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The MPTS Research Network: Strengthening Links

Report of the third Research Committee meeting, held June 4-10, 1990 in Chiang Mai, Thailand

Forestry/Fuelwood Research and Development (F/FRED) Project

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1990

Forestry/Fuelwood Research and Development (F/FRED) Project

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Acronyms

BAIF	=	Bharatiya Agro-Industries Foundation
CATIE	=	Center for Agronomic Research and Training
CSIRO	=	Commonwealth Scientific and Industrial Research Organization of Australia
FAO	=	Food and Agriculture Organization of the United Nations
F/FRED	=	Forestry/Fuelwood Research and Development Project
FRIM	=	Forestry Research Institute Malaysia
GTZ	=	German Agency for Technical Cooperation
IADSS	=	Information and Decision Support System
ICRAF	=	International Council for Research on Agroforestry
IDRC	=	International Development Research Centre of Canada
IUFRO	=	International Union of Forest Research Organizations
KUFF	=	Kasetsart University, Faculty of Forestry
LOA	=	Letter of Agreement
MOU	=	Memorandum of Understanding
MPTS	=	Multipurpose Tree Species
NFTA	=	Nitrogen Fixing Tree Association
PNGFRI	=	Papua New Guinea Forest Research Institute
RFD	=	Royal Forest Department of Thailand
TFRI	=	Taiwan Forestry Research Institute
TISTR	=	Thailand Institute for Scientific and Technological Research
UPLB	=	University of the Philippines at Los Banos
UPM	=	University Pertanian Malaysia

1. Background

The first meeting of an *ad interim* MPTS Research Committee took place in September 1986, in Bangkok, Thailand to discuss informally options for network activities, including collaborative research.

A second *ad interim* Research Committee met in December 1986 in Kuala Lumpur, Malaysia to design the first set of network field trials, which were established in the humid/subhumid tropics the following year, and to help prepare plans for future network development.

The first official MPTS Research Committee meeting was held in Kuching, Malaysia in April 1988, in conjunction with a meeting of the Network's Steering Committee. The main issues discussed at that time included the initiation of a program of small research grants, arrangements for twinning between institutions in the region, a traveling seminar focused on the network field trials, guidelines for collaborative research, and a protocol for the use of data from F/FRED-funded research.

In July 1989, the Research Committee met again in Los Banos, Philippines, where major issues discussed included preliminary considerations regarding on-farm research, further social and economic research, plans for wood utilization research, and clarification of the role of the Research Committee.

2. Meeting Summary

June 4, 1990

1. Opening Remarks by the Chairman

Chairman Suree Bhumibhamon opened the meeting and welcomed the committee members. The chairman also thanked Cesar N. Nuevo of the Philippines for hosting the last meeting and his counterparts in Chiang Mai for holding this third meeting.

The committee appointed Lim Hin Fui to be the rapporteur of the meeting.

2. Remarks by Project Team Leader

Ken MacDicken expressed thanks to the Deputy-Governor of Chiang Mai Province, Ariya Uparamee, for his hospitality, and to the project staff and committee members for their preparation of materials for the meeting. He stressed the importance of the draft five-year work plan and encouraged the committee members to comment on the draft.

3. Deputy-Governor's Remarks

Ariya Uparamee welcomed the committee to Chiang Mai and briefed members on the history of forestry practices in Thailand. Activities range from forest management by the Royal Forest Department to tree planting by small farmers. He recognized the F/FRED Project's support for a number of research activities in Chiang Mai and expressed hopes that the cooperation will continue.

4. Review of On-Going Programs

4.1. Network Trials

Humid and Sub-humid Zone

Kamis Awang briefed the committee on the humid/subhumid zone trials conducted by the MPTS Research Network. This network trial is generally considered successful, with 13 (87%) of 15 planned sites successfully established, and 10 sites remaining two years after establishment.

Problems and constraints encountered included seed supply and nursery problems, damage by animals, typhoon, fire and drought and delays in exchange of data among cooperators.

Recommendations made to help overcome these problems for future trials included: (i) emphasis should be given to species selection, (ii) common methodologies be followed more closely by cooperators, and (iii) exchange of data be improved.

A report on an intersite analysis of the data recorded from these trials after 12 months will be available in one month.

Arid and Semi-arid Zones

Lee Medema and Narayan Hegde briefed the committee on the arid and semi-arid network trials being conducted in Pakistan, India, Sri Lanka, and Nepal. Problems identified in the progress of these trials were deviation from the methodology established at the outset and irregular seed germination.

To overcome the problem of poor germination, it is suggested that additional sites be established using larger seedlots. Improved communications between the Network Secretariat and cooperators was also suggested. A field tour may assist in further understanding the problems faced in different locations.

Cooperators' reports on their experiments need to be completed on time. So far, only six (24%) of the 25 reports have been received by the Network Secretariat.

4.2. Provenance Trials of *Acacia auriculiformis* and *Dalbergia sissoo*

MacDicken explained that these provenance trials are also regional network trials. The *Acacia auriculiformis* trials have been established on more than 12 sites in 8 countries. These trials on *A. auriculiformis* have shown excellent germination and establishment. No problems were reported to date.

Dalbergia sissoo is an important MPTS in India, Nepal and Pakistan for meeting fodder and fuelwood needs, yet limited research information is available on it. A regional plan to coordinate research programs on this species has been developed. *Dalbergia* seed has been collected and distributed for use in provenance trials on 7 sites in 3 countries in 1990, and an annotated bibliography on the species is being prepared.

4.3. Studies on *Azadirachta indica* and *Melia azedarach*

Suree described the importance of *A. indica* to farmers in Thailand, and outlined research on that species and *Melia azedarach*, conducted 1988-90 through a research grant made by F/FRED to Kasetsart University's Faculty of Forestry (KUFF). Suree suggested the formation of a working group to consider the possibility of conducting a regional study on these species.

4.4 Research on Control of the Leucaena Psyllid

Banpot Napompeth discussed the network's program for research on the leucaena psyllid (see appendix 3).

In Thailand, the research program is coordinated by the National Biological Control Research Centre (NBCRC), a part of the National Research Council of Thailand located at Kasetsart University.

Banpot described the seriousness of the psyllid problem. It spreads rapidly and can be devastating where there is 100% defoliation. Resistant varieties of Leucaena and biological control measures are suggested means for addressing the problem.

F/FRED has sponsored meetings on psyllid control since 1987. These include background meetings, research workshops, national coordinators consultative meetings, and management meetings. The state-of-the-art in psyllid research may be found in the recent proceedings, *Leucaena Psyllid: Problems and Management*, published by F/FRED, the International Development Research Centre (IDRC) of Canada, and the Nitrogen Fixing Tree Association (NFTA).

Malaysia, Philippines, the Republic of China, and Thailand are participating in the regional program sponsored by the network.

Fuh-Juinn Pan announced that psyllid-resistant Leucaena seed that he collected in Guatemala and Indonesia is available to interested parties within the network.

4.5. Regional Study On Tree-Breeding Objectives

Anoja Wickramasinghe described the study on farmers' tree-breeding objectives, conducted in five countries in conjunction with the regional study on Farm and Village Forestry Practices. It was coordinated by Lert Chuntanaparb and Radha Ranganathan. The study aimed to (1) identify the species used and maintained by farmers, with their priority uses, and (2) identify ideotypes of multipurpose trees desired by farmers.

This study has provided information for tree breeders working on improvement of MPTS, and has demonstrated that farmers often have a good understanding of the type of trees they need. In some cases, the ideotypes identified are those employed in traditional tree improvement; in other cases they are very different.

The methodological procedure outlined for the researchers was modified in the course of the study to obtain the views of farmers in greater depth. The methodology followed in this study could be further improved for use in this field. There is a need for further studies involving both biological and social scientists.

Three reports of the study have been published by F/FRED.

4.6. Regional Study On Farm and Village Forestry

Charit Tingsabadh reported on the study, begun in 1989 (see appendix 2).

Most of the data from the various sites has been entered into the Farm and Village Forestry Database. Cooperators conducting the study presented their reports at a meeting in Bangkok early in 1990. Constraints identified by participants at that meeting included budget limitations, problems in translating the standardized formats for data collection, and difficulties faced as the software for the Farm and Village Forestry database was developed.

Solutions to a number of these problems were derived in this meeting, but data analysis using the database continues to pose problems. Currently, the database is designed for data storage but not for retrieval and manipulation. The solution may be to modify the available database.

For future studies, it is recommended that

(a) research should be replicated

(b) more purposive criteria for site selection be followed

(c) certain topics should be emphasized

(d) research findings should be disseminated in the local language

This type of study should be repeated in the future as more parties, such as FAO, show interest and support.

4.7. Economic Research

Lee Medema and Marian de los Angeles described two studies being conducted.

1. A pilot study on marketing aspects of MPTS, using data from the Farm and Village Forestry study. The pilot study was on the economics of fuelwood use in 2 villages (113 respondents) in Thailand and 6 villages in Philippines (150 respondents). Preliminary data were presented to the Committee.

2. Economic analysis by Plantek International on growth of tissue-culture field trials is in progress. Plantek International will distribute plantlets of *Eucalyptus camaldulensis* and *Leucaena leucocephala* to establish the trials this year and develop the seedling and plantlets of *Acacia mangium* and *A. auricuiiformis* for planting in 1991.

4.8. Twinning

Kamis Awang led a discussion of the network's twinning program, based on a background paper he prepared.

The MPTS Research Network encourages 'twinning' to further promote MPTS research activities through collaborative activities carried out by the twinned institutions. The areas of interest common to the institutions should be identified prior to signing a 'twinning' arrangement. A five-year plan of activities under the twinning arrangement should be included in a proposal.

Twinning activities may include:

(a) short-term exchanges of scientists (less than 6 months) for collaborative research or on-the-job training

(b) joint organization of meetings or training courses, pooling resource persons from the twinned institutions

(c) joint production of materials such as books, manuals, and/or audio-visual aids

(d) joint consultative service employing expertise from the twinned institutions

The only current arrangement is among KUFF, Universiti Pertanian Malaysia (UPM), and the College of Forestry, University of Philippines at Los Banos (UPLB). KUFF and UPM jointly organized a regional symposium on tree plantation and a course on the use of microcomputers in forestry research, both held in June 1989.

Two further twinning arrangements remain to be finalized. The first involves Forest Research Institute of Malaysia (FRIM), Taiwan Forestry Research Institute (TFRI), and KUFF. The second is between the Royal Forest Department of Thailand and Forest Department of Nepal. Country representatives should work with the institutions involved to ensure that these arrangements are finalized in the near future.

4.9. Training

The Secretariat's Training Officer, Celso Lantican, reported on the network's training program in the project's first phase (see appendix 4). The major accomplishments include:

- Ph.D. fellowship program implementation (6 fellows).

- shortcourses conducted at the country level (*Research Problem Identification and Proposal Preparation, Marketing of Tree Products by Small Farmers, Technical Writing and Problem Solving for Agroforestry Research*) and at the regional level (*Forestry for Social Scientists, Microcomputer Applications in Forestry Research, Social Science Concepts for Foresters, Experimental Methods for MPTS Research*). A total of 294 scientists have participated in the courses.

- course co-sponsorship at the regional level (for example, the course *Forestry Research Management*, co-sponsored with FRIM and IDRC).

Feedback from shortcourses is solicited from course participants. Joint organization of courses with other institutions is encouraged.

4.10. MPTS Research Compendiums

Lantican outlined the progress of the national compendiums on MPTS research (see appendix 5).

Compendiums have been completed for Bangladesh, Indonesia, Malaysia, Philippines, Thailand and Sri Lanka. A compendium for Taiwan is now being prepared. The completed national compendia have been entered into a database called COMPEN, using Paradox 3.0.

A regional compendium is expected to be completed by the end of July 1990.

4.11. Committee Elections

The committee confirmed that election of a chairman and three other representatives to the Steering Committee is to be held annually.

4.12. IADSS Development

Foster Cady pointed out that Version 2.0 of the Information and Decision Support System (IADSS) is outlined in the recent issue of *Farm Forestry News* (Vol. 3, No. 4, 1990).

IADSS contains the following databases:

(a) Experiment
(b) MPTS Specialist

(c) Abstract
(d) Soil
(e) Climate

In addition, it includes F/FRED Modeling (FMOD), for statistical analysis of experiment data. The Farm and Village Forestry Database is also in IADSS format.

Version 3.0 of IADSS is expected to be completed in three years. MPTS scientists are encouraged to contribute feedback to the development of the new version.

An area for improvement identified by the committee is the linkage between the Farm and Village Forestry database to FMOD or another analysis package. The new version should also be able to assist in economic analysis.

June 5, 1990

5. Reports of National MPTS Research Meetings

The meeting proceeded with the reports of the national MPTS research meetings (see section 3).

6. Plan for Developing National MPTS Research Networks

Ken MacDicken led discussion of the establishment of national MPTS research networks (see section 4), outlining the following purposes of national-level networks:

(1) improvement of communication at national and regional levels

(2) provision of streamlined, coordinating mechanisms for future F/FRED support

(3) identify mechanisms for increased support from other organizations.

The committee discussed the present status of national development plans.

June 7, 1990

7. Results of Group Discussions

For full reports of the group discussions as accepted by the Committee, see section 5.

7.1. Phase 2 Research

To ensure success in Phase 2, the network's research program should stress

1. standardized methodologies and careful selection of cooperators

2. adequate germplasm supplies

3. improvement of the Asian scientists' capacity to conduct and manage research through training

4. more relevant research for farmers

5. improvement in the conditions of trial sites

7.2. Theme Workshop on the Role of NGOs in Promoting MPTS

The Committee approved the proposal for a theme workshop on the role of NGOs in promoting MPTS, tentatively scheduled for February 1991 in Pune, India.

7.3. Social Science, Economics and Marketing Research in Phase 2

The group suggested that the network should continue to support more interdisciplinary research and prepare guidelines for how such studies will be undertaken.

Network trial designs should include elements of socioeconomic conditions.

Training should include greater emphasis on social science and economic topics.

Economic analysis of network trials recommended at the Los Banos meeting should be pursued, and result in an economic component of IADSS.

A working meeting should take place soon to develop methodologies for multidisciplinary, on-farm research.

Research on demand and supply of MPTS and their utilization, recommended in Los Banos, should be pursued.

The network should sponsor a review of national policies, particularly those that have a direct impact on small farmers.

The group provided a list of priority areas (see page 26).

7.4. New Network Experiments and On-Farm Trials

The group outlined proposals and plans for research on *Dalbergia sissoo* and *Albizia falcataria*, two species widely used in Asia for which scientific knowledge is seriously lacking.

On-farm trials should be technically and socioeconomically valuable, meaning that socioeconomic studies need to be integrated with field experiments. Trials should be intagrated into local land-use practices, and must involve participation of local people.

7.5. Extension for Promoting MPTS

With a background paper prepared by Narayan Hegde as a starting point, the group outlined an action plan through which the network and national networks could address critical needs of extension for promoting MPTS, including heightening policymakers' awareness of the role MPTS in rural economies, administering further small grants, conducting a field tour involving both researchers and extensionists, and the producing materials for use in broadcast media.

7.6. Information Exchange in the MPTS Research Network

Starting from a background paper prepared by Lim Hin-Fui, the group made three recommendations for better information exchange within the network:

1. publication of MPTS Research Notes through the creation of a specific section in *Farm Forestry News*, or some other means

2. establishment of national MPTS information centers

3. encouragement of exchange of MPTS publications directly between network institutions

7.7. Training in Phase 2

In Phase 2, the purpose of training will continue to be to enhance the capabilities of Asian scientists and institutions for conducting MPTS research (see appendix 4). This can be achieved by

a. conducting short- and long-term training courses

b. reviewing and developing training materials

c. providing more support to M.Sc. and Ph.D Programs

Training courses will be offered based on countries' identification of their priority training needs.

7.8. Manuals on MPTS

Discussion groups presented outlines for a series of five manuals on MPTS for use in extension (see appendix 6). Titles discussed were:

Nursery Practices for MPTS
Plantations of MPTS
MPTS in Agroforestry
Tending MPTS
Harvesting MPTS

Before proceeding with preparation of manuals, the network would review existing literature for applicability. The Committee recommended that another manual should consider products utilization and marketing aspects of MPTS.

8. Extending the MPTS Program to South Pacific Countries

Simon Saulei outlined a proposal for extending the MPTS Research Network to the South Pacific countries. The Committee agreed that support for a network trial designed for the sub-region is premature but that PNGFRI should be encouraged to develop a sub-regional network with F/FRED support. Interested countries will be invited to attend network training courses and receive network publications.

9. Sustainability of the MPTS Research Network Beyond Phase 2

The meeting discussed the sustainability of the network beyond the funding period by USAID, which ends in 1995. It was agreed that efforts to obtain support from other donor agencies should continue. The meeting was informed that the Consultative Group for International Agricultural Research is examining existing networks in agroforestry and forestry research, with a view toward identifying those for long-term international support.

10. Data Exchange

Foster Cady briefed the Committee on efforts by the Global Research Unit to facilitate exchange of experiment data with other international organizations such as ICRAF, CATIE, CSIRO, and OFI, at the treatment level. The Committee confirmed that this exchange of data with other networks is desirable.

The critical need for further developing the Farm and Village Forestry Database to permit data manipulation and analysis was raised. The developers of IADSS should consider this in their plans for further system development.

11. Other Business

11.1. Venue of the Next Committee Meeting

The meeting agreed to the following list of possible venues for the next Research Committee meeting, planned for June 1991. In order of preference, they are:

1. Nepal (Kathmandu)
2. India (Pune)
3. Republic of China (Taipei)

11.2. Representative to the Indonesian National MPTS Research Meeting

The Committee selected Simon Saulei to attend the meeting on 19-20 June 1990.

11.3. Schedule for National MPTS Research Meetings

The Committee proposed a tentative schedule for the coming round of national MPTS research meetings, between January and May 1991. The Chairman also noted which committee members would act as guest representatives to each meeting.

Time Period	Country (Representative)
January	
fourth week	India (Marian or Lim)
February	
third week	Philippines (Anoja)
March	
first week	Malaysia (Kailash)
second week	Thailand (Chung)
third week	Republic of China (Junus)

April

first week	Sri Lanka (Kamis)

May

first week	Indonesia (Kedar or Gunasena)

To Be Determined

Bangladesh	Cesar or Deb Roy
Nepal	Suree or Simon
Pakistan	Ombo or Charit
Papua New Guniea	Narayan or Pan

11.4. Network Directory

The Network Secretariat requested that Committee members help to update the directory of MPTS researchers distributed last December.

12. Election of Chairman and Other Representatives to the Steering Committee

Ken MacDicken presided over the election for Committee Chairman for the coming year, in which Suree Bhumibhamon was re-elected. Other representatives selected to attend the Steering Committee (one other biological scientist and two social scientists) were: Kamis Awang, Anoja Wickramasinghe, and Kailash Pyakuryal. Alternates selected were H.P.M. Gunasena (for biological representation) and Junus Kartasubrata (for social-science representation).

3. Report of Recent National MPTS Research Meetings

Bangladesh

No national research meeting has been conducted in Bangladesh.

India *R. Deb Roy/N. Hegde*

A total of 48 participants from various institutions and government agencies attended the meeting MPTS for Agroforestry Systems, where issues of MPTS were discussed in detail. Topics such as socioeconomic studies, tree-breeding techniques, management and production of MPTS, soil amelioration, and MPTS in livestock productivity were discussed.

The national research meeting was held February 2-3, 1990 at the Indian Grassland and Fodder Research Institute at Jhansi.

Indonesia *J. Kartasubrata/T. Sukandi*

The national research meeting will be held on June 19-20, 1990.

The main issues regarding the implementation of the current MPTS research and related activities will be reported, including provenance trials, on-farm trials of alley-cropping technology, research on diseases of *A. mangium*, a case study on farm and village forestry practices, villagers' perception of MPTS, and preferred MPTS.

Malaysia *K. Awang/L. Hin Fui*

Malaysia's third national research meeting was held in March 1990. The participants identified 11 priority areas for future MPTS research: socioeconomic studies, identification of bee pasture trees for honey production, identification of phosphate-extracting plants, management of rubber as a self-sustaining system, agroforestry, plantation establishment without burning, studies on indigenous and exotic fast growing species, dipterocarp cuttings, provenance trials of rattan, production of advanced planting material (nursery) and market surveys of fast-growing trees.

The first issue of MPTS-Malaysia's Newsletter was published. The next issue, along with the proceedings of the national research meeting, will be published soon.

Two theme meetings on MPTS are planned, one in November 1990 and another in mid-1991.

Nepal *K. P. Prajapati/K. Pyakuryal*

Nepal's national meeting has not yet taken place due to the political situation there.

Pakistan *L. Medema*

A national research meeting for Pakistan is scheduled for June 11, 1990. The draft of the country's MPTS national development plan has been prepared for discussion at that time.

Papua New Guinea *S. M. Saulei*

The national research committee met in February 1990 and discussed issues related to an MPTS research program, their relevance to current government policy, and the capacities of the implementing institutions.

The meeting also outlined the national MPTS research network development plan, particularly in two areas:

(1) countrywide survey of MPTS use and propagation by rural communities (on-going)

(2) current development in MPTS research projects

Philippines *C. Nuevo/M. de los Angeles*

The national research meeting was held February 17-18, 1990 in Cabagan, Isabela. The meeting was organized to discuss MPTS biotechnology and socioeconomic aspects of MPTS. The discussion also included the Philippines' master plan for forestry development and two other resource management projects.

At the meeting, the 1989 MPTS Scientific Achievement Award was presented to Dr. Mercedes Umali Garcia, who has contributed to the development of improved organic fertilizers for small-farm use.

The meeting identified directions for future development:

(a) Meeting on the Organizational and Management Needs of the Network

(b) Technology and Information Transfer

(c) MPTS Germplasm

(d) MPTS Socio-economic Research

(e) Impact Assessment of MPTS

Republic of China *H. H. Chung/F. J. Pan*

In March 1990, the national research meeting for Taiwan took place, at which papers were presented on diseases related to Leucaena and Eucalyptus species. The papers reflected the Republic's interest in MPTS studies on large-scale pest outbreaks in commercial plantations.

Following the papers, a panel recommended that the government provide more incentives to encourage farmers to plant MPTS.

Representatives from paper industries, the principal MPTS planters and users, indicated their plans to invest overseas (especially in countries of Southeast Asia) to produce MPTS raw materials for pulping use. This plan arises from the high cost of producing raw materials in Taiwan and the limited land available for MPTS plantations.

Proceedings of the meeting should be available later this year.

Sri Lanka *H.P.M. Gunasena/ A. Wickramasinghe*

The first national research meeting was held on March 1990. The meeting, inaugurated by the Prime Minister, was attended by 107 people. For the first time researchers in different agencies and institutions met to discuss collaborative research. Twenty-one papers were presented in the meeting. Proceedings will be available soon.

The meeting stressed the importance of home gardens and village forests. The national research committee will make recommendations on MPTS research to various government agencies and institutions for implementation.

MPTS-Sri Lanka plans to publish the first issue of its newsletter this year. Information on MPTS research throughout the country has been collected for the national compendium.

Thailand *S. Bhumibhamon/C. Tingsabadh*

Thailand's third national MPTS Research Meeting was held March 22-23, 1990, with 158 people participating.

Conclusions of the meeting were:

- Government plans call for forest area to be increased to 40% of the total land area. This should be broadly interpreted to include area under fruit trees, rubber and other permanent crops. MPTS should be planted on problem soils, with particular consideration given to native species (e.g., teak, bamboo). A Tree-fund should be established to promote tree planting and agroforestry.

- A Local Industry Center is proposed for increasing the value added to MPTS.

- The state should play a greater role in supporting fuelwood and charcoal production.

- Research is required on wood for energy, tree planting on problem soils, agroforestry, wood utilization of MPTS, and the socioeconomic aspects of growing MPTS.

- A newsletter should be initiated for MPTS research in Thailand.

4. Development of National MPTS Research Networks

Development plans for National MPTS Research Networks are being prepared through a series of small, informal meetings of current participants in MPTS research activities. The meetings include key MPTS researchers and research administrators, plus in most cases a member of the Network Secretariat. Individual national plans are being developed through the two stages described below.

Stage 1: Defining National Level Networks

A. Define the scope and focus of the national network in each country, including a list of key institutions and researchers involved and interested in MPTS research. This should also include a concise definition of the purpose and scope of network activities.

B. Propose an administrative plan for disbursement of F/FRED or other donor funds to assist the national network. This should include a five-year budget.

C. State local or national support to be provided to the network.

D. Present a plan for obtaining any necessary additional funds.

E. Describe linkages between the national network and the regional MPTS Research Network, as well as with other national or regional networks.

Stage 2: Preparing for Network Research

A. Conduct a national-level diagnosis-and-design (D&D) exercise to determine high-priority areas for MPTS research targetted for small farms.

B. Prepare a detailed plan for the highest priority MPTS research that might be funded by the Network Secretariat, including network research trials. This plan should focus on only the most critical problems of the highest priority MPTS identified through the D&D exercise.

C. Prepare a plan for exploration, collection, and exchange of seed.

D. Prepare a plan for short-term training that identifies the type of training and number of participants desired by the institutions.

The following paragraphs describe the status of each country's development plan.

India

An informal national committee, led by BAIF in Pune, will initiate an informal network program until a formal agreement with F/FRED is explored further with the Government of India. A quarterly newsletter on agroforestry is now published by the National Research Center for Agroforestry. A detailed plan will be submitted to the Network Secretariat.

Indonesia

A development plan for Indonesia is under preparation. The planned activities of other

national research committees will be discussed during Indonesia's upcoming national research meeting later in June 1990 and sent to the Network Secretariat.

Malaysia

Malaysia has drafted a national network development plan and submitted it to the Network Secretariat. The plan outlines a scheme for closer linkages at the institutional, national, and regional levels, and presents 11 priority areas of research. The plan identifies the need for short-term training on the following topics: social aspects of MPTS, research proposal and report writing, soil management of small farms, and plant propagation for technical assistants. The draft plan also includes a budget for support requested from the Network Secretariat.

Nepal

A preliminary development plan, which lists interested and potential national network members, was submitted to the Network Secretariat at the meeting. The Division of Forestry Research in the Department of Plant and Forestry Research is designated as the lead institution, with the Deputy Director General acting as national network coordinator. The preliminary plan describes the national network coordinator's role and the administrative set-up. The plan will be discussed and a budget drafted at the upcoming national research meeting.

Pakistan

A draft national plan has been prepared for review at the upcoming national research meeting.

Papua New Guinea

A draft development plan for Papua New Guinea seeks support for short-term training and research on rehabilitation of degraded areas and the need for fuelwood and building materials in meeting local needs. Integration of MPTS projects with fuelwood and agroforestry projects will be fostered where resources are limited.

Philippines

The development plan for the Philippines is in the second stage of preparation. The national research committee has already identified the scope of a national network and planned links with other groups, including the Upland Working Group for the Social Forestry Program, the Environmental Education Network of the Philippines (EENP), and the Philippine Council on Agriculture and Resources Research and Development (PCARRD), through its technical committee on agroforestry. The plan presents a scheme for network administration, including an executive committee for research policy and technical review, a permanent secretariat established with UPLB for communications and other administration, and a funding channel. The plan states the goal of organizing a registered research network and linking with similarly established local organizations by the end of 1990.

In 1991, the national network will strengthen interaction with other networks (e.g., EENP, PCARRD, SUAN) and discuss exchange of information through columns in their respective newsletters. The idea is to work within an upland development framework and disseminate technical information on MPTS. Later, this could include exchange visits to research sites and internships, within the Philippines and with other countries.

Republic of China

A work team of 40 scientists from 8 institutions have come up with a research plan, consisting of two major components: (a) pulp and paper manufacturing materials

supply (acacia, eucalyptus and leucaena species), and (b) development of MPTS uses (e.g., rattan shoots as food or medicine, other species as decorative plants).

These two components involve six research areas:

1. socioeconomic studies of MPTS
2. agricultural techniques of MPTS
3. provenance and species trials
4. genetic studies and breeding programs for certain species
5. identification of MPTS uses
6. insect and disease studies

Funding for this research will be sought from sources such as local donors.

Sri Lanka

A development plan for a Sri Lankan MPTS network is in preparation. In the next five years, the national committee plans to:

(a) conduct research on MPTS and develop appropriate agroforestry models and sociological surveys

(b) initiate a newsletter and advisory leaflets

(c) strengthen the network through linkages

(d) formulate a MPTS data bank

(e) establish seed orchards

(f) exchange seed materials

(g) prepare an anotated bibliography of local MPTS research

(h) provide short- and long-term training courses and develop a host graduate curricular on agroforestry

(i) support study tours at national and regional levels

(j) obtain funds from additional sources

Thailand

The National Sub-Committee on Research and Development of Multipurpose Trees of the National Research Council of Thailand, will soon finalize its national development plan for 1990-1994. The plan is expected to include the following:

(a) organization of a theme meeting and seminar to provide recommendations to the government on MPTS policy

(b) examinations of fast-growing MPTS, their environmental impacts, and marketing considerations

(c) development of research on agroforestry practices

(d) establishment of an information database on MPTS

5. Group Reports

Review of Network Experiments and Plans for Phase 2

The discussion was based on a paper prepared by Suree Bhumibhamon. The discussion group participants were:

Kainis Awang (chairman)
Suree Bhumibhamon
Lim Hin Fui
Celso Lantican
Fuh-Jiunn Pan (rapporteur)
R. Deb Roy

Objectives

In its second phase, the project aims should be defined as follows:

- To conduct quality research on MPTS of a standard comparable to that undertaken in agriculture by the international agricultural research centers (IARCs), including standardizing methods for comparable research on selection, improvement, and management of MPTS. Quality research will require careful selection of cooperators for network experiments to ensure maintenance of these research standards

- To ensure adequate supplies of good quality, properly identified germplasm and other material support

- To improve the capacity of Asian scientists and institutions to conduct and manage MPTS research

- To make MPTS research more relevant to small-scale farmers through focussed integration of biophysical and applied social-science perspectives.

Review of Phase 1 Research

Country Level

1. Network field trials for species, provenance assessment and methods development (over 50 field experiments were established).

2. The project provided documented germplasm, soil characterizations, and other material support for field research.

3. Social science and interdisciplinary studies of farmers' tree-growing practices and preferences were conducted.

4. Four national psyllid control research plans were supported.

5. Small research grants on priority topics were administered.

Regional Level

1. The network developed standardized methods and support for combined analysis of network field trials and regional social-science studies.

2. The project provided regional coordination and support for psyllid control research.

3. Germplasm was collected and distributed for evaluation and improvement.

4. Studies on farmer-based tree improvement (tree-breeding ideotypes) were completed.

5. Economic analysis of tissue culture trials was initiated.

Global Level

1. The Information and Decision Support System (IADSS) was developed for recording, analyzing, and exchanging MPTS research data, with databases for soil, climate, experiment information, and reference information on MPTS literature and specialists.

2. A state-of-the-art volume, *Modeling Growth and Yield of Multipurpose Tree Species*, was produced. A second state-of-the-art volume, on Improvement Strategies for Multipurpose Trees, is forthcoming.

3. The project-supported socioeconomic research at CATIE in Costa Rica and links with the MPTS Research Network.

4. The project has made progress in developing a summary database with CSIRO and CATIE for exchange of summary experiment data.

Network Trials

Humid/Subhumid Zone

While these trials on multiple sites are successful in a way unprecedented in Asia, certain weaknesses remain. Problems to be avoided or minimized in future trials include:

1. Originally 17 experiment sites from 6 countries were to be established. But experiments were started only on 15 sites in 5 countries. Cooperators in Pakistan failed to establish an experiment due to seed and nursery problems.

2. Of the 15 established sites, only 13 remained one year after planting. The Nueva Ecija site in the Philippines was burned by grass fire, and one of the TISTR sites in Thailand experienced very poor survival due to drought in late 1987.

3. Even among the remaining 13 experiments, not all have the total required plots due to one or more of the following reasons:

   a. Insufficient seedlings for establishing all the needed plots, caused by poor seed germination or nursery survival for one or two genotypes in particular.

   b. Poor survival of certain genotypes or in certain blocks, probably because of the site influences or poor management.

   c. Damage by animals from the surrounding areas (e.g., cattle and elephant).

   d. Damage by typhoon (Baybay, Philippines).

4. Not all cooperators have followed strictly the standard methodology agreed to when the experiment was designed. This could be due to the following reasons:

   a. Not all the eventual cooperators were involved in the initial experiment design, and given their varied research backgrounds, the need for strict adherence to standardized methodology in a multilocation trial was not fully appreciated.

   b. Insufficient funds to carry out all the stipulated activities. This was because some institutions made no provision to supplement resources provided by F/FRED, or the budget requests to F/FRED were underestimated.

   c. Difficulty in getting the necessary materials, instruments or manpower required by the standardized methodology.

5. The exchange of data has been slow. This could be due to the following reasons:

   a. Not all cooperators have ready access to computers at their institutions, or they themselves are not completely familiar with the use of microcomputers and IADSS.

b. For most cooperators, this experiment is one of several that require their time and expertise.

c. Communication among cooperators had generally been poor, except between the cooperators and the project staff.

6. The output from the trials thus far very limited. Factor 5 above may be one of the reasons for this. The 18-month data are now being analyzed with the release of IADSS version 2.0. F/MOD has almost all the required functions necessary for the analysis.

Arid and Semi-Arid Zone

The experiments are still in the establishment phase. The main problem encountered was poor seed germination (for *Eucalyptus camaldulensis*) and poor survival at some sites.

Network Experiments in Phase 2

The cooperators in the Phase 1 field trials (including trials in the humid/subhumid zone, arid and semi-arid zones, and the *Acacia auriculiformis* provenance trials) are encouraged to:

1. maintain the experiments in good condition until the end of Phase 2

2. use the trials for selection of "plus" trees and further genetic improvement

3. superimpose additional experiments on the trial sites, including

   - isozyme studies on *Acacia mangium* and *A. auriculiformis*

   - studies of farmer preferences regarding fuelwood use of biomass products harvested from the trials

   - studies on suspected hybrid trees of *A. auriculiformis* x *A. mangium*

   - decomposition of *Acacia* phyllodes

   - eco-physiological studies on the trial species

   - economic analyses of the trial species to determine direct and indirect benefits

4. pursue other opportunities that emerge as a result of analysis of the data.

Types of Research to be Supported by the Network

Regional Network Trials

This section reiterates the Committee's findings of July 1989.

1. Species selected for future network trials should fulfill at least three of the following criteria:

   a. produce timber and fuelwood

   b. produce food, fodder, and other useful commodities

   c. grow well in mixed plantations without seriously competing with food crops planted beneath the canopy

   d. improve soil conditions and prevent soil degradation

   e. grow fast under short rotations and possess good coppicing ability

Before selecting additional species, these criteria should be tested with small-scale farmers to confirm that they are desirable characteristics. The regional studies on farmers' use of trees and tree-breeding objectives conducted in Bangladesh, India, Indonesia, Nepal, the Philippines, Sri Lanka, and Thailand should make this possible.

2. The current network trials do not answer questions such as the interaction of MPTS with arable crops. However, introduction of a crop component in the present trials is not feasible. Separate trials incorporating crops grown in the region should be initiated on four or five locations to study the tree-crop interaction.

3. Orientation of the principal investigators in trials methodology is extremely beneficial for ensuring that uniform research methodology is practiced on all network trial sites. This can be done with videotapes and possibly by national-level orientation programs.

4. The following tree species, which have already appeared on lists as priority species, were reviewed for inclusion in network trials.

Artocarpus heterophyllus
Sesbania grandiflora
Albizia falcataria
Gliricidia sepium
Calliandra calothyrsus
Acacia leucophloea
Anacardium occidentale
Caesalpinia sappan
Gnetum gnemon

Anacardium may be excluded, as it is already a cash crop under study by other agencies. *Sesbania grandiflora* has very limited use as fodder and food, but the wood quality is poor. In fact, *Sesbania sesban* provides superior fodder and fuel. Other species like *Azadirachta indica*, *Melia azedarach*, and *Albizia procera* are popular in certain parts of Asia.

One or two species of local importance should be included with the 1987 trials until other species are selected.

5. In the design of future network trials, the following points should be considered:

a. inclusion of farmers' practices

b. evaluation of intercropping trees with agricultural crops

c. evaluation of plant spacing and cropping pattern

d. assessment of economic feasibility of the practice under study

e. incorporation of both biological and social science elements in the design

6. It was agreed that a preliminary group meeting will be held to develop a detailed design (tentatively in October 1990) in Thailand.

7. Poor germination of seeds presented a serious problem on many sites. To avoid this, greater quantities of seed material should be provided to future trial participants.

Small Grants Program

For the next series of small grants, interdisciplinary proposals and proposals on the following priority areas should be given priority:

- Conservation of MPTS germplasm (*in situ* and *ex situ* gene conservation project of selected MPTS)
- Increases in biomass yield through improved silviculture and management (for example, spacing, thinning, fertilizing, coppicing, watering, pollarding) for small farm use (fuelwood, fodder, poles, timber, etc.)
- Improvement and standardization of methods for nursery stock production (including vegetative propagation)
- Establishment of planting stock techniques for low-input, small-farm use
- Genetic improvement of MPTS
- Additional uses of MPTS

- Agroforestry techniques of MPTS grown in association with food, fodder, fiber, and medicinal crops (including diagnosis of land-use and farmer problems)

- Pest and disease control

- Nitrogen-fixing and mycorrhizal organisms for inoculation of trees to be planted under stress conditions

- Effects of MPTS on soil and water conservation

- Use of MPTS within indigenous forests and other land management systems

- Eco-physiological studies with the existing network trials and selected MPTS, including ways that MPTS can help ameliorate global climate change.

- Local institutions, beliefs, and customs affecting production and use of MPTS by small-scale farmers

- Comparison of social forestry programs, especially vis-a-vis MPTS

- Demand for MPTS products produced by small farmers

- Economic and financial analysis of MPTS cultivation

- Adoptability of MPTS by small-scale farmers

- Infrastructure and organization required for promotion of MPTS use

- Utilization of MPTS and market research

- The role of MPTS in addressing the problems of deforestation

- Growing MPTS in various agro-ecological zones

Collaborative Projects

It is proposed that F/FRED support integrated research projects involving perhaps three institutions in the region, working on a particular species (e.g., *Paraserianthes falcataria*). In such a program, each institution would focus on a particular research aspect of the species.

The field tour of humid/subhumid network trials should be repeated, particularly after completing the final measurement at 36 months. As proposed at the last Committee meeting, a field tour in the arid and semi-arid zone can be arranged one year after the establishment of the trials. The field tour would review the progress and problems faced in the network experiments in South Asia, and would include a concurrent travelling seminar on issues recommended by the Research Committee. In the humid/ subhumid tour, the travelling seminar emphasized:

- guidelines for nursery techniques

- refinement of standardized MPTS research methods

- modification of the minimum data set for the network trials

- data management and analysis

- design for future network experiments in that zone

- future field tours

- means of making research more responsive and accessible to small farmers' needs

Selected members of the Research Committee and project staff should join this field tour.

Mountain Zone

As planned in Phase 1, efforts to seek donor support for the establishment of network trials in the Mountain Zone should be undertaken early in Phase 2.

New Network Experiments

The discussion group participants were:

Foster B. Cady
H.P.M. Gunasena
Junus Kartasubrata (rapporteur)
Kenneth G. MacDicken
Kedar P. Prajapati (chairman)
Taulana Sukandi

Three proposed network experiments were discussed:

1. *Dalbergia sissoo* (paper prepared by K. MacDicken)

2. *Albizia falcataria* (paper prepared by T. Sukandi and O. Satjapradja)

3. On-farm trials (paper prepared by J. Kartasubrata)

Recommendations

1. *Dalbergia sissoo*

Dalbergia sissoo is a highly valued tree species in parts of India, Nepal and Pakistan. It provides excellent timber and a range of other products, including fodder, fuelwood, and medicine, yet has been inadequately studied. A cooperative field trial and information exchange on its silvicultural management and utilization, with sharing and evaluation of germplasm, will enhance scientific knowledge and plantation of this important species. A regional research plan has been developed as a guide for governments and funding agencies.

An integral part of the proposed Regional Research Plan for *D. sissoo* is an international series of *D. sissoo* provenance trials (see appendix 1 for experimental design). Collaboration for a total of seven experiments has been arranged with national institutions in India, Nepal, and Pakistan. Proposals have been submitted for sites, experimental design, spacing and plot size, minimum data set, and control of die-back disease. Funding arrangements for the experiments remain to be finalized.

2. *Albizia (Paraserianthes) falcataria*

Albizia falcataria is widely planted in a number of Asian countries. *Albizia* provides light construction/furniture timber, raw material for boxes and pulp industry, and leaves for fodder. The tree is also used for shading agricultural plantation crops.

Due to the increase in domestic and export demand for *Albizia* timber, Indonesia has embarked on an *Albizia* plantation program on village and forest lands. The program welcomes opportunities for information exchange and research among interested countries in the Asia-Pacific region, particularly in the humid/subhumid tropics.

Three types of *Albizia* research are proposed:

(1) Provenance trials

(2) Studies on control of pests and diseases, in particular the *Albizia* stem borer (*Xystrocera festiva*)

(3) Agroforestry systems using *Albizia*

The provenance trial would attempt to determine high-yielding varieties resistant to the stem borer and other pests.

The objective of the research on control of pests and diseases would be to find an effective and efficient method of controlling pests and diseases of *Albizia* plantations.

Research on agroforestry systems would seek suitable crop combinations using *Albizia falcataria*, in particular those effective after crown closure.

This species should be considered for network provenance trials. Adequate funding for the research program would need to be obtained.

3. On-farm trials

On-farm trials of MPTS have to be technically and economically feasible and socially acceptable. At the planning stage, the following steps have to be undertaken:

1. A survey of local demand for timber, fuelwood, fodder, and food from trees, raw material for wood-based industries, etc.

2. A survey of existing production systems, including agroforestry, to understand why they have been used by the local farmers. An MPTS on-farm trial should be integrated with the existing beneficial farming practices.

3. An inventory of local resources, such as land, labor and capital, to determine resource availability

Implementors of on-farm trials motivate local farmers using:

a. participatory problem identification

b. participatory setting of goals and targets

c. participatory selection of technologies to be applied

Identify trial plots on farmers' own land, aggregated to 10-20 ha (depending on local conditions). The trial must be managed by a field officer/facilitator.

The participants in the trial should be organized in farmer groups for bottom-up and top-down communication.

As trial implementation progresses, close monitoring is necessary to identify necessary corrective actions Regular monitoring can be performed by the field officers. For evaluations of long-term achievements, special teams should be recruited.

The approach of participatory action research outlined above has been successfully implemented in many Asian countries, and could be followed for on-farm MPTS trials in the region. Adequate financial support should be allocated for the trials.

Social Science, Economics and Marketing Research in Phase 2

The discussion group participants were:

Charit Tingsabadh (chairman)
Marian delos Angeles
Kailash Pyakuryal
Ancja Wickramasinghe
Lee Medema

Background

The group used the report of the second Research Committee meeting, held July 3-6, 1989 in Los Banos, the Philippines, as a basis for discussion. Research priorities in the areas of social science, economics, and marketing identified and approved by the Research Committee are contained in that document.

On this basis, the group reviewed the progress of on-going research and, based on this review, made suggestions to update and improve on the priorities established by the Research Committee during the Los Banos meeting. The research recommendations are organized by technical subject matter areas (social science, economics and marketing, and interdisciplinary) and by status categories (on-going Phase 1 research that should continue and new Phase 2 research).

On-going Phase 1 Research

Social Science Research

The study on farm and village forestry use practices: While the report on the analysis of the data is not yet completed, the group agreed with the recommendation of the Los Banos meeting that the regional study should be the basis for socioeconomic research in Phase 2.

The data set and methods for field research and analysis should be refined in future studies. The database and methods should also be used in appropriate studies supported by the small research grants program and in the social science and economic components of multidisciplinary research. Steps need to be taken to facilitate extraction of information from the database for use by others (such as programming work using ASCII files for easier data export).

Economics and Marketing

Plantek tissue culture trials: The economic analysis of these trials should continue. While delays in the implementation of the trials have been unfortunate, some of the species will be ready for planting this year. All participants are willing and ready to collect the cost information necessary for an economic analysis.

Analysis of pilot fuelwood questionnaire: A pilot questionnaire, designed to address issues of supply, demand and marketing for fuelwood and charcoal at the village level, was tested in six villages in the Philippines in conjunction with the farm and village forestry study. Although delayed due to difficulties in the farm and village data set, analysis of the questionnaire should continue. Results are expected to be available in late June 1990. If the results provide useful information, it is recommended that use of the questionnaire be expanded in conjunction with the Farm and Village Forestry database.

Marketing course: The Los Banos meeting questioned the need for training in marketing before methods of analysis have been developed. It was felt that the methods for analysis would depend upon the groups to be trained, and these groups had not yet been identified. The Network Secretariat has begun training in marketing with a course in Thailand, with others scheduled in the Philippines and Indonesia. The group felt that marketing training is important and should

continue in Phase 2, but the course syllabus and materials must be reviewed.

New Research for Phase 2

The group emphasized the important role of the Project in encouraging an interdisciplinary perspective among researchers. For example, biological researchers could state the socioeconomic implications of their studies; studies should likewise be set in the context of available knowledge by maximizing the use of the compendium. Social science's focus on the need to transform small-scale farmers into economically gainful entrepreneurs means that subsistence needs, production of marketable surplus, and meeting of industrial uses are all important. These concerns form the basis of the priorities below. On-farm network research will provide an appropriate focus for such integrated research.

Social Science Research and Training

Social science studies in conjunction with network trials: A suggestion of the Los Banos meeting was to conduct social science studies in conjunction with the network trials. The discussion group agrees.

Local multidisciplinary studies: The Los Banos meeting recommended that local, multidisciplinary studies be conducted in the context of broad national interest to meet the national priorities established in national MPTS research meetings. The group agreed with this recommendation. Such studies should also be conducted for priority research areas in economics.

Training: Social science should play a more prominent role in the training component of the Coordinating Unit. The course on social-science concepts for foresters taught in Phase 1 should be repeated and other courses in social-science research methodology should be developed.

Economics and Marketing

Economic analysis of network trials: The group agreed with the Los Banos meeting's suggestion that an economic analysis is needed of the network trials in the humid/sub-humid, arid, and semi-arid zones. As a product of such a study, an economic analysis program should become a component of IADSS.

Assessment of demand and supply: The group endorsed the priority need for an assessment of the demand, supply, and market channels for MPTS products at the national level also showing the international linkages.

Economic analyses of MPTS utilization research: The Los Banos meeting also recommended that economic analysis be a major component of MPTS utilization research. This would include economic and marketing studies of utilization studies of wood, bark, leaves, flowers, and fruits of MPTS. These economic studies should be given high priority and steps to start them early in Phase 2 should be taken immediately.

Development of a cadre of economists for planning and peer review: With the absence of an economist at the Network Secretariat at the start of Phase 2, it is important that a mechanism be developed for getting economic input into network activities. The group proposed that a cadre of economists be developed that will meet periodically to review and plan network activities in economics.

Development of standard research methods: Development of appropriate research and analyses methodologies need to be developed and distributed to regional scientists in the areas of economic analyses and market assessments. This was proposed

during the Los Banos meeting in the form of endorsing the development of an approach for "forest extension research and development" or a sociological and economic "tool kit" for use by social forestry workers.

Training: Economic analysis should be included in the network's training program . This should be in the form of refresher courses for professionals as well as introductory courses for foresters, extension agents, etc. MOU and LOA institutions should be enjoined to send participants to these courses who would eventually implement the network's social science and economic researches.

Interdisciplinary Research

The development of methodologies for multidisciplinary, on-farm research should receive high-priority attention. Implementation of on-farm research should await the development of such appropriate methods and the identification (and training) of appropriate multidisciplinary teams to conduct the research. Such teams could also be used to assess research problem areas and develop appropriate research agenda to be reviewed by the Research Committee.

The Los Banos meeting also recommended criteria for the adoption of new species in future network trials, and recommended that these criteria be tested with small-scale farmers to confirm their desirability. The usefulness of the tree ideotype studies is a case in point. The group recommended another such study using an interdisciplinary team approach.

The Los Banos meeting also recommended that the design of future network trials should consider assessment of economic feasibility and incorporate social-science elements. It was agreed that a preliminary group meeting be held prior to the next Research Committee meeting to develop a detailed design. It is recommended that such a meeting be held as soon as possible, perhaps in the fall of 1990.

The group recommended studies be undertaken to assess the usefulness and adoptability of network research results. Such an assessment would need to be interdisciplinary and focus on issues of technological feasibility, social acceptability, and economic gainfulness. For example, it is recommended that an analysis of existing national forest policies be examined to determine obstacles to and/or incentives for the adoption of research results by small-scale farmers.

There is, in fact, a marked need to conduct a review of national policies that affect small-scale farmers, including not only forest policies but also land-use and macro-economic (e.g., credit, trade) policies, among others.

Specific Priority Topics

1. Macro-level assessment of existing policies
2. Changes in forestry regulations and their impact on risk, etc.
3. Timber trade beyond national boundaries and their impact on small-scale farmers - industrial use from a small-scale farmer to supply commercial needs.
4. Fodder production and demand
5. Labor requirement for growing trees and farmers' constraints
6. Wood product market research for defining what can be feasibly grown, where credit should go, and how much

Training in Phase 2

The discussion group participants were:

Kamis Awang
Hsu-Ho Chung
Junus Kartasubrata
Celso B. Lantican (chairman)
R. Deb Roy (rapporteur)

The group recommended that the Committee adopt the training plan prepared by the Training Specialist (see appendix 4), with the following modifications:

Graduate training support - Because graduate training is very much needed, the project should continue to search for fellowship sponsors.

The Government of the Republic of China is currently discussing with Winrock the possibility of R.O.C funding for graduate fellowships and research through the MPTS Research Network.

Courses to be offered - Include (1) *Soil and water conservation through MPTS-based farming systems* and (2) *Community organizing*.

Training Materials/Facilities - Include provision of assistance for maintenance of existing farms that can be used for demonstration and training.

Curriculum development - Focus on provision of assistance for:

- o national curriculum development workshops
- o a curriculum-related study tour
- o sponsored participation in courses on curriculum development

In the Committee's discussion, questions were raised as to whether a shortcourse on community organizing lay beyond the network's comparative advantage in promoting research.

Theme Workshop: The Role of NGOs in Promoting MPTS

The discussion group participants were:

Hsu-Ho Chung
Narayan Hegde (chairman)
Cesar Nuevo
Simon Saulei
David Taylor (rapporteur)

For the proposed four-day theme workshop, nongovernmental organizations (NGOs) would include private voluntary organizations, MPTS users associations, cooperatives, and NGO unions or federations. The workshop would also include forestry and social scientists, policy makers, and representatives of the donor agencies.

Themes for Technical Sessions

1. Experiences of NGOs in Promoting MPTS with Case Studies

2. Scope for NGOs to Promote MPTS

   A. For small-scale farmers
   B. For large-scale plantations

3. Role of Government and International Organizations in Strengthening NGOs

Group Discussions

Group discussions following the technical sessions would separately address three aspects of successful activity by NGOs:

1) Forestry Extension, including Motivation, Training, and Transfer of Technology

2) Production and Marketing

3) Influencing Policymakers

Field Trip

The workshop should include a field trip, lasting one day or two afternoons, to local NGO activities. This should probably take place on the third day. Post-workshop field trips could be an additional program.

Participants

Participation would combine voluntary papers received in response to a brochure announcement, and presentations by specially invited guests.

Special invitees would include NGO leaders, international donors, and farmers, who could provide their impressions of working with NGOs.

Venue

The workshop should be held in a country where

- a large number of NGOs are involved in promoting MPTS for rural development

- a local organization is willing to make arrangements and has access to appropriate field trip sites

- visa formalities can be easily processed

Given these criteria, the working group suggested the following possibilities:

1) Pune, India
2) Manila, Philippines
3) Indonesia
4) Thailand

Co-Sponsorship

Winrock should approach the following organizations to co-sponsor the workshop, in view of their commitment to promote NGOs and MPTS:

- FAO
- IDRC
- World Bank
- World Resources Institute
- Asian Development Bank
- Ford Foundation
- U.N. Environmental Programme
- Other international aid agencies active in the host country

Supporting MPTS Extension

The discussion group participants were:

Suree Bhumibhamon
H.P.M. Gunasena
Narayan Hegde (chairman)
Cesar Nuevo
Taulana Sukandi
David Taylor (rapporteur)

The objective of this proposed program, to the degree that it could be supported by the network, would be to support extension of MPTS information to farmers and national scientists in the areas of research, production, and utilization.

Targets:

1. promote research on MPTS and extension
2. obtain support for MPTS development by national policy makers
3. encourage establishment of national MPTS networks
4. popularize MPTS cultivation in rural areas
5. explore wider uses of MPTS

The following action plan follows these five targets.

1. Researchers

A. Update the network's mailing list and continue to provide literature and slide sets. Strengthen the existing program for providing literature to researchers.

B. Provide small grants for critical equipment and research, including on-farm research.

E. Develop a concept paper on the role of MPTS for distribution to other researchers outside the network.

D. Sponsor a working group meeting to develop an inventory of seed sources available to researchers.

2. Policy Makers

A. For policy makers, develop a video/slide set highlighting the role of MPTS in developing rural economies. This should be distributed to all important agencies concerned with MPTS promotion, as identified by the Research Committee members from each country.

B. Research Committee members should identify national policy makers for inclusion on the network's mailing list, to ensure they receive MPTS information appropriate to them.

C. Encourage education departments to incorporate MPTS in curricula of elementary and secondary schools.

D. Approach universities to develop courses on MPTS. Such courses already developed elsewhere in the region can circulated among other universities. The national network coordinators would identify the appropriate individuals for contact.

3. National MPTS Networks

A. Encourage the formation of national networks, and provide grants for in-country meetings, training, travel, a small secretariat, newsletter, publications; also encourage links with other national networks.

B. Obtain a list of national network members from each network coordinator for inclusion on the *Farm Forestry News* mailing list.

4. Popularization of MPTS

A. Develop posters on successful, specific MPTS systems, and encourage local agencies to develop further posters and handouts, through the national networks.

B. Support development of video presentation of specific MPTS techniques for local agencies to use.

C. Develop materials for local broadcast media, and approach local media to use these materials.

D. Provide small grants for local agencies and NGOs to prepare MPTS nurseries for distribution to farmers. National network coordinators would identify the interested and capable local agencies.

E. Support a travelling field tour on the role of extension, involving both researchers and extension agents.

F. Develop materials for farmer training. National networks should identify interested local agencies for preparing and organizing these courses.

G. Encourage networks to identify farmers for participation in field tours (for example, to on-farm and network trials, and to successful production and marketing projects).

H. Encourage MPTS demonstrations along roadsides and community lands and homesteads, approaching these through national networks.

In these activities, the national network coordinators would act as resources for technical information to local organizations already engaged in this work.

5. Exploring MPTS Uses

A. Compile the various uses of MPTS in the region for distribution as handouts.

B. Provide small grants for exploring other uses of MPTS.

C. Provide small grants for studying wood and fodder properties for MPTS uses, particularly to fill gaps in existing information.

D. Develop literature/handouts regarding the use of MPTS for local industries, highlighting how MPTS may replace traditional raw materials.

E. Conduct a workshop involving wood-based industries and credit organizations on the uses of MPTS in local industries.

Information Exchange

The group discussion participants were:

Lim Hin Fui (chairman)
Simon Saulei (rapporteur)
Ken MacDicken
Fuh-Jiunn Pan
Kedar Prajapati
Foster Cady

Objective

To recommend ways of further developing information exchange in MPTS Research Network.

Discussion

The group discussed the background paper prepared by Lim, which pointed out the importance of continuing existing arrangements of information exchange among the Network Secretariat, the National MPTS research committees, and local organizations. The group made the following recommendations regarding the roles of the Network Secretariat and national MPTS networks.

Network Secretariat

1. The Secretariat should disseminate MPTS Research Notes, either through the creation of a special section in *Farm Forestry News* or through some other arrangement. This requires national MPTS networks and Research Committee members to provide information to the Network Secretariat.

2. The group suggested support for establishment of MPTS information centers in countries participating in the network.

National MPTS Research Networks

National networks should:

1. Provide information to the Network Secretariat for distribution.

2. Establish national MPTS information centers, preferably in libraries.

3. Develop mechanisms for preparing and distributing information to local clients (extension officers, industry and farmers).

4. Encourage the exchange of publications among national and regional network institutions.

The list below indicates MPTS-related publications produced in each country.

Country	Publication
India	*Indian Forester* *Indian Journal of Tree Science*
Indonesia	*Rimba Indonesia* *Duta Rimba* *Bulletin of Forest Research and Development*
Malaysia	*International Journal of Tropical Forest Science* *Malaysian Forester* *Pertanica*
Nepal	*Ban Ko Tankari*
Papua New Guinea	*Tropical Forest Research Notes* *Klinki*
Philippines	*Journal of Philippines Development* *Sylvatrop* *Canopy* *Upland Research News*

Republic of China	*Leucaena Research Reports* *Bulletin of Taiwan Forest Research Institute* *Bulletin of Taiwan University Experiment Forest* *Bulletin of Chung-hsin University* *Bulletin of National Chia-yi Agricultural College* *Quarterly Journal of Chinese Forestry Association* *Taiwan Forestry Journal* *Modern Furniture* *Forest Products Journal* *Modern Silviculture*
Sri Lanka	*Journal of Agriculture*
Thailand	*Nitrogen-fixing Trees Research Reports* *Thai Journal of Forestry*

It is suggested that the exchange of publications between organizations take place through library arrangements.

Appendices

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Cooperative Research on Dalbergia sissoo

Dalbergia sissoo Roxb. (shisham or sissoo) is widely recognized as an important multipurpose tree species in parts of India, Nepal and Pakistan. It is a highly valued timber and provides a range of other products such as fodder, fuelwood and medicine. Yet it has been inadequately studied. As a result, little progress has been made in improving the cultivation and management of sissoo.

While sissoo has been used on small farms for centuries, and large-scale plantations have existed for over 100 years, research has been spotty and largely uncoordinated. Very few studies have resulted in findings that are being implemented in the field. Seed for new plantings in both the private and public sectors are almost entirely from unimproved sources. Farmers probably manage and use sissoo timber, leaves, and branches just as their ancestors did centuries ago. The popularity of the timber for furniture, carving, and turning has, however, resulted in the decimation of natural stands. If this species is to continue to be available to consumers and still generate more money for growers, an intensive, systematic research program is needed.

Since *Dalbergia sissoo* is indigenous to parts of India, Nepal and Pakistan, a coordinated regional effort is likely to yield greater results than three independent research programs. Sharing and evaluating germplasm, conducting cooperative research, and exchanging information on the silviculture, management, and utilization of sissoo are likely to improve the effectiveness and efficiency of research on this important species.

Eight scientists from three countries met in Bangkok in September 1989 to review sissoo research and prepare a draft research plan for consideration by national research programs. The research plan is intended as a step toward enhanced regional research on *Dalbergia sissoo*. It is hoped that the Regional Research Plan will serve as a guide to research and funding agencies, both national and regional, as they consider the needs and opportunities for sissoo research. The F/FRED Project has made an initial commitment to support regional sissoo research in India, Nepal and Pakistan.

An integral part of the proposed Regional Research Plan is an international series of *Dalbergia sissoo* provenance trials. Collaboration for these experiments has been arranged in India through the BAIF Development Research Foundation in Pune, in Nepal through the Department of Forest and Plant Research, and in Pakistan through the Pakistan Forest Institute for seed collections and provenance trials. A total of seven sites have been proposed for this series of experiments, using the experiment design below.

Experimental design: Randomized complete block design with 15 provenances, 4 blocks per site

Spacing and plot size: 2 x 2 m with 49 trees per plot (7 rows of 7 trees). Total experiment would be 1.17 ha. Minimum data set:Survival, stem height and diameter at 10 cm and 1.3 m will be measured at every six months beginning at six months after transplanting. The number of stems and a form rating will be recorded at 24 months. Data will be exchanged using IADSS software, as for other F/FRED-funded network trials.

Seeds for the experiment were sent out by May 1990.

Regional Study on Farm and Village Forestry

Chart Tingsabadh

Background

The Regional Study on farm and Village Forestry began in 1989 in Bangladesh, Indonesia, Nepal, Philippines, Sri Lanka, and Thailand. The objective of the study was to "determine how selected social and economic variables affect the need and uses of tree products by farmers, in order to scale and marginal farm households."

A single conceptual framework and data collection procedure was used to carry out the study in the six countries. A computer program for storing and processing the field data was developed by F/FRED for use.

Progress of the study was reported at the January 1990 meeting at Chulalongkorn University Social Research Institute, Bangkok, Thailand.

F/FRED Research Support

Field work was supported by the Coordinating Unit; the Farm and Village Forestry software was developed by the Global Research Unit. Support for additional fieldwork sites was obtained from Ford Foundation in Thailand and the Philippines, and from GTZ in Sri Lanka. Support for the January 1990 meeting in Bangkok was obtained from FAO.

Problems and Constraints

The January meeting discussed the progress of the related case studies conducted by cooperating researchers and problems encountered in the regional study, with the following main points:

1. Budget limitations restricted researchers' time in the field for observation.

2. Translation of the standardized format for data collection and recording proved difficult. Some training in social scientific field methods was also necessary for field researchers.

3. The development of the data processing software at a location far removed from the researchers, and the simultaneous evolution of the software, made for difficulties for researchers in using the program, and led to some duplication of work.

These problems were mostly solved at the January meeting, and researchers were able to continue with the analysis and write-up of the study.

Future Directions

The following recommendations were made at the January meeting:

1. The study should be replicated on more sites to recognize greater variation in the agro-climatic zones and social and economic conditions.

2. More purposive criteria for site selection should be employed to obtain the required range of agro-climatic and socioeconomic variations.

3. Topics that should receive added emphasis are:

   - in-depth studies of "preferred species"

   - work task allocation by the sexes in forest resource management, including processing activities

   - quantification of use of trees for fuelwood, timber and other major uses

   - investigation of energy efficiencies of fuelwood and equipment used

   - assessment of potential supply of fuelwood and timber from sources sued by the communities

   - fodder sources and use, from grasses and tree leaves, by season, to complement tree-fodder

4. The network should support dissemination of the research findings in local-language publications and presentation materials.

Regional Research Program on Leucaena Psyllid Control

B. Napompeth

The Regional Research Program on Leucaena Psyllid Control was established in 1987 with F/FRED sponsorship soon after the invasion of the psyllid (*Heteropsylla cubana*) that caused severe damage to leucaena trees and plantations in Asia and the Pacific, starting from Hawaii in 1984. The countries in the region that helped to launch the regional effort were Indonesia, Malaysia, Philippines, Republic of China and Thailand. In 1989, Australia, Sri Lanka and Hawaii (U.S.A.) joined the regional program.

The program is administered by national coordinators from participating countries, through the regional coordinator and the Leucaena Psyllid Advisory Committee. F/FRED has provided substantial financial support, with nominal funding coming from each national program. IDRC has also funded national programs in Indonesia and the Philippines, and NFTA helps coordinate leucaena psyllid tolerance (LPT) trials in all participating countries. The initial regional research program is scheduled to be completed at the end of 1990.

Three meetings supported by F/FRED (Bangkok, March 1987; Manila, June 1987; and Bangkok, April 1988) have highlighted on-going research and results. An International Workshop on Leucaena Psyllid Management held in Bogor, Indonesia in January 1989 resulted in policy and research recommendations. Primary recommendations were that biological control and planting of resistant varieties should form the basis for leucaena psyllid management, and that international donors and development agencies should coordinate closely to improve research and development of leucaena and other multipurpose tree species.

Current Research Activities

In the regional research program, each country identified and proposed its own priorities based on available resources of expertise and facilities. Research topics undertaken by the participating countries are listed below.

<u>Australia</u>

Resistance of *Leucaena leucocephala* to the psyllid
Sampling techniques to assess psyllid populations
Predator and parasite surveys

<u>Indonesia</u>

Ecological investigations
Host relationships
Host plant resistance
Biological control

Malaysia

Biology, sampling and population dynamics
Screening for resistance to leucaena psyllids
Biological control
Entomopathogens

Philippines

Biology and mass-rearing of predators
Socioeconomic impact
Seed production and evaluation of psyllid-resistant selections

Republic of China

Search and evaluation of indigenous natural enemies
Isolation of local entomogenous fungi
Hybridization and selection of resistant and vigorous leucaenas

Sri Lanka

Annual cropping between the alleys of leucaena to achieve a biological stability
Testing resistant varieties
Identification of natural biological control agents

Thailand

Ecological investigations
Determination of economic threshold levels
Evaluation of native natural enemies
Introduction of exotic natural enemies
Evaluation of microbial control agents
Development of an integrated pest management (IPM) program
Determination of nature of resistance
Evaluation of resistant genotypes
Psyllid population monitoring methods
Evaluation of farmer-generated control techniques

U.S.A. (Hawaii)

Supply of available natural enemies of leucaena psyllid for introduction to the regional research program (State Department of Agriculture)
Coordination of LPT trials (NFTA)

As a result of this regional effort, a number of tolerant and/or resistant varieties and hybrids of leucaena have been identified. The coccinellid predators, *Curinus coeruleus* and *Olla abdominalis*, as well as the nymphal parasite, *Psyllaephagus yaseeni*, have been introduced to the region. Two scientists from the Philippines and Thailand have been trained in biological control of leucaena psyllid in Trinidad and the United Kingdom, in conjunction with IDRC and CAB International Institute of Biological Control. To achieve most of its research goals, it is anticipated that the regional program will continue for three to five years beyond 1990.

Training: Review and Future Plans

C. B. Lantican

Introduction

The cooperative agreement between Winrock International and the U.S. Agency for International Development (A.I.D.) calls for development of a training program in Phase 2. This paper provides a brief review of the accomplishments in training in Phase 1, describes the objective of the program in Phase 2, and outlines the activities that will be organized.

Review of Training in Phase 1

In Phase 1, the Project's training program:

- Sponsored six fellows from Bangladesh, Indonesia, Malaysia, Nepal, Philippines, and Thailand for doctoral training at the Michigan State University. The programs of study arranged for the fellows require two years of course work at the university and one year of thesis work in their home countries. The fellows are expected to complete their course work during the third quarter of 1990.

- Organized and conducted nine short courses attended by 294 participants from the following countries:

Bangladesh	Papua New Guinea
Indonesia	Philippines
Malaysia	Republic of China
Nepal	Sri Lanka
Pakistan	Thailand

- Co-sponsored several courses related to MPTS research. More than 50 scientists in the network have participated in these courses.

- Sponsored scientists in the network to participate in courses, seminars, and workshops relevant to MPTS offered by other organizations in Asia and the United States. More than 20 MPTS researchers have directly benefitted from this component of the program.

Phase 2 Training

The objective of the training program in Phase 2 is to continue to enhance the capability of Asian institutions to:

- design, establish, manage, and analyze MPTS experiments

- adapt and transfer technologies to farm use, according to farmer's needs and preferences for improved MPTS production and use

The program will consist of four major components:

- graduate training support
- short-term training
- development of training materials/facilities
- assistance for curriculum development

Graduate Training Support

No new fellowships for graduate training are planned for Phase 2. However, support for graduate theses, particularly for the Ph.D. fellows selected in Phase 1, will be provided. Support for graduate theses of other students will be made available through the project's small grants program.

Short-Term Training

This component of the program will address the following training needs of MPTS researchers in the region:

- *Research methods for the social sciences*
- *Research problem identification and proposal preparation*
- *Technical writing and presentation*
- *Technology packaging and dissemination*
- *Information management*
- *Financial/economic analysis*
- *Tree products marketing*
- *Multivariate methods for MPTS research*
- *Rapid rural appraisal and agro-ecosystem analysis*
- *Participatory research methods*

These training needs have been identified through:

- consultations between Network Secretariat staff and officials of MOU/LOA institutions

- consultations with MPTS researchers and previous participants of F/FRED training courses

- discussions in national research meetings

- discussions in meetings of the Steering and Research committees (Bangkok and in Los Banos in 1989)

The following strategies will be used to meet the above-mentioned training needs:

- course development
- course co-sponsorship

- sponsorship of participants to existing courses
- organization of study tours

The Training Specialist will undertake course development and organization in collaboration with institutions or individuals with a demonstrated ability to design and conduct short courses for international audiences. Possibilities for course co-sponsorship by other organizations will be explored after course designs have been completed.

The Network Secretariat will co-sponsor courses designed by other organizations where they substantially cover the training needs of MPTS researchers.

As in Phase 1, the Project will sponsor participation of MPTS scientists to relevant courses. The inventory of these courses will be updated as new information becomes available. Announcements about future offerings will be made through *Farm Forestry News*.

Study tours provide an effective means of acquiring new knowledge. Emphasis will be placed on visits to F/FRED-supported projects such as the network field trials, international provenance trials, and experiments under the small grants program. Study tours or field trips will be included as part of some of the courses to be offered.

Courses Planned for Phase 2

Courses to be offered in Phase 2 include continued offerings of several courses conducted in Phase I and a number of new courses. Phase 1 courses that will continue to be offered are:

- *Research problem identification and proposal preparation*
- *Technical writing and presentation*
- *Marketing of tree products from small farms*
- *Microcomputer applications*

Research problem identification and proposal preparation has been conducted in Indonesia, Pakistan and Sri Lanka. The need for this course became apparent when the proposals for research grants in Phase 1 were being evaluated. Requests to offer the course have been received from Papua New Guinea and Nepal.

Technical Writing and Presentation has been offered only in Taiwan, where it was conducted by the Singapore-based ASEAN Regional Language Center. MPTS researchers in Indonesia and Sri Lanka have expressed a strong interest to have this course offered in their countries.

Marketing of tree products from small farms has been offered in Thailand and in the Philippines. Requests have been received to present it also in Indonesia and Pakistan.

A course on *Microcomputer applications in forestry research* was conducted in 1988 in Malaysia with participants from throughout the region. The course focussed on two general topics: databases and spreadsheets. The course on microcomputer applications to be offered in Phase 2 on a roving basis will not duplicate coverage on these topics, but will emphasize use of the MPTS research compendiums and the latest version of IADSS.

New courses to be offered include:

- *Statistical methods for social science research*
- *Technology packaging and dissemination*
- *Information management*
- *Financial and economic analysis for MPTS researchers*
- *Multivariate methods for MPTS research*
- *Rapid rural appraisal and agro-ecosystems analysis*
- *Participatory research*

Two of these courses will be offered to participants from throughout the region: (1) information management and (2) technology packaging and dissemination. The rest will be offered in participating countries on a roving basis.

F/FRED's experience in Phase I has shown that conducting short courses on a roving basis has the following advantages over courses offered to regional audiences:

- Courses are offered only where they are most needed.
- It is more cost-effective. For the same amount of money, more participants can be trained.
- Course knowledge is spread more broadly in each country.
- It promotes linkages at the national level.
- It permits a greater use of specific, local examples, which helps make courses more relevant to local needs.

Development of Training Materials/Facilities

This component of the program will focus on the development of or search for manuals, slide sets, video programs, and computer software useful for training, and will include the development of training facilities such as MPTS demonstration farms.

In developing and/or compiling training materials, priority shall be given to the following:

Type	Subject/Description
Books/manuals	Rapid rural appraisal
	Participatory research
	Financial and economic analysis for MPTS research
	Technology packaging and dissemination

Slide sets/video programs	Soil and water conservation in hilly lands through farm forestry
	Social science concepts and methodologies for foresters and agricul-turists
	MPTS germplasm collection and handling
Interactive software training packages	Design of species and provenance trials
	Identification of MPTS pests and diseases
	Rapid rural appraisal
	Financial and economic analysis
	Agroecosystems analysis
	Tree improvement

The Project will support development of MPTS demonstration farms that, in addition to researchers, can be used to train teachers, extension workers, farmers, and even policy makers and implementors. Subject to the availability of funds, at least one demonstration farm will be established in each country in the network.

Update on the Compendium of MPTS Research

C. B. Lantican

Background

The MPTS Research Compendium is an inventory of completed and on-going research on multipurpose tree species in Asia. Work on the compendium was initiated in seven countries during the second quarter of 1989. With the exception of the Taiwan compendium, the Project funded this work. The Taiwan Forestry Research Institute provided the funds for the Taiwan compendium.

Present Status

The progress of the national compendiums is presented below.

Completed	In Progress
Bangladesh	Sri Lanka
Indonesia	Taiwan
Malaysia	
Philippines	
Thailand	

The compendium for Sri Lanka is nearly complete and is likely to be finished before the end of June 1990. The one for Taiwan is expected to be completed by the end of 1990.

The national compendiums that have already been completed have been entered into a database called COMPEN using Paradox 3.0, a leading commercial database software. A printed copy of COMPEN will be distributed to all MOU/LOA institutions.

COMPEN will be updated on an annual basis in cooperation with MOU/LOA institutions. Training on the use of COMPEN will be carried out as a part of the microcomputer course to be conducted in Phase 2.

Manual Series on MPTS

Discussion groups considered the proposal for a series of five manuals on MPTS cultivation for use in extension. Titles discussed were:

Nursery Practices for Multipurpose Trees
Multipurpose Tree Species in Agroforestry
MPTS in Plantations
Tending MPTS
Harvesting MPTS

The discussions resulted in outlines for each of the above manual titles. Before proceeding with preparation of manuals, the network will review existing literature.

Manual 1: Nursery Practices for MPTS

The discussion was based on an outline drafted by Kamis Awang. Other discussion group participants were Kedar Prajapati, Taulana Sukandi, and Anoja Wickramasinghe.

1. Establishing a Nursery

1.1 Type of Nursery

1.1.1 Temporary
1.1.2. Permanent

1.2. Factors in Selecting a Nursery Site

1.2.1. Factors important for Seedling Growth
(water, soil, topography, materials, microclimate, biotic factors)
1.2.2. Factors important for Nursery Management
(location, access, ownership, size, labor supply)

1.3. Basic Facilities

1.3.1. Requirements
(access roads and paths; fencing; shelter for tools, materials, and workers; soil dump; seedbed; potbeds; shading and shelter for plants)
1.3.2. Options
(windbreaks, compost area, working shed, seed extraction area)

1.4. Nursery Design Considerations

1.4.1. Overall Size
1.4.2. Shape
1.4.3. Width and Location of Paths and Roads
1.4.4. Size of Beds or Subdivision
1.4.5. Location of Buildings
1.4.6. Location of Fences
1.4.7. Location of Water Main
1.4.8. Location of Compost Area

1.5. Required Tools

1.5.1. For Working the Soil
1.5.2. For Layout
1.5.3. For Preparing Potting Soil and Pot Filling
1.5.4. For Watering
1.5.6. For Transport Within the Nursery
1.5.7. For Tending Seedlings

2.0. Seed

2.1. Where to Get Seed

2.1.1. Own Collection
2.1.2. Forest or Agricultural Service
2.1.3. Universities, Research Institutes
2.1.4. Commercial Seed Suppliers
2.1.5. Selection of Species and Provenances

2.2. Seed Collection

2.3. Extraction and Storage

2.3.1. Extraction Methods, by Species
2.3.2. Storage Condition
2.3.3. Storage Containers

3.0. Growing Seedlings in Containers

3.1. Types of Pots
3.2. Preparation of Potting Mixture
3.3. Filling the Pots
3.4. Storage Containers
3.5. Seed Sowing
3.6. Pricking Out
3.7. Care and Tending
3.8. Preparation for Planting Out

4.0. Growing Bare-Rooted Seedlings

4.1. Sowing
4.2. Root Pruning
4.3. Lifting
4.4. Packing

5.0 Producing Other Planting Materials

5.1. Stumps
5.2. Cuttings

6.0. Nursery Organization and Record

6.1. Production Calendar
6.2. Schedule for Supplies
6.3. Workers and Organization
6.4. Nursery Records

Manual 2: Plantations of MPTS

Discussion started from an outline prepared by Cesar Nuevo. Other group participants were Hsu-Ho Chung, Simon Saulei, and Charit Tingsabadh.

This manual should deal with different sizes of block plantings of MPTS for the Asia-Pacific countries. One assumption is that the plantation is a single species MPTS plantation, or if there is a mix of species, then it is a mixture of tree species that are multipurpose.

1.0. Planning and Organization

1.1. Objective of the Plantation
1.2. Cropping Scheme
1.3. Species Selection
1.4. Map Layout
1.5. Organization and Composition of Working Crew
1.6. Planting Methods
1.7. Size of Planting Stocks
1.8. Delivery and Distribution System
1.9. Terrain and Soil Type

Technical considerations include species-site suitability (altitudinal and latitudinal factors, pest and disease control, prevailing climatic and weather conditions, biotic and edaphic factors).

2.0. Selection of Species or Species Mix

This section should provide the farmer with options concerning the tree species, or species mix, that can be grown successfully on various types of sites. The importance of the intended product in this decision should be stressed.

3.0. Site Selection

3.1. Economics
3.2. Distance and Accessibility
3.3. Terrain and Soil
3.4. Climate
3.5. Ownership of Land, Trees and Other Social Aspects
3.6. Size of Available Area

4.0. Site Preparation

It is important to include a flow chart or decision-tree that clarifies the choice of site-preparation technology.

4.1. Manual Preparation
4.2. Mechanized Preparation
4.3. Burning
4.4. Chemical Method

5.0. Tree Planting/Seeding

5.1. Planting Stock
5.2. Planting methods
5.3. Field Design and Layout
    5.3.1. spacing of plantings
    5.3.2. arrangement/design
5.4. Direct Seeding

6.0. Considerations for Adverse Sites

6.1. Dry Sites
6.2. Rocky Sites and Steep Slopes
6.3. High Grass and Acidic Soils
6.4. Nutrient-deficient Sites
6.5. Flooded and Polluted Wastelands
6.6. Timberline
6.7. Open Mining Areas and Exposed Landslides
6.8. Saline Environments

Manual 3: MPTS in Agroforestry

Discussion started from an outline drafted by Junus Kartasubrata. Other group participants were H.P.M. Gunasena, Narayan Hegde, Ken MacDicken, and Kailash Pyakuryal.

Increasing population pressure presents the challenge for the farmer of improving farmland productivity. In addition to food grains, farmers also need fodder, fuel, timber and cash income. Agroforestry with MPTS can help address these needs.

Agroforestry is defined here as the combination of woody perennials with agricultural crops and livestock production. Different agroforestry systems and their details should be included in an appendix.

1.0 Selection of Species

1.1. List MPTS for different agro-climatic regions, with their uses (in tabular form).
1.2. From the short-list of MPTS suitable for the site, select species suited to on farmers' needs.
1.3. Ensure that available resources are optimally utilized.

2.0. Placement of Trees

2.1. Describe locations where MPTS can be planted (for example, gullies, land unsuitable for agriculture, field bunds, boundaries).
2.2. Outline criteria for deciding the size and nature of tree population: competition with crops, income optimization, soil and water conservation, specific objectives such as shelterbelt hedgerow, etc.

It was recognized that management issues would be covered in the manual on tending. The manual should include illustrations and graphics.

Manual 4: Tending MPTS

Discussion started from an outline drafted by Fuh-Juinn Pan. Other group participants were Marian delos Angeles, R. Deb Roy, and David Taylor.

1.0. General Considerations

1.1. Why Tend
Efficiency and improved production over natural growth
Avoidance of competition with crops
1.2. Determining Uses

2.0. Weeding

2.1. Techniques
By hand
Instruments
Biological
Chemicals
Density control
2.2. Frequency

3.0. Fertilization

3.1. Soil nutrient situation - status and symptoms
3.2. Types of fertilizer
3.3. Application - timing and dosage

4.0. Control of Pests and Diseases

4.1. Pests
- Symptoms, thresholds of damage
- Biological control
- Chemical control
- Integrated pest management (IPM)
- Fencing (biological and 'social') against livestock damage

5.0. Thinning and Singling

5.1. Types, with reference to agroforestry
5.2. Timing
5.3. Methods

6.0. Coppicing and Pollarding

6.1. Timing of operations
6.2. Types
6.3. Methods

7.0. Pruning

7.1. Purpose
7.2. Timing
7.3. Types
- Fodder
- Poles
- Hedgerows
- Fuelwood

7.4. Methods

8.0. Lopping

8.1. When to start
8.2. Frequency
8.3. Intensity - canopy percentage
8.4. Instruments used

9.0. Irrigation for Arid and Semi-arid Areas

Manual 5: Harvesting MPTS

Discussion started from an outline drafted by Suree Bhumibhamon. Other group participants were Kamis Awang, Foster Cady, Lim Hin-Fui, and Celso Lantican.

This manual would provide guidelines for researchers, cooperatives, extension workers and farmers on harvesting MPTS on small farms.

1.0 Planning

1.1. Inventory of Stand and Tree Types
(Do, DBH, Ht, branchiness, bark, other tree parameters, volume per unit area, under-growth, long size, wood density, other log parameters)
1.2. Topographic Conditions
(topography, terrain pattern and component, ground roughness, flooded area, suitability for roads, susceptibility to erosion)
1.3. Annual and Seasonal Climate Conditions
(rainfall, water discharge, temperature, number of rainy days)
1.4. Accessibility
(access to markets, density of road, skidding distance)
1.5. Economic Parameters
(availability of equipment, cost of new equipment, price of products, etc.)
1.6. Labor
(availability, skill, number of workshops per year, payment system)

2.0. Harvesting

2.1. Availability of Equipment for Small-Farm Operation
2.2. Description of Operations
(felling, branch removal and disposal, bucking, piling, debarking)
2.3. Constraints
(topography, labor)

3.0. Transportation

3.1. Upgrading Transportation to Meet Harvesting Requirements
(haul road, strip road, access road)
3.2. Types of Transport
(bicycle, motorcycle, animal, carts, boats, raft, train)

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Field Visits

The Committee visited an alley-cropping experiment at Chiang Mai University Field Station, funded through the F/FRED small research grants program. Chalermpone Sampet, Associate Professor of Agronomy in the Faculty of Agriculture, explained to Committee members that his experiment with *Leucaena leucocephala*, grown in single and double rows in several spacings between alleys of maize, was based on local farmers' maize-growing practices. The objectives of the experiment are to examine the potential for alley-cropping with *Leucaena* (1) for maintaining soil fertility and crop yield with minimum nitrogen application, and (2) for linking fodder and food crop production in a single system. The experiment was planted in March 1989 and the first pruning of *Leucaena* plants was performed in July of that year and the cuttings used as green manure. During the rainy season, Chalermpone explained, *Leucaena* plants can be cut monthly. Committee members asked questions regarding the experiment's consideration of current farmer practices and methods of determining changes in soil properties. A progress report submitted in March 1990 provided details.

The Committee then visited the site of a development project with the Lisu hill tribe and lowland people. The two-year old Doi Wieng Pha Highland Development Project, supported by the U.N. Fund for Drug Abuse Control, is managed by the Narcotics Control Board. The project aims to improve the highland dwellers' lifestyle through integrated rural development and thus discourage poppy cultivation. The project provides the hill people with formal and informal education and secure Thai citizenship rights. Committee members received a briefing by Thanad Vajirajutipong, Project Director, along with a socioeconomic baseline survey of the 54 villages in which the project is active. The visit included a tour of a nursery in which coffee, bamboo, leucaena, Khasi pine, sesbania, and other species were grown for use by the villagers. The project provides free seedlings, including fruit trees, education in agricultural practices, and employs the villagers in various aspects of the project. Economic incentives of poppy-growing and villagers' uncertainties regarding new lifestyles pose significant obstacles to progress, however. Members of the Committee suggested contour plantings on steep slopes, and themselves planted bamboo seedlings (*Dendrocalamus asper*) at the site. On the return trip, the Committee visited the Doi Suthep National Park.

After the meeting concluded, the Committee visited the Pine Improvement Centre southeast of Chiang Mai, where Prasit Sa-Ardavut, Royal Forest Department, gave a briefing on the centre's tree improvement and seed production work. Gen Granhoff, a Danish consultant, outlined the centre's strategy for breeding and improvement plans for pine and eucalyptus species. At the Huey Bong Experimental Station nearby, the Committee observed species trials sponsored by the Australian Council for International Agricultural Research (ACIAR) and seed orchards of *Pinus kesiya* and *P. caribaea*. The Committee also observed provenance trials of *P. merkusii*, a species native to Thailand . Mr. Pradit Homjeen informed the group that the provenances from Srisaket and Surin provinces performed best. After 10 years, provenances from northern Thailand that had experienced a long period of grass-stage showed excellent survival and growth. Poor juvenile-mature relationship of *P. merkusii* indicated the need for progeny tests of longer duration. *P. oocarpa* and *P. tecunumanii* have also shown good growth and stem form on upland sites.

A further visit to the Teak Improvement Centre at Ngao, Lampang, included a review by Apichart Kaosa-and of Thailand's pioneering genetic advances with this important native species. Apichart also gave information on the centre's breedings strategy and use of tissue culture in large-scale production of teak. International provenance trials have shown promising Thai provenances. More work will be done to develop clonal materials. The center has found that environmental factors play a major role in aspects of wood quality. Pairat Piyapant presented methods for large-scale production of improved teak seed at Mae Gar substation.

The Committee concluded with a visit to Doi Tung, east of Chiang Rai, near the Laotian border, where the King of Thailand's mother is sponsoring the integrated Doi Tung project involving 33 agencies and 22 villages. Wacharachai Kasemsiri, Chairman of the Social Forestry Project working group, arranged the visit. Sitthichai Ungpakorn, Director of Chiang Rai Regional Forest Office, explained that the project, with objectives similar to those of the Wieng Pha project, also provides free seedlings, and in addition promotes more secure land tenure through land-use permits. The project makes use of radio broadcasts for public awareness of the importance of tree-planting. The day of the Committee's visit, 7,000 people from the region participated in an exercise in which over 65,000 seedlings were planted on a steep mountainside. Species planted included *Acacia mangium* and *Tectona grandis* (teak). The forestry office's work complements that of a nearby agricultural station, which employs local people in raising horticultural plants and vegetables for demonstration, and provides them with free seeds. Vegetables, particularly cabbage, kale, and leek, are popular crops.

The Project is funded by the Royal Thai Government, and in three years has proven successful. Sitthichai credits the king's mother's popularity and her active involvement with a good deal of the project's success in the face of complex organizational demands and the entrenched incentives of poppy cultivation.

Program

Date	Activity
June 4	Opening ceremony
	Adoption of the agenda
	Approval of the minutes of the last meeting
	Matters arising from the minutes of last meeting
	Review of on-going programs
	Network trials Humid and subhumid zone (Kamis) Arid and semi-arid zone (Narayan) Provenance trials of *Acacia auriculiformis* and *Dalbergia sissoo* (Ken) Studies on *Azadirachta indica* and *Melia azedarach* (Suree) Leucaena Psyllid Research (Banpot) Regional Study on Tree-breeding Objectives (Anoja) Regional Study on Farm and Village Forestry (Charit) Economics Research (Lee) Twinning (Kamis) Training (Celso) MPTS research compendium (Celso)
	Other matters
	IADSS development (Foster)
June 5	Report on national MPTS research meetings Indonesia India Malaysia Nepal Papua New Guinea Philippines Republic of China (Taiwan) Thailand
	Development of National MPTS Research Networks

Group discussions
- Research program for Phase 2 (Suree)
- Theme workshop: NGOs (Narayan)
- Production of MPTS and its relation to socio-economic aspects (Marian)
- New network experiments *Dalbergia sissoo* (Ken)
- *Albizia falcataria* (Taulana)
- On-farm trials (Junus)

June 6 — Field Trip

June 7 — Group Discussions
- Extension techniques to promote MPTS (Narayan)
- Information exchange (Lim)
- Economics and marketing research (Lee)
- Training in Phase 2 (Celso)

Group Discussions: MPTS manuals
- Establishment of MPTS nurseries (Kamis)
- Plantations of MPTS (Cesar)
- MPTS in agroforestry (Junus)
- Tending MPTS (Fuh-Jiunn)
- Harvesting MPTS (Suree)

Extending the MPTS program to South Pacific countries (Simon)

Cooperation with other networks (Suree/Kamis)

Data exchange (Foster)

Other business

Election of Research Committee Chairman

Election of Representatives to the Steering Committee

June 8-10 — Post Meeting Field Visits