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# **Native MPTS and Approaches for Sustaining MPTS Development**

*Report of the fifth  
MPTS Research Committee meeting  
held June 21-30, 1992  
in Taiwan, the Republic of China*

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



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## Acronyms

ACIAR	=	Australian Council for International Agricultural Research
BAIF	=	BAIF Development Research Foundation (Pune, India)
CATIE	=	Center for Agronomic Research and Training (Turrialba, Costa Rica)
CIDA	=	Canadian International Development Agency
COGREDA	=	Consultative Group for Research and Development of Acacias
CSIRO	=	Commonwealth Scientific and Industrial Research Organization
CTFT	=	Centre Technique Forestiere Tropical
CUSRI	=	Chulalongkorn University Social Research Institute (Bangkok, Thailand)
DANIDA	=	Danish International Development Agency
ER&D	=	Extension research and development
ERDB	=	Ecosystems Research and Development Bureau of the Philippines (Los Banos)
FAO	=	Food and Agriculture Organization of the United Nations
FINNIDA	=	Finnish International Development Agency
F/FRED	=	Forestry/Fuelwood Research and Development Project
FORSPA	=	Forestry Research Support Project for Asia-Pacific (Bangkok, Thailand)
FPRDI	=	Forest Products Research and Development Institute (Los Banos, Philippines)
FRD	=	Forestry Research Division, Forest Department (Nepal)
FRDC	=	Forestry Research Development Centre (Bogor, Indonesia)
FRIM	=	Forestry Research Institute Malaysia (Kuala Lumpur, Malaysia)
FVF	=	Farm and village forestry
GIS	=	Geographic information system
IADSS	=	Information and Decision Support System
ICRAF	=	International Center for Research on Agroforestry (Nairobi, Kenya)
IDRC	=	International Development Research Centre of Canada
IOF	=	Institute of Forestry (Pokhara, Nepal)
IUFRO	=	International Union of Forest Research Organizations
GRS	=	F/FRED Global Research Systems
KUFF	=	Kasetsart University, Faculty of Forestry (Bangkok, Thailand)
LSP	=	Leucaena Seed Production
MOU	=	Memorandum of Understanding
MPTS	=	Multipurpose tree species
MUSFAD	=	MPTS Utilization for Small Farm Development
NFTA	=	Nitrogen Fixing Tree Association (Waimanolo, Hawaii, U.S.A.)
NGO	=	Non-governmental organization
OFI	=	Oxford Forestry Institute
PCARRD	=	Philippines Council for Agriculture and Resources Research and Development
PFI	=	Pakistan Forestry Institute (Peshawar, Pakistan)
RECOFTC	=	Regional Community Forestry Training Centre (Bangkok, Thailand)
TFRI	=	Taiwan Forestry Research Institute (Taipei, Taiwan)
TISTR	=	Thailand Institute for Scientific and Technological Research (Bangkok, Thailand)
UP	=	University of Peradeniya (Peradeniya, Sri Lanka)
UPLB	=	University of the Philippines at Los Banos
UPM	=	Universiti Pertanian Malaysia (Serdang, Malaysia)
VISCA	=	Visayas State College of Agriculture (Leyte, Philippines)
WID	=	Women In Development

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## 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 travelling 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 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.

In June 1990, the Research Committee met in Chiang Mai, Thailand. In addition to reviewing on-going activities, the Committee recognized the role of NGOs in adoption of MPTS technologies, and encouraged: work on strengthening the standard methodologies used in network research, the establishment of provenance trials of *Dalbergia sissoo*, and the preparation of information kits and manuals.

The Committee next met in Kathmandu, Nepal, in June 1991. It examined the Network field trials, small research grants program, and the transition in applied social science and interdisciplinary studies in the Project's second phase (1990-1995). Citing the need to address research results to policymakers, the Committee summarized national policies and identified priorities for MPTS research in meeting demands for wood industry materials, food, fuelwood, fodder, and environmental amelioration. Other issues included information and technology transfer, training needs by country, and the role of local industry centers.

## 2. Executive Summary

The Research Committee meeting in Taiwan reviewed ongoing and proposed Network programs and discussed issues under the themes of Native MPTS and Approaches to Sustaining MPTS Development.

Ongoing Network trials involve *Acacia auriculiformis*, *A. mangium*, *Dalbergia sissoo*, and *Leucaena* species. New activities are developing on *Casuarina equisetifolia*, *Azadirachta indica*, and *Artocarpus heterophyllus*. Existing research results on *A. mangium* are being reviewed and a monograph is being prepared.

More in-depth analysis of Network data on farm and village forest-use practices is underway in the Philippines, including development of a geographical information system for comparison of land-use patterns. A workshop of researchers involved in the study on farmers' tree-breeding objectives assessed the substantive findings and methodological factors to be considered in further Network interdisciplinary studies. Some follow-up activities to this study are addressed in the *Artocarpus* network.

Review of MPTSys, the project-developed software system for data management and analysis, focussed on plans for improvement of the growth simulation model, MPTGro. A January 1992 meeting of experts in the region identified the needs of two primary user groups -- research scientists and program planners -- and drafted a workplan for continued model refinement. MPTSys development by F/FRED Project staff in the United States is now complete and the software is available to all cooperators.

An overview of the new Women-In-Development initiative funded by AID included a proposed range of activities and an indication of the use of gender-disaggregated FVF data in this context.

Representatives presented the results of 1992 national MPTS meetings and programs in India, Indonesia, Malaysia, Nepal, Pakistan, Papua New Guinea, the Philippines, the Republic of China (Taiwan), Sri Lanka, and Thailand.

Working group discussions on Native MPTS examined the issues of indigenous knowledge, management and improvement, constraints on research and development in this area, product development, and marketing. The Committee cited the need to collect and screen indigenous and scientific knowledge on a national basis before identifying prospects for regional collaboration. In this regard, the coordinated regional program on MPTS Utilization for Small Farm Development (MUSFAD), developed by Network scientists in 1991, should be supported by donors as one way of addressing the need for greater information on products from native species.

Group discussions on Approaches for Sustaining MPTS Development covered: application of knowledge from Network trials to benefit small farmers; on-farm trials and the role of the private sector in tree farming; ways to improve targeting rural poor as beneficiaries of forestry development programs, including gender analysis; and the future of the MPTS Research Network itself.

Improved seed sources and nationally relevant information on site-species matching appeared as two Network trials outputs that could directly feed MPTS development efforts. Examples of cooperation among government, wood industry, and farmers to promote tree-growing on private land exist in the region. These should be explored, with an emphasis on improving economic benefits to tree farmers.

For more targeted forestry project benefits, planning should examine rural poor beneficiaries by economic categories and by gender. Refined gender analysis methods can lead to more efficient assessment of the development potential of MPTS technologies.

The future of the Network after 1995 should be charted based on an assessment of its achievements and how they fit into the infrastructure and experience of longer-term international efforts.

### 3. Minutes of the Meeting

June 21, 1992

#### 1. Opening Ceremony

The Taiwan Forestry Research Institute (TFRI) hosted the opening ceremony. Dr. Y.J. Huang, Forest Department Head, Council of Agriculture, Republic of China (ROC), acted as Chief Guest.

##### 1.1. Welcoming Remarks

Dr. Huang welcomed the Research Committee and the National MPTS Meeting of ROC. He stressed the importance of research on MPTS for rural poor people and called for closer collaboration with other countries in the region. He recalled with gratitude the support of the Agricultural Development Council, one of Winrock International's precursor institutions, for Chinese students studying in the United States.

##### 1.2. Remarks by the F/FRED Team Leader

Dr. Rick J. Van Den Beldt, F/FRED Team Leader, expressed his pleasure for the opportunity to address the RCC National MPTS meeting. He observed that the gathering of Committee representatives from the other countries in Taipei for the start of the national meeting was very much in the spirit of networking. He stressed the need to supplement forest resources with small-farm production of MPTS for continued supplies of tree products for household use and income in rural areas. He also described the philosophy, objectives, and activities of the F/FRED Project and the MPTS Research Network. He concluded by expressing appreciation for the widely renowned Chinese hospitality, embodied in the Chinese proverb, "There is nothing so valued as a visit from a friend from afar."

##### 1.3. Presentation of Plaque of Appreciation to TFRI

Dr. Van Den Beldt presented Dr. Jeng-Chuan Yang, Director, TFRI, with a plaque in appreciation of TFRI's role as host for the Committee meeting.

##### 1.4. Presentation of the MPTS Scientific Achievement Award

The MPTS Scientific Achievement Award, given bi-annually to a scientist for outstanding contributions to MPTS research, was awarded to Dr. Fuh-Jiunn Pan of TFRI for his development of improved varieties of *Leucaena* species. Dr. Van Den Beldt announced the award, which was presented to Dr. Pan by Dr. Suree Bhumibhamon, Committee Chair.

##### 1.5. Remarks by the Chairman

Dr. Suree express his thanks to TFRI and the Council of Agriculture for hosting the meeting. He stressed the importance of MPTS to rural poor, quoting Finang, the Chinese poet. He also expressed interest in learning more about Chinese experiences.

##### 1.6. Welcome Remarks by the Director of TFRI

In his welcome address, Dr. Yang described Taiwan's active program in MPTS research, particularly agroforestry studies. He expressed appreciation for the award recognizing Dr. Fuh-Jiunn Pan's work.

##### 2.0. Tour of TFRI

Dr. Yang briefed the Research Committee on the structure and activities of TFRI. This was followed by a guided tour of the botanical garden led by Dr. Chin-Ming Li, TFRI's Head of the Botany Division.

##### 3.0. Appointment of Rapporteurs

On opening the meeting, the Committee appointed Dr. Ahmad Said Sajap and Dr. Zahid Emby to be rapporteurs.

#### 4.0. Adoption of the Agenda

The Committee reviewed and adopted the proposed agenda (Appendix 1).

#### 5.0. Approval of the Minutes of the Last Meeting

The report of the June 1991 meeting in Kathmandu, Nepal was reviewed and approved by the Committee.

#### 6.0. Matters Arising from the Minutes of the Last Meeting

Dr. Suree informed the group that the Network's Steering Committee, in its December 1991 meeting, had reviewed the Research Committee's 1991 report with the following comments and questions:

- o It confirmed the Research Committee's call for an inventory of fuelwood research results, possibly led by FAO's Rural Wood Energy Development Programme.
- o The MPTS Research Network should not spread itself too thin, thereby losing its comparative advantage.
- o Portions of the 1991 Research Committee report could be distributed as brochures for planners.
- o Follow-up studies should examine land tenure.
- o To what extent has improved planting material been distributed?
- o What is the status of analysis of the 1987 network trials?
- o Priorities are needed for the regional and national research programs.
- o National MPTS Committees should recognize the contributions of outstanding tree farmers with awards.

#### 7.0. Review of On-going Network Programs

##### 7.1. Network Research

##### 7.1.1. 1987 Humid-Zone Trials

Dr. Kamis Awang, Humid Zone Network Specialist, reported that as of March 1991 data collection was completed for all sites in the 1987 Network trials of *Leucaena* spp., *Acacia mangium*, and *A. auriculiformis*. A preliminary intersite analysis of the 18-month data from 10 sites was reported in *Farm Forestry News* 4(3). A more comprehensive analysis using the data taken at 36 months is now underway. In addition, individual trials cooperators are preparing their own interpretations of the results at their sites. Additional studies on chemical and physical suitability for pulp, paper, and other composite products have been initiated through UPLB and UPM.

##### 7.1.2. 1991 Humid-Zone Trials

The second set of trials in this environmental zone was established on 33 sites in Costa Rica, Indonesia, Malaysia, the Philippines, ROC, Sri Lanka, and Thailand, with the participation of 24 institutions. Five of these sites are being supported by CATIE, FINNIDA, and ODA in collaboration with F/FRED.

Like the 1987 trials, this set of trials includes pruning and thinning treatments to compare leaf and wood biomass production under different managements, using two genotypes each of *Leucaena* species and *A. auriculiformis*. The trials will also assess tree form. In addition, the labor requirement for the cutting treatments at 12 and 24 months will be measured. All sites will undergo thorough climate and soil characterization. Sampling and field description of the soils have been undertaken on all sites. At some sites, the trials are already 6 months old and the first set of data is being collected.

It was suggested that local species should also be considered in this type of trial, as in the 1989 Arid and Semi-arid Zone Trials.

### **7.1.3. 1989 Network Trials in the Arid and Semi-arid Zones**

Dr. Michael Read, who recently joined the Secretariat as Arid and Semi-arid Zone Network Specialist, reported that the progress of these trials was rather slow due to problems encountered in the management of the trials. A meeting to discuss this set of trials was held in Kandy, Sri Lanka, September 23-27, 1991. Some of the problems discussed in the meeting were:

- o poor tree growth due to biotic and abiotic factors
- o trials were not managed according to agreed-upon guidelines
- o poor data collection and storage

Only five trials in the Semi-arid Zone and four in the Arid Zone are considered successful for continued support.

### **7.1.4. COGREDA and *Acacia mangium* Monograph**

Dr. Kamis reported that, per the recommendations of the 1991 Research Committee meeting, a consultative group of 18 experts from 7 countries met June 1-3, 1992 in Phuket, Thailand to review Research and Development of Acacias. The full range of *Acacia* research was discussed, and research gaps were identified and prioritized. Recommendations were made in the following areas:

- o species assessment and improvement
- o silviculture
- o utilization, economics and marketing

At the same meeting, plans for preparing a monograph synthesizing research, including the grey literature, on *Acacia mangium* were finalized and authorial duties agreed upon.

### **7.1.5. International Provenance Trials of *Acacia auriculiformis***

Dr. Kamis reported that this series of international provenance trials began in 1989 using seed from a collection conducted with ACIAR. The trials were designed to identify the most promising of 25 provenances tested at each of 12 sites in 8 countries, with the participation of 9 institutions. F/FRED co-sponsored these trials with ACIAR, FINNIDA, and GTZ. The experiments are now about 30 months old.

Performance of these provenances at 12 months for three sites in Thailand was reported in *MPTS Research Notes* 1(3). Compilation of the 24-month data for intersite analysis has just concluded, and analysis is currently underway in collaboration with ACIAR scientists. Based on the results, F/FRED is planning to set up small seed production areas of the most promising provenances in countries in the region.

### **7.1.6. *Dalbergia sissoo* Provenance Trials**

Dr. Shams-ur-Rehman, representative from Pakistan, reported the progress of the international provenance trials of *Dalbergia sissoo*. These are proceeding well in Pakistan and Nepal, with an added site in Sri Lanka. The trial site in India experienced poor germination, but data available from that site will be sent by Dr. Hegde. The Committee recommended study of the problems of seed procurement, and investigation of the provenances outside their native range. Seed orchards for arid and semi-arid species including *D. sissoo* have been established in Pakistan; seeds are available on request.

### **7.1.7. *Casuarina equisetifolia* Provenance Trials**

Dr. Kamis reported on the latest set of international provenance trials involving *Casuarina equisetifolia*. In 1990-91, CSIRO's Division of Forestry sponsored range-wide collections of about 50 geographic and land races of *C. equisetifolia* in 13 different countries. The F/FRED Project has made an initial commitment to support the establishment and management of provenance trials using these accessions in 5

countries in the MPTS Research Network. The trials will evaluate 25 seedlots using a standard randomized complete block design (RCBD) with 4 replicates. Representatives from Papua New Guinea and the Philippines also expressed interest to participate in the trials. The Network Secretariat agreed to arrange for seed to be sent for that purpose.

#### **7.1.8. *Azadirachta indica* Provenance Trials**

Dr. Van Den Beldt and Dr. Suree described *Azadirachta indica* A. Juss. (neem) as a quintessential multipurpose tree, providing important products at nearly every level of rural economies in many countries. Products include: toothbrushes and toothpaste; fodder, fertilizer, and fuelwood; insecticides and industrial oils; soap and shampoo; birth control products; and medicine.

Network activity on neem began in March 1992, following its identification as a priority species in the 1991 Kathmandu meeting. F/FRED has signed an MOU with the Centre Technique Forestier Tropical (CTFT) in France for inter-regional collaboration between Asia and Africa. Three provenances, represented by 30 mother trees (single-tree basis) were collected by Kasetsart University and BAIF Development Research Foundation in 1992 to serve as a "trial run" of cooperation. Using this seed, progeny studies will be planted in the respective countries, and isozyme analysis will be conducted by CTFT. Two studies on seed handling and ontogeny have also been funded at Kasetsart University.

The core neem network should be developed by the end of 1992, and cemented with an expert consultation now scheduled for January 1993, at which experience from the 1992 collections will help define priority areas and procedures for the 1993 collection.

Seed from collections will be outplanted either in 1993 or 1994. Trials (perhaps as many as 15 in Africa and Asia) will be funded through the Project's second phase, which ends in April 1995. Arrangements will be made with Network cooperators to continue the trials until age 10.

Major efforts will be made to include all countries in the species' natural range. Anticipated difficulties include seed export in India, lack of cooperators in Myanmar (Burma), and scarcity of native stands in Malaysia. Solutions to such problems will be sought in advance. National germplasm collections are also urged to benefit each respective country. Cooperators' assistance is needed to arrange exchange of seed internationally.

#### **7.1.9. The Artocarpus Network**

Dr. John Raintree, Network Social Scientist, reviewed the basis for collaborative research on *Artocarpus heterophyllus* (jackfruit). The results of the regional study on Farm and Village Forestry practices (FVF) study showed it to be one of the most widely used species in tropical Asia, as well as one of the most neglected by researchers.

An expert consultation is to be arranged, probably in early 1993. The Research Committee was asked to help decide the focus of the consultation. Several research needs are clear, including: (1) germplasm exploration and evaluation, (2) identification of tree improvement objectives, (3) germplasm collection and exchange within and between countries, (4) identification and development of practical propagation methods, (5) multiplication and dissemination of improved germplasm to communities, and (6) improved production, utilization, and marketing.

A documentary survey of jackfruit production and research in the Philippines by Dr. A.L. Acedo, Jr. has been published as MPTS Research Series Monograph No. 1. Prof. H.P.M. Gunasena has completed a similar survey for Sri Lanka. A survey of jackfruit production areas in the central Visayas, Philippines has also been completed. In preparation is a survey of jackfruit utilization and marketing in the central Visayas.

In addition to the expert consultation, state-of-the-art reviews, and germplasm collection activities already mentioned, the Network Secretariat proposes focussed activities on research on improved propagation and multiplication methods

and action research on multiplication of germplasm by community-based institutions (e.g., small-enterprise development in women's nursery groups).

Due to AID budget cuts affecting the Extension R&D activities, funding for the Artocarpus network is limited. Although some funds are available from the tree improvement budget and the new Women In Development (WID) initiative, substantial additional funding will be needed for this network to realize its full potential. The Network Secretariat will explore the potential of involving other donors.

The ensuing discussion raised a number of points. In countries like Sri Lanka the species is regarded as the tree of the poor, as it serves as a rice substitute, particularly during the dry season. As such, jackfruit would be given first priority, with other members of the genus such as *A. altii*s (breadfruit) being taken up later. Germplasm should be collected immediately, after identifying superior varieties recognized by farmers for their food and timber quality. Exchange of germplasm should also start immediately, with problems that arise being tackled as they are encountered. Horticulturalists from the Departments of Agriculture should be invited to the planned consultative meeting. Perhaps then, selection based on fruit and timber quality can be combined. FAO may assist in organization. Vegetative reproduction, including grafting, should be emphasized, as trees grown from seeds show a high degree of variability.

#### 7.1.10. *Leucaena* Research

Dr. Pan reported on progress in research on *Leucaena* resistance to the psyllid pest *Heteropsylla cubana*. TFRI and Network cooperators in four other countries have been working on this with F/FRED support, managed by NFTA, since 1988. He has found better resistance with K156 X K636 hybrids. He pointed out that through continuous selection of more advanced hybrid generations, a truly psyllid-resistant *leucaena* can be obtained. The fluctuating population of psyllids in the field has led to the need for cage experiments to screen for psyllid resistance.

#### 7.1.11. MPTGro

MPTGro is the growth simulation package developed as part of MPTSys, the software package developed by F/FRED staff in the United States. Dr. Kamis reported that a workshop to evaluate the applicability of MPTGro was held January 20-25, 1992 in Pattaya, Thailand. This workshop, attended by 14 scientists from 9 countries, identified two main user groups for which to target further MPTGro improvement: (1) intermediate users (scientists and researchers) and (2) end users (managers, policy makers and extension agents). This implies that the model should be both complex enough to be used as a meaningful research tool and simple enough to easily communicate ideas to end users.

The meeting also mapped out areas for model improvement: (1) the growth simulation itself; (2) the influences of management practices on growth; and (3) influences of environmental stress on growth.

A task force of four experts met in April 1992 in Malaysia to further define the workplan for model improvement (see Appendix 2).

#### 7.1.12. Small Research Grants Program

Dr. Van Den Beldt reported that 23 small research grants were awarded in 1991 (maximum grant amount, \$10,000) on the basis of merit. An announcement for the 1992 round of grants was included in *Farm Forestry News* 5(2). Proposals received are now being considered.

Reports from the 1988 small grants series are, with few exceptions, already submitted. The quality of these reports varies, but in general was found to be low. Factors for this include the difficulty in administering and monitoring a large number of grants with a (then) understaffed Network Secretariat and inexperience of awardees in conducting research.

Dr. Van Den Beldt considered the Small Grants program a qualified success. Administrative procedures have been adjusted for the 1991 and 1992 series to provide greater decentralization, a stricter review process, and direct solicitation of

proposals to supplement the newsletter announcement.

The 1992 grant series will be the last in F/FRED's Phase 2. An effort will be made to synthesize and publish as much good-quality output from the Small Research Grants program as possible.

The ensuing discussion raised the question of more funding and larger individual grants. Dr. Van Den Beldt asked National Committee members to help monitor these studies.

#### **7.1.13. Analysis of the Farm and Village Forestry Study Data**

Dr. Raintree and Dr. Herminia Francisco, representative from the Philippines, reported on further follow-up to the 1989 regional study, highlighting FVF activities in the Philippines as examples of what can be done in other Network countries.

Three comparative analyses on various aspects of Philippine FVF practices are currently underway on: (1) assessment of market orientation of tree cultivation in selected upland communities; (2) tree-breeding objectives and management practices of upland farmers; and (3) gender differentiation in land- and tree-use activities. These studies are using data from the FVF study as well as data collected as part of the extended analysis effort.

In addition to these studies, two FVF researchers are engaged in in-depth analyses of land- and tree-use practices in their respective study villages.

Simultaneously, a geographic information system (GIS) is being developed for FVF analyses in the Philippines of the sites included in the regional study. The ultimate objective is to use GIS output to make comparative analyses more meaningful.

In the marketing study, one general pattern emerging is the very limited marketing of MPTS products in most of the study sites, as these get consumed mostly for home use.

Dr. Francisco reported that gender differentiation observed in forest- and tree-use practices

includes the fact that men are identified with the heavier farm tasks, such as land clearing and digging, tree felling and hauling, and even fuelwood collection. Women performed generally less strenuous jobs of weeding, marketing of farm produce, and fuelwood collection (mainly twigs and branches). In general, these preliminary results indicate a greater participation of men in forest and other land use activities than women.

Drs. Raintree and Francisco also forwarded recommendations made at the FVF Consolidation workshop held in the Philippines in late November 1991 (see Appendix 3).

Recommended priority follow-up activities building upon (but going beyond) the FVF dataset included regional comparative studies, case studies, and practical follow-up actions. However, according to the report, the Network Secretariat is unable to fund any of the recommended follow-up activities. An award of a grant for Women-In-Development (WID) studies may permit some of these activities to go ahead.

#### **7.1.14. Farmers' Tree-Breeding Objectives**

Dr. Raintree and Prof. Anoja Wickramasinghe, representative from Sri Lanka, reported on follow-up to the 1989 regional study on Farmers' Tree-Breeding Objectives (TBO), carried out in 31 villages in 7 Asian countries.

Results of this study for the region were earlier reported by Chuntanaparb and Ranganathan in MPTS Research Series Report No. 10, in 1990. In September 1991 a meeting was held in Kandy, Sri Lanka to review and consolidate the results of the TBO study. Review of the methodological and substantive findings of the study led to the conclusion that the methodology developed by the study participants can elicit farmers' tree-breeding ideotypes, but the exact expression of these ideotypes is influenced by methodological variables and situational factors. Truly multipurpose trees present the same problem to farmers and researchers alike: how to rank the characteristics associated with different use components. F/FRED will publish the report of the workshop soon.

According to Dr. Raintree and Prof. Wickramasinghe, one of the most important

general lessons from the TBO study is the observation that there are at least four levels of choice at which farmers decide on tree attributes and preferences (in order of increasing specificity: type of tree, tree species, cultivar, and ideotype). While the TBO study aimed to identify preferences at the fourth level, many of farmers' needs can be met by informed decisions at earlier levels. This study emphasized that farmers can and should be consulted about their own tree improvement objectives.

In considering prospects for going beyond the TBO study to engage in actual tree improvement with farmers, Committee members noted that the scope of consultation would need to be broadened beyond farmers to include other user groups and consumers within the communities.

It was also suggested that a new round of ideotype investigations, using an improved, standardized TBO methodology, should proceed in the original TBO sites. This should lead to the identification of plus trees of the most important local species, and establishment of clonal seed orchards for the benefit of the communities.

In terms of funding, the most likely prospect for continuing the work begun by the TBO study is under the aegis of the Artocarpus network and the WID project.

The Committee felt that this study shows how social scientists can help in the breeding process by presenting breeders with types most preferred by farmers. In order for these efforts to be worthwhile, however, breeders have to participate. If there is no follow up in breeding, then this research has no applied purpose. This highlights the importance of ensuring that the methodology developed by the study scientists is suited to the uses to which breeders would apply the results.

The Committee agreed that in order for this work to be pursued successfully, these findings must be supported by a good and efficient extension service. Through extension follow-up visits, farmers receive on a continuous basis advice on the cultivation of these trees and their compatibility with other crops.

### **7.1.15. Standard Measurement Methods**

Dr. Van Den Beldt reported on the preparation of a manual in order to promote more comparable research. F/FRED sponsored a workshop in May 1991 at which experienced international foresters reviewed MPTS measurement methodology, incorporating previously written materials from ICRAF, F/FRED, and OFI. The outcome of the exercise was a manual on the subject, entitled *Standard Research Methods for Multipurpose Trees and Shrubs*, published jointly with ICRAF earlier in 1992. Chapters include measurement decisions, experimental designs, minimum data sets, non-destructive measurement options, and destructive sampling methodology.

The manual has been sent out to about 500 MPTS Network collaborators and other interested persons. It might be advisable to prepare an updated version of the manual in 1994. The Research Committee accepted the manual *in toto*.

## **7.2. Other Program Activities**

### **7.2.1. Women in Development (WID) Studies**

Dr. Raintree explained the aims of the WID component of the F/FRED project (see Appendix 4). The FVF study showed that men and women play different roles in the production and utilization of tree products. The WID project activities were proposed for adoption as a network program that would promote gender analysis and greater participation of women in the MPTS Research Network's research, training, and workshops. A consultative workshop involving representatives from countries in the region has been proposed, but limited funding would require definition of a target group and the consultation of FAO, which has already been active in such activities.

### **7.2.2. Institutional Twinning**

Dr. Celso Lantican, Network Training Officer, reviewed the institutional twinning program involving UPLB, UPM, and KUFF. Current activities in the program are: provenance trials of *Acacia crassicarpa*, graduate education, an

international symposium in 1993 on MPTS for Rural Livelihood Enhancement, and joint preparation of a manual on social forestry. With regard to proposed cooperation between TFRI and FRIM, the two organizations have been encouraged to discuss sign an MOU.

### 7.2.3. MPTS Utilization for Small-Farm Development (MUSFAD)

Dr. Lantican reviewed the origin of this coordinated regional plan for utilization research on MPTS based on identified national priorities. Scientists from Indonesia, Malaysia, Philippines, ROC, and Thailand planned their national components of the program at a meeting in 1991. The program focusses on making trees more useful to farmers and developing products from nonwood tree parts (bark, leaves, flowers, roots, seeds). Species identified for study in the planning workshop included species in the genera *Cinnamomum*, *Leucaena*, *Acacia*, and *Sesbania*, along with *Pithecellobium dulce* and several others. Initial work is to proceed on *Cinnamomum*. Each country will examine harvesting methods, economics, and anatomical, physical, and chemical properties of the selected species and their potential to produce food, feed, fertilizers, and essential oils. Economic and marketing of these products is also to be studied. Donor funds for the regional program are being sought.

### 7.2.4. Training

Dr. Lantican reported on the Network's training program.

Two of the Ph.D. fellows sponsored by F/FRED to complete their degrees at Michigan State University have completed their degree requirements (Vitoon Viriyasakultorn of Thailand and Madhav Karki of Nepal). The remaining three fellows are expected to complete their degrees within the year.

A new M.Sc. fellowship program has been developed, outlined in the 1991 Steering Committee report. Fellows will study at UPLB, with additional courses at Kasetsart University and Universiti Pertanian Malaysia facilitated through the twinning program. They may

conduct their thesis in their home countries, either with government organizations or with NGOs. Network Secretariat staff and faculty members of UPM and KUFF may serve on the fellows' guidance committees.

Short courses organized and conducted in the past year include:

- o Technical Writing and Presentation (Indonesia - 35 participants)
- o Multivariate Methods for MPTS Research (Malaysia, 20 participants; Sri Lanka, 20 participants)
- o Data Analysis and Interpretation (Republic of China, 22 participants; Thailand, 20 participants)

In addition, a first correspondence course on designing effective research proposals was successfully conducted. The course had 170 participants from 11 Asian countries.

A second correspondence course, on design and analysis of field experiments, will start in the last quarter of 1992.

An evaluation of the short-term component of the training program is planned.

Training materials were developed on research problem identification and proposal preparation, and an inventory of references on research methods in the social sciences was developed that is planned for distribution as a database.

A workshop to organize preparation of a manual on multivariate analysis methods will be organized in the Philippines in July 1992. The purpose of the manual will be to provide MPTS researchers with an easy-to-use reference on multivariate methods.

Finally, one or two specialists from the Network Secretariat are still planned to assist the University of Peradeniya to develop an agroforestry curriculum at the M.S. level.

### **7.2.5. M.S. Thesis Research on NGO Topics**

Dr. Van Den Beldt led discussion of this activity, which was recommended at the 1991 workshop on the Role of NGOs in Promoting On-farm Tree Technologies, and approved in December 1991 by the Network's Steering Committee. The program will link university MS thesis research in particular -- and government programs more generally -- with the work and concerns of experienced, field-based NGOs active in agroforestry. Thesis support funds aim to attract students to conduct research on MPTS at an NGO site and with active participation by the NGO staff. This grant program for one year totals US\$4000-5000 for at least four fellowships. Initially managed by UPLB's Agroforest Program, the F/FRED funds will complement Ford Foundation funding for upland NGO support. A review after the first set of thesis grants will determine whether to extend the program to other countries through, for example, the institutional twinning program.

### **7.2.6. Farm Forestry News and MPTS Research Notes**

A report by Norma Adams was presented by Dr. Van Den Beldt on *Farm Forestry News*, the Project's widely distributed newsletter. The Committee appreciated the work done and trusted that *Farm Forestry News* will continue to contribute in its important role in information exchange. Another useful publication is *MPTS Research Notes*, a series of bi-monthly bulletins summarizing recent and ongoing research on MPTS and their management. Network cooperators and their colleagues are invited to contribute summaries.

### **7.2.7. Manual for Extension of MPTS**

Discussion of the extension manual proceeded from a background paper by David Taylor, Information Specialist. Following the recommendations of the 1991 Kathmandu meeting, module authors of the proposed manual met in October 1991 to finalize manual structure, discuss drafts with the editor, and describe needed illustrations to an artist. Following review by outside NGO extension personnel and

research-extension specialists, the manual is now in press and scheduled to be released in July 1992. The manual consists of eight stand-alone modules and fact cards on 41 species.

The Committee is asked to make recommendations on distribution of the manual to key groups in their respective countries, and to consider the need and practical options for translating the manual into local languages employing the F/FRED policy of copublication.

### **7.2.8. MPTSys Development**

Dr. Kamis reported on the development of MPTSys, a microcomputer information and decision support system for research on multipurpose trees. MPTSys is based on a modular approach to system design with database management and application programs. The system includes a research database, decision support package, and reference databases. On the advice of a technical advisory committee of Asian scientists convened in December 1990, subsystem links were developed (for example, among MPTData, MPTInfo, and MPTStat) for specific sets of system users.

Version 3.0 of the system has now been completed. It consists of three types of stand-alone components: research databases, decision support packages, and reference databases. Of these components, the Experiment Database (MPT DATA), data analysis component (MPTStat), and growth simulation model (MPTGro) are currently the most widely used by Network cooperators.

Now that the task has been completed, the Project's Global Research Systems Staff operations in the United States have been phased out. Responsibility for maintaining MPTSys has been transferred to the Secretariat in Bangkok, which has recently recruited a statistician, Dr. P. Venkateswalu, and a computer specialist, Ms. Achara Jantrasaengaram.

There is a plan for the components and subsystems to be evaluated for their usefulness. Meanwhile, Network cooperators can help by contributing their response and experience in using the system. The Network Secretariat will

make available to cooperators any component or subsystem on request.

### 7.2.9. Need for a Sub-Regional MPTS Network for South Pacific

Dr. Prem Srivastava, representative from Papua New Guinea, described the status of forest resources and research in forestry and MPTS in the island countries of South Pacific. Resources, in terms of both trained manpower and funds, are scarce. It is suggested that a collaborative research and training program in priority areas would be very effective in the South Pacific as a sub-region, for the following reasons:

- (1) It is a homogenous sub-region with many similarities among the nations in terms of land tenure, form of subsistence agriculture, dependence on forest plants, and environment.

- (2) The composition of forest species, and possibly of MPTS as well, is different than that of other regions.
- (3) Activities on a sub-network basis could be cost effective. More scientists could receive suitable training if the courses were organized for the sub-region.

Before formalizing the program, the Committee recommended formation of a sub-regional MPTS committee. Terms of reference, priority research areas, and training needs should be identified in a sub-regional seminar in which other regional programs and donors could take part.

## 8.0 Reports of National Meetings and Country Programs

### INDIA

Narayan G. Hegde  
Prem S. Pathak

#### *National MPTS Meeting for 1992*

In India, national meetings are organized on key topics related to MPTS promotion. Representatives of the national and state governments, research institutions, forest departments, and NGOs are invited to identify the priority issues for research and field extension. More than 115 delegates attended the most recent national meeting, held March 8-11, 1992 in Pune, on Promotion of MPTS for Non-wood Forest Products. A special session on improvement, production, and uses of neem was also organized. A summary of the meeting's proceedings and recommendations has been sent to over 1,000 organizations and individuals throughout India. The proceedings of the workshop, containing over 25 papers, will be published soon.

The proceedings of the previous national meeting, Special Focus on MPTS for Small Farmers, has been published and distributed.

#### *National MPTS Research Program*

MPTS national network activities in India are limited to national and regional workshops, publication of a quarterly MPTS newsletter, and organization of training for field workers associated with local NGOs.

Publication of the MPTS Newsletter was launched during the recent national meeting. The mailing list covers the heads of the Departments of Forests, Environment and Agriculture, ICAR Institutions, Agricultural Universities, and more than 600 NGOs. They will receive the quarterly newsletter free of charge during the first year. Efforts are being made to identify plus trees, exchange superior-quality seeds, and share success stories to help popularize MPTS among farmers.

The national MPTS network is also involved in identifying training needs for NGO staff.

In India, the National Network of Agroforestry is working in 31 centers in 5 agroclimatic zones. In their six research projects they emphasize testing of MPTS and their germplasm collection in each zone. Species for each zone have been identified. In its eighth plan, nine more centers are proposed. Another informal network on tree biology emphasizes MPTS for detailed study so that basic research inputs can provide a sound basis for management and production decisions. Research priorities and species identification were presented in the background paper. Efforts have been made to include MPTS management and utilization courses in the existing national training and refresher courses (for various levels of participants), ranging from 1 week to 9 months.

Knowledge of MPTS is important in order that agroforestry and silvipastoral systems improve degraded lands, and for evolving a sustainable production strategy for the country. The Range Management Society of India broadened its scope by including agroforestry in its journal, now entitled *Range Management and Agroforestry*, in which half the space is devoted to MPTS in agroforestry systems.

## INDONESIA

Boen Purnama  
Yamin Mile

### *National MPTS Meeting for 1992*

The Indonesian national MPTS meeting was held June 16-17, 1992 at Cisarua, Bogor. The theme of the meeting was Increasing the Role of MPTS in Supporting Food Sufficiency, Wood Supply, Small Farmers' Income, and Sustainable Environment. One hundred twenty participants from 22 research institutions and organizations attended the meeting.

At the meeting, the national MPTS committee agreed to add *Artocarpus altilis* (breadfruit) to the MPTS priority list, which now consists of nine species: *Artocarpus heterophyllus*, *A. altilis*, *Aleurites moluccana*, *Azadirachta indica*, *Cinnamomum casia*, *Melia azedarach*, *Paraser-*

*ianthes falcataria*, *Parkia speciosa*, and *Sesbania grandiflora*.

Research needed on each species was described, based on the categories of: germplasm inventory and biology, cultural techniques and biotechnology, utilization, and socioeconomics.

### *National MPTS Research Program*

The national meeting also recommended the following urgent activities:

1. accelerated inventory of organizations and institutions in the country involved or interested in MPTS research
2. finalization of the national program as a basis for seeking financial assistance and research support
3. communication and dissemination of important research findings and information

## MALAYSIA

Ahmad Said Sajap  
Zahid Emby

### *National MPTS Meeting for 1992*

MPTS-Malaysia, the National MPTS committee, has met twice since the June 1991 Research Committee Meeting in Kathmandu. The first meeting, held December 12, 1991, was preceded by a seminar on Prospective of MPTS-Malaysia. The five papers presented have been compiled and will be published soon. The second meeting, held on April 24, 1992, was preceded by a seminar on Indigenous Species for Forest Plantation. Seventeen papers were presented at the seminar and are being compiled for publication in the near future.

### *National MPTS Research Program*

Activities of MPTS-Malaysia are divided into two components: publication and research. The National Committee publishes a newsletter twice a year. Seminar proceedings are also published.

In terms of research, three on-going projects are partially sponsored by Winrock; a number of others related to MPTS are carried out by scientists from Malaysian research organizations including FRIM, UPM, UKM, SAFODA, SFI, FRC-Sabah, and Forest Department-Sarawak.

**NEPAL** Kedar P. Prajapati  
Kailash N. Pyakuryal

#### *National MPTS Meeting for 1992*

A National Research Committee Meeting was held in Kathmandu May 18-19, 1992. The meeting identified and prioritized the following topics for future research.

1. Biological science topics: identification, survey, mapping, study, and silvicultural operations of indigenous MPTS.
2. Social-science topics: indigenous MPTS forest management, gender issues, and technology transfer.
3. Other aspects: survey and documentation of other forest products.

The National MPTS Networking Committee was formed with 9 members: 1 coordinator, 1 co-coordinator, and 7 members. The Network Committee is proposing to establish a secretariat with support from the regional Network Secretariat.

#### *National MPTS Research Program*

Ongoing Network trial research in Nepal is being carried out by the Forest Research Division, Institute of Forestry, and Institute of Agriculture and Animal Science at four sites. In Network trials, *Eucalyptus camaldulensis* has shown the best height and diameter growth, followed by *Dalbergia sissoo*.

Nepali sites in the international series of *Dalbergia sissoo* provenance trial were established by FRD at two locations in the eastern and western regions of Nepal.

Small research grants studies are also underway.

**PAKISTAN** Shams-ur-Rehman

#### *National MPTS Meeting for 1992*

The national MPTS meeting in Pakistan will take place in October/November 1992, after which a national program may be effectively planned. Trials on arid and semi-arid species have yielded useful information only in the last few years.

#### *National MPTS Research Program*

Based upon the results obtained so far, it is suggested to:

1. Establish seed orchards of promising species, for example, *Prosopis pallida* and *Eucalyptus camaldulensis*
2. The *Dalbergia sissoo* seed orchards may be silviculturally improved for better seed production and distribution.
3. The performance of *P. pallida* in arid areas of Pakistan should be demonstrated to farmers to address problems of fuelwood shortage and soil erosion.

**PAPUA NEW GUINEA** Prem Srivastava

#### *National MPTS Meeting for 1992*

The national MPTS meeting for Papua New Guinea took place at the Forest Research Institute, Lae, May 25-26, 1992. The meeting was attended by 20 participants from 11 organizations. Dr. Raintree represented the Network Secretariat. The meeting reviewed on-going research involving MPTS, formed a new country MPTS Committee and determined its functions, and discussed new MPTS species network programs on *Casuarina*, *Artocarpus*, *Azadirachta indica*, and a sub-regional MPTS network for South Pacific. The following recommendations for action emerged:

1. Prepare an identification of different species, varieties, hybrids of *Leucaena*.
2. Synthesize the information on MPTS in the country.
3. Write an MPTS Handbook for Papua New Guinea.
4. Inventory MPTS currently used in the country.
5. Submit research proposals to the Network Secretariat for funding.
6. Establish sites in the *Casuarina* provenance trials
7. Establish efficient methods for distributing MPTS literature.

**PHILIPPINES**

Segundino Foronda  
Herminia Francisco

*National MPTS Meeting for 1992*

The MPTS (Philippines) Network held its fifth annual meeting May 3-5, 1992 at the Development Academy of the Philippines, Tagaytay City. Thirteen papers were presented, covering the biological and socioeconomic topics.

Problems identified in the course of the studies included: 1) seed availability and procurement, 2) long droughts, 3) limited reference materials on methodologies of valuation and assessment, including marketing, 4) long clearing period for donor payments, and 5) power outages.

*National MPTS Research Program*

The Network identified research gaps related to MPTS and formulated strategies to help institutions build their capabilities. Beyond 1995, the network believes that its activities can be sustained by PCARRD, particularly under its mandate for Agroforestry Commodities.

**REPUBLIC OF CHINA**

Hsu-Ho Chung  
Fuh-Jiunn Pan

*National MPTS Meeting for 1992*

The national meeting for ROC took place June 22-23, 1992 in Taipei. Topics included policies for encouraging afforestation and agroforestry on agricultural lands, and research on acacias, leucaena, Paulownia, and *Cinnamomum micranthum*.

*National MPTS Research Program*

Research activities for the next five years, identified in the national MPTS meeting, include:

1. breeding genotypes of fast-growing Acacia, Eucalyptus, Leucaena, and Paulownia species for plantation in lowland areas
2. developing a country-wide forest farming system (or agricultural lands afforestation projects)
3. developing agroforestry systems in Eucalyptus plantations
4. conducting economic studies and financial analyses of non-wood production of tree species

**SRI LANKA**

H.P.M. Gunasena  
Anoja Wickramasinghe

*National MPTS Meeting for 1992*

The national MPTS meeting was held May 1-3, 1992, attended by about 130 participants. Recommendations emerging from the meeting included multilocational testing of MPTS for agro-ecological adaptability, initiation of on-farm pilot projects with farmers, production of a newsletter in English and Sinhala languages, an MPTS directory, an annotated bibliography on local MPTS research and agroforestry, and curriculum development. Short-term training needs include social-science research methods, forestry

mensuration, and nursery techniques. Lack of seeds has been a major constraint to popularization of MPTS.

*National MPTS Research Program -- Ongoing*

1. Evaluation of MPTS for ecological adaptability
2. *Dalbergia sissoo* provenance trials
3. Provenance trials of *Gliricidia sepium* based on germplasm received from OFI
4. Provenance trials on Acacias
5. Evaluation of *Leucaena* spp. germplasm for psyllid resistance
6. Humid Zone Network trial sites
7. Alley-cropping using *G. sepium* and *L. Leucocephala*
8. Socioeconomic studies of rural agroforestry systems
9. Economic studies on non-wood products

**THAILAND**

Suree Bhumibhamon

*National MPTS Meeting for 1992*

The Fourth National MPTS Seminar was held March 23-24, 1992 on the Status of Production and Utilization of Fuelwood and Charcoal in Thailand. About 80 participants from government agencies and enterprises, NGOs, and the private sector participated. Discussion focussed on policy, planning, legal issues, production systems, utilization systems, processing, and R&D, as well as the role of NGOs and state agencies in fuelwood use. The Seminar's recommendations are now being submitted to National Research Council of Thailand and responsible energy agencies for further action.

*National MPTS Research Program*

The National Sub-Committee on Research and Development of MPTS, under the National Research Council of Thailand, coordinates network activities in the country. Working groups on Teak, Bamboo, Melia and Azadirachta, and the Environment were formed for activities on these specific topics. The Sub-committee meets once a month and organizes three or four seminars or workshops each year. A newsletter, *Man and Tree*, is soon to be published bi-monthly with primary support from Monsanto (Thailand) and additional funds from F/FRED. An NGO participant was recommended to join the Sub-committee. The Sub-committee enjoys close collaboration with F/FRED's Network Secretariat in Bangkok.

## 9.0 Group Discussions

The Committee reviewed the presentations prepared by the working groups and approved them as revised in the following sections of the report.

### 10. Other business

#### 10.1. Venue of the Next Committee Meeting

Due to budget constraints, the Committee agreed to organize the next Research Committee meeting in Bangkok, Thailand, tentatively scheduled for the second week of May, with a post-meeting tour to be organized in the northeastern part of Thailand.

#### 10.2. Schedule for the Next Series of National MPTS Research Meetings

The Committee proposed a tentative program for the next series of national meetings. The following list presents the schedules of the national meetings.

<i>Time period</i>	<i>Country</i>
1992 <u>November</u> first week	Pakistan
1993 <u>January</u> fourth week	India
<u>February</u> first or second week	Nepal
first or second week	Sri Lanka
<u>March</u> first week	Philippines
second week	Thailand
third week	Indonesia
<u>April</u> to be determined	Malaysia
to be determined	ROC
third week	PNG

### 10.3. Close of Meeting

The Chairman expressed his thanks to all members of the Research Committee for their contributions, and to Winrock International-F/FRED for its support. He once again thanked TFRI and the Council of Agriculture for hosting the meeting. On behalf of the Research Committee, he also expressed his thanks to Dr. Hsu-Ho Chung and Dr. Fuh-Jiunn Pan for their kind hospitality and care throughout the meeting.

### 11. Election of the Chairman of the Research Committee

Dr. Suree Bhumibhamon was re-elected as the Chairman of MPTS Research Committee.

### 12. Election of Representatives to the Steering Committee

The Committee elected members to serve on the Steering Committee for its December 1992 meeting. In addition to Dr. Suree, who will attend as Research Committee Chairman, the following were elected:

Dr. Prem Srivastava (biological sciences)  
Dr. Prem Pathak (biological sciences)  
Dr. H.A. Francisco (social sciences)  
Dr. Hsu-Ho Chung (social sciences)

### 13. Post-meeting Tour

A post meeting tour was arranged by Dr. Chung and Dr. Pan. Details of the post-meeting tour appear in Appendix 5.

## **Working Group Reports**

### **Part One:**

#### **Native Multipurpose Tree Species**

Indigenous Knowledge of Native MPTS

Management and Improvement of Native MPTS

Constraints to Research and Development of Native MPTS

Product Development of Native MPTS

Economics and Marketing of Native MPTS

## Indigenous Knowledge of Native MPTS

Discussion group members were:

Kailash Pyakuryal	<i>Nepal</i>
Rick Van Den Beldt	<i>Network Secretariat</i>
Boen Purnama	<i>Indonesia</i>
Segundino Foronda	<i>Philippines</i>
Ta-Wei Hu	<i>ROC (observer)</i>

Over centuries, rural communities have accumulated a wealth of indigenous knowledge on the growth and use of trees and other plants. This is true not only for domesticated horticultural tree species, but also for many forest tree species. Such knowledge has had profound impact on the world economy in the areas of:

- o food and beverages
- o medical and veterinary pharmacopeia
- o animal husbandry
- o oils, waxes, latexes, shellacs, fibers and other industrial raw materials
- o agronomic, forestry and land-use relationships
- o plant management in general

Indigenous knowledge has proved most useful where it has been formalized and incorporated into mainstream, evolving economies. An example is the plant-based pharmacopeia that developed into modern Chinese medicine.

Making further use of indigenous knowledge of tree species will be a significant challenge for two reasons:

- o Such knowledge is passed along orally, and is now being eroded steadily by external knowledge and technologies.
- o Most indigenous knowledge is documented poorly or in a form not immediately useful to scientists and other decision-makers.

It must be recognized that there is a need to screen this knowledge to assess which elements can be confirmed scientifically and which elements are based more on local beliefs.

The following steps are needed to assess the constraints and potential for adapting indigenous knowledge:

- o Catalogue information. Where this has already been done, this activity may synthesize and combine existing data bases.
- o Screen synthesized information through a technical filter to pre-determine its validity on a scientific basis. Inaccurate or outlandish claims should be screened out at this stage.
- o Make screened and validated information available to those that can use it in a form that is useful.
- o Assess the viability of these species and products at different scales of economic production systems, from household to industrial.

## Management and Improvement of Native MPTS

Discussion group members were:

Kamis Awang	<i>Network Secretariat</i>
Shams-ur-Rehman	<i>Pakistan</i>
Ahmad Said Sajap	<i>Malaysia</i>
Boen Purnama	<i>Indonesia</i>
Suree Bhumibhamon	<i>Thailand</i>

### Problem

Insufficient knowledge on native MPTS -- their growth, management, and utilization.

### Action Needed

#### *Management of Native MPTS*

1. Conduct ethnobotanical surveys from the existing literature with a view toward identifying gaps in documentation.
2. Prioritize native MPTS for industrial purposes.
3. For biodiversity conservation, explore flora, fauna, and non-wood products for inclusion in forestry management implementation plans.
4. Domesticate native MPTS by conducting biological, silvicultural, and horticultural research required to grow the species properly.
5. Identify appropriate indigenous technologies of native MPTS utilization, and possibilities for improving these technologies.

#### *Improvement of Native MPTS*

Conventional tree improvement programs for native MPTS should be initiated in each country, with the following objectives and actions.

### 1. Objective: Conservation and Exploration

#### Action

- (a) Develop a national policy framework to foster sustainable use of native MPTS and maintenance of biodiversity. NGOs and grassroots organizations should participate in drafting these policies.
- (b) Explore priority native MPTS to enable protection of gene pools, species, habitats, and ecosystems. With people's participation, make a prioritized list. Farmers should also join the exploration team.
- (c) Maintain genetic materials to preserve the diversity, both *in situ* and *ex situ*. Establish seed sources, clone banks, and multiplication gardens to test the selected materials. Farmers would receive information on the most suitable materials, based on their preferences.

### 2. Objective: Propagation of Selected Species

#### Action

- (d) Study the simplest and cheapest methods of propagation of selected native MPTS. Institutions and grassroots organizations can share problems and experiences.
- (e) Transfer this technology to develop mass production systems. Provide training or materials to grassroots organizations to produce enough materials to meet farmers' needs.

3. **Objective:** Expand and encourage the sustainable use of products of native MPTS for local benefit.

**Action**

- (f) Identify and quantify the local economic value of native MPTS products in development and land-use planning.
- (g) Develop and promote native MPTS use through market and product development.

## Constraints to Research and Development of Native MPTS

Discussion group members were:

Prem Srivastava	<i>Papua New Guinea</i>
Kedar Prajapati	<i>Nepal</i>
Celso Lantican	<i>Network Secretariat</i>
Fuh-Jiunn Pan	<i>ROC (Taiwan)</i>

Discussion identified the following constraints to research and development of native species:

- o Lack of interest, commitment, and/or accountability of researchers on this topic
- o Insufficient funding
- o Inadequate resources of qualified research personnel
- o Low priority on forestry research as set out in national policies
- o Within forestry research programs, low priority on native MPTS
- o Lack of knowledge of the economic potential of native MPTS
- o Scarcity of literature, especially in the local language
- o Lack of proper facilities
- o Lack of understanding about MPTS by decision makers
- o Lack of continuity of research programs

To address these constraints, the following actions are recommended:

- o Identify sources of funding support for research.
- o Determine training needs for researchers studying native MPTS.
- o Inventory and collect available information on native MPTS, by country.
- o Determine the needs and perceptions of farmers regarding native MPTS.
- o Prepare a list of native MPTS common to the region for possible collaborative research and information exchange.
- o Publicize the importance of multipurpose trees among policymakers.
- o Provide incentives for scientists working on native MPTS.
- o Develop research programs at the national, regional, and international levels.
- o Establish mechanisms for monitoring and evaluating the research under these programs.

Refer also to the recommendations made by the working group on Application of Knowledge for Network Trials for Small Farmers (p. 17).

## Product Development of Native MPTS

Group discussion members included:

Hsu-Ho Chung	<i>ROC (Taiwan)</i>
Michael Read	<i>Network Secretariat</i>
Yamin Mile	<i>Indonesia</i>
Zahid Emby	<i>Malaysia</i>

### Why Product Development? Why Native MPTS?

Research to produce high value-added products (wood or non-wood) to meet market need is as significant as -- if not more important than -- any other area of research on MPTS. Exotic MPTS may produce quality products, but it could take years of development and extension effort before sometimes conservative small farmers accept and produce such products.

#### Research Needs:

1. Production: Qualitative and Quantitative
2. Survey of Existing Uses
3. Explore the Potential New Products
4. Technology Development

Native MPTS have their uses; studies are needed to qualify and quantify these and their production. Many traditional uses of these MPTS are narrowly localized. Studies therefore need to survey such uses and their potential application in other areas (or regions) where the same species are grown. Research is also needed to explore the potential new products from species which may either increase the farmers income and/or the welfare of farmers.

To increase farmers' income from MPTS products, technologies need to be developed that would reduce the costs of production. In addition, further processing of products from native MPTS could significantly increase the value of these products. Low-cost, efficient, and innovative appropriate technologies that produce

high value-added products need to be developed. In this connection, NGOs undoubtedly will play an important role in needs assessment.

#### Recommended Action

##### *Support for MUSFAD*

Most of this discussion has been cited in the review of MUSFAD presented by Dr. Lantican earlier. F/FRED can play several roles, one of which is research project development for products from MPTS. In this, F/FRED has already sponsored a workshop and prepared the MUSFAD proposal. F/FRED should promote MUSFAD among international donors to obtain funding for the proposed research projects included in the coordinated MUSFAD proposal.

##### *Product Information Network*

F/FRED could also establish a product information network for the exchange of information on supply and demand of products from native MPTS, the technology for product development, etc. Such information networks are highly cost-effective. F/FRED should pursue this in the immediate future.

With limited funds available at this point in Phase 2, F/FRED might prioritize the proposed MUSFAD component research projects and fund a few of those on the top priority list. In light of the importance of product development for native MPTS, this important area of research should be identified as a focal point for the F/FRED Project's third phase, should USAID support emerge for this.

## Economics and Marketing of Native MPTS

Discussion group members were:

Sompetch Mungkorndin	<i>Network Secretariat</i>
Herminia Francisco	<i>Philippines</i>
Anoja Wickramasinghe	<i>Sri Lanka</i>
Prem Pathak	<i>India</i>

<b>MPTS focus:</b>	both introduced and native species	Gain understanding of the marketing systems for major MPTS through analytical review of literature.
<b>Product focus:</b>	wood and non-wood products, products already marketed and potentially marketable	Analyze marketing system of MPTS products to identify constraints and opportunities.
<b>Subject focus:</b>	production, consumption, distribution and utilization	Conduct demand and supply analysis for selected MPTS products (macro-analysis).
<b>General principles:</b>		Analyze consumption behavior patterns and determinants.
	<ul style="list-style-type: none"><li>o highlight both the use and market value of MPTS</li></ul>	Assess economic feasibility of village and household level processing.
	<ul style="list-style-type: none"><li>o enhance market value as a strategy to uplift economic conditions of small farmers without necessarily neglecting use value to both the private individuals and society.</li></ul>	Assess economic feasibility of government support pricing to encourage MPTS cultivation/utilization (off-site benefits).
<b>Specific concerns/researchable areas:</b>		Research must consider the whole picture of economics, marketing, and utilization of MPTS and place on them proper price tags in order to present farmers with a more informed basis for their decisions.
	Conduct financial and economic analyses on	
	<ul style="list-style-type: none"><li>o valuation of marketed products</li><li>o valuation of marketable products consumed at home</li><li>o valuation of non-marketable products (environmental and sustainability function)</li><li>o integrated economic analysis of on-farm trials</li></ul>	

## **Working Group Reports**

### **Part Two:**

#### **Approaches for Sustaining MPTS Development**

Application of Knowledge from Network Trials for Small Farmers

On-farm Trials and the Role of the Private Sector in Tree Farming

Forests and the Poor: Lessons from Below

Gender Analysis

The Future of the MPTS Research Network

## Application of Knowledge from Network Trials for Small Farmers

The group discussion members were:

Kamis Awang	<i>Network Secretariat</i>
Kedar Prajapati	<i>Nepal</i>
Segundino Foronda	<i>Philippines</i>
Shams-ur-Rehman	<i>Pakistan</i>

Species and provenance Network trials have been established in three environmental zones and nine countries so far. The following points were identified related to making these trials more beneficial to small farmers:

- o The project is relatively short-term and full rotation growth data cannot be derived for timber production. Still, the resulting information on fodder, fuelwood, and pole production which can be useful to farmers.
  - o Farmers in the region do not practice the precisely defined management treatments of pruning, thinning, or pollarding in the manner spelled out for the trials cooperators. This reflects the original purpose of the trials as a means to obtain scientifically comparable results among cooperators in the region for better site-species matching; tests of local practices do not lend themselves to regional comparability.
  - o Identification of ideotypes may be easier in the Humid Zone, but in the arid and semi-arid regions this is difficult due to harsh climatic conditions.
  - o With infestation of psyllids affecting *Leucaena leucocephala* in the region, farmers may benefit most by the establishment of seed production areas of psyllid-resistant varieties, including K636, for better leaf production. The F/FRED-sponsored leucaena seed orchards are promising in this regard. Other existing trials may be used as demonstration plots where appropriate.
  - o National MPTS networks may work with NGOs to prepare demonstration materials
- (for example, videos, slide presentations, and primers written in local languages).
- o National seed centers should be established, with relevant literature on species to help farmers to obtain better quality seeds and information on different species suitable for their sites.
  - o Studies of marketing of MPTS products could encourage farmers to plant MPTS for income generation.
  - o In order to address farmers' problems, their needs as clients should be identified before carrying out future research programs. Existing knowledge of MPTS can be effectively incorporated into on-farm trials for better collaboration and integration with farmers.

## On-Farm Trials and The Role of the Private Sector in Tree Farming

Discussion group members were:

Fuh-Jiunn Pan	<i>ROC (Taiwan)</i>
Sompetch Mungkorndin	<i>Network Secretariat</i>
Yamin Mile	<i>Indonesia</i>
Michael Read	<i>Network Secretariat</i>

The group discussed the proprietary status of forest land in the countries represented by group members (ROC, Thailand, Malaysia, and Indonesia). It was noted that virtually all forest land is government owned. For this reason, farmers are not generally in a position to make management decisions concerning the trees in these areas.

Examples of tree farming on private land were noted in Thailand (eucalyptus and teak), Indonesia (*Paraserianthes falcataria* grown by cooperatives of small farmers) and Taiwan (where 90% of locally supplied wood products come from private landholdings). In the future, more wood products will have to be produced on private lands. It was noted that there is now a total logging ban in ROC and Thailand.

The group considered that government and industry should cooperate with farmers to encourage production of forest products on private lands. Most of this discussion centered on commercial products of MPTS, not household uses. The public sector could provide information, organize workshops, and perhaps provide trees or seeds. Industry could supply information and markets for the trees at harvest. The case of Indonesia was put forward as an example in which: (1) the Forest Department sets up demonstration plots, (2) farmers organize themselves into cooperatives of 20-30 farmers and plant *Paraserianthes falcataria*, and (3) merchants come to buy the wood at harvest.

On-farm trials are generally considered useful as a research and demonstration tool.

### Discussion points

- Q: Is it F/FRED's mandate to become involved in commercial forest products?
- A. The consensus of the 1991 Steering Committee meeting was that it is within F/FRED's mandate to be involved, inasmuch as it would benefit small farmers.
- Comment: We must be careful not to focus on economic benefits which might attract large companies to the detriment of small-scale farmers.
- Comment: We must consider the whole range of marketing, economics, and utilization issues and their price tags in conveying information to farmers.
- Comment: We must consider the socioeconomic aspects and the non-commercial products of MPT species in addition to their commercial values.

## Forests and the Poor: Lessons from Below

Discussion group members were:

Kallash Pyakuryal	<i>Nepal</i>
Suree Bhumibhamon	<i>Thailand</i>
Zahid Emby	<i>Malaysia</i>
Boen Purnama	<i>Indonesia</i>

Rural poor have always had a close relationship with forests, which provide them land for agriculture and basic needs of wood, fuel, food, fodder, and even water supply. Indigenous knowledge on the use of forest resources, usually in sustainable ways, has long been employed by rural dwellers living near the forest.

Basic points are:

1. The poor are concerned for conservation of forest land for their survival.
2. The poor have indigenous knowledge of forest products and forest management.
3. The poor can be participants in joint forestry management.

State intervention in natural forests has displaced native populations from using and managing forests and forest products. As a result, forests are gradually degraded and/or there have been acute management problems. Poor people have suffered most. To meet their basic needs, they need help in getting organized.

### Problems

1. Poverty is pervasive.
2. Dependence on forests and forest products has increased.
3. Deforestation has increased at an alarming rate creating environmental problems and declining land productivity.
4. Most poverty alleviation programs have failed to reach the real poor because they were not targeted properly.

5. National policies on poverty alleviation and forestry development seldom coordinate with each other coherently.

### Action Needed

For this discussion, the rural poor were classified into three categories:

1. The landless
2. The poorest of the poor, whose income is less than half of the threshold income for subsistence.
3. Small farmers whose income is not sufficient for subsistence.

Actions needed for each of these categories are as follows.

#### For landless farmers

1. Introduce MPTS for food and fuel.
2. Train them in handicraft manufacture using wood from stand thinning operations to create value-added products.
3. Involve farmers in forest management activities such as planting, thinning, and harvesting, to provide a source of income.
4. Improve their agroforestry systems by using wider spacings and introducing silvicultural management and bee-keeping as forest trees grow bigger.
5. Reduce forest damage by introducing more efficient use of resources, such as improved stoves.

6. Use and increase the role of buffer zones as production sites for landless farmers.

2. Develop cooperatives among farmers to provide them with better access to markets for MPTS products.

The poorest of the poor

1. Augment income by providing on- and off-farm jobs.
2. Introduce tree tenure on community land (provide rights of access to trees, while land remains in the hands of the community).
3. For those with land, integrate MPTS into agriculture to give them an income through sale of the tree products as well as value-added products.

3. Conduct research activities on the following topics through small research grants:

- (a) Integrating micro-level programs with macro-level policies for poverty alleviation, including ways for properly targeting the poor beneficiaries.
- (b) Development of a poverty alleviation model by selecting a given village/area to be developed.

Small farmers

1. Introduce local industries as part of MPTS development.

4. Modify forestry curricula by incorporating training in the relationships between people and forests, not just emphasizing the trees.

**Table 1.** Estimated size of landless populations in Network countries.

Country	Percentage of population dependent on agriculture	Landless		
		No. of families	No. of people	Percentage of total population
India	80	17,000,000	100,000,000	12
Indonesia	70	5,400,000	27,000,000	14
Malaysia	70	320,000	1,600,000	10
Nepal	93	600,000	3,600,000	20
Pakistan	70	2,000,000	12,000,000	10
Philippines	70-80	3,000,000	18,000,000	28
PNG	90	n.a.	n.a.	<1
ROC	21	n.a.	n.a.	n.a.
Sri Lanka	74	580,000	2,900,000	17
Thailand	70	1,000,000	10,000,000	18

n.a. = not available

## Gender Analysis

Discussion group members were:

Anoja Wickramasinghe	<i>Sri Lanka</i>
John Raintree	<i>Network Secretariat</i>
Herminia A. Francisco	<i>Philippines</i>
Rick Van Den Beldt	<i>Network Secretariat</i>

The group agreed at the outset that the multiple-use nature of MPTS creates a special need for an analysis of gender differences in dealing with multipurpose trees. It was further agreed that such analysis should encompass the whole range of MPTS activities, including seed distribution, production, processing, marketing, and utilization.

Some time was devoted to discussing the truth or falsity of certain gender stereotypes. The consensus at the end was that it was very difficult to generalize since there are numerous exceptions to general patterns. Since each situation may require its own analysis, the group felt that it should be a priority to devise simple, efficient, and robust methodologies for gender analysis.

The discussion then shifted to methodological issues. A number of general analysis methodologies exist and should be consulted by the Network, but the group felt that the MPTS Research Network should try to maintain a focus on its own research agenda and address the gender dimensions of MPTS research. In this way the gender analysis could make a meaningful contribution to MPTS research and the MPTS

Research Network could make a unique contribution to global understanding of gender issues as they relate to an important field in research and development.

Activity analysis is one of the key components of gender analysis. Identifying the "what, who, where, and how" of relevant land use and production activities can provide essential descriptive information as a basis for any subsequent information. The questions "why" and "how" can add a diagnostic dimension and help identify relevant intervention points for MPTS research and development.

Beyond activity analysis, other important methods might focus on gender differences in perceptions and preferred uses of trees, and opportunities for MPTS development. The group felt that the overall guiding question for any methodological work should be, How to efficiently assess MPTS development potential?

The remainder of the discussion centered on logistics and planning of the upcoming WID workshop.

## The Future of the MPTS Research Network

Discussion group members were:

H.P.M. Gunasena	<i>Sri Lanka</i>
Prem Srivastava	<i>Papua New Guinea</i>
Celso Lantican	<i>Network Secretariat</i>
Prem Pathak	<i>India</i>

USAID support for the MPTS Research Network is assured until April 1995. This discussion aims to review the Network's achievements to determine the strongest role for the Network in the future.

### Achievements

1. Research networking (intranational and international) involving India, Indonesia, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, ROC, Sri Lanka, and Thailand has taken place.
2. Research on MPTS was intensified within the respective countries and at regional level.
3. A range of publications have been produced and distributed widely.
4. Training courses/workshops have been organized.
5. Software packages for data collection, management, and analysis have been developed.
6. Interaction and collaboration within the countries among relevant departments and Institutes, and at the regional and international levels, has been greatly enhanced.
7. National MPTS committees have been established.
8. More than 50 small research grant proposals have been funded so far.
9. Research information has been disseminated.

10. Seminars and workshops have been organized to examine issues from a range of viewpoints and institutional perspectives.

### Future Activities

1. Continuation of ongoing trials.
2. Application of proven technologies in the field, with farmers' participation.
3. Expansion of networks in other countries in Asia-Pacific region, including South Pacific countries.
4. More MPTS species selected for Network trials, including neem, jackfruit, and *Casuarina equisetifolia*.
5. Continued organization of training courses to address the needs of researchers and extension workers in the region.
6. Selection of suitable species for reforestation and further studies of species/site compatibility.
7. Research on management, product development, and utilization of proven MPTS.
8. Research on marketing and social aspects.
9. Conservation and distribution of improved germplasm and preservation of biodiversity.

### Action

The group is of the opinion that USAID should continue to support the activities mentioned

above in a third phase of the Project, under any of the following strategies:

- o Restoration forestry
- o Rehabilitation of degraded lands
- o Sustainability of natural resources and the environment, with the objective of improving the quality of life of the people in the region

If Phase 3 funding is not possible to further support this program, an alternative is to employ the expertise, experience, and infrastructure of other international agencies, such as CIFOR, ICRAF, IDRC, and other donors. At the same time, the current research programs and associated activities of the national MPTS committees would be integrated into the respective national research programs and strengthened.

# **Appendices**

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*Appendix 1*

**Meeting Agenda**

*June 21, 1992*

Arrival in Taipei

*June 22*

Opening Ceremony for the Research Committee meeting and National MPTS Meeting of ROC, at Taiwan Forestry Research Institute (TFRI)

Tour of TFRI

Research Committee Meeting

1. Adoption of Agenda
2. Approval of Minutes of the last meeting
3. Matters arising from the minutes of the last meeting
4. Review of on-going programs

4.1. Network research

1987 and 1991 Humid and Subhumid Zone (Kamis Awang)  
1989 Arid and Semi Arid Zone (Michael Read, H.P.M. Gurasena)  
COGREDA and *Acacia auriculiformis* provenance trials (Kamis Awang, Suree Bhumibhamon)  
*Dalbergia sissoo* Provenance Trials (Rick Van Den Beldt, Shams-ur-Rehman)  
*Azadirachta indica* Network Trials (Rick Van Den Beldt, Suree Bhumibhamon)  
*Artocarpus* network (John Raintree)  
MPTGro (Kamis Awang)  
Psyllid Resistance and Improvement of *Leucaena* Species (Fuh-Jiunn Pan)  
Small Research Grant Programs (Rick Van Den Beldt)  
Farm and Village Forestry Study (John Raintree, Herminia Francisco)  
Farmers' Tree Breeding Objectives (John Raintree, Anoja Wickramasinghe)  
MPTS Economic Study (Sometch Mungkorndin)  
Standard Measurements Methods (Rick Van Den Beldt)

*June 23*

Trip to Chia-yi

Visit Chia-yi Institute of Agriculture and the MPTS trials there

Visit Bi-Tsu-Toe Nursery, Chung-pu Branch Station, TFRI

Dinner hosted by Chia-yi Institute of Agriculture

Continue to Kao-Hsiung

**June 24**

**National Sun Yat-Sen University, Kao-hsiung**

**4.1. Review of On-going Programs (continued)**

WID Project (John Raintree)  
Twinning (Celso Lantican)  
MPTS Utilization for Small Farm Development MUSFAD (Celso Lantican)  
Training and Training by Correspondence (Celso Lantican)  
Postgraduate Program linking NGOs to Universities (Rick Van Den Beldt and David Taylor)  
*Farm Forestry News* and *MPTS Research Notes* (background paper prepared by Norma Adams)  
Manual for Extension of MPTS (background paper prepared by David Taylor)  
MPTSys Development (Kamis Awang)  
Reports on National MPTS Research Meetings (national representatives)  
Update on National Programs of MPTS Research (national representatives)

**June 25**

**5. Group discussions**

**5.1. Native MPTS**

Indigenous Knowledge of Native MPTS (H.P.M. Gunasena)  
Management and Improvement of Native MPTS (Siree Bhumibhamon)  
Enhancing R&D of Native MPTS (Celso Lantican)  
Product Development of Native MPTS (Hsu-Ho Chung)  
Marketing of Native MPTS (Narayan Hegde)

**5.2. Toward Sustainable Approaches**

Application of Knowledge from Network Trials for Small Farmers (Kamis Awang)  
On-Farm Trials and the Role of Private Sector in Tree Farming (Fuh-Jiunn Pan)  
Standard of Being of Rural Poor (Kailash Pyakuryal)  
Future of MPTS Research Network (Rick Van Den Beldt)  
Gender Analysis (Anoja Wickramasinghe)

**Final Session**

**6. Other Business**

Election of Committee Chairman  
Election of Steering Committee members

**June 26-29**                      **Post-meeting Tour**

**June 30**                         **Departure**

## Areas Identified for Further Development of MPTGro

The task force comprising Dr. Lim Meng Tsai (Chairman, Malaysia), Dr. Agus Setyarso (Indonesia), Dr. Hemanthi Ramasinghe (Sri Lanka) and Dr. Kamis Awang (NS) met April 21-22, 1992 to draw up an action plan that can be implemented within the remaining period of the F/FRED Project. This covers the following areas.

### Basic Model

#### 1. Allometrics

Derivation of allometric regressions from 1987 trials data for incorporating into the model.

#### 2. Species

As the model already has *Acacia auriculiformis* and *Leucaena diversifolia*, efforts will be focused on creating plant files for *A. mangium* and *Eucalyptus camaldulensis* using available information.

#### 3. Growth

Changes in the input section of the model (not programming changes) should be made in two areas.

- (a) Estimation of leaf area from existing leaf biomass by undertaking a study on specific leaf area.
- (b) Definition of (theoretical/ empirical) limits for parameters such as basal areas, densities, volumes, and leaf area index.

#### 4. Rotation Period

The lengthening of simulation period could be achieved by incorporating data obtained through cross-sectional studies of existing stands of different ages.

### Management Influences

#### 1. Thinning and density

Further studies need to be carried out on *A. mangium*.

### Environmental Influences

#### 1. Water stress

The current water stress model is acceptable and does not require changes at the moment.

#### 2. Soil nutrients

This factor is considered a very important modifier in the model.

Research into correlating biomass production, foliar nutrient contents, and soil nutrients of existing stands of different ages and on different sites is recommended.

Four research proposals have been developed for funding under the Small Research Grants program that can directly contribute to further improvement of the model.

## Ongoing and Recommended Follow-up to the FVF Study

### Ongoing activities

A list of current research projects related to the FVF study is given below. Several of these are part of an initiative to extend the FVF study on a national level in the Philippines.

<u>Study Title</u>	<u>Researcher(s)</u>
<i>Completed</i>	
Comparative Analysis of Farm- and Village-Forestry Practices in South Asia (In press with Oxford Forestry Institute)	Wickramasinghe
<i>In Progress</i>	
Analysis of Gender Issues Pertaining to Farm and Village Forestry Practices in Asia	Wickramasinghe
Comparative Analysis of Land Tenure and Forest Land-use Systems in the Philippines	Penalba
National Comparative Analysis of Gender Differentiation in Land- and Forest-Use Practices in the Philippines	Diamante & Dizon
Household Labor Allocation and the Production, Maintenance and Utilization of MPTS in Two Integrated Social Forestry Program Sites in the Cordillera	Pollisco-Bentagan
The Use of MPTS in Agroforestry Systems of Mt. Makiling	Dizon
Forest- and Land-Use Practices of Farm Households in the Upland Villages of Laguna	Maligalig
Farm/Forest Use Practices in Oriental Mindoro, Philippines	Mallion & Diamante
Ideotype Specifications for MPTS Breeding: Analysis of Farmers' Tree-Use Practices and Preferences in the Philippines	Dizon, Francisco, and Maligalig
Development of a Geographic Analysis System for Forest Management and MPTS Use in the Philippines	Francisco
Indigenous Management of MPTS in the Mid-hills of Nepal	Pokharel

### Recommended Follow-Up

The FVF Consolidation and Planning Workshop, held in the Philippines in late November/early December 1991, was organized with the assistance of Dr. Herminia Francisco, College of Economics and Management, UPLB, and attended by FVF cooperators from the Philippines, Indonesia, Nepal, Sri

Lanka, and Thailand. The purpose of the meeting was to review and consolidate the experience with the FVF study, hear progress reports on ongoing activities, and identify priorities for follow-up activities.

Researchers identified use of the existing database to test and develop coherent theoretical perspectives on farm and village forestry patterns and practices in the region as top priority for continued F/FRED support. The workshop participants felt that comparative analysis of similarities and differences between households and villages would be more revealing than summary analysis of aggregate data, particularly if based on sound hypotheses derived from commodity economics, land-use analysis, and household decision-making perspectives.

The following additional activities, which build upon but go beyond the FVF dataset, were also identified as priorities:

#### Regional Comparative Studies

1. Network-wide study on gender analysis of farm and village forestry patterns using a shared methodology
2. Regionally coordinated analysis of the impact of government policies on farmers' use of MPTS
3. Comparative study of regional experience with local nurseries and other MPTS seed and seedling distribution systems
4. Inventory of MPTS biomass supply, subsistence demand, and market surplus in selected FVF communities
5. A diagnostic assessment of MPTS needs and specific relevance of Network Trial results in selected FVF communities

#### Case Studies

1. In-depth studies of processing and utilization of MPTS for selected uses (e.g. food, fodder, fuelwood, building materials, cash income, etc.)
2. Case studies of indigenous forest management
3. In-depth case studies of tenurial factors affecting farm and village forestry practices
4. Case study of large kinship-based forest management and user groups (e.g. large surname-based groups in Nepal)
5. Case studies of the role of foresters and local communities in forest management

#### Practical Follow-up Actions

1. Use the FVF studies to identify priority species for further research in participating countries
2. Distribute appropriate MPTS seeds and seedlings to communities that participated in the FVF study (preferably following site- and user-group-specific needs assessment and employing distribution system recommendations from the regional study)

## F/FRED's Women-In-Development Project

Women in Development (WID) is a relatively new focus in MPTS research activities, made possible within the MPTS Research Network by a grant from the WID Office of AID in Washington. The aims of the WID support to research are to:

- o improve the overall effectiveness of development efforts by increasing awareness of the gender dimensions of development and natural resource management
- o provide increased opportunities to women as researchers and beneficiaries of development

As such, WID falls within the scope of the applied social science component of F/FRED.

As originally designed, the F/FRED project had no explicit WID or gender analysis component beyond compliance with the general AID requirement for gender-disaggregated analysis of socioeconomic data. F/FRED's general social science component has, however, fostered Network research activities which have resulted in a growing awareness of the gender dimensions of MPTS usage.

The 1989 FVF study showed that men and women in Asia play different roles with respect to the production and use of different tree products. While the detailed division of labor and decision-making responsibilities is not the same in every country, the general pattern is that men are primarily involved with trees as sources of cash income, while women are more involved with the domestic uses of trees for food, fodder, fuelwood, medicinal preparations, etc. Marketing of the non-wood component of trees is also, in many countries, an activity in which women are heavily involved.

While there is overlap between men's and women's spheres, it is undeniable that an interest in multipurpose trees takes researchers deep into the women's sphere. In order to conduct good research, we must be aware of how women and

men perceive, produce, care for, and utilize multipurpose trees in different ways. Only with this understanding will we be able to target our research efforts to develop the full potential of multipurpose trees.

### Purpose and Goals

While gender analysis is an explicit focus of some on-going network studies and an implicit focus of others, all of the on-going studies--and all of those to come--would benefit significantly from the use of a more comprehensive methodology for gender analysis as well as a more explicit and widely shared analysis of WID opportunities and implications.

The WID project will seek to build upon existing initiatives to strengthen, expand and link on-going efforts in gender analysis; add a gender analysis component to selected research activities which lack an explicit gender focus; and, where appropriate, introduce a WID orientation into new network research activities.

Through these efforts the WID project hopes to refine the orientation of MPTS researchers towards small farm and village forestry management systems. Gender analysis will improve understanding of MPTS producers' and user groups' needs and preferences. Results will be used to communicate to researchers and policy makers the impact of gender variables on access, management, utilization and improvement of MPTS and implications for effective extension and land use approaches.

The WID project supports two distinct kinds of activities:

- 1) *Gender analysis activities* aimed at increasing researchers' awareness of the need for gender analysis in MPTS research, training researchers in gender analysis concepts and methodologies, strengthening project-funded socioeconomic and interdisciplinary research by including gender analysis

2) *WID activities* which seek to increase the participation of women in MPTS research networks, training activities and workshops; provide support for research conducted by women scientists; and increase the participation of women beneficiaries in MPTS research, extension and training activities, especially in regard to opportunities for small enterprise development and community-based research.

5. Give special emphasis to small enterprise development potentials for women participants in the Artocarpus Network and other tree improvement efforts (e.g. multiplication and distribution of improved germplasm through small scale nurseries, etc.)

### Specific Objectives

To achieve these aims we propose to:

1. Add a gender analysis component to selected on-going research projects.
2. Incorporate of a gender analysis component in new research projects arising from the Applied Social Science, Interdisciplinary Studies, and Small Research Grants programs.
3. Institutionalize a Gender Analysis Network as a subnetwork within the MPTS Research Network, convening a mini-workshop of 15-20 cooperators to initiate the network and to develop a shared methodological approach, and holding a workshop at the conclusion of the research period (1994?) to present and discuss results and identify implications for research and development and subsequent follow-up actions.
4. Develop a training course to disseminate gender analysis methodology and enhance awareness of the gender dimension of MPTS production and utilization in Asia.

Jackfruit tree improvement: an example of WID opportunities

Jackfruit tree improvement is a particularly fitting subject for WID activities. While much of the potential for jackfruit tree improvement appears to be for marketable qualities of the fruit (both ripe and immature fruit), the reason the tree is so widely and deeply appreciated in Asia is because of the role it plays in regional food security. As a staple food within the household economy of low resource farmers throughout tropical Asia, as a food-producing timber tree, and as a major source of fodder in some parts of the region, jackfruit presents an uncommonly complex set of choices to tree improvement programs.

Women users and processors of jackfruit for domestic consumption will be the key to understanding the non-market components of jackfruit demand and, at the other extreme, it is the market women of Asia who will provide many of the key insights into the commercial prospects for jackfruit. Thus, a WID orientation can provide an efficient entry into key aspects of the jackfruit picture.

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*The Secretariat welcomes comments, suggestions, and expressions of interest to participate in this new network.*

## Gender Analysis: An Analytical Tool for More Effective MPTS Development

Anoja Wickramasinghe

Tree-use practices are culture-based phenomena. For example, the differential engagement of men and women in using trees is determined by the tasks they conventionally perform within their social and environmental context, and by intra-

household matters.

Within a broad context, 'gender' captures the socially defined differences between men and women and enables us to disclose issues that

Interventional programs should address. Underlying concepts related to gender analysis concern the manner in which responsibilities are divided between men and women. It permits examination of available resources and identification of constraints to their potential contribution.

### **Gender and Tree-Use Practices**

Realizing that deforestation is linked to the adverse effects of rural energy shortages on rural poor people, forestry programs have sought to integrate people for better and more effective reforestation and forest management. However, less effective participatory forestry programs and low returns from multi-million dollar forestry projects have indicated the practical limitations of considering 'people' as a homogeneous group. The differential engagement of men and women in forestry-related tasks, their knowledge, experience, interest, and needs have been revealed by research. Studies have documented, for example, the greater ability of women to recognize tree products (Hoskins 1982), and use them to meet survival needs (Hoskins 1983).

Such differentials can also be revealed by analysis of the FVF data set collected at 26 sites in Bangladesh, Indonesia, Nepal, Philippines, Sri Lanka, and Thailand. Clearly, both men and women are engaged in obtaining tree products. But many community-specific variations can also be found. Of the 9 categories of products described in the data set (fodder, fuelwood, charcoal, timber, industrial raw materials, materials for handicrafts, house construction, occasional uses and other), fuelwood, food, and fodder were the most widespread uses. Broadly, this indicates the use of trees in meeting family subsistence needs, but the data also reveal the relative priority placed on major products by both genders. For example, males tend to be more involved in getting timber and construction materials than women.

Men were shown to use widely most of the sources of supply of forest/tree sources (government forest, private forest, common forest, other common areas, homesteads, farm plots, farm agroforestry systems, on-farm non-tree

products, off-farm non-tree products, purchased tree products and purchased non-tree products). Of all the sources, women were more likely to obtain products from homegardens and trees scattered in farmland. Compared to that of males, women's use of government forests, private forests, and farm plots with trees was low (Wickramasinghe, forthcoming). In this also, however, there were site-specific variations.

### **Research Needs**

But how products are obtained and the gender-specific information on the collectors in the data set is only a glimpse of the issue. For better understanding of men and women's participation in forestry, gender-specific analysis is needed on indigenous knowledge, collection of germplasm, propagation, nurturing, and priority species. Information is also needed on the availability of physical resources, labor, time, and skills of the target groups in order to identify constraints to their participation in forestry activities. For this information, case studies on gender-specific issues pertaining to tree farming by small-scale farmers are needed. In this way, gender analysis can provide a framework for designing more appropriately-targeted MPTS activities in the region.

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## Post-meeting Tour

### Kenting National Park

June 26, 1992

After driving south of Kao-Shiung for two and a half hours, the Committee members reached the Kenting National Park. The members were received by Mr. John Shen, Ranger at the national park. Mr. Shen conducted a slide show presentation of the marine life in the park.

Kenting National Park is Taiwan's first National Park, established in 1933. It covers 1,700 ha land area and 15,600 ha marine life, containing hundreds of species of birds, butterflies, reptiles, and small mammals. The park is managed under the Taiwan Forest Bureau. Nearly 2 million tourists visit the area each year and there is urgent need to protect the natural resources.

The group visited the Kenting Youth Activity Center, with buildings in the typical Chinese pagoda style. Facilities include community houses, a dormitory school, and cafeteria.

### Tropical Botanical Garden

June 26, 1992

After the Kenting National Park, the group visited the Tropical Botanical Garden. Like the national park, the Botanical Garden comes under the Taiwan Forest Bureau. It covers 425 ha (2.5% of the total land of the park area), and was opened to the public in 1960. The Garden contains more than 1,200 species: 300 exotic species introduced about 100 years ago, and the rest indigenous species. Taiwan ebony is also planted in groups near the research station. The Botanical Garden serves as a living museum for research.

Hiking trails wind through the gardens, trees, and flowers. *Casuarina equisetifolia*, *Araucaria* species, *Barringtonia* species, *Gardenia* species, *Ficus* species, *Cycas* species, bougainvillea, and

many more, are planted densely on either side of the trails and add beauty to the garden. Many fauna were also evident, including one beautifully colored, human-faced spider.

### Visit to Hua-Lien

June 27, 1992

Hua-Lien is a small town located in the eastern part of ROC, 50 minutes from Kao-Shiung by plane. Two field trip destinations in Hua-Lien area were Jan-Fong Farm and Shou-Fong provenance trial plots. As measured at Jau-Fong farm, the area has an annual rainfall of about 2100 mm and an elevation of 60 m above sea level.

### Jau-Fong Farm

This farm covers an area of 800 ha of former wasteland purchased by a life insurance company for agricultural activities, including agricultural crops of watermelon, cantaloupe and sugar cane; tree farming; and a dairy farm. Soils are mostly sandy soil combined with mud from the river, with soil thickness about 50 cm. Soil pH was 6-7.5 at the beginning of the project.

### Progeny Test Plots

This experiment is the result of good cooperation among three parties -- Jau-Fong Farm, TFRI, and the Chung-Hwa Pulp Industry -- and is an example of the collaboration recommended by the Committee (see pp. 26).

Plots established by Dr. Yang, currently the Director of TFRI, are now managed by Dr. Fuh-Jiunn Pan. The objective of plots is to identify the most suitable trees for pulpwood production.

*Acacia auriculiformis* at the site are now 2 years, 8 months old, planted at a spacing of 2 x 2 m. The plantation represents careful selection from plus trees in forest stands around the country. This species is exhibiting very fine growth.

The *Eucalyptus camaldulensis* planting is the same age and plant density as *A. auriculiformis*. Growth has been very poor. Improvement has been attempted through hybrids with nitrogen-fixing species such as leucaena, but results so far have not been promising. Dr. Pan has recommended replacing *Eucalyptus* with other species or finding other, better provenances.

*Leucaena* variety K636 has shown superior growth relative to other species, and is recommended for planting.

#### F/FRED-supported International Provenance Trials

The *Acacia auriculiformis* provenance trial, included in the ACIAR-F/FRED series established in 1989, is also 2 years 8 months old, planted with a block of size 6 x 6 m. Spacing is 3 x 3 m. Weeding and cleaning was intensive at the early growth stage, with no herbicides used. Further weeding is undertaken when trees are measured.

This species shows good growth (height, diameter, and tree form).

As in the progeny test plot described earlier, *Leucaena* K636 has performed the best. *Leucaena* K8 has performed very poorly.

*Acacia auriculiformis* hybrids are also being tested, and have shown better growth than the non-hybrids. The pulp company has expressed interest in planting this hybrid, but mass production of seeds of F1 accessions remains a problem.

A plot of *Leucocephala* hybrids was established by Dr. Pan four years ago. The objective of this hybrid experiment are threefold: (1) identify psyllid-resistant trees, (2) improve tree form and (3) breed for faster-growing trees. Spacing is 2 x 2 m. The hybrid is a cross of *Leucaena leucocephala* with *L. diversifolia*. Plus trees were selected and controlled pollination was done. Variability in the F2 plots is still very high, so further hybridization is necessary to obtain a stable genotype, around F5.

#### **Shou-Fong**

This plantation of tissue culture plantlets of eucalypts and acacias was established by TFRI and Hua-Lien Agriculture High School at a spacing of 3 x 3 m. Plantlets originated from hybrids of (1) *Eucalyptus camaldulensis* and *E. urophylla* and (2) *Acacia mangium* and *A. auriculiformis*. Both sets of hybrids are showing satisfactory growth. A study is comparing the growth of plantlets from tissue culture and those propagated from cuttings. At 15 months, the latter is performing better, but result are as yet inconclusive.

#### **Chi-Lan-Shan Forest**

June 29, 1992

This visit was arranged by the Forestry Development Agency (FDA) to observe the management of natural and planted stands of red cypress (*Chamaecyparis* spp.) in the Chi-Lan-Shan Recreation Area.

The stand is a mixed forest of different species, varying with altitude. At first thinning, 6 rows are cut and 6 retained with 1 x 1 m between trees. Species include *Chamaecyparis formosana* and *C. obtusa*.

Selective thinning is done in the naturally regenerated stand, following three thinning regimes on the basis of basal area:

- (1) Light thinning: trees with basal area 20-25%
- (2) Medium thinning: trees with basal area 30-35%
- (3) Heavy thinning: trees with basal area 40-45%
- (4) Control

During the tour, cable logging was observed, in which mature trees are cut and transported by the FDA.

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The Forestry/Fuelwood Research and Development (F/FRED) Project is designed to help scientists address the needs of small-scale farmers in the developing world for fuelwood and other tree products. Funded by the U.S. Agency for International Development, the project provides a network through which scientists exchange research plans, methods, and results. Research and development activities center on the production and use of trees that meet the several household needs of small farmers.

F/FRED is implemented by the Winrock International Institute for Agricultural Development, a private, non-profit U.S. organization working in agricultural development around the world. It was established in 1985 through the merging of the Agricultural Development Council, the International Agricultural Development Service, and the Winrock International Livestock Research and Training Center. Winrock's mission is to reduce hunger and poverty in the world through sustainable agricultural and rural development. Winrock helps people of developing areas to strengthen their agricultural research and extension systems, develop their human resources, institute appropriate food and agricultural policies, manage their renewable resources, and improve their agricultural production systems.

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