these activities were well underway or close to implementation at the end of the previous semester (July 31, 1986) but came slowly and inexorably to a virtual standstill by the end of the sixth semester (January 31, 1987).

A further and serious detriment to progress in this semester was the evolution of significant leadership problems directly effecting the efficient operation of the forestry program. The source of these problems was overt political partisanship. It led to the resignations or firing of several experienced and competent administrative and technical employees of the PDR-Palcazu during the period between September and December 1986. The restaffing of the PRD-Palcazu leadership, administration, and technical units including the UDF had only begun at the close of the semester. In restaffing the UDF, priority has been given, lamentably, to partisan loyalties rather than to administrative or technical competence and commitment. If allowed to continue, this situation will have negative repercussions for the project, overall, in both the short and long term.

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A final comment in this section relates to the administration of the road maintenance program of the PDR-Palcazu. All advisors are agreed that the lack of a fully operational Road Maintenance Pool dedicated exclusively to maintaining and improving the highway between Iscozacin and Villarica has made work in the valley very difficult. Amongst other problems has been the decision to include the bulldozer, front-end loader and ditcher acquired specifically for use in constructing forest access roads under control of the UDF to the Maintenance Pool and the quartering and administration of that Pool in far-away Villarica. Further comments on this problem are included in the discussion of specific advisor fields of activity.

### 1.2 Technical Advisory Services: Level-of -Effort

The following table summarizes, by technical specialty, the periods of work and level-of-effort, of forestry and land use technical assistance applied to the project by TSC personnel during this sixth semester under the contract.

Specialty (Technician)	Costa Rica or Puerto Rico	Peru	Total Person-months
General Forester, Land Use Ecologist, (Chief-of-Party) (J. Tosi)	8/1-8/20 9/6-9/30/86 1/, 6, 7, 8, 13, 14, 19, 20, 26/87	8/21-9/5, 10/16-11/8/86 1/27-31/87	3.2
Natural Forest Mgt. Specialist (R. Simeone)		8/1/86- 1/31/87	6.0
Wood Industrial Engineer (M. Kroner)		8/1/86- 1/31/87	6.0
Land Use Capability Specialist (R. Bolanos)		10/17 - 11/14/86	1.1
Forest Inventory Specialist (Wm. Aspinal)		10/16- 11/19/86	1.1
Logging and Road Engineer (Aspinal)		8/1-15/86 9/1-10/86	1.0
Tropical Dendrologist (G. Hartshorn)		8/15-29 9/21-28/86	0.7

Forest Products and Marketing (H.Greub)	9/20-27	9/5-27/86	0.7
Wood Preservation Specialist (G.Gonzalez)	9/20-29	8/22-9/19	1.3

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Ten specialties/eight technicians .....	21.1
Average monthly level-of-effort .....	3.51

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### 1.3 Recruitment, Orientation, and Training of Forestry Unit Counterparts

In all five previous reports, the Chief-of-Party has called attention to problems of inadequate staffing of counterpart personnel by PEPP. In terms of numbers, this problem was partially remedied in the fifth semester with the unexpected arrival of nine recently graduated and totally inexperienced foresters trained in the Coast and Sierra. The advisors were not consulted in the selection of these technicians despite a long-standing agreement between PEPP and AID that all candidates would be screened and appointments be made on the basis of their being acceptable to both AID advisors and PEPP. With few exceptions, the new lot of appointees has turned out to be mediocre at best. From their numbers no qualified counterparts were found for the key advisor posts of wood industrial engineering, wood preservation, and forest products and marketing, and these posts either remained vacant or were held by second rate technicians throughout the sixth semester. A promised contract for temporary services with Ing. Narcisso Reyna in Forest Products and Marketing was never acted upon by Project Administration, to serious detriment of the products and marketing program set up by short-term advisor H.Greub. Near the end of the semester, several resignations were pending in key counterpart positions (forest inventory, draft animal logging, natural forest management). It will be interesting to see whether these positions are filled promptly with competent and experienced personnel acceptable to the advisors concerned.

After being held for several months by a quite competent and long-experienced project forester, Ing. Nora Carrillo, the post of Chief of the Forestry Development Unit was given near the close of the semester to Ing. Fidel Bazar, a comparative newcomer. The appointment of Ing. Bazar was made by PEPP leadership, apparently on a partisan basis, despite the vociferous objections of AID forestry advisors who unanimously judge him to be unfitted for this key post on the basis of his previous performance as leader of a forestry research division of the UDF. Ing. Bazar was also considered to show extreme partisan prejudice when dealing

with all other employees in the UDF, including simple laborers. His appointment bodes poorly for the future harmonious development of this unit and for the continuation in service of its most competent and experienced long-term national forestry personnel

Given the importance of the new computer as a tool for several areas of forestry, including dendrology, inventory, logging and road construction, marketing, and general report preparation, it was recommended during this semester that the UDF insure the maximum efficiency in its use as well as its correct and continued maintenance in the adverse climatic and infrastructural environment of the Iscozacari camp of PRD-Palcazu, by employing a full-time computer programmer. No action had been taken up to the end of the semester on this recommendation and it is expected that sporadic and unexpected operational problems and "down-time" will occur as a consequence, affecting the progress of specific technical tasks.

Training of both counterparts and of employees of the Yanesha Forestry Cooperative continued at an accelerated pace during this semester, particularly the latter. It is the advisors' considered opinion that training effort should now be concentrated in the Amuesha cooperative because it alone promises to be a permanent feature of sustainable development in the Palcazu Valley. Project professionals have already demonstrated lack of any long-term personal commitment to Project objectives, a realistic attitude for them to hold in view of the low salary incentives and the demonstrably erratic behavior of PEPP project leadership with respect to employment contracts.

In the fifth semester report, a recommendation was made that an amendment be made to this contract to increase the level-of-effort of technical advisors in forestry up to PACD of September 30, 1987. Included in this increase was the creation of a new short-term post of forest business administration advisor to assist the management of the Yanesha Forestry Cooperative. Because no action was taken with respect to the overall amendment recommendation by AID, the post remained unfilled throughout the semester.

## 2.0 STATUS OF WORK UNDER THE CONTRACT

The following section highlights the activities of the advisors during the sixth semester of work under this contract, or from August 1, 1986 through January 31, 1987. Although each advisor's activities are dealt with separately, only highlights are touched. Details are contained in the bi-monthly reports of long-term advisors and in the individual trip reports of short-term advisors. Other information may be found in the numerous special

reports and memoranda sent to PDR-Palcazu headquarters, to the UDF-Palcazu, and to AID/Peru in Lima. The most salient of these reports and memoranda are mentioned herein.

### 2.1 Natural Forest Management.

The natural forest management specialist, Ing. Robert Simone, in the final six months of activity under his three year contract as a long-term advisor, utilized this period to consolidate the gains made in the preceding semester with the creation of the Yanasha Forestry Cooperative. This involved principally the following:

(1) Establishment of production forest area limits in the native community reserves of Shiringamazu, Alto Iscozacin, Loma Linda, Laguna, Nueva Aldea, Buenos Aires and 7 de Julio. This is a land use planning activity which involved the training of selected comuneros in mapping actual land use and land use capability upon a standardized large-scale base map of the community land area, and the subsequent planning of all long-term land use. These plans are presented upon formal maps recognized by each community which delimit areas to be held permanently for each major land use, from agricultural to protection. The maps indicate precisely those areas of forest potential, currently in old-growth forest, to be permanently managed for sustained-yield production of woody raw material which will be industrialized and marketed through the cooperative. Forest production lands currently shown to be in one or another non-forest use are demarcated and targeted for eventual recuperation under the forestry extension program, a longer term process involving education and possibly agro-forestry.

(2) A "Forest Management" Office was implemented in the Yanasha Forestry Cooperative. This office, under the leadership of Senior Emilio Sanchona, a comunero of the Shiringamazu community, was organized and its personnel trained to take over all management and extraction activities in the production forest blocks as defined above.

During this semester, this office carried on an energetic program of field activities for the preparation of the sustained-yield management plans of Shiringamazu and Alto Iscozacin community forests. The plan for Shiringamazu, where the first commercial harvesting will take place as soon as the Pres-Cap processing facility is terminated, was finished and presented at the close of the semester.

The following table, taken from the natural forest management specialist's final report for 1986, summarizes the areas of production forest determined by the foregoing

procedures and divisions, for the 10 native communities currently signed up to participate in the Yanesha Forestry Cooperative.

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Forest Production Areas in Ten Native Communities of the Valley and their Potential Productive Capacity

Native Community	Area of First Block (has.)	No. of Strips in Blk. per/yr.	Total For. Prod. Area Identified (has.)	Potential No.Strips per/year	Reserved by comun al accord
Shiringa-mazu	300	4	1000	12	yes
Alto Iscoz-cin	80	1	500	6	yes
Laguna	150	3	200	4	yes
Loma Linda	100	2	300	4	yes
San Pedro	200	4	500	6	no
Buenos Aires	100	2	600	8	no
7 de Junio	500	6	3500	42	no
Santa Rosa Chuchurras	500	6	1500	18	no
Santa Rosa Pichinaz	100	2	300	4	no
Nueva Aldea	50	1	100	2	no
<b>Total</b>	<b>2080</b>	<b>31</b>	<b>8500</b>	<b>118</b>	<b>(4)</b>

(3) Work on the infrastructure of the Yanesha Forestry Cooperative was pushed forward, with the construction of offices, storerooms, dining hall, bunkrooms, meeting hall, and electrical and water systems at the headquarters site. Most of the lumber for these installations, as well as for the buildings housing the sawmill and the wood preservation plant, was sawn in the cooperative mill from logs salvaged from nearby clearings and from the highway right-of-way. The

wood industrial engineer participated in this activity, particularly as regards the production facility structures, log yards, and drying yards.

(4) Participation in a Workshop on Forestry Experience in the Selva Peruana. This workshop, set up by APODESA and run in Pucallpa near the end of August, had the participation of many Peruvian foresters and forestry organizations, both public and private, with interest in the humid and wet forests of the Selva. It was the first forum in Peru for a formal presentation of the strip clearcutting method ~~of the~~ and the progress to date of the Palcazu Project. The natural forest management specialist, assisted by the General Forester and Chief-of-Party and the then-acting head of the UDF, Ing. Nora Carrillo, made a two-hour presentation of the antecedents, the objectives, and progress of the Palcazu forestry program, with special focus on the strip-clearcutting system of extraction and natural regeneration, the integrated processing of timbers, and the marketing of a diversified product line under direct control and for the exclusive benefit of the Yanasha Forestry Cooperative. During the presentation, several UDF technicians also intervened as well as Emilio Sanchoma, Chief of the Forest Management Office of the Cooperative. All participants benefited from the exchange of ideas with other participants involved in forest management programs in the Selva, especially those at Von Humboldt National Forest and Jenaro Herrera.

(5) Participation in the International Conference on Tropical Forest Management, held in San Juan, Puerto Rico between September 22 and 27, 1986. This specialist, accompanied by the tropical dendrologist (G. Hartshorn), and several representatives from PEPP (Saito, Cueva, Vilchez) plus two representatives of the Yanasha Forestry Cooperative (Sanchoma, Lazaro) participated in the conference. Although they had not been invited originally to discourse, they had the unexpected opportunity while there to give a two-hour presentation on the natural forest management system in place in the Palcazu Valley, the first occasion in which this project has been presented to an international body of foresters. This presentation aroused great interest among participants in the Congress and sets the stage for a continuing series of scientific and technical publications and lectures on the results and implications of this pilot project in management of tropical natural forests, without tree planting.

The natural forest management specialist terminates his three year long-term assignment on February 19, 1987. He departed his post for terminal vacations on January 14, 1987.

## 2.2 Forest Inventory.

The forest inventory advisor, Ing. Wm. Aspirall, applied a total of 1.1 person-months to the project during this semester. A detailed report of his activities in this field between the 17th of October and the 18th of November 1986 is presented in his report (TSC-102-C dated November 1986).

Forest inventory field work in the project is well advanced due to timely and adequate staffing and support from the UDF. For over a year, however, a major impasse has been the inability of the inventory section of the UDF to rapidly process the large volume of field data taken in inventory work, a task for which the new IBM XT computer, installed in the fifth semester, is ideally suited. Start-up problems (due to late completion of the forestry office building at Iscozacin and breakdowns in the camp's electrical power system) and the lack of computer knowhow on the part of the national technicians working in forest inventory, delayed progress in processing data on this machine.

Finally in October, after a newspaper solicitation of candidates, a highly competent computer trainer/programmer was contracted locally by TSC. With his assistance, the computer equipment was put into full operational condition as was also a computer belonging to the PDR-Palcazu administration and, using both machines and a carefully designed work schedule, all key personnel in inventory as well as other technicians and administrative personnel of the project and some advisors, were given an intensive, hands-on course in elementary computer operation, applications, and maintenance. The course ran between November 12 and 25, 1986. An advanced course for the same persons, covered the LOTUS 1-2-3 program used by both administration and forest inventory personnel. This ran from November 26 through December 12, 1986. Both courses were judged to be successful and most participants were able subsequently to operate the machines for both word processing and spreadsheet operations without further assistance.

The computer trainer/programmer, Mr. Victor Manuel Recuenco, in close collaboration with the inventory advisor, also prepared a special program for forest inventories in the project, to be run on the TSC/ AID machine.

Basic forest inventories completed during this semester by the UDF inventory section under the guidance of the advisor were the following:

- (1) Compartment 12- Shiringamazu Management Block

- (2) Compartment 16- Alto Iscozacin Manage-Block
- (3) Compartment 8 - Laguna Management Block
- (4) Permanent Inventory Plot - Puerto Mairo Forest Reserve
- (5) Permanent Inventory Plot - Alto Iscozacin

These inventories were supplemented by maps and tables and referenced to the Forest Type Map of Palcazu Valley prepared by Robert Kommetter (La Molina).

### 2.3 Tropical dendrology.

The tropical dendrologist, Dr. Gary Hartshorn, visited the project during the last two weeks of August during which period he advised his new national counterpart, Ing. William Pariona and the native tree identifiers (materos) on the continuation of the program for collection, pressing, and drying of fertile specimens of native trees in the valley forests. Further work was also undertaken in the organization and identification of trees in the arboretum, and a rapid survey of new regeneration in demonstration strip number 2 was completed.

Between September 22 and 27, Dr. Hartshorn participated in the International Conference on Tropical Forest Management in Puerto Rico (see 2.1) where he was the principal exponent of the natural forest management system being deployed in the Palcazu Valley.

On his return from Puerto Rico, Hartshorn had exhausted his total allotment of 6 person-months of short term professional services under the contract and will not return to the project unless a requested contract revision permitting an increase in the overall level-of-effort is forthcoming.

### 2.4 Logging and Road Engineering.

Wood extraction and forest road construction are advised by William Aspinall, who is also adviser for forest inventory in the project. Because the combined total time allotted to these two specialties amounts to a total of 24 person-months, Aspinall spends a larger total time on-project than any other short-term advisor and often combines labours in the two specialties in the course of a single week's work. However, blurred the time relationship, he calculates that he spent about an equal amount of time in each, or roughly a month in logging and road engineering (see 2.2). At the end of January 1987, less than a month of an original 12 person-months remained for this specialty.

The Logging and Road Engineering Sub-Unit of the UDF became fully staffed with counterpart personnel in the preceding semester and was working well, technically-speaking, throughout the semester reported here. However, field execution of the work plan set up by the sub-unit under guidance and training of the advisor ran into continuous difficulties and intolerable delays due to the lack of adequate and timely project financing, failure to order and/or receive materials and supplies requested through the Project administration, and, above, all, the assignment of UDF road building and maintenance machinery to the Maintenance Pool in Villarica combined with the failure of the pool to supply agreed upon machinery time to on-site road building projects of the UDF and the Yanesha Forestry Cooperative.

Attention during this semester was focused upon the problem of transporting logs and other forest products from the designated production strips programmed for harvest in early 1987 to the cooperative's wood processing plant. This problem has grown out of all reasonable proportions due to the aforementioned lack of cooperation from the Machinery Pool, combined with the failure of AID to approve the importation of a flat bed truck or alternative log-transporting machinery for exclusive use of the cooperative, or to support the advisors' recommendation that the road construction machinery originally designated for the UDF in the Project Paper be under the control of the UDF itself rather than consigned, as it now is, to the Highway Maintenance Unit's Machinery Pool in far-away Villarica.

The construction of planned forest roads has not proceeded as planned in this semester due to the aforementioned obstacles. Similarly, logs available in abandoned chacras and felled and abandoned in the course of new highway construction could not be delivered to the sawmill for processing simply because there was no suitable vehicle for transport under control of the UDF while PRD-Palcazu, being underfinanced, could not meet obligations for contracting private transport for this purpose. A part of the delay in construction of the Pres-Cap plant, was due simply to the unavailability of lumber for construction while the sawmill lay essentially under-utilized for lack of raw material.

Because of a shortage of technical personnel in the engineering unit, lack of funds for its personnel to travel outside the valley, and the lack of cooperation from the Road Maintenance Unit, the advisor had no alternative but to make frequent and costly trips to Villarica to talk with the chief of this unit, in the attempt to improve this situation. His trips, in the vehicle rented by TSC for the transport of advisors within the valley, gave him the

opportunity to appreciate the sad state of the new highway, which is essential to the financial success of the forestry cooperative as well as other producers in the Palcazu Valley. The impression is one of abandonment by the Highway Maintenance Unit, particularly in the section between kilometer 1 and Puerto Herrera on the Iscozaciri River. The connecting link to Iscozaciri Camp, not an integral part of the new highway, is in equally deplorable condition due to lack of the routine maintenance for which this unit is primarily intended. Lack of equipment is given as the cause of this situation, although on various occasions the existing equipment is known to have been sent on assignments totally outside its nominal jurisdiction (e.g., Huarcabamba) under orders from Lima or at request of local political figures.

The problem of moving logs from the first strips to the sawmill and preservation plant might be solved provisionally by acquisition of a farm tractor and repair of an abandoned four-wheel flatbed trailer salvaged by the advisors from a junk pile at the Iscozaciri camp. Repair was started on the trailer this semester but no tires or tractor purchase was authorized. To date neither the PDR-Palcazu administration nor the Project Managers Office in AID has shown any interest in solving this key issue, which could have very negative effects on the economics of running the cooperative.

The question of log extraction from the clear-cut strips is not currently considered paramount by the advisor. Experience with oxen logging on the demonstration strips and in an around the sawmill site on salvage material indicates that there will be no major difficulties in this regard. A potential problem with felling and bucking is the failure to have yet received the lot of chainsaws and chainsaw repair parts ordered from overseas in 1985.

A detailed discussion of these issues and the logging engineer's activities may be found in the following documents:

<u>Reports</u>	<u>Memoranda</u>	<u>Letters</u>
TSC-094-C	102-86-TSC	
TSC-102-C	078-86-TSC	CCT-156-86
TSC-088-C	089-86-TSC	
	104-86-TSC	
	105-86-TSC	

## 2.5 Wood Industrial Engineering.

The advisor in this post, Mr. Michael Kroner, has been on long-term status since August 1985. His achievements in the last three semesters (he acted as a short term advisor

for six months in this same specialty in 1984-85) all lead to the procurement, design, installation, start-up operation, and training of native Amuesha operators of the wood processing plant at kilometer 41 (Shiringamazu) of the carretera marginal.

During this semester, Ing. Kroner continued with additions and refinements to, and the in-service training of native operators for, the Might-Mite sawmill. Deplorably, his choice for the post of chief sawyer and sawmill manager, Mr. Niko Saldani, (a "colono" rather than a native comunero) after playing a vital role in setting up the sawmill and assisting in the early stages of training the native mill workers, was summarily fired by the UDF, presumably on political grounds. He was not replaced, at least with a person of equal technical competence and leadership ability.

Although considerable progress was made in sawmill operation over the six month period from August to February, both infrastructural growth and mill output would have been much, much greater had there been a qualified counterpart for the advisor, a competent and experienced advisor for the native Administrator of the Cooperative, full and agile administrative and technical support from the PDR-Palcazu and UDF and, last and by far the most important, delivery (and payment for) requested services, supplies, materials, tools, and equipment essential to the operation of the mill and to the construction and equipping of the Pres-Cap wood preservation plant ancillary to it.

During this semester, the advisor conducted a series of short, intensive, hands-on courses for Coop mill workers in the fields of maintenance and conditioning of circular resaws, in responsibilities and functions of the log yard manager and his workers, and in operation, maintenance, and repairs to the Might-Mite portable sawmill.

Additions to the mill layout included design of the winch-log turner which will be built in the metal-working shop of Gilardi-Gamarra in Lima. As an interim measure, a manually-operated "molinete" or capstan-winch will be installed for this purpose. Also designed in this period was the lumber and lumber-drying yard adjacent to the mill. Execution of these plans was held up by the simple lack of funds and administrative agility for their acquisition on the part of the PDR-PALcazu.

As plant engineer, Mr. Kroner was also responsible for the design, construction, and equipping of the Pres-Cap wood preservation plant of the wood processing complex at Km. 41. With the design complete, the plant site cleared and graded, and the roof up over the central core of the plant at the end of the preceding semester (July 1986), progress in construction diminished to a painfully slow level as the

consequence of the above-mentioned personnel, administrative, and financial problems of the PDR-Palcazu. This plant should have been terminated and operating by December of 1986 but, due to the forementioned difficulties, interminable delays were experienced in having necessary construction materials such as cement, lumber, and roofing materials delivered to the site. As for the wood preserving equipment built to the advisors specifications in the Gilardi-Gamarra shop in Lima, much of this was held against payment, not forthcoming, from the Project. Fabrication there of other necessary equipment for the plant was not even started for the same reason.

Because this is the first industrial wood preservation plant of its type in Peru, indeed in the humid tropics of the world, no formal design existed on paper which could serve as a practical model from which to depart. Under the advisors supervision, therefore, the drafting department of the UDF in Iscozacin, drew up a set of plans for a plant corresponding to the specific situation and geographic setting at Shiringamazu. Beyond their specific use by the Cooperative, these plans will be of considerable utility to the future of the wood preservation industry in the Peruvian Amazon (and elsewhere in the humid tropics).

During this semester, the wood industrial engineer also supervised the construction of the carpentry training shop at Iscozacin, engaged a master carpenter trainer to head this shop (L. May) and prepared a tentative program of training in woodworking to be implemented once electricity is installed and necessary tools procured. Under his supervision, the first Costa Rican style ox cart was also finished and demonstrated in the Valley. He also participated with the Chief-of-Party and other advisors in drawing up a list of mill and transport equipment to be procured offshore, principally for use by the Forestry Cooperative.

## 2.6 Wood preservation.

Mr. Guillermo Gonzalez, expert in wood preservation, visited the project between August 22 and September 19, leaving him with only one week out of his original three person months of effort to be applied to the project. This week was consumed subsequently in the preparation of his second report entitled Preservacion de la madera en el Proyecto Palcazu: Desarrollo de Recursos de la Selva central del Peru (TSC-096-C).

This specialist's visit took place early in the semester, before it was apparent that financial and administrative constrictions would, in the four following months, bring planned construction of the wood preservation plant and manufacture of its equipment and machinery to a

near standstill. Although many of his recommendations had, for this reason, yet to be acted upon at the end of January 1987, the question of plant worker safety and disposal of toxic wastes came to a head during this hiatus and Ing. Gonzalez undertook consultations with experts abroad prior to the preparation, at his own expense, of an Appendix to his cited report and covering these questions in more detail (Adendum al Informe TSC-096-C).

Wood preservation has turned out to be one of the most economically significant aspects of the wood production business of the Yanesha Forestry Cooperative as well as an aspect inherently replete with technical problems, not foreseen by the preparers of the Project Paper. In early September, therefore, the Chief -of-Party and General Forester recommended to AID that the level-of-effort in this field be increased by several months in the year remaining to the end of the Project Agreement with PEPP. This recommendation was not acted upon during this semester (see 3.0) but probably will be in the next.

## 2.7 Forest Products and Marketing.

The products and marketing specialist, Mr. Henry Greub, was in Peru between the 5th and the 19th of September. As noted in the fifth semestral report, his PDR-Palcazu counterpart, Ing. Narcisso Reyria, was about to terminate his contract, and the PDR-Palcazu administration refused to renew it for reasons which had nothing to do with his technical competence or past performance. An agreement was reached with Reyria, nevertheless, whereby PEPP would contract with him directly to undertake a short-term study of specialized wood markets in Lima, Pucallpa, and Selva, to supervise preparation of illustrated wood descriptions for sales promotion for 12 of the most abundant timber species in the Palcazu Valley, and to initiate the paperwork with INTINTEC with respect to the inscription of preserved posts and railroad ties. For obscure reasons, PEPP never fulfilled their agreement to contract this work with Reyria and the products and marketing studies necessary to the development of markets for the Cooperative's coming output was set back by at least six months. The advisor has not, as a result, deemed it worthwhile to return unless and until this problem can be resolved. A full report on his visit, including a copy of the work plan for the counterpart study and activities in his absence, can be found in report number TSC-093-C.

## 2.8 Land Capability Classification; Land Use Ecology.

Ing. Rafael Bolanos, short-term advisor in land capability classification, spent the period from mid-October to mid-November in the valley. His time there, coincided with that of the short-term advisor in Land Use Ecology

(J.Tosi, also General Forester and Chief-of-Party). The opportunity was taken, therefore, to assess the state of the land use program and of these advisors' role in its future orientation. As stressed in previous semestral reports, and most notably in the fifth, sustainable development in this ecologically fragile valley cannot be achieved without a major effort to bring actual land use into close harmony with ecologically-determined land use capability. Yet, to date there has been great and continuing resistance to this idea on the part of both PEPP leadership and even project professionals (other than the foresters). This resistance had been virtually overcome about the end of the July 1985, but then, with major shift in government policy as well as in personnel in the PRD-Palcazu, the resistance (e.g., introduction of the concept of "chacras integrales" to be applied generally throughout the valley) -- and need to begin the educational process anew -- started all over again. As a result, no positive action had been taken by the Project to implement the original PP directives for land titling on the basis of an official land capability map of the valley or for the execution of the continuous land use survey.

The two advisors in consultation with other TA personnel from TSC and AID therefore decided that the only realistic alternative would be to develop a simple manual for the ad hoc, practical classification of land use capability on individual farms and native community lands, to be reproduced and made available through trained extension agents, the forest district agents, and the Cooperative technical division (Forest Management Office). This approach had already been tested successfully for land use planning in several native communities, specifically those participating in the Yanesha Forestry Cooperative.

In mid-October, fieldwork was undertaken to establish baseline limits and descriptors for such a set of guidelines, and in early November, under the leadership of the advisor in land capability classification, the results were tested in the form of two short courses, the first for native land classifiers and the second for the Project's extension agents and the loan request evaluator from the Iscozacin office of the Banco Agrario. The land use ecologist participated in the first of these two courses.

The preliminary (provisional) form of the resulting classification is presented in the land capability specialist's report on this visit to the Project (TSC-101-C). It is proposed that after further field testing and refinements, this classification will be presented in the form of an attractively illustrated and printed extension bulletin. If this bulletin is widely disseminated, and if the extension agents, forest district inspectors, and the bank's loan evaluator apply it strictly in dealing with

colonos, comuneros, and in granting timber harvesting licenses, then a reasonable harmony between land use and land capability should evolve in the Palcazu Valley.

### 2.9 General Forestry and Team Leadership

The undersigned, as general forester and, again, as land use ecologist (both short term positions), is also the nominal Chief-of-Party for the forestry and land use advisory team provided through AID to the PRD-Palcazu. His role is one of overall technical planning, team selection, and team orientation. As general manager of the Tropical Science Center, he also administers the contract under which the advisors conduct their activities and is directly responsible for their actions before the Rural Development Office of AID and of PEPP in Peru. ( This is noted here solely because there has been some recent indication of uncertainty as to the nature of his role, duties, and authority by various persons involved in the Project).

In his role as general forester, the advisor visited the Project on three occasions during the sixth semester of operations under the contract. The first of these visits, in August-September, was for the purpose of evaluating progress of the Cooperative, regeneration in the demonstration clearcut strips, and conducting coordination meetings with both short and long-term advisors present at the duty station (Simeone, Aspinal, Krones, Greub, Gonzalez). On this occasion, also, the advisor participated in the national forestry workshop held in Pucallpa, as speaker (see 2.1) and also met with the Project Manager to discuss the needs for an increase in the level-of-effort over the final year of the project (to September 30, 1987. On his return to the Costa Rica headquarters of TSC, he prepared, at the request of the Project Manager (R.Waldron), a series of memoranda covering the following:

- 1/ Justification for a Two Year Extension of the Project (100-86-TSC);
- 2/ Commentary on "Ex-ante Evaluation of Benefits to Central Selva Project Research (Preliminary Draft (101-86-TSC);
- 3/ Proposed workplan and revised budget for the Period October 1, 1986 through September 30, 1987 (102-86-TSC);
- 4/ Amended Project with two years extension: Land Use and Forestry Technical Advisory Requirements and Budget (103-86-TSC).

In the third of the documents listed as well as in the fifth semestral report prepared in San Jose at this time,

the Chief-of-Party indicated clearly the need for an amendment to the subject contract which would permit an increase in the level-of-effort by the TSC advisor team using unexpended funds available in the contract (but not obligated). The purpose of this increase would be to concentrate on making a success of the Yanasha Forestry Cooperative in the short time remaining to PACD. It was assumed that this effort would be necessary whether or not an agreement was reached during the following months to extend the life of the PEPP/AID Agreement for support of the PDR-Palcazu for an additional two years or more.

The advisor visited the project again between the middle of October and early November, during which visit he performed similar activities to those of the previous visit and also assisted the land capability specialist in design of a practical methodology for training in and implementation of ecologically harmonious land use in the valley. During this visit and again in a letter in mid-November directed to the Project Manager, he reiterated the urgency for a contract amendment increasing the level-of-effort, particularly in the fields of wood preservation, natural forest management, draft animal logging, and dendrology, and adding a new short-term (local hire) post of advisor in forest business administration.

A final visit to Peru, in late January, was undertaken for the sole purpose of meeting with the Project Manager to reach an agreement on the precise terms and cost of such an amendment. Because an agreement was reached at that time, it was presumed that an amendment would be negotiated with the Regional Contracting Officer no later than the end of February 1987.

### 3.0 PLANS FOR ENSUING PERIOD

Great uncertainty continues as to the future of the Project at this time. The current PACD under the PA with the GOP is September 30, 1987, at most seven months away. The forestry program and most importantly, the native community forest management and wood production cooperative is still in its infancy and will have great trouble surviving, let alone becoming a financial and social success, without financial and technical assistance of a high order continuing beyond the current PACD. Details of this problem are included in memoranda (see 2.10) to the Project Manager dating back to September 1986. Added to this problem is the continuing lack of administrative agility in PEPP, confusion there as to the proper orientation of development in the Valley, absence of competent, non-partisan leadership and administrative ability in the UDF of the PDR-Palcazu, and the total lack of funding for in-country purchases of essential supplies, materials, equipment, and operations of the forestry cooperative itself. Hopefully, most of these

problems, as well as the attainment of a needed amendment to the TSC contract, increasing the level-of-effort by advisors, can be reached promptly in the first months of the coming semester of operations. Presuming that this will happen, the ensuing period should see:

1/ Termination and equipping of the Pres-Cap wood preservation plant at Km.41., including additional safety and environmentally sound waste disposal features.

2/ A two weeks period of trial operations of the Pres-Cap plant, including intensive on-job training of plant manager and all operators under direct supervision of the wood industrial engineer and the wood preservation specialist.

3/ Deployment of logging crews and oxen of the cooperative to the first strip to be clearcut in Shiringamazu Management Block No.1. Under supervision of the logging engineer and the draft animal specialist, harvesting of the first strip and loading and hauling of the products on appropriate vehicles to the sawmill and wood preservation plants. Training of all cooperative personnel in the mechanics of synchronized harvesting and processing.

4/ Commercial production of sawn lumber to products defined by market analysis and wood qualities, including air-drying of this lumber under U.S. technical standards.

5/ A start on commercial production of treated poles and posts in the Pres-Cap Plant. Testing of poles by species in testing device, by species, for approval by INTINTEC.

6/ Opening of the access road into Alto Iscozacin production forest area.

7/ Installation of log turner and winch in sawmill.

8/ Training of Cooperative manager in forest business administration methods; development of appropriate management and administration procedures for the cooperative.

9/ Printing and distribution of land use capability extension manual; printing and distribution of marketing information on 12 important timber species of the Palcazu Valley (cooperation with SENATI).

10/ First training courses in the carpentry shop, Iscozacin; construction of more ox-carts for sale in the valley as a training practice for aspirants.

11/ Continuation of research activities on demonstration strips and cooperation with private researchers on similar research to be set up on the production strips at Shirigamazu.

12/ Analysis of steps to take opportuniely for support of the cooperative should a Project Extension be agreed upon, and if such an extension is not approved.

San Jose, Costa Rica  
April 15, 1987

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Joseph A. Tosi, Jr.  
General Forester and  
Chief-of-Party

SEVENTH SEMI-ANNUAL REPORT ON FORESTRY TECHNICAL ADVISORY SERVICES RENDERED TO THE PROYECTO ESPECIAL PICHIS-PALCAZU BY THE TROPICAL SCIENCE CENTER UNDER CONTRACT NO.527-0270-C-00-4013-00 Dated February 1, 1984

## 1.0 INTRODUCTION

The following is a summary report on forestry and land utilization technical assistance and advisory services provided to the Proyecto Especial Pichis Palcazu (PEPP), Palcazu Rural Development Project, between February 1 and July 31, 1987, the seventh of eight six-month periods of the subject contract with USAID/Peru. During this period, technical advisory services were provided by Tropical Science Center (TSC) in the following fields: *general forestry* (project leadership and coordination), *land use capability*, *natural forest management*, *wood industrial engineering*, *tropical dendrology*, *logging and road engineering*, *draft animal logging*, *wood preservation*, and *forest business administration* for a total of 22.08 person-months of technical services. Average monthly level-of-effort for this period was 3.36 person-months.

### 1.1 ~~Organization and Administration~~

#### 1.1.1 San Jose, Costa Rica Office.

Project activities under the contract were monitored and partially directed from TSC headquarters in San Jose, Costa Rica. During this semester, the required sixth semi-annual summary reports on technical assistance in Spanish and English for PEPP and AID, respectively, and the administrative and financial report to AID/Peru were prepared and all short-term advisors who visited the project during the semester were briefed before departure and their technical reports reviewed and discussed with the Team Leader/General Forester upon their return.

Administrative effort during this semester included negotiation of a major contract amendment permitting an increase in the level-of-effort to PACD (September 30, 1987) by a total of 16.2 person-months, including the contracting of a short-term advisor in *forest business administration* for a continuous four-months period starting June 1, 1987.

#### 1.1.2 Lima, Peru Offices of AID and PEPP.

During this semester, the long-term advisor in natural forest management terminated his three year contract

(February 19, 1987), being on terminal leave. Because he had acted as TSC coordinator in Peru in the absence of the Chief-of-Party, the short-term advisor in logging and forest road engineering, Mr. William Aspinall, was assigned to this task, which included liaison with the Project Manager and Project Coordinator of AID and with the headquarters staff of PEPP, both in Lima.

Periodic visits were also made to Lima by both short and long term advisors to attend meetings, procure supplies, deal with public agencies relating to the project, and to attend personal health and family matters. These activities are detailed in the individual specialist reports and memoranda submitted to AID and to TSC listed in Section 2 of this report.

#### 1.1.3 Iscozacin Duty Station.

As mentioned above, Mr. William Aspinall, specialist in forest inventory and logging engineering, a short-term advisor but continuously in residence at the Iscozacin headquarters of the PDR-Palcazu, Iscozacin, acted as field team coordinator and spokesman for the TSC team of advisors before the Project Manager and the Director, Administrator, and Forestry Development Unit (UDF) of the PDR-Palcazu, except when the Chief-of-Party was actually present there.

Transport of the advisors and their counterparts between the Iscozacin duty station and the field operations areas was no problem during this semester. By special agreement with the Project Director, one of the new pickups, delivered to the project in January 1987, was assigned to exclusive use of the advisors under the personal responsibility of Ing. Aspinall. Under this agreement, all repairs, fuel, and maintenance services were to be paid by TSC. The arrangement worked well and provided considerable savings over the monthly fees for a rented vehicle incurred in the previous two semesters.

A lack of full funding for the PRD-Palcazu (allegedly originating in PEPP central administration) and reported as beginning in the preceding six-month period (see SIXTH SEMESTRAL REPORT), continued during virtually all of this seventh period. The general lack of liquidity in the PDR-Palcazu greatly restricted field operations and the hiring of needed replacement counterpart personnel for the UDF. It also slowed construction and equipment purchases for the Pres-Cap wood preservation plant at the Yanasha Forestry Cooperative to a snail's pace, thus reducing the effectiveness of forestry technical advisory services to the project in this period under the contract.

In addition to the aforementioned financial limitations on project activities, it should be noted that an amendment to this contract increasing the allowable level-of-effort between February 1 and September 30, 1987 (PACD), recommended in October 1986 and agreed upon in late January 1987, was not actually negotiated and signed by the RCO until late May 1987, near the close of the semester. This situation was reflected in the comparatively low total level-of-effort during the semester: only in June was it possible to send badly needed short-term advisors in wood preservation, draft animal logging, dendrology, forest business administration, and natural forest management to the valley. Arriving so late, the wood preservation specialist and the forest business administration advisor had insufficient time to coordinate their activities with those of the wood industrial engineer, M. Kroner, who terminated his field stay in early July. This situation, beyond control of the contractor, can be considered a detriment to timely progress with the operational plan for the year as well as to efficient technology transfer in the Yanasha Forestry Cooperative.

In the immediately preceding semestral report, it was noted that politically-motivated deployment of the road maintenance component of the PDR-Palcazu had serious, negative implications for development of the forestry cooperative as well as for the valley in general. This situation worsened during the seventh semester reported upon herein, coinciding incidentally with the departure of the advisor to that component (N.Herring). Road maintenance equipment, including those units originally destined for exclusive use and control by the UDF of the Project, spent an inordinate amount of time totally outside of the project area and, when present there, on infrastructural construction projects intended to improve the political standing of the project rather than maintenance of the highway or construction of agreed-upon forest extraction roads in the native communities.

#### 1.2 Technical Advisory Services: Level-of-Effort.

The following table summarizes, by technical specialty, the periods of work and level-of-effort of forestry and land use technical assistance applied to the project by TSC personnel during this seventh semester under the contract:

Specialty (Technician)	Costa Rica	Peru	Total Person-months
General forester/ (J.Tosi)	3/12;4/20;5/13; 5/18,20-22;6/8; 7/12,24,27,31.	2/1;6/9-7/1	1.64
Natural Forest Mgt. (R.Simeone)		2/1-17; 6/19-7/18	1.53
Wood Industrial Eng- ineer (M.Krones)		2/1 - 7/30	6.00
Land Use Capability Specialist (R.Bolanos)		4/24-5/15	0.75
Logging and Road Engineer/ Field Coordinator (W.Aspinal)		2/1 - 7/20	5.61
Tropical Dendrologist (G.Hartshorn)		4/27-5/28; 6/23-7/10	1.58
Wood Preservation Specialist (G.Gonzalez)	3/15-19	5/19-7/24	2.44
Draft Animal Specialist (W.Cordero)		6/23-7/8	0.53
Forest Business Administrator (R.Gonzalez)		6/1- 7/31	2.00
Eight specialties/eight technicians			22.08
Average monthly level-of-effort			3.36

### 1.3 Recruitment, Orientation, and Training of Forestry Unit Counterparts

There was a net loss of experienced professional forestry staff in the Forestry Development Unit of the Project during this semester, continuing a trend already underway in the preceding semester. Highly trained counterparts for both the draft animal specialist and the wood industrial engineer resigned or failed to have their contracts renewed. The wood preservation specialist has never had an assigned counterpart, a serious detriment given the critical importance of competent supervision in this specialty as the Pres-Cap plant approaches operability.

In forest products and marketing, again, a suitable replacement for Narcisso Reyna never materialized. The project assigned a recent graduate lacking in background (Salvatierra) to this post, then re-assigned him without consultation with the advisor in this specialty to work in forest inventory. With few exceptions, professionals in the UDF do not benefit from a continuous close association with a specific advisor. Under the present head of the unit (Bazan), regular weekly coordination meetings of UDF staff and advisors, a standard procedure during previous semesters, were not held and key advisors, lacking competent counterparts, were forced to do the work which would normally correspond to their counterparts, that is, in actual direction and execution of project activities. This situation had numerous negative consequences for project projection within the valley as well as being an inefficient use of expensive technical advisory services. It can only be remedied by appointment of a fully competent and non-political professional forester as head of the Forestry Development Unit (UDF).

The employment of a full-time computer programmer, recommended in the previous semester, was never acted upon (again, ostensibly for lack of funds) by the project. The TSC computer equipment installed in the forestry office building at great expense and essential to the work of several technicians in the unit has, as a result, slowly deteriorated during the course of the semester and was inoperable and in Lima undergoing repairs at its close.

Training of such counterparts as were assigned to advisors and to employees of the Yanasha Forestry Cooperative, especially the latter, continued at an accelerated pace during this semester. Given the absence of qualified counterparts for several advisors plus the poor quality of most of those assigned, training effort was concentrated in the Amuesha cooperative where the environment is most favorable and enthusiasm greatest. This included, near the end of the semester, the creation of a new advisory post: ~~forest business administration~~, and the recruitment of an expert national, Mr. Ricardo Gonzalez, to fill it. Mr. Gonzalez began work working directly with the Director and administrative staff of the cooperative in Shiringamazu, in June, and will remain in residence there until September 30. He turned in an excellent first report.

## 2.0 STATUS OF WORK UNDER THE CONTRACT

The following section highlights the activities of the advisors who were present on the project during this semester. Details are included in the individual reports of each advisor, as listed.

## 2.1 ~~Natural Forest Management.~~

No advisory services were provided in this specialty until the last two months when, following a contract amendment increasing the allowable level-of-effort, Mr. Robert Simeone, previously long-term advisor, returned under a short-term contract for roughly a month's time. During this period, he was able to review five month's independent work by the Forest Management Unit of the Yanesha Forestry Cooperative (YFC) and to guide a planning process for the forthcoming period in the native communities of Loma Linda, Laguna, Santa Rosa, and San Pedro de Pinchinaz. His report on this activity (TSC- ) provides details.

In mid-semester, Mr. Simeone submitted his final report for the year 1986 (TSC-107-C). This report summarizes the year's experiences in implementation of the Yanesha Forestry Cooperative, the principal activity of the UDF and its advisors in the Palcazu Valley, as well as other advisory and coordination activities. It is interesting to note that, according to Simeone, the wood processing plant at Shiringamazu was 80 percent complete at the end of 1986 (?). While possibly exaggerated, a very considerable achievement had resulted, largely from the great enthusiasm of the natives as well as a well-staffed and well-financed forestry development unit (UDF) in the PRD-Palcazu during that year. (Although, by mid-October, staff resignations and funding cuts at PEPP were already beginning a reversal of these favorable factors).

Regretably, at the end of May 1987, the situation at Shiringamazu had not advanced very far beyond that existing at the end of 1986, due to a continuation and aggravation of the above-noted trends in personnel and funding for operations. In particular, construction and equipping of the Pres-Cap wood preservation facility, essential to general start-up of the integrated wood extraction and processing activities under the overall forest management plan, was at a virtual standstill for lack of essential building materials as well as funds for the implementation of a contract with the metal-mechanical shop of Gilardi-Gamarra in Lima, which was to design and manufacture the equipment for pole handling and pressurizing the Pres-Cap system. Delays at AID in Lima in the processing of a contract amendment for the advisors in forestry, recommended by the Chief-of-Party seven months previously, made it impossible to put a wood preservation specialist on site to advise on Pres-Cap plant safety and treatment details with the long-term advisor in wood industrial engineering. due to terminate his assignment at the end of the semester.

## 2.2 Wood Industrial Engineering.

During this semester, Mr. Michael Krones, long term advisor in wood industrial engineering, was principally responsible for the technical aspects of the installation of the Pres-Cap wood preservation plant as well as improvements in the layout and functioning of the Mighty-Mite portable sawmill. He was greatly assisted in the first of these tasks, however, by Mr. William Aspinall, logging and road construction engineer. Aspinall took responsibility for logistics and personnel assignments through coordination with the UDF/PRD-Palcazu. Given the shortages of materials for plant construction and the failure of PEPP to conclude a contract with Gilardi-Gamarra for essential hardware, little was accomplished on the Pres-Cap plant infrastructure until late June, when materials finally started to arrive at the site. In late May, the wood preservation specialist, Mr. Guillermo Gonzalez, arrived at Iscozacin to assist in final design and supervision of the construction and installation of this plant. Unfortunately, he arrived too late to work really effectively with Mr. Krones, who departed at the close of his assignment in early July.

At the sawmill, which functioned commercially during the semester on the basis of salvage logs purchased from Shringamazú community members, some improvements were made to the table resaws and a "molinete" or hand operated wooden capstan winch for pulling logs from the logyard onto the loading deck and up to the saw was installed. In-service training of sawmill personnel continued on under his guidance during the period in which the mill produced a small amount of wood (roughly 400 board feet per day) for the highway bridge contractor as well as some of the lumber needed for the Pres-Cap plant construction.

Two intensive short training courses were conducted under the aegis of this advisor during the semester:

1/ Maintenance and conditioning of circular saws used on the table re-saws;

2/ Responsibilities and functions of log yard supervisor.

Finally, the wood drying and storage yard layout was designed by the specialist. For lack of personnel and materials, this layout was not implemented, however.

During the last month at the duty station, Mr. Kronos also prepared his final report (TSC-114-C:Informe Final sobre Las Actividades Desarrolladas en la Implementacion y Puesta en Marcha del Primer Nucleo de Transformacion en la Cooperativa Forestal Yanasha"). This voluminous and well-illustrated report includes final drawings for the Pres-Cap Plant Installation and for the Sawmill, Logyard, and Wood Storage Areas.

### 2.3 ~~Logging and Road Engineer; Field Coordinator~~

This post continued to be filled by short-term advisor William Aspinall who also replaced Mr. Robert Simeone as TSC Field Coordinator in the absence of the General Forester and Chief-of-Party. Mr. Aspinall, who has been advisor in forest inventory as well as logging in past semesters, advised as needed and kept abreast of activities of the UDF in forest inventory in addition to his other duties. Although he is a short-term advisor, he was at work continuously through the semester.

With respect to extraction, little activity could or did take place under the projected production schedule for 1987. This was due to the continuing delay in putting the wood preservation unit of the conversion facility into production. Until total utilization is feasible, commercial production of timbers under the strip clearcutting system in the first management block of the cooperative at Shiringamazu will be held up.

Extraction, with oxen, was limited to scattered roadsides logs left from the construction of the highway and to logs found on the ground in pastures and agricultural clearings. Production of even this timber was handicapped by the lack of regular, PRD or Cooperative-controlled highway transport equipment.

A further constraint on extraction was the lack of counterpart personnel for the advisor in the UDF. Nevertheless, it was possible to advance work in layout and preparation of logging trails in the first three strips of Block 1, Shiringamazu, and to advance construction of the secondary logging road into the first extraction block of Alto Iscozacin. The logging road construction schedule was not met due to failure of the Road Maintenance Unit to fully provide promised equipment and scheduled assistance.

### 2.4 ~~Draft Animal Logging~~

Between June 23 and July 8, under the amended contract, the draft animal specialist, Mr. William Cordero, returned to the valley after a prolonged absence of almost a

year. This long absence, a product of both a low level-of-effort provision for this specialty in the original contract and delays in affectuating a necessary amendment thereto increasing same, was reflected in a number of developments, most of which were seen by the advisor as negative (TSC-118-C). A further and complicating factor was the arbitrary firing, by the Project, of Ing. Celso Ratachi, national counterpart to the advisor in draft animals, apparently for simple political reasons, after more than two years of training and experience for this post. The replacement for this post had neither been selected with the concurrence of nor upon the recommendations of the advisor. As a consequence, it was apparent to Ing. Cordero upon his arrival that the draft animal program, advancing so well at the end of the fifth semester under the contract, had retrogressed, especially in respect to draft animal selection and training and the training of new boyeros in the native communities. This last, in particular, will redound negatively to the forest management and extraction programs when these get underway on a commercial scale in the next few months.

Ing. Cordero spent much of his time on this visit in attempting to revitalize the draft animal program in these respects, although due to the shortness of his visit, he could scarcely make up for the two years of training and experience of Ing. Ratachi as totally lost to his new (and less qualified) counterpart, Ing. Hiber Paulino.

During this visit, also, the advisor worked with the advisor in natural forest management, Ing. Simeone, and with the forest management and exploitation division of the CFY (Sr. Sanchoma) in coordination of their work with the training and use of the four teams of oxen already property of the cooperative. This included visits to the first year strip clearcut sites and planning for oxen-based extraction to the roadhead. Emphasis was given to the need to acquire highway transport equipment for hauling logs between the strip-roadhead landings and the processing plant rather than to employ the oxen for this purpose, as was the practice at the time.

At the sawmill, the advisor demonstrated the use the oxen for tasks such as hauling sawn materials to the Pres-Cap construction site with the ox-cart rather than on the backs of men, the use of block and tackle with oxen to manipulate heavy logs upgrade, and to organize the logyard stocks with oxen rather than with manpower.

While in Lima, he visited the shops of Gilardi-Gamarra, where the original "sulky" had been built and was undergoing repairs. Also, he saw and criticized the Project initiative modified sulky, with double wheels, as

Finally, and of great importance, was the attention given to the question of the *credit in kind* program, under Extension, through which natives and colonos were to acquire oxen. With the change of administration and consequently, of department heads at the PDR-Palcazu, the entire program for which preparations had been made in preceding years, appeared to have been abandoned. Given the funding shortage prevailing during the semester, apparently nothing could be done to reactivate this critical element in the forestry extension and development plan.

The advisor plans to return for a further visit before PACD on September 30, in order to supervise proposed extraction activities on the ground and to determine the needs of other native communities members of the cooperative, for oxen, training, and extraction equipment.

## 2.5 ~~Tropical Dendrology~~

At the beginning of this semester, the available time for this advisor, like that of several other short term specialists, had been exhausted. It was not until late in the period, following a contract amendment, that he was able to revisit the project area. A major part of his time under the amendment, moreover, had been allotted, at the request of the Project Manager of AID, to the Forestry Sector Review, a multi-national task totally outside the context of the Project in the Palcazu Valley. This special work was undertaken, mostly in Lima and other cities of the Selva, in late April and in May. It was not until late June and early July that he was able to actually return to project-related work in the Palcazu Valley.

As in the case of the draft animal specialist, the dendrologist had exhausted his limited available time under the contract in mid-1986 and had not returned to the valley in the interim. In contrast to the former, however, he was pleasantly surprised to find that work in his field had proceeded well and competently in his absence. This was due to the fact that he had had a truly motivated and experienced counterpart assigned to him as well as a continuation in service of several excellent "materos" or practical tree identifiers. The UDF had, also, provided adequate funds for the operations of these persons and had left them alone to do their assigned job when not needed as labor on the construction work at Shiringamazu.

Dr. Hartshorn was in Peru a total of 16 days, of which three were spent in Lima at the request of AID. While in the Palcazu Valley, he devoted 90 percent of his time to

dendrology and 10 percent to natural forest management. With respect to the former, he paid special attention to the inventory work in the arboretum, which had been lagging with the assignment of the materos to construction of the Pres-Cap plant at Shiringamazú. The remainder of his time was spent checking unusual common names on the inventory field sheets. This checking turned up many misidentifications as well as several tree species heretofore unknown in the valley.

In company with R. Simeone and J. Tosi, the dendrologist also reviewed work in natural forest management, particularly its silvicultural aspects. A survey was made of the natural regeneration on the two demonstration strips at Iscozacin, and a decision was made to make Hartshorn responsible for coordination with the UDF with respect to all silvicultural treatments on these strips. Hartshorn held detailed discussions with the UDF silviculturalist, Wm. Ramirez in respect to these treatments, including inventory, climber control, and reduction in number of stump sprouts. To make sure these recommendations were clear, Hartshorn wrote a memorandum of understanding of what should and should not be done by the UDF in these strips.

## 2.6 Wood Preservation

Under the fourth amendment to the contract (May 20, 1987), the wood preservation specialist, Ing. Guillermo Gonzalez, was allotted a total of four months of additional time. He returned to the Project area in late May and remained continuously until late July. During this period, he was engaged in final design for the Pres-Cap wood preservation installation as well as related matters concerning worker safety and handling of the CCA wood preservative chemicals.

Upon arrival, Ing. Gonzalez was also confronted with a continuation of the problem of funding for the purchase of materials and the continuing lack of a contract between PRD-Palcazu and Gilardi-Gamarra for the provision of chemical and log handling equipment for the plant, discussed heretofore (2.2). A further detriment to his accomplishing much was his late arrival and the impossibility of working effectively with the wood industrial engineer, due to shortly depart permanently from his long-term post and any further work with the CFY at Shiringamazú where the Pres-Cap plant is being installed. Not all technical details for the pressure system could be worked out satisfactorily on site between the two engineers in the short time before Kronos' departure, and this led to later disagreements between the two which had to be resolved by the Chief-of-Party and the Project Manager of AID at the close of the semester.

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One of the more significant developments of this period was the visit of a special technical commission brought at the instance of the Regional Environmental Officer and the Project Manager, to evaluate several plant safety and environmental contamination issues raised by the forthcoming production of chemically-treated posts at the integrated wood conversion plant of the CFY, Shiringamazu. This committee, comprised of three experts from the U.S., visited the site over a three-day period in early June and was attended to by the wood preservation specialist, the wood industrial engineer, and the Chief-of-Party, as well as intermittently by project counterpart staff and the Director of the PRD-Palcazu. The results of their visit and recommendations thereof, are included in the document entitled *Final Report on the Field Visit to the Frescap Wood Preservation Plant in Shiringamazu, Peru, June 21-26 1987* by R.Brunker, G.Gill and L.Krahl (Washington, D.C August 221, 1987: The Conservation Foundation). This report, in general, gives high marks to the safety and anti-contamination safeguards already built into the plant design and operational systems by TSC advisors.

Because Ing. Gonzalez returned directly to the project in continuance of his work in early August, no separate report was rendered for this semester.

## 2.7 Land Capability

The specialist in land capability, Ing. Rafael Bolanos, made a final (pre-amendment) visit under the original time allotment to the Project in the months of April and May. His visit concentrated on three themes:

- a/ Continuous land use inventory;
- b/ Field manual of land use capability for extensionists and farmers;
- c/ Credit approvals by Banco Agrario based on land capability.

As noted in previous reports, the Continuous Land Use Inventory Program of PRD-Palcazu, approved by the Project and included in all Operational Plans, has been nothing more than a source of funds for other projects of the Project administration. The specialist notes in his report (TSC-112-C) that this program continues to lack implementation under the Unit of Cataster and Titulation because of lack of assigned personnel, total change of personnel including the unit chief, and lack of equipment and materials ordered over two years previously and not removed from Peruvian Customs by the Project (PEPP).

Meanwhile, funds allocated to this program under the annual operating plan and budget, are conveniently used to cover expenses of other units or of the administration itself. Nothing could be achieved in any substantial way to reverse this situation during the visit of the advisor.

Given that the Catastral and Titling Unit has not been disposed to revise the land use capability map of the valley, or to cease on-going titling (until an acceptable substitute for said map can be produced as decreed by INADE in early 1986 following a government commission report indicating the illegal character of the map produced in 1984-85 by this same unit), the advisor in collaboration with the land use ecologist (Chief-of-Party) decided to prepare a simple field manual for the practical determination of land use capability at large scale (farm or community level). Such a manual, based upon practical experience under the ecological conditions of the Palcazu Valley, was prepared in rough form during the visit and, after discussion and revision by the head of the Extension Unit of the PRD-Palcazu and the land use ecologist, was refined, illustrated, and printed in 500 copies at the headquarters offices of the contractor (San Jose, Costa Rica) for delivery to the Project in June 1987. This manual will be used by field extension workers, native community trainers, and by colonos as well as by the Banco Agrario to determine land capability for long-term development objectives.

On the fifth of May, a meeting was held between the head of the Banco Agrario in Iscozacin, the chief of the palcazu Valley Forest District, the Director and all department heads of the PRD-Palcazu, to discuss and reach agreement on the need for Project approval of all loans being made by the bank to private farmers and native community members in the valley. Although there was general agreement on the need by all present, and although an agreement was reached that the Director would seek formal approval from the Director of PEPP in Lima, no further progress ensued in this matter before the end of the semester.

## 2.7 ~~Forest Business Administration~~

Mr. Ricardo Gonzalez Costa, a business management expert of Peruvian nationality, was hired during this semester following approval of the stated contract amendment with AID, and began work on June 1, 1987. Mr. Gonzalez was posted to the Shiringamazu site of the Yanasha Forestry Cooperative, where he stayed full-time. His duties were as follows:

1/ Provide in-service training to the administrative staff of the cooperative in all matters relating to the efficient and effective administration of the forestry cooperative.

2/ Evaluate and recommend measures to improve the existing system of administration, taking into account the statutes and internal regulations of the cooperative as a legal entity.

3/ Design and implement a system for quality and quantity control for the Processing Center.

4/ Design and implement a standardized system for monthly financial, logistical, and inventory control.

5/ In conjunction with the Plant Foreman and the Chief of the Field Crews, implement a system for synchronizing harvest and delivery of strip clearcut timbers and processing schedules at the plant.

6/ Prepare monthly reports to PEPP and AID advisors covering personnel evaluation, training, advances in programs, financial conditions, future requirements and recommendations for the improvement of administration.

A very exhaustive and detailed report covering these activities was rendered by the advisor in July (Primer informe preliminar AUDITORIA ADMINISTRATIVA Y OPERATIVA, ANALISIS Y RECOMENDACIONES - Cooperativa Forestal Yanasha Limitada. Junio-Julio 1987). The findings of this report are pretty shocking: there is a long way to go in upgrading the capabilities, motivation, and productivity of the administration and labor force of this cooperative before it can qualify as an economically competitive business operation. Output is extremely low, labor is inefficient (but willing), skills are virtually nonexistent, and, above all, there is a failure of leadership at one end and a lack of respect for authority at the other. This situation indicates a need for continuing technical advisory services, especially business management-related advice, for several years into the future. Unless such support is made available, the cooperative will probably be a financial failure.

## 2.8 ~~General forestry; Land Use Ecology~~

The Chief-of-Party, Dr. Joseph A. Tosi, Jr., also General Forester and Land Use Ecologist under the contract, continued during this semester to perform the various duties of this post relating to team coordination and overall supervision of the advisory services in forestry and land

utilization. Some twelve days of his time was used in coordination activities, including analyses requested by the Project Manager of AID for the pending contract amendment, briefing and debriefing advisors, and preparation of semi-annual reports in the San Jose headquarters, the remainder, some twenty-two days in all, were in Peru, principally in the Palcazu Valley, on both technical advisory matters and team coordination.

The concentration of work late in the semester was an inevitable consequence of the delay in finalizing the amendment to the contract with AID which would provide for an additional 16 person-months of advisory services up to September 30, 1987. This effort was crowded into the period following the signing of the amendment on May 20, when all advisors except for the two already on-station for whom time remained under the unamended contract were enabled to return to the field.

While in Lima enroute to the Project, the advisor located and hired the new advisor in Forest Business Administration, and assisted in convincing the administration of PEPP to sign a contract for the manufacture of necessary hardware for the PresCap wood preservation plant by the Taller Gilardi-Gamarra.

At the Project, following a review of progress and problems at the Forestry Cooperative, including both plant construction and woods work, meetings were held with both advisors and UDF counterparts to work out problems and strategies for moving the projected work ahead. Three days were given over entirely to the CCA - Environmental Inspection team reported upon under 2.6. This attention included one day at the Pres-Cap site, another at the demonstration strips at Iscozacin, and a third in intensive discussion meetings on the details which would later appear in the consultants' report.

On the 26th of June, with the arrival of advisors Hartshorn, Simeone, and Cordero, meetings were held with the UDF again, to push for more positive action at the cooperative, with respect to recruitment of needed counterparts, and to plan for the visit of the participants in the APODESA-sponsored forest management workshop-seminar in August. Individual meetings with advisors were also held during this period to discuss developments in specific technical matters in each specialty. The Chief-of-Party also met with the anthropologist and people from the social unit to press for a more cooperative attitude on their part with respect to the Yanasha Forestry Cooperative where problems had arisen over lines and principles of authority in administration had arisen.

### 3.0 PLANS FOR ENSUING PERIOD

Great uncertainty existed at the end of this semester as regards the future of the project. The contractor had been advised that AID would support an extension beyond the PACD of September 30, 1987 but that the Peruvian Government had yet to make a formal commitment to such an extension. Subsequently, and prior to the preparation of this report, a nine-months interim extension was negotiated with the GOP but at the time such an extension was by no means a certainty and all plans were oriented towards a PACD in two months time. All effort was directed toward placing the Yanasha Forestry Cooperative on a production basis, with termination of the Pres-Cap Plant and the placing of this plant into operation before advisory services were withdrawn. This meant abandonment of virtually all other projects in forestry. Furthermore, some attention was to be given to finding alternative sources of support, financing as well as technical, which might give the coop a somewhat better chance of survival in the case of withdrawal of AID support of PEPP.

The following advisors were to continue with their programmed work before the end of September: G. Gonzalez in wood preservation, H. Greub in products and marketing, G. Hartshorn in dendrology, R. Simeone, in natural forest management, W. Aspinall in logging and road construction (as well as field coordination), Wm. Cordero in draft animals, R. Gonzalez in forest business administration, and J. Tosi in general forestry. R. Bolanos was also to return to complete his work in land use capability classification and continuous land use inventory.

With the announcement in late August of a nine-month extension, to June 30, 1988, but without additional person-months of effort or funding therefore under the contract, all advisors were to be withdrawn at the end of September 1987 until the contract relationship with AID could be adjusted to fit the new circumstances. Details on the outcome of this situation will be reported in the final report (January 31 or June 30, 1988).

In summary, the seventh semester under the contract saw slow progress with the actions needed to put the Yanasha Forestry Cooperative into commercial production

and a late start in getting needed advisory services back into the field to remedy this situation. Both difficulties, while beyond the control of the contractor, were being overcome near the end of the semester.

San Jose, Costa Rica  
September 30, 1987

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Joseph A. Tosi, Jr.  
General Forester and  
Team Leader