

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



Winrock International Institute for Agricultural Development

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

PROGRESS REPORT

May 1986 - March 1987



Winrock International Institute for Agricultural Development

**Supported by the U.S. Agency for International Development
Project No. 936-5547**

TABLE OF CONTENTS

I.	INTRODUCTION.....	2
II.	SUMMARY.....	3
III.	ACTIVITIES.....	5
A.	COMPONENT A -- Research Policy, Planning and Management	
1.	Regional Policy and Plans.....	5
	Species Selection	
	Work Plans	
	Task Orders	
	Network Establishment	
2.	Country Specific Research and Sector Assessments..	6
3.	Institutional Specific Research.....	6
	The Role of MOUs	
	Twinning for Institution Building	
	USAID Buy-ins	
	Integration of Forestry into Agricultural Research	
4.	Individual Researcher Capablity Enhancement.....	8
5.	Information Management.....	9
6.	Donor Coordination.....	9
7.	Publications.....	10
8.	Project Administration.....	11
	Coordination with AID	
	Budget	
	Procurement	
	Communications	
	Staff	
B.	Component B -- Network Development and Research Support	
1.	Establishment of Research Network.....	14
2.	1987 Field Trials.....	15
3.	Land and Forest Management.....	16
4.	Psyllid Pest Control.....	17
5.	Team Biosketches... ..	17

C. Component C -- Global Research

1. F/FRED Information Data Base System.....19
2. Coordination fo Replicated Experiments.....20
3. Summary Data Base Uses.....20
4. Supplementary Data Base Classification.....21
Specialist Directory
Bibliographic Data Base
5. DBASE III PLUS.....22
6. Data Base Coordination and Administration.....23
7. Biotechnology.....23

IV. APPENDICES

- I. Contractor Responsibilities and Activities Summary
- II. Bangkok Field Specialist Workplan
- III. Global Research Workplan
- IV. Task Order Summary
- V. Framework of the F/FRED Research Network
- VI. Announcement of Establishment of a Research Network for MPTS
- VII. Summary of Person Months
- VIII. Budget Summary for the Period Ending January 31, 1987

DISTRIBUTION:

AID/W

S&T/FNR (Morison)	2
S&T/FNR (Chetwynd)	1
ANE/TR (Ichord)	1
M/SER/OP (Thomas)	1

USAID Missions/Embassies

Bangkok	1
Manila	1
Dhaka	1
Islamabad	1
Kathmandu	1
New Delhi	1
Rangoon	1
Colombo	1
Kuala Lumpur	1
Benjing	1

Winrock

Arlington F/FRED staff	5
Bangkok F/FRED staff	3
Director, Technical Cooperation	1
Regional Office, Bangkok	1
Library, Headquarters	1

University of Hawaii, Maui	2
----------------------------	---

Economic Unit OP 709-2000 (Schwartz)	1
--------------------------------------	---

I. INTRODUCTION

This report covers the period from May 1986 to March 1987 for the Forestry/Fuelwood Research and Development Project (F/FRED). Although the activities of the three principal project components overlap, this report is organized to present the progress of these three components:

- A. Research Policy, Planning and Management;
- B. Network Development and Research Support;
- C. Global Research.

During the period covered by this report, F/FRED has concentrated efforts on tasks that have emerged as priorities. The project continues to be flexible in addressing important issues in the field of multipurpose tree species (MPTS) research. Work is proceeding in a systematic way to develop research linkages for incorporating MPTS into land-use systems in Asia through genetic improvement and better understanding of tree utilization.

In recognition of the interdependence between species selection/biological tree improvement and acceptance and utilization at the village level, steps have been taken to strengthen the multi-disciplinary interaction between the biophysical and socio-economic dimensions of the F/FRED project.

b

II. SUMMARY

During the past eight months, the F/FRED project has formulated a framework for stimulating research and information exchange on MPTS. The objectives of the project are now clearly defined and project staff are concentrating on identified priority topics within the annual work plan.

The F/FRED Forestry Research Network was formally established at a workshop in Bangkok, Thailand in September 1986. At that workshop, an organizational framework was adopted, a Steering Committee formed, and a system of working committees established. Eight Asian institutions had formally joined the research networks by December 1986.

Research Policy

The Winrock International F/FRED staff in Arlington, Virginia has continued to provide project direction and administrative support to field staff, and has continued development of task orders, subcontracts, and information dissemination. Twenty-three task orders have been issued. A subcontract with Auburn University for training and technical assistance for Indian institutions has been negotiated. A grant has been made to CATIE for continuing Terence Linkletter's appointment there. Winrock has co-sponsored technical and policy workshops and has published a meeting proceedings and two newsletters during this reporting period.

Detailed work plans have been prepared for field network activities and for global research. Annex I describes contract activities to date in relation to contract responsibilities and budget allocations.

Project Administration

Communication capabilities have been improving with the installation of electronic mail accounts at F/FRED locations in Bangkok, Costa Rica, Hawaii, and the University of Minnesota. Telex systems have been added to F/FRED offices in Hawaii and Bangkok that also operate from microcomputers.

The F/FRED budget has been reorganized for the microcomputer to provide a useful planning and management tool that documents expenses against detailed line items. The budget now conforms to Winrock chart of accounts codes and AID billing categories.

An active publications program is underway which includes a quarterly newsletter, workshop proceedings, a handbook series and technical manuals. Desktop publishing by the project staff both expedites work and reduces costs.

The Networks

Network Establishment

The major accomplishment during this reporting period in developing research policy and plans was the formal establishment of the F/FRED Research Network in Asia at a workshop in Thailand in September 1986. At that meeting, an organizational framework was adopted for the research networks and committees were established to provide continuing guidance and direction from regional scientists and research institutions. Key decisions from the workshop were reflected in the workshop's public announcement, which appears in Appendix VI. A detailed report of proceedings of the workshop was published and distributed to participants and interested parties.

A pilot program of field trials has been initiated by ten research institutions at sixteen sites in six countries in Asia. The design of field trials and related minimum data sets to be collected were defined at a meeting of the Research Committee and experiment collaborators in Malaysia in December 1986.

Early research by participating institutions will concentrate on the arid and semi-arid, and humid environmental zones, and will focus on *Leucaena* and *Acacia* species. Initial trials will contribute to the further development of research guidelines and data base analysis processes. They will also serve to establish protocols for initiating further studies with other species and environmental zones.

The Bangkok field office at Kasetsart University, is now fully staffed and operational with three technical specialists and support staff. Work plans have been prepared consistent with the objectives of the project. The specialists are actively engaged in a series of implementation actions involving field trial supervision, workshops, training and assistance to participating institutions.

Global Research and Development

The F/FRED data base management system is evolving together with the networks. Forms for entering biophysical information and research results have been developed from the minimum data set adopted by the research committee so that data tables can now be linked for analysis. Other components of the system, such as a computerized bibliography, a specialists directory and research summary data bases, are developing in concert with the work of other organizations involved in MPTS information management. This system will be demonstrated at a training workshop in Bangkok during the summer of 1987.

Biotechnology is recognized by the F/FRED project as an area of great potential in the improvement and utilization of MPTS. A series of studies is currently being carried out in collaboration with each of the components of the project to identify specific research that might be undertaken for the F/FRED priority species.

III. Activities

A. Component A - Research Policy, Planning and Management

1. Regional Research Policy and Plans

Species Selection

Building upon recommendations of the Asia IUFRO conference held in Sri Lanka in 1984, and the terms of its September 14, 1985 contract with A.I.D., Winrock made a study of multipurpose tree species (MPTS) for priority research under the F/FRED project. Six species were recommended and approved by A.I.D. for research. This species selection was an important policy decision of long term significance. Two more species of special interest to Thailand were added to the priority list. The species selection study and recommendations constituted the first major document produced under the contract.

Coordination with A.I.D.

Important decisions affecting research policy and all other project plans are reviewed and discussed at monthly project coordination meetings attended by A.I.D. and Winrock staff members concerned with the F/FRED Project. For A.I.D., this includes the project officer from the Science and Technology Bureau's Directorate of Energy and Natural Resources and co-managers from the same Bureau's Directorate for Human Resources, and from the Bureau for Asia and Near East.

Work Plans

Policy direction and control is exercised through the process of receiving and approving work plans submitted by the Research Networks and Global Research components of the project, (components B and C, respectively). Work plans for 1987 for these two components appear at Appendix II and III.

Task Orders

The execution of research and other activities under the project is administered through task orders that, like work plans and major policy issues, are developed and recommended by Winrock but not put in force until reviewed and approved by A.I.D.. As of March 1987, twenty-two task orders had been issued, with one pending approval. Task orders initiated during this reporting period are listed and summarized briefly in Appendix IV.

2. Country Specific Research and Sector Assessments

Winrock has been prepared to assist with forestry and natural resource sector assessments as anticipated under the contract. Thus far, however, there have been no requests from USAID Missions for this type of assistance and no opportunities to proceed with major sector assessments. Winrock was able to respond to a direct request from a well-qualified Thai forestry research specialist for help to undertake a study to determine MPTS research priorities in Thailand. The study is sponsored by the National Research Council of Thailand. Results were published in late 1986 under the title "The Status of Multipurpose Trees in Thailand". Opportunities for MPTS related country studies and sector assessments should improve now that the F/FRED Research Network has been formally established and the F/FRED forestry specialists based in Thailand are in a position to increase their country visits and dialogue with Asian foresters and USAID staff.

3. Institutional Specific Research

Considerable progress has been made in stimulating expanded MPTS research activities on the part of Asian forestry research institutions. This progress is described under Component B, Research Network.

The Role of MOUs

A draft Memorandum of Understanding was developed to provide the formal basis and respective obligations for cooperation between Asian research or education institutions and the F/FRED organization. Eight Asian institutions have formally affiliated themselves with the F/FRED Research Network. Others are expected to do so. A total of 10 Asian research institutions are committed to participating in the pilot program of MPTS field trials in 1987. The 1988 and later-year field trials by participating institutions are expected to grow in number.

The terms of the MOU state that the participating institution has an interest in contributing to the understanding and improvement of MPTS in ways that contribute to the objectives of the F/FRED networks. Specifically, they provide guidelines for developing the information data bases, germplasm management, research strengthening through workshops, training and collaboration and coordination of programs with other organizations involved in MPTS research.

Twinning for Institution Building

Larger-scale institutional strengthening is possible through "twinning" arrangements between Asian institutions and U.S. Schools of Forestry. F/FRED core funds can support limited "twinning" (collaborative) activities or subprojects.

One such subproject was undertaken in November 1986 to assist two Indian universities and the Indian National Botanical Research Institute. Phase I of the India sub-project was completed in 1986. This phase included the evaluation of USAID Delhi's project design and detailed recommendations for the implementation of the project. Phase II, involving a subcontract with Auburn University, is ready for implementation pending approval by the Government of India.

Under the subcontract between Winrock and Auburn University, the following institutions are being assisted:

- o Maudurai Kamaraj University and Bharathidasan University (MKU/BU) on a subproject called Research and Development Studies of Woody Biomass Species on Arid Marginal Lands; Lab Cum Plantation Approach. This subproject will involve a combined effort to develop plantation stock through selection and improvement and the production of Woody Biomass through short-rotation intensive culture methods in semi-arid marginal lands over a 36-month period.
- o National Botanical Research Institute (NBRI) on a subproject entitled Production of Woody Biomass on substandard Soils. This subproject will involve an integrated effort to evaluate the biomass production and fuelwood properties of firewood tree and shrub species grown on substandard soil over a 36-month period.

The subprojects involve detailed program definition, technical assistance and training. They include visits by Indian scientists to the United States for study tours and for training at US institutions. The primary goal of these subprojects is to develop a woody biomass program with an understanding of the species that may be used, with a strategy for improving these species through research, and with an awareness of current techniques to maximize effectiveness of plantation management.

USAID Buy-ins

Additional subcontracts between U.S. Schools of Forestry and Asian institutions administered through Winrock's F/FRED project will depend on receipt of contract authority to administer "buy-in" funds from USAID Mission accounts.

Integration of Forestry into Agricultural Research

Efforts to encourage the integration of forestry into agricultural research systems will be continued over the next reporting period. Training programs and workshops for forestry institutions and participation of agricultural science institutions in F/FRED network activities are planned to accomplish this. Three of the eight MOUs signed to date are with agricultural universities. This represents a substantial beginning in bringing the F/FRED Research Network to the attention of some of the principal agricultural training institutions in Asia. As noted above, through a separate project financed by USAID/India, Winrock is providing substantial training opportunities to the faculties of several Indian agricultural universities.

4. Individual Researcher Capability Enhancement

Individual researchers are assisted by a variety of means to improve their capabilities. These means include:

- o attendance at workshops;
- o short training courses;
- o long-term training;
- o grants for individual research.

During the reporting period, the F/FRED project sponsored the following number of individuals from Asian countries for participation in short-term training/career enhancement activities:

- o attendance at IUFRO World Congress (Sept 86).....2
- o participation in F/FRED inaugural
workshop (Sept 86).....54
- o MPTS Research Committee/Field
Trials Meeting (Dec 87).....14
- o Psyllid Central Workshop (Nov 86).....7
- o Grants to individual researchers.....1

The first short-term training course is planned by the Global Research Component of F/FRED for the summer of 1987 to train a group of Thai data management and field trial specialists. This course is expected to be

repeated in other countries later in the year. The project is expected to provide a series of such short-term training opportunities throughout the life of the project. Likewise, a regular program of project supported or related workshops and conferences is planned to occur every few months to reach a growing number of individual Asian researchers in the biophysical and social sciences concerned with multipurpose tree improvement and use.

A process of selection is underway to identify six Asian scientists for long-term training to begin in 1988.

5. Information Management

The F/FRED Project goals of improving the availability and use of information on multipurpose tree species are being achieved as planned. A quarterly newsletter, "Farm Forestry News", is being published and sent to some 1000 persons or institutions in 66 countries. A mini-library of 50 volumes is being shipped to the institutions that have signed MOUs with Winrock. Preparation of a series of four volumes on agroforestry/MPTS research is under preparation. Publication is expected for the last volume by mid-1988. Topics covered are: Research Management; Biophysical Research; Social Science Research; and Common Property/Social Forestry Issues.

Cooperating research institutions will be assisted in strengthening or establishing Documentation Centers for MPTS Research. The type of materials described above will contribute to the Centers. Consideration is also being given to assist the cooperating institutions improve or establish electronic data-management capabilities.

6. Donor Coordination

Winrock, together with A.I.D. Washington, has presented the F/FRED project at two meetings of donor agencies involved in forestry development programs. These meetings have served to identify areas of cooperation with other groups and helped mold the F/FRED work plan to provide a unique role in understanding MPTS improvement and utilization.

On May 29, 1986, donor representatives and members of the international forestry community in the Washington area met at Winrock International offices in Arlington, where they were introduced to the project by A.I.D. and Winrock personnel. Representatives from the International Development Research Centre (IDRC), the Food and Agriculture Organization of the United Nations (FAO), the Governments of Finland and Japan, and the World Bank gave presentations of their projects relevant to F/FRED.

A similar meeting was held in Bangkok in September 1986 to present the project to the Asian donor community. Representatives from the Asian Development Bank (ADB), Canadian International Development Agency (CIDA), United Nations Development Program (UNDP), Australian Centre for International Agricultural Research (ACIAR), FAO Regional Office, Japanese International Cooperation Agency (JICA), and the Ford Foundation met with F/FRED staff and A.I.D. administrators. Key issues discussed at this meeting included the A.I.D. priorities that led to the development of the F/FRED project and the 1984 IUFRO meeting held in Sri Lanka that identified species networks similar to those established under F/FRED with focus on three environmental zones.

Opportunities for coordinating F/FRED activities with other projects in the region were explored. Many projects exist in which MPTS biophysical and socio-economic data collection could be coordinated with F/FRED data sets. For example, ACIAR has agreed to cooperate with the project in supplying superior germplasm for distribution to participating institutions.

7. Publications

The F/FRED publications series includes "Farm Forestry News" (the quarterly project newsletter), workshop proceedings, handbooks, training manuals, technical bulletins, and brochures.

To date, three issues of "Farm Forestry News" have been produced. This newsletter is distributed to approximately one thousand readers in sixty-six countries. "Forestry Networks", the proceedings of the September 1986 F/FRED networks workshop in Bangkok, Thailand, has been produced and distributed to all workshop participants and related A.I.D. and Winrock International personnel. Preparation is now underway to develop an agroforestry handbook series and a F/FRED Project brochure.

In an effort to produce high-quality publications at reduced time and cost, Winrock is using state-of-the-art desktop-publishing technologies. "Forestry Networks" was produced in-house at Winrock's Arlington, Virginia office, using the Microsoft Word software program and Hewlett Packard laser printer. The resulting reduction in type-setting costs was significant. Winrock is now exploring other desktop-publishing packages to respond to the unique needs of the F/FRED publications series.

8. Project Administration

Coordination with A.I.D.

The innovative character of the F/FRED research project calls for an unusual degree of flexibility and responsiveness to issues related to establishing a new field of research in Asia. Considerable diplomacy and skill is required to create the new F/FRED Research Network, involving some 10 countries and several dozen research institutions. Since the project is funded by A.I.D., special coordination is required between Winrock and the USAID Missions or representatives in the participating countries; the three A.I.D. co-managers in Washington, D.C.; and the concerned international development and donor community.

To assure compliance with A.I.D. policy and procedural guidance, and coordination of field operations, such as travel, F/FRED project management hosts a monthly coordination meeting in Arlington, Virginia with concerned A.I.D. staff officers. F/FRED field staff operate in Asia within an established set of procedures and travel clearances for dealing with respective A.I.D. Missions.

Coordination of specific program activities is achieved through the system of work plans and task orders and related budget allocations described above.

Budget

See Appendix VIII for a summary of the F/FRED Budget and report of expenditures through December 31, 1986.

Procurement

Commodity procurement for project use, such as office equipment and vehicles, is undertaken by Winrock following its procurement policies and practices, which include securing waivers from A.I.D. as required for non-U.S. origin and source items.

Providing grants and equipment to Asian institutions or scientists is governed by a special document reviewed and approved by the A.I.D. contract officer and Winrock management. This document is the "Policy and Procedure Guidelines for Administration of Small-Value Procurement Under The F/FRED Project." The document authorizes the F/FRED contract team leader in Asia to make such procurement up to a value of \$6,000 with amounts up to \$25,000 to be approved by Winrock senior management. Larger procurements are submitted to the A.I.D. contract officer for approval.

Communications

All F/FRED project staff are interconnected by electronic mail service. This F/FRED network provides direct office-to-office communications through computers installed at each location. Network call signs and a message numbering system permit easy tracking of each message.

ITT Dialcom, Inc.'s electronic mail system (E-Mail) is the system employed. The F/FRED E-mail hook-up currently includes Arlington Virginia; Bangkok, Thailand; Maui, Hawaii; Turrialba, Costa Rica; and St. Paul, Minnesota. The E-mail system allows for quick and efficient communication among different geographic locations.

E-mail capabilities include sending entire microcomputer files via satellite and telephone lines. A file is created and transferred via a modem through telephone lines to a local relay station operated by Telenet. From there, files are transmitted by satellite to another relay station and are then distributed by telephone lines from which the user accesses their electronic "mail box."

The Dialcom system also allows the microcomputer user to send telexes. Telexes are used when direct E-mail service is not available, such as USAID Missions, Asian institutions or individuals. The process is similar to the E-mail system, with Western Union being the relay station. Telex capability at the F/FRED Coordinating Unit will greatly facilitate the logistics of getting participants to meetings and clearing travel authorization for the F/FRED field team.

Staff

A list of the F/FRED Winrock staff and the long-term consultants contracted under the F/FRED Services in Asia contract is as follows:

STAFF (Name and Position)	PERIOD
Thomas. C. Niblock, Project Manager	Sept 1985-Present
Kirtland M. Barker, Project Specialist	Feb 1986-Present
Kristine Smith, Project Secretary	Sept 1985-Present
Norma Adams, Project Editor	Sept 1985-Present
William Hyde, Land & Forest Mgmt. (L,F & M) Specialist	April 1986-Dec 1986
Ken MacDicken, Team Leader and MPTS Network Specialist	Jan 1987-Present
Charles Mehl, LF&M Project Specialist	Jan 1987-Present
Lee Medema, Forestry Economist	Feb 1987-Present
Terence Linkletter, Data Base Specialist	Dec 1985-Present
Foster Cady Research and Development Director University of Hawaii subcontract	July 1986-Present

105

55 (Principal Consultants

James Brewbaker	Nitrogen Fixing Tree Association and University of Hawaii
Robert K. Dixon	Auburn University
Dietmar Rose	University of Hawaii

Component B Network Development and Research Support

The F/FRED coordinating unit on the campus of Kasetsart University in Bangkok is now fully staffed with three specialists and a support staff. The offices are equipped with three microcomputers and communications facilities including electronic mail, telex, and a dedicated telephone connection. With the project now clearly defined, a work plan outlining the goals and activities of the three team members has been prepared (Appendix II).

1. Establishment of Research Network

One of Winrock's first steps in developing a project framework following the initial evaluation of species networks identified at the IUFRO meeting in Sri Lanka, was to convene, in June 1986, a small group of Asian forestry research and information specialists from some of the institutions recommended in the evaluation report. This group formed the ad-interim steering committee, which planned the first forestry networks workshop that formally established the F/FRED project in Asia. This interim steering committee agreed to focus the agenda of this meeting on electronic information management to support field research activities in MPTS.

The September 24-27, 1986 workshop brought together more than sixty forestry research and information specialists from Bangladesh, China, India, Indonesia, Malaysia, Nepal, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, and the United States. Common interests in MPTS research and the exchange of information on these species became the basis for establishing the F/FRED Research Network.

The workshop participants drafted and adopted an organizational framework for the network that extends membership and/or observer status to institutions and organizations working in forestry and agriculture research. A Steering Committee was formed, which became the governing body of the network and is composed of a representative of each country involved with the network.

A Research Committee with two subcommittees were formed to monitor biophysical and socio-economic research priorities and to see that these two disciplines are integrated. The Research Committee also reviews and approves research studies; monitors data collection and research methodology; and establishes guidelines for future research. The organizational framework of the network is described in Appendix V.

2. 1987 Field Trials

During the September workshop in Bangkok, a consensus was reached on the need to establish field trials in the 1987 rainy season. As a result, the Network Trials Planning session was held in Kuala Lumpur, Malaysia December 14-18, 1986 to refine guidelines established in Bangkok and to plan the 1987 trials. Participants agreed to work on three species initially, with a basic experimental design and methodology, and to collect a minimum data set in a standardized manner. *Leucaena diversifolia*, L, *leucocephala* crossed with *L. diversifolia*, and two provenances of *Acacia auriculiformis* and *A. mangium* will be planted this year.

The following ten cooperators have made an initial commitment to establish some sixteen experimental sites using an experimental design developed at the Network Trials Planning Meeting:

Indonesia Forest Research and Development Centre
 Forest Research Institute of Malaysia
 Universiti Pertanian Malaysia
 Pakistan Forestry Institute
 Forestry Research Institute, Philippines
 Visayas State College of Agriculture, Philippines
 Taiwan Forest Research Institute
 Kasetsart University
 Royal Forest Department, Thailand
 Thailand Institute of Scientific and Techn. Research

Cooperating scientists from these institutions have received from the Australian Commonwealth Scientific and Industrial Research Organization (CSIRO) two provenances of *Acacia auriculiformis* and *Acacia mangium* and, from NFTA, one psyllid-resistant variety of *Leucaena diversifolia* and one *L. leucocephala* x *L. diversifolia* hybrid. A manual on standardized experimental methods for network trials is being completed. Training tools, such as video tapes and short courses will ensure that establishment and mensuration techniques used in network experiments are comparable between experimental sites. Initial efforts will bring social scientists together with foresters and agriculturalists who are participating in network experiments. Network specialists will visit network trial participants during the first half of 1987 to discuss preparation for trials and will help integrate social science studies with MPTS trials.

The field measurements will be entered into the experiment data base that will be housed at the global research unit in Maui. Here experiment data will be maintained and updating of the data base will occur. Ideally, data entry from field forms will be done by the cooperating scientists at their institutions. F/FRED will make available the data-base software for data

entry and retrieval. Cooperators will enter data via microcomputer using these programs and ship data diskettes with data base additions to Maui. In return, cooperators will have access and receive at regular intervals the latest, updated version of the full data base. Cooperators will also be trained in data retrieval so that they can benefit as early as possible from access to as much data as has been accumulated. This procedure should accelerate the pace of data analysis, model development, and the identification of critical areas or gaps in information.

The Project is providing germplasm, soil characterization services for experiment sites, assistance in data analysis, data base management and modeling, assistance in research design and standardization of methodologies, and information support services.

To aid in training and in research standardization, a manual has been drafted detailing the experimental design and measurement procedures. A training video is also being produced which will demonstrate techniques.

Initial trials are centered on species that are appropriate for the humid environmental zones. An arid and semi-arid network research program will be initiated in the same manner.

3. Land and Forest Management

The workplan for the Land and Forest Management activity changed in the last reporting period to emphasize integration with the MPTS biophysical research program. A workshop on the role and future of applied social-science research in forestry to help establish an F/FRED research agenda for Thailand was held on March 13. The workshop brought university, government agency and private organization representatives together to frame a social science research agenda considering charcoal use, Thai legal structure, land tenure, indigenous land-use preferences and forest-products market trends. This will provide a basis for other such meetings throughout the region and has thus established the beginnings of the LFM network.

Training sessions entitled:

- o Major Forestry Concepts for Social Scientists
- o Major Social Science Concepts for Foresters
- o Economic Analysis for Project Planning, for mid-level government forestry officials

have been incorporated into the LFM workplan to provide an orientation to these disciplines as part of the objective to integrate forest science and socio-economic study.

4. Pysllid Pest Control

In 1984, a species of *Heteropsylla* was noted in Hawaii, with similar subsequent reports from Samoa and the Philippines in 1985 identifying a leafhopper-like pest attacking *Leucaena*. Spread of this insect became extensive in the Pacific Islands, the Philippines, Hawaii and Indonesia in some areas. The Forestry Support Program supplied the services of Max McFadden to evaluate the problem in Hawaii, the Philippines and New Caledonia. Dr. McFadden's report provided a basis from which to formulate a plan for F/FRED involvement in psyllid research.

Task order 14 established a task force of specialists to study and recommend control measures for psyllid pests harmful to *Leucaena* and other MPTS species. Max McFadden chairs the task force. In November 1986, F/FRED co-sponsored a workshop with the Nitrogen Fixing Tree Association on "The Biological and Genetic Control Strategies for the *Leucaena* Psyllid". An action plan to control the psyllid was produced at that workshop, which is under consideration in a number of Asian countries. The workshop established a series of psyllid resistant *Leucaena* trials. A meeting of the task force in March 1987 took place to outline, in detail, the F/FRED psyllid research program.

5. Team Biosketches

Ken MacDicken, Team Leader and MPTS Network Specialist, is an agroforester with experience throughout Asia and the Pacific. As Research Associate for the Nitrogen Fixing Tree Association (NFTA) (1983-1986), he developed training materials on nitrogen-fixing tree management; designed, organized, and managed projects; developed computer-based information systems; and monitored agroforestry research. Concurrent with this full-time position, he was also self-employed in nitrogen-fixing research development, upland community development, fuelwood plantation establishment, and shifting cultivation improvement.

As a Peace Corps Volunteer (1975-1978), MacDicken helped design, organize, and manage an agroforestation project for the mountain people of the Island of Mindoro, Philippines. This included work with the leguminous tree species *Leucaena leucocephala*, *Pterocarpus indicus*, and *Sesbania grandiflora*. In the Philippines, he helped redesign an upland development project that supported local community development.

MacDicken received his M.S. in Agronomy and Soil Science from the University of Hawaii in 1983.

Charles Mehl, LFM Network Specialist, has nearly four years of experience working in Thailand. As Rural Development Economist/Advisor to the Land Reform Areas Project, he helped design and implement training workshops; supervised project planning, monitoring, and evaluation; and developed farmer surveys to monitor changes in land holding, credit use, and

agricultural production. As a World Bank consultant, he analyzed the major historical changes in patterns of inheritance and other land transactions in rural Thailand, comparing private- and public-land ownership. In 1983, as an irrigation consultant in the Nakhon Phanom Province of Northeast Thailand, he researched public and private institutions involved in water management. While a Fulbright Fellow in Northeast Thailand (1982-1983), he analyzed variations in agricultural production, labor use, land ownership patterns, and local leadership in the Nakhon Ratchasima Province. Mehl received his Ph.D. in Development Sociology from Cornell University. He speaks fluent Thai.

Lee Medema, F/FRED's Forestry Economist, is a University of Idaho professor on detail from the Viking company. He received his Ph.D. in Forest Economics from the University of Washington in 1977. He has nine years of university teaching experience in economics of conservation; forest policy, administration, and management; investment analysis; and advanced forest economics. He is knowledgeable about the role of economic forces in resource analysis and conservation, timber management decisions for biological and financial production objectives, legislation and policy affecting land use, and public land management. In 1982, Medema conducted investment analyses of a proposed USAID-supported social forestry project in Maharashtra, India. Earlier, he made investment analyses of fuelwood plantations in Sri Lanka (1981). More recently, he helped prepare a report for USAID on investment analysis of a proposed management plan for the Dinderesso Forest in Burkina Faso. Medema's involvement in forest economics education includes graduate-level training last year of agroforesters at the Pakistan Forestry Institute.

Component C Global Research

Global research and development offices have been established on the island of Maui, Hawaii. Dr. Foster Cady, Research and Development Director has hired systems programmer Julie Pak and data base manager Eric Pang. Together, they have orchestrated the purchase of F/FRED computer systems for the project and have supervised the environmental control renovations at their offices to protect this equipment. The computer facility and offices are now completely operational.

The Global Research team has worked closely with field staff in Bangkok and consultant Dietmar Rose to develop a data base management system, to establish the MPTS network field trials, and to establish a network of organizations working in MPTS worldwide.

Foster Cady has been instrumental in focussing the field trials on key factors affecting growth and yield and has organized soil analysis for the upcoming field trials.

1. F/FRED Information Data Base System

The global research component of the F/FRED Project has defined the types of data bases that will be contained in its information management system. This process has evolved through study of existing systems and through discussions and meetings of Asian researchers and specialists in data management from key forestry research organizations. The following summary of the Information Data Base System represents the results of the Global Research component's meetings and work to date.

The experiment data base, the primary type of data base for the F/FRED Project, contains information based purely on measurements and analysis of replicated experiments. It is ideally suited for comparative studies of species performance with uniform standards for measurement and for analyzing information on standardized geographic and physical descriptions of experiment sites. Further, it provides the data quality control required for developing environmental growth and yield models. This, in turn, helps transfer MPTS technology to environments that differ from the experimental sites. Because scientists have access to raw experiment data, the possibilities for analyzing subsets of the total data base, data aggregation, and model validation are excellent.

After performing appropriate statistical, economic, and other analyses, the summarized information from replicated experiments can be entered into another data base table that contains highly condensed, key information on MPTS and is suited for practical management decisions. The F/FRED Project terms this a summary data base. In this data base, abstraction leads to models for predicting species behavior that has been rigorously tested and found reliable.

All other information not based strictly on controlled experiments is found in supplementary data bases. But there is no absolute division between summary and supplementary information, and data bases might contain elements of both.

2. Coordination of Replicated Experiments

At the December 1986 Network Trials Planning Meeting in Kuala Lumpur, Malaysia, cooperators agreed to experimental and treatment designs and associated minimum data sets for the 1987 field trials. The field measurements from these trials will be entered into the experiment data base. Ideally, cooperating scientists at their respective institutions will enter data from field forms. The global research component of F/FRED will make available the data base software for data entry, retrieval, and other uses. Cooperators can enter data via microcomputers using these programs. In return, they will have access to and receive on a regular basis updated versions of the full data base. They will also receive training in using data base programs and in data retrieval, which will maximize their access to accumulated data. This, in turn, will accelerate data analysis, model development, and identification of critical areas and information gaps.

3. Summary Data Base Uses

The F/FRED summary data base, an integral part of the experiment data base, can be used to capture information directly from existing experiments either within or outside the F/FRED network. Although a percentage of quality control is lost with outside data, its entry into F/FRED's data base is acceptable as long as the degree of experimental variability is included and the information requested is clearly defined, understood, and can be provided. In some cases, it may be possible to transfer all the required information from other data bases into the F/FRED data base.

The summary data base being developed by the Tropical Agronomic Center for Research and Education (CATIE) Tree Crop Production Project (Madelena) is based on formal experiments, as well as demonstration-plot information. Under joint sponsorship of the global F/FRED component and the Madelena

Project, Terry Linkletter, Management Information Systems Specialist, is helping to ensure that data from MPTS studies in the Latin American tropics are incorporated into the F/FRED information data base system. Minimum data sets, field forms, procedures, and a prototype data base management system are being developed with recognition of F/FRED experience in Asia. In cooperation with CATIE (with funding provided by the Kellogg Foundation), Dr. Dietmar Rose and Luis Ugalde at the University of Minnesota College of Forestry are carrying out the data base design.

In addition to the CATIE system, the Global Research team is working together with the developers of TREDAT, a tree- information data base developed by the Commonwealth Scientific and Industrial Research Organization (CSIRO) and the Queensland Department of Forestry in Australia. This system is based on another set of experiments and on other information sources.

Merging portions of these summary data bases with the F/FRED summary data base is highly desirable in view of the amount of data required for environmental modeling. Combining data might be easily accomplished at some levels of data detail but impossible at other levels.

A key concern in designing the F/FRED minimum data set and associated data base is the ability to incorporate as many MPTS experiments worldwide as possible. When many observations are available, developing environmental growth and yield models that will allow MPTS technology transfer to environments where experiments have not been done is enhanced. The data used for aggregation in F/FRED will be screened for compatibility and quality.

Efforts will be made in the next reporting period to work out data sharing arrangements with ICRAF in Africa and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India among others.

4. Supplementary Data Base Classification

F/FRED will examine and classify supplementary data bases relevant to MPTS and will coordinate its efforts with other groups worldwide to attempt a global synthesis of portions of relevant regional data bases. F/FRED will also develop new data bases, including supplementary data bases, that cover various information types to serve different needs. Two examples are discussed below.

Specialist Directory

The MPTS specialists data base provides ready access to individuals who have specific skills and experience related to MPTS research. Information about people with identified skills or experience will be made available to network participants upon request. The data base and associated software will also be made available to network members, who will be asked to provide names of other individuals that might serve as additional network resources.

The global research unit at Maui, Hawaii, will develop, as part of the F/FRED system, the software needed to add, update, and retrieve data from the MPTS specialists data base. The form included as an annex to this report is designed to obtain the desired information on MPTS expertise for the data base. It will be sent out to network members periodically for updating. The software and data base will be made available to F/FRED network participants and others who express interest. Updates of the data base and the latest software will also be distributed regularly.

Bibliographic Data base

Many network participants do not have ready access to bibliographic retrieval services, such as DIALOG, to provide them the latest MPTS citations. The global research team has reliable access to such services and will develop a bibliography data base to house literature citations and abstracts directly relevant to MPTS research.

This data base serves to make network participants aware of what work is being done in their field of interest and who is doing it. It represents the basic concept of information exchange and organization and will serve to demonstrate the principles of data base management systems at the April Training workshop in Bangkok.

5. DBase III Plus

The dBase III Plus package, a powerful relational data base program, is being used for all data base activities. It has excellent documentation, is user-friendly, and has a wide distribution. It is also the standard package selected by USAID for all A.I.D. Missions and all F/FRED software will run on mission computers. For collaborators who currently do not have access to this package, compiled versions of any programs developed by F/FRED can be made available. Compiled programs do not require the original software package and are not subject to reprogramming or inadvertent changes in the files. This also alleviates copyright infringement problems.

6. Data Base Coordination and Administration

It is essential for F/FRED to be aware of other data-base efforts relevant to MPTS. Working closely with projects and institutions developing these related data bases will:

- o avoid duplicating efforts,
- o direct data-base development toward more useful applications,
- o help identify and correct problems, and o promote data base use.

7. Biotechnology

Biotechnology is recognized by F/FRED staff and network participants as an important area of forestry research. Each of the three components are contributing to define a program in Biotechnology that is appropriate for MPTS in the framework of the F/FRED project.

Since the first reporting period, a MOU has been signed with Plantek International in Singapore and a biotechnology task order has been issued. The task order outlines the first steps in adopting MPTS research priorities in several facets of biotechnology. There will be an assessment study of the role of biotechnology in MPTS improvement and management in collaboration with Plantek. It has been proposed that a task force be formed, much the same as the psyllid group has evolved, to address this topic and to report to the Research Committee.

Thus far, the scope of work proposes a series of six studies to review the state-of-the-art for several biotechnologies and their potential impact on small farm production and use of MPTS. They will focus on the species that have been selected as priority MPTS and will cover the following topics:

- o Potentials and constraints to tissue culture of MPTS;
- o Potential for productivity improvements through the use of mycorrhizal inoculants;
- o Potential for yield increases of leguminous MPTS using improved Rhizobium strains;
- o Small-farm production of gums, resins, and exudates;
- o Small-farmer access to biotechnology and socio-economic factors affecting access; and
- o Potential socio-economic impact of biotechnology on selected countries of the region.

To ensure that the studies will be relevant to F/FRED goals, detailed study plans will be developed by the F/FRED staff, the Research Committee, and network collaborators. The studies will be contracted to network participants and will, where applicable, involve outside consultants with expertise in specific aspects of biotechnology. Reports of the studies will be submitted for publication when appropriate.

The workplan summary for the Global Research Component is included as appendix III in this report.

TABLE OF CONTENTS

I.	INTRODUCTION.....	2
II.	SUMMARY.....	3
III.	ACTIVITIES.....	5
A.	COMPONENT A -- Research Policy, Planning and Management	
1.	Regional Policy and Plans.....	5
	Species Selection	
	Work Plans	
	Task Orders	
	Network Establishment	
2.	Country Specific Research and Sector Assessments..	6
3.	Institutional Specific Research.....	6
	The Role of MOUs	
	Twinning for Institution Building	
	USAID Buy-ins	
	Integration of Forestry into Agricultural Research	
4.	Individual Researcher Capablity Enhancement.....	8
5.	Information Management.....	9
6.	Donor Coordination.....	9
7.	Publications.....	10
8.	Project Administration.....	11
	Coordination with AID	
	Budget	
	Procurement	
	Communications	
	Staff	
B.	Component B -- Network Development and Research Support	
1.	Establishment of Research Network.....	14
2.	1987 Field Trials.....	15
3.	Land and Forest Management.....	16
4.	Psyllid Pest Control.....	17
5.	Team Biosketches... ..	17

C. Component C -- Global Research

1. F/FRED Information Data Base System.....19
2. Coordination fo Replicated Experiments.....20
3. Summary Data Base Uses.....20
4. Supplementary Data Base Classification.....21
Specialist Directory
Bibliographic Data Base
5. DBASE III PLUS.....22
6. Data Base Coordination and Administration.....23
7. Biotechnology.....23

IV. APPENDICES

- I. Contractor Responsiblities and Activities Summary
- II. Bangkok Field Specialist Workplan
- III. Global Research Workplan
- IV. Task Order Summary
- V. Framework of the F/FRED Research Network
- VI. Announcement of Establishment of a Research
Network for MPTS
- VII. Summary of Person Months
- VIII. Budget Summary for the Period Ending January 31,
1987

DISTRIBUTION:

ID/W

S&T/FNR (Morison)	2
S&T/FNR (Chetwynd)	1
ANE/TR (Ichord)	1
M/SER/OP (Thomas)	1

USAID Missions/Embassies

Bangkok	1
Manila	1
Dhaka	1
Islamabad	1
Kathmandu	1
New Delhi	1
Rangoon	1
Colombo	1
Kuala Lumpur	1
Benjing	1

Winrock

Arlington F/FRED staff	5
Bangkok F/FRED staff	3
Director, Technical Cooperation	1
Regional Office, Bangkok	1
Library, Headquarters	1

University of Hawaii, Maui	2
----------------------------	---

Economic Unit OP 709-2000 (Schwartz)	1
--------------------------------------	---

I. INTRODUCTION

This report covers the period from May 1986 to March 1987 for the Forestry/Fuelwood Research and Development Project (F/FRED). Although the activities of the three principal project components overlap, this report is organized to present the progress of these three components:

- A. Research Policy, Planning and Management;
- B. Network Development and Research Support;
- C. Global Research.

During the period covered by this report, F/FRED has concentrated efforts on tasks that have emerged as priorities. The project continues to be flexible in addressing important issues in the field of multipurpose tree species (MPTS) research. Work is proceeding in a systematic way to develop research linkages for incorporating MPTS into land-use systems in Asia through genetic improvement and better understanding of tree utilization.

In recognition of the interdependence between species selection/biological tree improvement and acceptance and utilization at the village level, steps have been taken to strengthen the multi-disciplinary interaction between the biophysical and socio-economic dimensions of the F/FRED project.

II. SUMMARY

During the past eight months, the F/FRED project has formulated a framework for stimulating research and information exchange on MFFS. The objectives of the project are now clearly defined and project staff are concentrating on identified priority topics within the annual work plan.

The F/FRED Forestry Research Network was formally established at a workshop in Bangkok, Thailand in September 1986. At that workshop, an organizational framework was adopted, a Steering Committee formed, and a system of working committees established. Eight Asian institutions had formally joined the research networks by December 1986.

Research Policy

The Winrock International F/FRED staff in Arlington, Virginia has continued to provide project direction and administrative support to field staff, and has continued development of task orders, subcontracts, and information dissemination. Twenty-three task orders have been issued. A subcontract with Auburn University for training and technical assistance for Indian institutions has been negotiated. A grant has been made to CATIE for continuing Terence Linkletter's appointment there. Winrock has co-sponsored technical and policy workshops and has published a meeting proceedings and two newsletters during this reporting period.

Detailed work plans have been prepared for field network activities and for global research. Annex I describes contract activities to date in relation to contract responsibilities and budget allocations.

Project Administration

Communication capabilities have been improving with the installation of electronic mail accounts at F/FRED locations in Bangkok, Costa Rica, Hawaii, and the University of Minnesota. Telex systems have been added to F/FRED offices in Hawaii and Bangkok that also operate from microcomputers.

The F/FRED budget has been reorganized for the microcomputer to provide a useful planning and management tool that documents expenses against detailed line items. The budget now conforms to Winrock chart of accounts codes and AID billing categories.

An active publications program is underway which includes a quarterly newsletter, workshop proceedings, a handbook series and technical manuals. Desktop publishing by the project staff both expedites work and reduces costs.

The Networks

Network Establishment

The major accomplishment during this reporting period in developing research policy and plans was the formal establishment of the F/FRED Research Network in Asia at a workshop in Thailand in September 1986. At that meeting, an organizational framework was adopted for the research networks and committees were established to provide continuing guidance and direction from regional scientists and research institutions. Key decisions from the workshop were reflected in the workshop's public announcement, which appears in Appendix VI. A detailed report of proceedings of the workshop was published and distributed to participants and interested parties.

A pilot program of field trials has been initiated by ten research institutions at sixteen sites in six countries in Asia. The design of field trials and related minimum data sets to be collected were defined at a meeting of the Research Committee and experiment collaborators in Malaysia in December 1986.

Early research by participating institutions will concentrate on the arid and semi-arid, and humid environmental zones, and will focus on *Leucaena* and *Acacia* species. Initial trials will contribute to the further development of research guidelines and data base analysis processes. They will also serve to establish protocols for initiating further studies with other species and environmental zones.

The Bangkok field office at Kasetsart University, is now fully staffed and operational with three technical specialists and support staff. Work plans have been prepared consistent with the objectives of the project. The specialists are actively engaged in a series of implementation actions involving field trial supervision, workshops, training and assistance to participating institutions.

Global Research and Development

The F/FRED data base management system is evolving together with the networks. Forms for entering biophysical information and research results have been developed from the minimum data set adopted by the research committee so that data tables can now be linked for analysis. Other components of the system, such as a computerized bibliography, a specialists directory and research summary data bases, are developing in concert with the work of other organizations involved in MPTS information management. This system will be demonstrated at a training workshop in Bangkok during the summer of 1987.

Biotechnology is recognized by the F/FRED project as an area of great potential in the improvement and utilization of MPTS. A series of studies is currently being carried out in collaboration with each of the components of the project to identify specific research that might be undertaken for the F/FRED priority species.

III. Activities

A. Component A - Research Policy, Planning and Management

1. Regional Research Policy and Plans

Species Selection

Building upon recommendations of the Asia IUFRO conference held in Sri Lanka in 1984, and the terms of its September 14, 1985 contract with A.I.D., Winrock made a study of multipurpose tree species (MPTS) for priority research under the F/FRED project. Six species were recommended and approved by A.I.D. for research. This species selection was an important policy decision of long term significance. Two more species of special interest to Thailand were added to the priority list. The species selection study and recommendations constituted the first major document produced under the contract.

Coordination with A.I.D.

Important decisions affecting research policy and all other project plans are reviewed and discussed at monthly project coordination meetings attended by A.I.D. and Winrock staff members concerned with the F/FRED Project. For A.I.D., this includes the project officer from the Science and Technology Bureau's Directorate of Energy and Natural Resources and co-managers from the same Bureau's Directorate for Human Resources, and from the Bureau for Asia and Near East.

Work Plans

Policy direction and control is exercised through the process of receiving and approving work plans submitted by the Research Networks and Global Research components of the project, (components B and C, respectively). Work plans for 1987 for these two components appear at Appendix II and III.

Task Orders

The execution of research and other activities under the project is administered through task orders that, like work plans and major policy issues, are developed and recommended by Winrock but not put in force until reviewed and approved by A.I.D.. As of March 1987, twenty-two task orders had been issued, with one pending approval. Task orders initiated during this reporting period are listed and summarized briefly in Appendix IV.

35

2. Country Specific Research and Sector Assessments

Winrock has been prepared to assist with forestry and natural resource sector assessments as anticipated under the contract. Thus far, however, there have been no requests from USAID Missions for this type of assistance and no opportunities to proceed with major sector assessments. Winrock was able to respond to a direct request from a well-qualified Thai forestry research specialist for help to undertake a study to determine MPTS research priorities in Thailand. The study is sponsored by the National Research Council of Thailand. Results were published in late 1986 under the title "The Status of Multipurpose Trees in Thailand". Opportunities for MPTS related country studies and sector assessments should improve now that the F/FRED Research Network has been formally established and the F/FRED forestry specialists based in Thailand are in a position to increase their country visits and dialogue with Asian foresters and USAID staff.

3. Institutional Specific Research

Considerable progress has been made in stimulating expanded MPTS research activities on the part of Asian forestry research institutions. This progress is described under Component B, Research Network.

The Role of MOUs

A draft Memorandum of Understanding was developed to provide the formal basis and respective obligations for cooperation between Asian research or education institutions and the F/FRED organization. Eight Asian institutions have formally affiliated themselves with the F/FRED Research Network. Others are expected to do so. A total of 10 Asian research institutions are committed to participating in the pilot program of MPTS field trials in 1987. The 1988 and later-year field trials by participating institutions are expected to grow in number.

The terms of the MOU state that the participating institution has an interest in contributing to the understanding and improvement of MPTS in ways that contribute to the objectives of the F/FRED networks. Specifically, they provide guidelines for developing the information data bases, germplasm management, research strengthening through workshops, training and collaboration and coordination of programs with other organizations involved in MPTS research.

3/6

Twinning for Institution Building

Larger-scale institutional strengthening is possible through "twinning" arrangements between Asian institutions and U.S. Schools of Forestry. F/FRED core funds can support limited "twinning" (collaborative) activities or subprojects.

One such subproject was undertaken in November 1986 to assist two Indian universities and the Indian National Botanical Research Institute. Phase I of the India sub-project was completed in 1986. This phase included the evaluation of USAID Delhi's project design and detailed recommendations for the implementation of the project. Phase II, involving a subcontract with Auburn University, is ready for implementation pending approval by the Government of India.

Under the subcontract between Winrock and Auburn University, the following institutions are being assisted:

- o Maudurai Kamaraj University and Bharathidasan University (MKU/BU) on a subproject called Research and Development Studies of Woody Biomass Species on Arid Marginal Lands; Lab Cum Plantation Approach. This subproject will involve a combined effort to develop plantation stock through selection and improvement and the production of Woody Biomass through short- rotation intensive culture methods in semi-arid marginal lands over a 36-month period.
- o National Botanical Research Institute (NBRI) on a subproject entitled Production of Woody Biomass on substandard Soils. This subproject will involve an integrated effort to evaluate the biomass production and fuelwood properties of firewood tree and shrub species grown on substandard soil over a 36-month period.

The subprojects involve detailed program definition, technical assistance and training. They include visits by Indian scientists to the United States for study tours and for training at US institutions. The primary goal of these subprojects is to develop a woody biomass program with an understanding of the species that may be used, with a strategy for improving these species through research, and with an awareness of current techniques to maximize effectiveness of plantation management.

USAID Buy-ins

Additional subcontracts between U.S. Schools of Forestry and Asian institutions administered through Winrock's F/FRED project will depend on receipt of contract authority to administer "buy-in" funds from USAID Mission accounts.

Integration of Forestry into Agricultural Research

Efforts to encourage the integration of forestry into agricultural research systems will be continued over the next reporting period. Training programs and workshops for forestry institutions and participation of agricultural science institutions in F/FRED network activities are planned to accomplish this. Three of the eight MOUs signed to date are with agricultural universities. This represents a substantial beginning in bringing the F/FRED Research Network to the attention of some of the principal agricultural training institutions in Asia. As noted above, through a separate project financed by USAID/India, Winrock is providing substantial training opportunities to the faculties of several Indian agricultural universities.

4. Individual Researcher Capability Enhancement

Individual researchers are assisted by a variety of means to improve their capabilities. These means include:

- o attendance at workshops;
- o short training courses;
- o long-term training;
- o grants for individual research.

During the reporting period, the F/FRED project sponsored the following number of individuals from Asian countries for participation in short-term training/career enhancement activities:

- o attendance at IUFRO World Congress (Sept 86).....2
- o participation in F/FRED inaugural workshop (Sept 86).....54
- o MPTS Research Committee/Field Trials Meeting (Dec 87).....14
- o Psyllid Central Workshop (Nov 86).....7
- o Grants to individual researchers.....1

The first short-term training course is planned by the Global Research Component of F/FRED for the summer of 1987 to train a group of Thai data management and field trial specialists. This course is expected to be

repeated in other countries later in the year. The project is expected to provide a series of such short-term training opportunities throughout the life of the project. Likewise, a regular program of project supported or related workshops and conferences is planned to occur every few months to reach a growing number of individual Asian researchers in the biophysical and social sciences concerned with multipurpose tree improvement and use.

A process of selection is underway to identify six Asian scientists for long-term training to begin in 1988.

5. Information Management

The F/FRED Project goals of improving the availability and use of information on multipurpose tree species are being achieved as planned. A quarterly newsletter, "Farm Forestry News", is being published and sent to some 1000 persons or institutions in 66 countries. A mini-library of 50 volumes is being shipped to the institutions that have signed MOUs with Winrock. Preparation of a series of four volumes on agroforestry/MPTS research is under preparation. Publication is expected for the last volume by mid-1988. Topics covered are: Research Management; Biophysical Research; Social Science Research; and Common Property/Social Forestry Issues.

Cooperating research institutions will be assisted in strengthening or establishing Documentation Centers for MPTS Research. The type of materials described above will contribute to the Centers. Consideration is also being given to assist the cooperating institutions improve or establish electronic data-management capabilities.

6. Donor Coordination

Winrock, together with A.I.D. Washington, has presented the F/FRED project at two meetings of donor agencies involved in forestry development programs. These meetings have served to identify areas of cooperation with other groups and helped mold the F/FRED work plan to provide a unique role in understanding MPTS improvement and utilization.

On May 29, 1986, donor representatives and members of the international forestry community in the Washington area met at Winrock International offices in Arlington, where they were introduced to the project by A.I.D. and Winrock personnel. Representatives from the International Development Research Centre (IDRC), the Food and Agriculture Organization of the United Nations (FAO), the Governments of Finland and Japan, and the World Bank gave presentations of their projects relevant to F/FRED.

A similar meeting was held in Bangkok in September 1986 to present the project to the Asian donor community. Representatives from the Asian Development Bank (ADB), Canadian International Development Agency (CIDA), United Nations Development Program (UNDP), Australian Centre for International Agricultural Research (ACIAR), FAO Regional Office, Japanese International Cooperation Agency (JICA), and the Ford Foundation met with F/FRED staff and A.I.D. administrators. Key issues discussed at this meeting included the A.I.D. priorities that led to the development of the F/FRED project and the 1984 IUFRO meeting held in Sri Lanka that identified species networks similar to those established under F/FRED with focus on three environmental zones.

Opportunities for coordinating F/FRED activities with other projects in the region were explored. Many projects exist in which MPTS biophysical and socio-economic data collection could be coordinated with F/FRED data sets. For example, ACIAR has agreed to cooperate with the project in supplying superior germplasm for distribution to participating institutions.

7. Publications

The F/FRED publications series includes "Farm Forestry News" (the quarterly project newsletter), workshop proceedings, handbooks, training manuals, technical bulletins, and brochures.

To date, three issues of "Farm Forestry News" have been produced. This newsletter is distributed to approximately one thousand readers in sixty-six countries. "Forestry Networks", the proceedings of the September 1986 F/FRED networks workshop in Bangkok, Thailand, has been produced and distributed to all workshop participants and related A.I.D. and Winrock International personnel. Preparation is now underway to develop an agroforestry handbook series and a F/FRED Project brochure.

In an effort to produce high-quality publications at reduced time and cost, Winrock is using state-of-the-art desktop-publishing technologies. "Forestry Networks" was produced in-house at Winrock's Arlington, Virginia office, using the Microsoft Word software program and Hewlett Packard laser printer. The resulting reduction in type-setting costs was significant. Winrock is now exploring other desktop-publishing packages to respond to the unique needs of the F/FRED publications series.

8. Project Administration

Coordination with A.I.D.

The innovative character of the F/FRED research project calls for an unusual degree of flexibility and responsiveness to issues related to establishing a new field of research in Asia. Considerable diplomacy and skill is required to create the new F/FRED Research Network, involving some 10 countries and several dozen research institutions. Since the project is funded by A.I.D., special coordination is required between Winrock and the USAID Missions or representatives in the participating countries; the three A.I.D. co-managers in Washington, D.C.; and the concerned international development and donor community.

To assure compliance with A.I.D. policy and procedural guidance, and coordination of field operations, such as travel, F/FRED project management hosts a monthly coordination meeting in Arlington, Virginia with concerned A.I.D. staff officers. F/FRED field staff operate in Asia within an established set of procedures and travel clearances for dealing with respective A.I.D. Missions.

Coordination of specific program activities is achieved through the system of work plans and task orders and related budget allocations described above.

Budget

See Appendix VIII for a summary of the F/FRED Budget and report of expenditures through December 31, 1986.

Procurement

Commodity procurement for project use, such as office equipment and vehicles, is undertaken by Winrock following its procurement policies and practices, which include securing waivers from A.I.D. as required for non-U.S. origin and source items.

Providing grants and equipment to Asian institutions or scientists is governed by a special document reviewed and approved by the A.I.D. contract officer and Winrock management. This document is the "Policy and Procedure Guidelines for Administration of Small-Value Procurement Under The F/FRED Project." The document authorizes the F/FRED contract team leader in Asia to make such procurement up to a value of \$6,000 with amounts up to \$25,000 to be approved by Winrock senior management. Larger procurements are submitted to the A.I.D. contract officer for approval.

Communications

All F/FRED project staff are interconnected by electronic mail service. This F/FRED network provides direct office-to-office communications through computers installed at each location. Network call signs and a message numbering system permit easy tracking of each message.

ITT Dialcom, Inc.'s electronic mail system (E-Mail) is the system employed. The F/FRED E-mail hook-up currently includes Arlington Virginia; Bangkok, Thailand; Maui, Hawaii; Turrialba, Costa Rica; and St. Paul, Minnesota. The E-mail system allows for quick and efficient communication among different geographic locations.

E-mail capabilities include sending entire microcomputer files via satellite and telephone lines. A file is created and transferred via a modem through telephone lines to a local relay station operated by Telenet. From there, files are transmitted by satellite to another relay station and are then distributed by telephone lines from which the user accesses their electronic "mail box."

The Dialcom system also allows the microcomputer user to send telexes. Telexes are used when direct E-mail service is not available, such as USAID Missions, Asian institutions or individuals. The process is similar to the E-mail system, with Western Union being the relay station. Telex capability at the F/FRED Coordinating Unit will greatly facilitate the logistics of getting participants to meetings and clearing travel authorization for the F/FRED field team.

Staff

A list of the F/FRED Winrock staff and the long-term consultants contracted under the F/FRED Services in Asia contract is as follows:

STAFF (Name and Position)	PERIOD
Thomas. C. Niblock, Project Manager	Sept 1985-Present
Kirtland M. Barker, Project Specialist	Feb 1986-Present
Christine Smith, Project Secretary	Sept 1985-Present
Norma Adams, Project Editor	Sept 1985-Present
William Hyde, Land & Forest Mgmt. (L,F & M) Specialist	April 1986-Dec 1986
Ken MacDicken, Team Leader and MPTS Network Specialist	Jan 1987-Present
Charles Mehl, LF&M Project Specialist	Jan 1987-Present
Lee Medema, Forestry Economist	Feb 1987-Present
Terence Linkletter, Data Base Specialist	Dec 1985-Present
Foster Cady Research and Development Director University of Hawaii subcontract	July 1986-Present

0005
PS (Principal Consultants

James Brewbaker	Nitrogen Fixing Tree Association and University of Hawaii
Robert K. Dixon	Auburn University
Dietmar Rose	University of Hawaii

Component B Network Development and Research Support

The F/FRED coordinating unit on the campus of Kasetsart University in Bangkok is now fully staffed with three specialists and a support staff. The offices are equipped with three microcomputers and communications facilities including electronic mail, telex, and a dedicated telephone connection. With the project now clearly defined, a work plan outlining the goals and activities of the three team members has been prepared (Appendix II).

1. Establishment of Research Network

One of Winrock's first steps in developing a project framework following the initial evaluation of species networks identified at the IUFRO meeting in Sri Lanka, was to convene, in June 1986, a small group of Asian forestry research and information specialists from some of the institutions recommended in the evaluation report. This group formed the ad-interim steering committee, which planned the first forestry networks workshop that formally established the F/FRED project in Asia. This interim steering committee agreed to focus the agenda of this meeting on electronic information management to support field research activities in MPTS.

The September 24-27, 1986 workshop brought together more than sixty forestry research and information specialists from Bangladesh, China, India, Indonesia, Malaysia, Nepal, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, and the United States. Common interests in MPTS research and the exchange of information on these species became the basis for establishing the F/FRED Research Network.

The workshop participants drafted and adopted an organizational framework for the network that extends membership and/or observer status to institutions and organizations working in forestry and agriculture research. A Steering Committee was formed, which became the governing body of the network and is composed of a representative of each country involved with the network.

A Research Committee with two subcommittees were formed to monitor biophysical and socio-economic research priorities and to see that these two disciplines are integrated. The Research Committee also reviews and approves research studies; monitors data collection and research methodology; and establishes guidelines for future research. The organizational framework of the network is described in Appendix V.

2. 1987 Field Trials

During the September workshop in Bangkok, a consensus was reached on the need to establish field trials in the 1987 rainy season. As a result, the Network Trials Planning session was held in Kuala Lumpur, Malaysia December 14-18, 1986 to refine guidelines established in Bangkok and to plan the 1987 trials. Participants agreed to work on three species initially, with a basic experimental design and methodology, and to collect a minimum data set in a standardized manner. *Leucaena diversifolia*, L, *leucocephala* crossed with *L. diversifolia*, and two provenances of *Acacia auriculiformis* and *A. mangium* will be planted this year.

The following ten cooperators have made an initial commitment to establish some sixteen experimental sites using an experimental design developed at the Network Trials Planning Meeting:

Indonesia Forest Research and Development Centre
 Forest Research Institute of Malaysia
 Universiti Pertanian Malaysia
 Pakistan Forestry Institute
 Forestry Research Institute, Philippines
 Visayas State College of Agriculture, Philippines
 Taiwan Forest Research Institute
 Kasetsart University
 Royal Forest Department, Thailand
 Thailand Institute of Scientific and Techn. Research

Cooperating scientists from these institutions have received from the Australian Commonwealth Scientific and Industrial Research Organization (CSIRO) two provenances of *Acacia auriculiformis* and *Acacia mangium* and, from NFTA, one psyllid-resistant variety of *Leucaena diversifolia* and one *L. leucocephala* x *L. diversifolia* hybrid. A manual on standardized experimental methods for network trials is being completed. Training tools, such as video tapes and short courses will ensure that establishment and mensuration techniques used in network experiments are comparable between experimental sites. Initial efforts will bring social scientists together with foresters and agriculturalists who are participating in network experiments. Network specialists will visit network trial participants during the first half of 1987 to discuss preparation for trials and will help integrate social science studies with MPTS trials.

The field measurements will be entered into the experiment data base that will be housed at the global research unit in Maui. Here experiment data will be maintained and updating of the data base will occur. Ideally, data entry from field forms will be done by the cooperating scientists at their institutions. F/FRED will make available the data-base software for data

entry and retrieval. Cooperators will enter data via microcomputer using these programs and ship data diskettes with data base additions to Maui. In return, cooperators will have access and receive at regular intervals the latest, updated version of the full data base. Cooperators will also be trained in data retrieval so that they can benefit as early as possible from access to as much data as has been accumulated. This procedure should accelerate the pace of data analysis, model development, and the identification of critical areas or gaps in information.

The Project is providing germplasm, soil characterization services for experiment sites, assistance in data analysis, data base management and modeling, assistance in research design and standardization of methodologies, and information support services.

To aid in training and in research standardization, a manual has been drafted detailing the experimental design and measurement procedures. A training video is also being produced which will demonstrate techniques.

Initial trials are centered on species that are appropriate for the humid environmental zones. An arid and semi-arid network research program will be initiated in the same manner.

3. Land and Forest Management

The workplan for the Land and Forest Management activity changed in the last reporting period to emphasize integration with the MPTS biophysical research program. A workshop on the role and future of applied social-science research in forestry to help establish an F/FRED research agenda for Thailand was held on March 13. The workshop brought university, government agency and private organization representatives together to frame a social science research agenda considering charcoal use, Thai legal structure, land tenure, indigenous land-use preferences and forest-products market trends. This will provide a basis for other such meetings throughout the region and has thus established the beginnings of the LFM network.

Training sessions entitled:

- o Major Forestry Concepts for Social Scientists
- o Major Social Science Concepts for Foresters
- o Economic Analysis for Project Planning, for mid-level government forestry officials

have been incorporated into the LFM workplan to provide an orientation to these disciplines as part of the objective to integrate forest science and socio-economic study.

4. Psyllid Pest Control

In 1984, a species of *Heteropsylla* was noted in Hawaii, with similar subsequent reports from Samoa and the Philippines in 1985 identifying a leafhopper-like pest attacking *Leucaena*. Spread of this insect became extensive in the Pacific Islands, the Philippines, Hawaii and Indonesia in some areas. The Forestry Support Program supplied the services of Max McFadden to evaluate the problem in Hawaii, the Philippines and New Caledonia. Dr. McFadden's report provided a basis from which to formulate a plan for F/FRED involvement in psyllid research.

Task order 14 established a task force of specialists to study and recommend control measures for psyllid pests harmful to *Leucaena* and other MPTS species. Max McFadden chairs the task force. In November 1986, F/FRED co-sponsored a workshop with the Nitrogen Fixing Tree Association on "The Biological and Genetic Control Strategies for the *Leucaena* Psyllid". An action plan to control the psyllid was produced at that workshop, which is under consideration in a number of Asian countries. The workshop established a series of psyllid resistant *Leucaena* trials. A meeting of the task force in March 1987 took place to outline, in detail, the F/FRED psyllid research program.

5. Team Biosketches

Ken MacDicken, Team Leader and MPTS Network Specialist, is an agroforester with experience throughout Asia and the Pacific. As Research Associate for the Nitrogen Fixing Tree Association (NFTA) (1983-1986), he developed training materials on nitrogen-fixing tree management; designed, organized, and managed projects; developed computer-based information systems; and monitored agroforestry research. Concurrent with this full-time position, he was also self-employed in nitrogen-fixing research development, upland community development, fuelwood plantation establishment, and shifting cultivation improvement.

As a Peace Corps Volunteer (1975-1978), MacDicken helped design, organize, and manage an agroforestation project for the mountain people of the Island of Mindoro, Philippines. This included work with the leguminous tree species *Leucaena leucocephala*, *Pterocarpus indicus*, and *Sesbania grandiflora*. In the Philippines, he helped redesign an upland development project that supported local community development.

MacDicken received his M.S. in Agronomy and Soil Science from the University of Hawaii in 1983.

Charles Mehl, LFM Network Specialist, has nearly four years of experience working in Thailand. As Rural Development Economist/Advisor to the Land Reform Areas Project, he helped design and implement training workshops; supervised project planning, monitoring, and evaluation; and developed farmer surveys to monitor changes in land holding, credit use, and

agricultural production. As a World Bank consultant, he analyzed the major historical changes in patterns of inheritance and other land transactions in rural Thailand, comparing private- and public-land ownership. In 1983, as an irrigation consultant in the Nakhon Phanom Province of Northeast Thailand, he researched public and private institutions involved in water management. While a Fulbright Fellow in Northeast Thailand (1982-1983), he analyzed variations in agricultural production, labor use, land ownership patterns, and local leadership in the Nakhon Ratchasima Province. Mehl received his Ph.D. in Development Sociology from Cornell University. He speaks fluent Thai.

Lee Medema, F/FRED's Forestry Economist, is a University of Idaho professor on detail from the Viking company. He received his Ph.D. in Forest Economics from the University of Washington in 1977. He has nine years of university teaching experience in economics of conservation; forest policy, administration, and management; investment analysis; and advanced forest economics. He is knowledgeable about the role of economic forces in resource analysis and conservation, timber management decisions for biological and financial production objectives, legislation and policy affecting land use, and public land management. In 1982, Medema conducted investment analyses of a proposed USAID- supported social forestry project in Maharashtra, India. Earlier, he made investment analyses of fuelwood plantations in Sri Lanka (1981). More recently, he helped prepare a report for USAID on investment analysis of a proposed management plan for the Dinderesso Forest in Burkina Faso. Medema's involvement in forest economics education includes graduate-level training last year of agroforesters at the Pakistan Forestry Institute.

Component C Global Research

Global research and development offices have been established on the island of Maui, Hawaii. Dr. Foster Cady, Research and Development Director has hired systems programmer Julie Pak and data base manager Eric Pang. Together, they have orchestrated the purchase of F/FRED computer systems for the project and have supervised the environmental control renovations at their offices to protect this equipment. The computer facility and offices are now completely operational.

The Global Research team has worked closely with field staff in Bangkok and consultant Dietmar Rose to develop a data base management system, to establish the MPTS network field trials, and to establish a network of organizations working in MPTS worldwide.

Foster Cady has been instrumental in focussing the field trials on key factors affecting growth and yield and has organized soil analysis for the upcoming field trials.

1. F/FRED Information Data Base System

The global research component of the F/FRED Project has defined the types of data bases that will be contained in its information management system. This process has evolved through study of existing systems and through discussions and meetings of Asian researchers and specialists in data management from key forestry research organizations. The following summary of the Information Data Base System represents the results of the Global Research component's meetings and work to date.

The experiment data base, the primary type of data base for the F/FRED Project, contains information based purely on measurements and analysis of replicated experiments. It is ideally suited for comparative studies of species performance with uniform standards for measurement and for analyzing information on standardized geographic and physical descriptions of experiment sites. Further, it provides the data quality control required for developing environmental growth and yield models. This, in turn, helps transfer MPTS technology to environments that differ from the experimental sites. Because scientists have access to raw experiment data, the possibilities for analyzing subsets of the total data base, data aggregation, and model validation are excellent.

After performing appropriate statistical, economic, and other analyses, the summarized information from replicated experiments can be entered into another data base table that contains highly condensed, key information on MPTS and is suited for practical management decisions. The F/FRED Project terms this a summary data base. In this data base, abstraction leads to models for predicting species behavior that has been rigorously tested and found reliable.

All other information not based strictly on controlled experiments is found in supplementary data bases. But there is no absolute division between summary and supplementary information, and data bases might contain elements of both.

2. Coordination of Replicated Experiments

At the December 1986 Network Trials Planning Meeting in Kuala Lumpur, Malaysia, cooperators agreed to experimental and treatment designs and associated minimum data sets for the 1987 field trials. The field measurements from these trials will be entered into the experiment data base. Ideally, cooperating scientists at their respective institutions will enter data from field forms. The global research component of F/FRED will make available the data base software for data entry, retrieval, and other uses. Cooperators can enter data via microcomputers using these programs. In return, they will have access to and receive on a regular basis updated versions of the full data base. They will also receive training in using data base programs and in data retrieval, which will maximize their access to accumulated data. This, in turn, will accelerate data analysis, model development, and identification of critical areas and information gaps.

3. Summary Data Base Uses

The F/FRED summary data base, an integral part of the experiment data base, can be used to capture information directly from existing experiments either within or outside the F/FRED network. Although a percentage of quality control is lost with outside data, its entry into F/FRED's data base is acceptable as long as the degree of experimental variability is included and the information requested is clearly defined, understood, and can be provided. In some cases, it may be possible to transfer all the required information from other data bases into the F/FRED data base.

The summary data base being developed by the Tropical Agronomic Center for Research and Education (CATIE) Tree Crop Production Project (Madelena) is based on formal experiments, as well as demonstration-plot information. Under joint sponsorship of the global F/FRED component and the Madelena

Project, Terry Linkletter, Management Information Systems Specialist, is helping to ensure that data from MPTS studies in the Latin American tropics are incorporated into the F/FRED information data base system. Minimum data sets, field forms, procedures, and a prototype data base management system are being developed with recognition of F/FRED experience in Asia. In cooperation with CATIE (with funding provided by the Kellogg Foundation), Dr. Dietmar Rose and Luis Ugalde at the University of Minnesota College of Forestry are carrying out the data base design.

In addition to the CATIE system, the Global Research team is working together with the developers of TREDAT, a tree- information data base developed by the Commonwealth Scientific and Industrial Research Organization (CSIRO) and the Queensland Department of Forestry in Australia. This system is based on another set of experiments and on other information sources.

Merging portions of these summary data bases with the F/FRED summary data base is highly desirable in view of the amount of data required for environmental modeling. Combining data might be easily accomplished at some levels of data detail but impossible at other levels.

A key concern in designing the F/FRED minimum data set and associated data base is the ability to incorporate as many MPTS experiments worldwide as possible. When many observations are available, developing environmental growth and yield models that will allow MPTS technology transfer to environments where experiments have not been done is enhanced. The data used for aggregation in F/FRED will be screened for compatibility and quality.

Efforts will be made in the next reporting period to work out data sharing arrangements with ICRAF in Africa and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India among others.

4. Supplementary Data Base Classification

F/FRED will examine and classify supplementary data bases relevant to MPTS and will coordinate its efforts with other groups worldwide to attempt a global synthesis of portions of relevant regional data bases. F/FRED will also develop new data bases, including supplementary data bases, that cover various information types to serve different needs. Two examples are discussed below.

Specialist Directory

The MPTS specialists data base provides ready access to individuals who have specific skills and experience related to MPTS research. Information about people with identified skills or experience will be made available to network participants upon request. The data base and associated software will also be made available to network members, who will be asked to provide names of other individuals that might serve as additional network resources.

The global research unit at Maui, Hawaii, will develop, as part of the F/FRED system, the software needed to add, update, and retrieve data from the MPTS specialists data base. The form included as an annex to this report is designed to obtain the desired information on MPTS expertise for the data base. It will be sent out to network members periodically for updating. The software and data base will be made available to F/FRED network participants and others who express interest. Updates of the data base and the latest software will also be distributed regularly.

Bibliographic Data base

Many network participants do not have ready access to bibliographic retrieval services, such as DIALOG, to provide them the latest MPTS citations. The global research team has reliable access to such services and will develop a bibliography data base to house literature citations and abstracts directly relevant to MPTS research.

This data base serves to make network participants aware of what work is being done in their field of interest and who is doing it. It represents the basic concept of information exchange and organization and will serve to demonstrate the principles of data base management systems at the April Training workshop in Bangkok.

5. DBase III Plus

The dBase III Plus package, a powerful relational data base program, is being used for all data base activities. It has excellent documentation, is user-friendly, and has a wide distribution. It is also the standard package selected by USAID for all A.I.D. Missions and all F/FRED software will run on mission computers. For collaborators who currently do not have access to this package, compiled versions of any programs developed by F/FRED can be made available. Compiled programs do not require the original software package and are not subject to reprogramming or inadvertent changes in the files. This also alleviates copyright infringement problems.

6. Data Base Coordination and Administration

It is essential for F/FRED to be aware of other data-base efforts relevant to MPTS. Working closely with projects and institutions developing these related data bases will:

- o avoid duplicating efforts,
- o direct data-base development toward more useful applications,
- o help identify and correct problems, and o promote data base use.

7. Biotechnology

Biotechnology is recognized by F/FRED staff and network participants as an important area of forestry research. Each of the three components are contributing to define a program in Biotechnology that is appropriate for MPTS in the framework of the F/FRED project.

Since the first reporting period, a MOU has been signed with Plantek International in Singapore and a biotechnology task order has been issued. The task order outlines the first steps in adopting MPTS research priorities in several facets of biotechnology. There will be an assessment study of the role of biotechnology in MPTS improvement and management in collaboration with Plantek. It has been proposed that a task force be formed, much the same as the psyllid group has evolved, to address this topic and to report to the Research Committee.

Thus far, the scope of work proposes a series of six studies to review the state-of-the-art for several biotechnologies and their potential impact on small farm production and use of MPTS. They will focus on the species that have been selected as priority MPTS and will cover the following topics:

- o Potentials and constraints to tissue culture of MPTS;
- o Potential for productivity improvements through the use of mycorrhizal inoculants;
- o Potential for yield increases of leguminous MPTS using improved Rhizobium strains;
- o Small-farm production of gums, resins, and exudates;
- o Small-farmer access to biotechnology and socio-economic factors affecting access; and
- o Potential socio-economic impact of biotechnology on selected countries of the region.

To ensure that the studies will be relevant to F/FRED goals, detailed study plans will be developed by the F/FRED staff, the Research Committee, and network collaborators. The studies will be contracted to network participants and will, where applicable, involve outside consultants with expertise in specific aspects of biotechnology. Reports of the studies will be submitted for publication when appropriate.

The workplan summary for the Global Research Component is included as appendix III in this report.

F/FRED SERVICES IN ASIA CONTRACT—AID/WINROCK

CONTRACTOR RESPONSIBILITIES—ACTIVITIES/TASK ORDERS—BUDGET ALLOCATIONS

COMPONENT A—RESEARCH POLICY, PLANNING AND MANAGEMENT (ARLINGTON, VIRGINIA)

<u>Responsibilities</u>	<u>Activities/Task Orders</u>	<u>Budget Allocation</u>
1. <u>Country/Forestry Sector Assessments/ Plans</u>		
a. <u>Recommend Multipurpose Tree Species (MPTS) Networks for F/FRED</u>	<u>Task Order No. 1</u>	\$ 6,918.00
Review ongoing USAID Mission projects in forestry, energy and agriculture that would support network research and research dissemination;	<u>Task Order No. 2</u>	\$ 70,021.00
Evaluate potential network institutions and their projects with MPTS;	The prescribed review, evaluation and recommendations were made and are recorded in a final report submitted to AID in April, 1986.	
Develop recommendations for the establishment of MPTS networks based on regional distribution of network participants, zonal distribution of network institutions by environment type and the ability to get networks operating within the shortest time.	A review team visited 14 forestry research institutions in six countries as a basis for the report.	
b. <u>Consult with the international donor community to share plans and assess ongoing MPTS activities as a basis for development of F/FRED work plans; and to set a pattern for continuing donor collaboration so as to minimize duplicating in-country programs and to benefit from sharing experience.</u>	<u>Task Order No. 3</u>	Staff time only
	A coordination meeting was held for the donor community on May 29, 1986 at Winrock offices in Arlington, Va. A second meeting was held for donor representatives in Asia in Bangkok, Thailand on September 22, 1986.	
	An F/FRED staff visit (MacDicken and Cady) to Australia in December 1986 served to coordinate F/FRED program plans with relevant research undertaken in or by Australian institutions.	

c. Prepare a report on the status of MPTS activity in Thailand.

Task Order No. 10

\$ 2,000.00

Dr. Suree Ehumibhamon, Kasetsart University, Thailand prepared a case study to determine forestry research priorities in Thailand. The study, "The Status of Multipurpose Tree in Thailand," was completed and published in 1986. It was produced under sponsorship of the Subcommittee on the Research and Development of Multipurpose Tree of the National Research Council of Thailand.

2. Institutional Guidelines/Plans for Research and Management

A proposed MOU was drafted by Winrock and considered/endorsed by the F/FRED Steering Committee. The institutions that had formerly joined the F/FRED Network by MOU as of December 31, 1986 were as follows:

a. Negotiate Memoranda of Understanding (MOU) between Winrock and Asian institutions formalizing cooperation on forestry research activities to establish membership in the F/FRED Research network, and identify benefits and responsibilities of participation in the project.

Forest Research Institute of Malaysia
Forestry Research Institute, Ministry of
Natural Resources; Philippines
UPLB, Philippines
PLANTEK, Singapore
Forestry Department, Sri Lanka
Forest Research Institute, Taiwan
Kasetsart University, Thailand
Visayas State Univ., Leyte, Philippines

b. Provide F/FRED funds for technical assistance to two Indian universities and to the National Botanical Research Institute of India. Assist two universities (Madurai Kamaraj University and Bharathidasan University) in development of plantation stock through selection and improvement of short rotation or biomass. Assist the NBRI with evaluation of biomass production and fuelwood properties of firewood tree and shrub species.

A team sent to India in October 1986 carried out Phase I of the subproject, preparing a report defining in detail work to be performed in Phase II, i.e., participant training, study tours and expatriate visits to India. As of March 1986, Winrock had negotiated a subcontract for Phase II activities with Auburn University, School of Forestry.

\$ 382,000.00

3. Regional Research Planning/Evaluation/Training

a. Assign an expatriate data base specialist to CATIE in Costa Rica to establish linkage between F/FRED Asia and related forestry research in Central America and support the short-term assignment of a graduate student for data base compilation. The assignments provide mutual strengthening of MPTS data base development in Central America and Asia and exchange of data and results of research between Asia and Central America.

4. Information Management Systems

a. Plan the Global Research Component

b. Prepare and publish a series of handbooks on Agroforestry Research, conduct workshops and meetings incident to this task, distribute the materials to Asian institutions and colleagues.

Task Orders No. 3 and 18

By agreement with the Weyerhaeuser Company, Winrock supported one of its employees for a twelve-month assignment at CATIE (Dec. 85 - Dec. 86) and extended this assignment for twelve months at 50% of Weyerhaeuser costs in the form of a grant to CATIE. A PhD candidate from Costa Rica will be supported for 3-4 months work in 1987.

\$ 70,000.00 - 1986 (Linkletter)
42,500.00 - 1987 (Linkletter)
7,750.00 - 1987 (Ugalde)

Task Order No. 5

Three planning meetings for the Global Research Component of F/FRED were held between February 1986 and August 1987. Planning focused on the MPTS Data Base and development of uniform data sets of research information. The results of the planning meetings were presented to the F/FRED MPTS Research Committee in Bangkok in September of 1986 and reviewed in further detail at the MPTS Research Committee meeting in Kuala Lumpur in December of 1986. These planning sessions led to the UH Global Research Component development of a definitive plan for the F/FRED Data Base.

\$ 4,608.00

Task Order No. 15

Four handbooks on agroforestry are in preparation with titles as follows:

Research Management
Biophysical Research
Social Science Research
Common Property/Social Forestry
Issues

Winrock's agroforester, William R. Bentley, is Managing Editor. Technical and associate editors are being identified for each volume with publication of all four volumes by mid-1988.

\$ 183,384.00 est.

c. Assist Asian F/FRED Member Institutions develop or strengthen documentation centers for MPTS research information, and distribute pertinent information to the Centers.

Task Order No. 16

\$ 43,600.00 est.

The Memoranda of Understanding with Asian institutions provide for collaboration between Winrock and network members in establishment of documentation centers. Winrock has developed a mini-library of some fifty selected volumes which is being made available to member institutions. A continuing program of literature distribution has been initiated to provide periodic update of material. A workshop for librarians from member institutions is planned for late 1987.

d. Issue quarterly newsletters on the F/FRED project.

Beginning in the summer of 1986, publication of a quarterly newsletter (Farm Forestry News) was begun. The plan for publication was approved by AID.

\$ 2,000.00 per issue-est.

To date, three newsletters have been produced. The original mailing list, now expanded to some 1000, has been automated and is divided into 35 categories to facilitate special project mailings.

5. Other Responsibilities

Task Order No. 4

\$ 3,689.35

a. Support a brief specialist visit to Thailand to assess biotechnology/tissue culture activities in Thailand of interest to F/FRED.

Dr. Cyrus McKell of MPI provided a preliminary assessment of tissue culture activities in Thailand.

b. Participate in an East-West Center Workshop on "Strategies for Improving the Effectiveness of Asia-Pacific Forestry Research for Sustainable Development."

Task Order No. 6

\$ 1,970.73

Winrock Senior Program Officer Dr. William Bentley represented the F/FRED Project in the Workshop, serving as commentator and rapporteur of the evaluation session.

COMPONENT B - NETWORK DEVELOPMENT AND RESEARCH SUPPORT (BANGKOK, THAILAND)

<u>Responsibilities</u>	<u>Activities/Task Orders</u>	<u>Budget Allocation</u>
1. <u>Network Development and Research Support</u>		
a. <u>NPTS Research Network</u>		
(1) <u>Establish the F/FRED Research Network in Asia</u>		
(a) <u>Bring together a group of Asian forestry specialists as an ad hoc Steering Committee for the F/FRED Project.</u>	<u>Task Order No. 9</u> The Ad Hoc F/FRED Steering Committee met in Bangkok, Thailand June 23-24, 1986. The committee planned a formal meeting for establishment of the F/FRED network to be held in September of 1986. The agenda, participants to be invited and papers to be delivered were decided.	Staff expenses for travel and per diem
(b) <u>Communicate with and visit prospective institutional members of the F/FRED research network to encourage participation in F/FRED meetings and explain network membership.</u>	<u>Task Order No. 12</u> The F/FRED field staff visited prospective network members in July and August 1986 to explain the F/FRED project and introduce the concept of formal participation in the research network through an exchange of Memoranda of Understanding (MOU). Eight MOUs had been signed between Winrock and participating Asian institutions as of by Dec. 31, 1986.	Staff expenses for travel and per diem
(c) <u>Create a formal project Steering Committee and establish an organizational framework for the F/FRED Research Network.</u>	<u>Task Order No. 13</u> At the first forestry networks workshop held in Bangkok in September 1986, Asian forestry research scientists and officials adopted a written document that formally established the F/FRED Research Network and issued a public announcement of network establishment. The record of this key meeting was published in January 1986. It contains copies of organization documents produced as well as the professional papers delivered at the Workshop.	\$64,398 est.

59

(2) Establish a plan for MPTS field trials and initiate a pilot program of field trials in 1987.

(a) Hold a planning workshop of the Asian specialists who would be involved in MPTS field trials.

(b) Administer a pilot program of MPTS field trials in 1987.

Task Order No. 17

\$54,165 est

A workshop for prospective participants in F/FRED field trials was held in Kuala Lumpur, Malaysia in December 1986. Eighteen scientists, representing eight countries, attended. Agreement was reached on research design and minimum data sets. Ten Asian forestry research institutions agreed to plant field trials at 16 sites for the 1987 pilot program. Germplasm for the field trials were procured from Australia (acacia); and Hawaii (leucaena).

Task Order No. 19

\$127,000 est.

A trip to Australia by MPTS Network Specialist MacDicken and Global Research Director Cady resulted in agreement to procure acacia seed from Australia. Seed was procured from Australia and Hawaii and delivered to cooperating nurseries.

(3) Establish a regional research plan to identify psyllid control methods and resistant tree genotypes of Leucaena and other MPTS species.

Task Order No. 14

\$15,000 est.

A team of four scientists met with Asian counterparts to develop research priorities. Field visits were made and information gathered. This was followed by a decision to co-host an Asian Psyllid Control Workshop with the Nitrogen Fixing Tree Association of Hawaii. The workshop was held in November, 1986. Its purpose was to recommend biological and genetic control measures. A psyllid-control "action plan" was produced, which was widely circulated to concerned Asian and other institutions and governments through AID. Winrock then reconstituted the F/FRED Psyllid Control Team under direction of USDA entomologist Max McFadden. He and other team members met in Bangkok, Thailand in March 1987 to plan future activities.

(4) Explore prospects for "new" biotechnology opportunities for priority MPTS species.

Task Order No. 22

\$73,500

The F/FRED team in Asia considered how best to harness new biotechnology to meet project needs and recommend an initial series of six studies to clarify what is known about biotechnologies pertinent to increasing small-farm production of F/FRED priority species. All six studies, with expected completion date of summer 1987, will help determine subsequent research. The six studies are:

1. Potentials and Constraints to Tissue Culture of MPTS.
2. Potential for productivity, improvements through the use of mycorrhizal inoculants.
3. Potential for yield increases of leguminous MPTS using improved Rhizobium strains.
4. Small farm production of gums, resins and exudates.
5. Small farmer access to biotechnology (socio-economic factors affecting access).
6. Potential socio-economic impact of biotech on selected countries of the region.

b. Land and Forest Management (LFM) Network

a. Bring together a group of social scientists to identify focal topics for the socio-economic component of the F/FRED networks; identify potential network participants and develop funding plans for support of research grants in the area of land and desert management.

A meeting held August 4-5, 1986 in Bangkok, was attended by Asian and international scientists, who identified focal topics for research, suggested network participants, and planned future activities.

\$7,038 est.

The meeting report was considered by F/FRED Project Management and AID project officers to be insufficiently targeted to F/FRED priority interests. The report was not adopted. AID and Winrock decided to have a new LFM network project specialist develop a new work plan for this component. The new work plan had been developed by February 1987. A first step in implementation was a meeting held in Bangkok, in March 1987.

Responsibilities

1. Develop, collect, analyze, and synthesize information from all regions

a. Develop guidelines and manuals for, among other topics:

Species improvement
Biotechnology
Agroforestry

b. Conduct special training, e.g. database management systems.

c. Hold workshops for exchange of information and modeling.

Activities/Task Orders

Task Order No. 7

A series of three meetings (Arlington, St. Paul, and Honolulu) was attended by data management specialists to design the F/FRED data base system. Uniform data sets were developed and considered in a meeting of Asian forestry specialists in Kuala Lumpur in December 1986. The "F/FRED Data Base System Organization" document was presented for consideration in January 1987. Representatives of CATIE and ICRAF participated in the Honolulu meeting. This data-base development activity was coordinated with development of plans for field trials under Component B of F/FRED. Funding of these activities was provided from all three project components.

The document A Guide for Multipurpose Tree Species Research Cooperators was issued in Feb. 1987 as the foundation of a more comprehensive manual on F/FRED field trials.

The F/FRED Data Base System consists of experiment, summary, and supplementary databases. The first is related to field trials conducted under F/FRED or carried out in harmony with F/FRED. The summary database contains condensed, key information on MPTS and is suited for practical management decisions. Supplementary databases under F/FRED include MPTS specialists and bibliography databases.

A special data-base training course was prepared to be held for a group of Thai specialists April 14-18, 1987. This is planned as the first of a series of such training courses in the Asia region to introduce and provide instruction in management of the F/FRED data-base system.

To be scheduled.

Budget Allocation

Staff expenses for travel, per diem and honorarium

69

APPENDIX II

F/FRED COORDINATING UNIT DRAFT WORKPLAN - 1987

This workplan is a set of output-oriented goals designed to achieve project objectives by specified dates. An effort has been made to incorporate the following factors which might be considered critical to network success (Plucknett and Smith, 1984):

- o the problem should be clearly defined and widely shared with a realistic research agenda for dealing with the problem;
- o there must be strong self-interest; effective networks cannot be mandated;
- o participants must be willing to commit resources such as personnel and facilities;
- o outside funding must be available to facilitate the birth of networks;
- o participants must be sufficiently trained and experienced to make a contribution.

The F/FRED project design has taken these factors into account. The activities to be carried out in achieving the following goals will be done in a manner which develops a core of institutions and individuals actively interested in networking in areas related to MPTS for small farm use.

The activities outlined in this workplan will be carried out by the Bangkok-based F/FRED Coordinating Unit.

I. Network development strategies and priorities

Winrock is charged in the Asia Forestry Research Services contract with developing a final workplan and schedule of activities in consultation with AID/W, missions and host countries. The Bangkok-based network element of this planning process is well underway, and should be substantially completed by the end of 1987. Network development is a slow process if important self-interests are to be incorporated. Recognizing this fact, the workplan defines a strategy for network development.

Plucknett, D.L. and N.J.H. Smith. 1984. Networking in International Agricultural Research. Science, Vol. 225, No. 4666:989-993.

63

A. Goal: Clearly defined research agenda for F/FRED network.

The F/FRED contract includes a number of priority areas of research which the project will support (e.g. species trials, management research, social science studies of farmer use of MPTS, etc.). This research agenda will include a clear, concise statement of topics which will be supported by F/FRED. Levels of support will be estimated as well as a plan for implementation. All will be developed with a high degree of Asian input.

Completion date: April 10, 1987

B. Goal: Develop a strategy for the integration of MPTS and social science research in F/FRED activities.

F/FRED is designed to integrate social science and biological research with the desired result of improving MPTS production on small farms. This strategy will describe how MPTS and social science research activities will be linked in F/FRED activities and how F/FRED will help encourage these links in participating institutions.

Completion date: April 1, 1987

C. Goal: Establish socio-economic research agenda for F/FRED in selected participating countries.

In order to develop an effective network of social scientists in F/FRED and to assure that the project addresses socio-economic issues relevant to the participating countries, it will be necessary to establish research agenda for each country within the more broadly defined species-driven research agenda for the F/FRED network. Foresters and social scientists from each country will be responsible for setting their own research priorities for the applied social science issues most critical to their own society. This will allow incorporation of current research and development interests relevant to MPTS research and development in the network. From this base of relevant research agenda, and through the development of the farm and village level data set, regional social scientists can begin exchanging information and ideas and eventually rethink and improve the orientation and methodologies of such research. The research agenda will be developed through informal workshops. It is expected that workshops will help identify the core of social scientists working on applied social science issues who can participate in the F/FRED network.

Completion date: December 1, 1987

D. Goal: Establish curriculum for short training programs on major forestry concepts for social scientists and major social science concepts for foresters.

Many biological or social scientists express a desire to work together, but differences in the ways they approach the same problems, in the questions each group will ask and in their methodologies, often creates obstacles to their understanding and working with each other. F/FRED will help develop a set of two training sessions to give each group some idea of the ways the other group conceptualizes research problems, carries out the research, and analyzes the results. The training sessions would be organized by an appropriate Asian institute, then taught throughout the region.

Completion date: December 1, 1987

E. Goal: Complete an assessment of the potential for improvement of small farm MPTS production through several areas of biotechnology.

There is interest in AID/W in biotech research as a means of rapid improvement of MPTS productivity. Several areas of promise have been identified, and feasibility studies begun. The assessment will consist of 6 studies by Asian scientists with limited input from outside consultants. Results will be published by F/FRED.

Completion date: December 1, 1987

F. Goal: Develop a plan for organizing short-term training.

Short-term training is a major mechanism for improvement of research skills for network participants. This plan will identify the steps required to setup a short-term training agenda for the next 2 years. The plan will include provisions for a training needs assessment by the coordinating unit network team, an inventory of available courses which are relevant for F/FRED network participants, and a plan for filling identified gaps in short-term training opportunities.

Completion date: April 1, 1987

G. Goal: Develop a plan for summarizing relevant data on existing or completed MPTS trials in Asia.

A number of experiments with the F/FRED priority species have been conducted in Asia, yet most of the data from these remains unpublished or the results not widely disseminated. The coordinating unit will work with GRD and regional scientists preparing a plan for summarizing this data for input into the network data bases.

Completion date: September 1, 1987

II. Research support

F/FRED is designed to improve research methods and information management, develop and monitor agreed upon collaborative research programs in Asia, provide commodities required for research management, and conduct workshops and conferences necessary for network building. The following Coordinating Unit goals define areas of research support which will help meet these project requirements.

A. Goal: Regional coordination of past management research on leucaena psyllid problem.

The Leucaena psyllid presents a regional problem with serious impacts in several F/FRED network countries. Control methods and alternatives are being studied in several countries with little coordination/communication between scientists. F/FRED will initially help coordinate regional communications through a series of in-country planning meetings with the desired result that all nations and regional activities on the leucaena psyllid problem will be coordinated by an Asian institution with limited F/FRED support.

Completion date: September 1, 1987

B. Goal: Germplasm collections made for at least five priority species.

Quality germplasm is one of the major constraints to MPTS improvement in Asia. Seed will be collected, processed and disseminated for the two Australian acacia species in cooperation with CSIRO, Melia and Azadirachta will be completed in Thailand and possibly elsewhere in cooperation with KUFF, and seed production of psyllid-resistant leucaenas will be initiated. Plans will be developed for germplasm collections of the three arid and semiarid zone network priority species.

Completion date: December 1, 1987

C. Goal: Successful establishment of applied social science research projects in conjunction with MPTS trials.

To initiate the integrated approach to MPTS research, five applied social science research small grants programs will be established through institutes in at least four of the F/FRED countries participating in the MPTS trials. Each program will be for \$5,000, to support research on topics related to the trials, such as the characteristics of trees farmers would refer for fuelwood, fodder, and other uses, the indigenous land and forest management systems of the farmers in the communities around the MPTS trial sites, etc.

Completion date: October 1, 1987

D. Goal: Successful establishment of at least 15 network trials using F/FRED funding where necessary.

The F/FRED Research Network is in part designed to generate and communicate research results among Asian scientists. Data will also be generated for a regional growth and yield modelling effort coordinated by the Global Research and Development component. An initial set of experiments was designed by network participants in December 1986. Seed and a guide to establishment was sent out to participants in late January, and the processing of cost proposals has begun. The coordinating unit will follow-up these trials and provide training and support where necessary.

Completion date: October 1, 1987

E. Goal: Provide fellowships for Ph.D. study in the U.S.

Six fellowships are to be provided through F/FRED for Ph.D. study in the U.S. Three will be for study in the biological sciences and three for the social sciences. The fellowships will be awarded competitively. Grantees will be matched with faculty working on topics covered by F/FRED. Students in the biological sciences would have to work on at least one of the targeted species. Students in the social sciences would have to work on an issue concerning small farmer use of trees, indigenous forest management systems, etc., that would be directly relevant to the development and use of the targeted MPTS. Dissertation topics would be subject to approval by the F/FRED management and Coordinating Unit team.

Completion date: August 15, 1987

III. Network coordination processes

The F/FRED Coordinating Unit network team is to help develop F/FRED research networks two areas: 1) humid and sub-humid tropics; 2) arid and semi-arid tropics. The research to be conducted under these networks must be oriented to meeting the needs of small farmers and the rural populations for tree products such as fuelwood, fodder, etc. This network coordination role requires definition of several processes which are now partially in place. Goals for 1987 include further refinement and implementation of these processes.

A. Goal: Establish regular coordination meetings with other donor agencies and projects active in the areas of F/FRED interest.

A number of donors are working in the general areas of MPTS and social sciences related to small farmers. As a regional project, F/FRED is in an excellent position to coordinate project activities with those of regional donors (i.e. FAO, IDRC, ACIAR, etc.). Informal steps have already been taken to coordinate with other donors. Regular coordination meetings will be scheduled quarterly in Bangkok to insure close collaboration.

Completion date: June 1, 1987

B. Goal: Reorganization of F/FRED Steering and Research Committee.

The Steering Committee is to serve as the governing body of the F/FRED Research Network and a Research Committee was formed to focus on the biophysical and socio-economic dimensions for achieving the network objectives. To date, however, both committees have functioned on an ad interim basis. A membership structure, selection process and terms of references will be developed for each committee.

Completion date: April 30, 1987

C. Goal: Monitor USAID Mission forestry programs and provide Mission requested support.

The USAID Missions and their forestry and agricultural projects are an integral part of the F/FRED Research Network. Lines of communication will be improved and projects of mutual interest developed.

Completion date: This is an on-going activity over the life of the project.

D. Goal: Process and mechanism in place for research grants program.

One of the keys to successful networking is limited provision of outside support where necessary. A practical review and approval process for providing F/FRED research grant funds will be established which is acceptable to Winrock, AID/W and network participants and which places heavy reliance on the Research Committee as the main actor. The concept of matching grants which supplement on-going in-country programs will be incorporated in the criteria for future grants.

Completion date: June 1, 1987

E. Goal: Conduct National MPTS organizing conferences.

In-country communication among scientists is a very important part of the F/FRED Research Network. National MPTS Organizing Conferences are planned in each of ten participating countries. The purpose of the conferences is to (1) select a country representative to serve a one-year term on the Research Committee, (2) provide a forum for the exchange of information and views on F/FRED Network related research, (3) monitor F/FRED related MPTS research and (4) develop a country research agenda for the selected country representative to the Research Committee.

Completion date: October 30, 1987.

66

F. Goal: Develop a strategy and establish an arid and semiarid network.

The MPTS for the Arid and Semiarid zone is designed to focus research on Acacia nilotica, Dalbergia sisso, and Eucalyptus camaldulensis. Asian scientists conducting research or who are interested in conducting research on these species will be identified and invited to attend a network organizing meeting to be held in Pakistan in November. The output of this meeting will be the start of a MPTS Network for the Arid and Semiarid zones.

Completion date: December 1, 1987

G. Goal: Conduct a scientific workshop on MPTS for small farm use which summarizes the state of the art.

While there is much said about MPTS for small farmers, little effort has been made to summarize what is know about small farm use of MPTS. F/FRED can serve a catalytic role in supporting a workshop and publishing proceedings which summarize this information.

Completion date: December 1, 1987

H. Goal: Develop a strategy and establish a network based on Melia azadirach and Azadirachta indica.

Part of the agreement between KUFF and AID/W to hosting the F/FRED project was a commitment by AID to support a Melia and Azadirachta network headquartered at KUFF. A strategy for initiating this network will be developed in close cooperation with the Faculty of Forestry members.

Completion date: August 1, 1987

IV. Data Set Definition and Development

Electronic data storage, retrieval and analysis is a major function of the global research component in Hawaii. The Coordinating Unit has been called on to provide some of the social science input to these data bases.

A. Goal: Define and Establish Minimum Socio-Economic Data Set to be Integrated with MPTS Minimum Data Set.

Socio-economic factors can have significant effects on the results of MPTS field trials, if the trials are made in farmers' fields. So long as the MPTS network experiments are carried out in experiment stations or other controlled conditions, there will be few social, economic or cultural factors affecting the tree growing. With the goal of eventually establishing network trials in farmers' fields, a minimum socio-economic data set will be defined and set up. This data set for MPTS field trials established by the Global Research component, so that the socio-economic data can be analyzed separately by social scientists yet remain a part of the complete analysis of the MPTS trials. The minimum socio-economic data set will be defined by the F/FRED Coordinating Unit team, reviewed by selected Asian social scientists and the F/FRED Global Research staff and set up by the Global Research component.

Completion date: August 1, 1987

B. Goal: Develop Minimum Family and Village Level Land and Forest Management Data Set.

Supporting research on land and forest management by small farmers and the development of effective extension methods for small farmer use of MPTS are among the major activities supported by F/FRED. A cross-national exchange of information on farmer and village level land and forest management can stimulate comparative research, raise new questions on forest and woodlot use for regional researchers and policy makers to explore, and contribute to the development of new extension methods. A data set of family and village level information on land and forest management systems will be developed by the F/FRED coordinating unit and regional social scientists and foresters to help support their research and extension needs.

Completion date: July 1988

Global Research Workplan for 1987

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Experiment Data Base

create/modify paper forms	XXXX					XXXXXX						
create/modify computer forms	XXXXXXXX					XXXX						
socio-economic data forms						XXXXXX						
create/modify data structure	XXXXXXXXXX					XXXXXXXXXX						
review forms		XXXXXXXXXXXXXX				XXX						
menu system for forms	XX	XXX				X						
add/mod/del program for each form	XXXXXXXXXXXXXX					XXXXXXXXXXXXXX				XXXXXXXXXX		
inquire program module for each form		XXXX				XXXXXXXXXXXXXX				XXXXXXXXXX		
on-line help module						XXXXXXXXXXXXXX						
program testing		XXXXXX				XXXXXX	XXXX			XXX		
user documentation		XX				XXXX				XX.XXX		
system documentation		X				XX				XXXX		
report programs							XXXX					XXXXXXXXXX
interface to stat pkg	X		XX				XXXXXXXXXXXXXX					
integration into F/FRED system										XXXX		
interface other pkg, incl. graphics				XX						XXX		XXXXXXXXXX
copy disks for alpha testing										XX		
general distribution												XXX

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Specialists Data Base

create/edit paper form	XXX	XX										
review paper form		XXX										
create/edit computer form		X	X							XX		
create/modify data structure	XX		X							XX		
add/modify/delete routines		XXXXXXXX								XX		
inquire routines		XXXXXXXXXX				XX				XX		
integration of program routines			XXX							XX		
integration into menu-driven system			X		XX					XX		
software testing			X		XXX					XX		
user documentation		X			XXX					XX		
system documentation		X			XXX					XX		
report/mailling labels						XXXX				XX		
integration into F/FRED system							XX			X		
copy disks for alpha testing							XX			X		
copies for general distribution										XX		

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Bibliography Data Base

create computer form		XXXX						XX				
create/modify data structure		XXXX						XX				
add/modify/delete routines		XXXXXX			XX							
inquire routines			XXXX			XXXXXXXXXXXXXX				XXXX		
integrate add and inquire routines						XXXXXX						
software testing								XXX				
user documentation										XX		
system documentation										XX		
report/output program												XXXXXXXXXX
integration into F/FRED system												XX
copy disks for alpha testing										XX		
copies for general distribution												

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

April Workshop

prepare lecture material					XXXXX							
prepare computer exercises					XXXXXXXX							
create/enter data sets					XXXXXXXX							

Summary/Information Data Bases

integration of graphics pkg												
integrate inspire-in f/fred format												
integrate tree species data base												
integrate seed source data base												

F/FRED Task Orders

Note: Task Orders are used to plan and administer discrete sub-projects. They may be initiated under each of the three principal components of the project, i.e., Management (Arlington); Networks (Bangkok); and Global Research (Hawaii). In all cases, the Task Orders will be submitted for AID Project Manager concurrence by the Winrock Project Director. Task Orders are submitted in a format endorsed by AID, sample attached.

<u>T.O. No.</u>	<u>Objective and Accomplishment</u>	<u>Date Completed</u>	<u>Cost</u>
1.	Objective: Prepare a Scope-of Work for MPTS Network Report Accomplishment: Three specialists(Cady, Dove, MacDicken) met in Arlington, VA. with Winrock and AID staff on September 25 and 26 and two prepared the Scope-of-Work which was accepted by AID.	9/27/85	\$6,918.00
2.	Objective: To field a team to visit Asian forestry research institutions; meet with USAID staff and recommend NTE three research networks for MPTS. Accomplishment: The team visited 14 Asian forestry research institutions; met with 6 USAID staffs and submitted the required report with recommendations to AID on February 4, 1986. AID requested an oral presentation and discussion of the report which was held in Arlington, Va. with team members MacDicken and Hyde on Feb. 13. A revised final draft report was submitted to AID on March 5, 1986.	5/3/86	\$70,021.00
3.	Objective: Arrange for the one year assignment of Weyerhaeuser (to date) employee Terence Linkletter to CATIE, Turrialba, Costa Rica under the Global Research component of the project, for purposes of coordinating regional data bases and planning for F/FRED activities in Latin America.	12/31/86	\$18,930

Accomplishment: A letter agreement was signed between Winrock and Weyerhaeuser on November 8, 1985 and Mr. Linkletter arrived at post in Costa Rica in December of 1985. Mr. Linkletter attended a Global Research coordination meeting in Arlington, Va., Feb. 27-28, 1986. His work is proceeding with guidance of the F/FRED R & D Director Foster Cady, and Data Base consultant Dietmar Rose.

4. Objective: Facilitate visit by Dr. Cyrus McKell to Bangkok, Thailand to advise AID and Winrock regarding tissue culture research in Thailand relevant to F/FRED MPTS research. 12/10/85 \$3,689.35

Accomplishment: Dr. McKell completed his assignment as planned and submitted a field trip report on December 10, 1985.

5. Objective: To initiate Global Research Component of F/FRED to discuss MPTS data base, and outline work plans. 2/25-28/86 \$4,608.00

Accomplishments: Specialists Cady, Rose and Linkletter met with AID officers and Winrock staff to present the status of MPTS data base at CATIE and collaborate on global research scope of work.

6. Objective: Participate in East-West Center workshop on "Strategies for Improving the Effectiveness of Asia-Pacific Forestry Research for Sustainable Development," Honolulu, Hawaii; William R. Bentley participated and served as commentator and rapporteur as requested by EWC. 3/17-21/86 \$1,971.00

Accomplishment: Attended all sessions; chaired a sub-group on the roles of technical assistance and PVO agencies' roles in forestry research; served as rapporteur for summary session on evaluating effectiveness; filed trip memo to the files with copies to USAID/S & T.

7. **Objective:** Develop uniform data sets for MPTS network; coordinate work plans for global research and MPTS network components, and establish computer hardware and software conventions for F/FRED project.
- 5/86
- Consultant honoraria & Per diem
- Planned activities:** Meet in St. Paul, Minnesota to work with data base, discuss activities of CATIE and develop a list of variables to be measured in F/FRED field trials, and finalize computer requirements for all components of the project: Attendees: Dixon, Cady, Rose, Barker, Ugalde.
8. **Objective:** Present the F/FRED project to representatives of donor institutions/agencies.
- 5/29/86-
9/22/86
- Staff time only
- Planned activities:** donor community representatives from Canada and Washington-based organizations will meet with AID project officers, Winrock local staff and F/FRED specialists (Cady, Dixon and Rose) to discuss F/FRED project goals which might be added to F/FRED activities.
9. **Objective:** Assemble an ad interim steering committee to participate in MPTS activities under F/FRED.
- 6/23-24/86
- Staff expenses only

Planned activities: A two-day meeting will address overall MPTS network objectives, formulation of network by-laws and development of network activities. Participants will contribute their perspective on the project's direction and work plan. Participants are to include: J. Madamba (Philippines), M. Salleh (Malaysia), M. Sheik (Pakistan), R. Singh (India), and S. Bhumibhamon (Thailand).

10. Objective: Research grant to Thai forestry researcher Dr. Suree Bhumibhamon to prepare a report on the status of multipurpose tree activity in Thailand. Completed 1/87 \$2,000

Planned activities: Finish research and publish a report which will outline problems in planning MPTS research, discuss past achievements and current research efforts relevant to MPTS networks and make recommendations on future programs in this research area.

11. Objective: Bringing together an initial core group of LFMN members for the purpose of providing initial organization for the Land and Forest Management Network (LFMN) component of the F/FRED project. 8/24-29/86 \$7,038

Planned activities: Assembly of small group of forester-social scientists for two days in Bangkok in early August. Persons to be invited will be chosen from personal contacts and recommendations and/or from persons interviewed during field visits.

	Objective:	8/86-9/86	Staff expenses
12.	<p>Objective: This activity continues efforts to formally establish MPTS and LFM networks in Asia. Networks specialists will travel to potential participating institutions within the region and personally brief scientists and administrators on current status of F/FRED activities, proposed September workshop, and introduce MOU and other project documents.</p> <p>Travel to Philippines, Singapore, Malaysia, Sri Lanka, Burma, China (and other countries upon request) is anticipated. USAID monitors and institutional representatives will be briefed on current network activities, accomplishments of recent steering committee meeting and agenda for F/FRED Sept. 1986 workshop. One important event in each visit will be to negotiate terms of MOU and expedite signing process. network specialists will catalogue institutional strengths, deficiencies and goals.</p>	8/86-9/86	Staff expenses
13.	<p>F/FRED Workshop Bangkok September 24 -27 1986. Formal introduction of project to the Asian forestry research community. Workshop focus on microcomputer data management.</p>	09/27/86	\$65,000
14	<p>Psyllid Control for Leucaena Establish a comprehensive regional research plan to identify psyllid control methods. Create a task force of four scientists: a physiologist, genetist, entomologist and a regional specialist to investigate biological control, chemical control and other MPTR species.</p>	Ongoing	\$15,000
15.	<p>Prepare Agroforestry Manuals. Organize authors and prepare monographs, readings and research hand books that will provide useful reference for Asian agroforestry researchers.</p>	Ongoing	\$183,000

Agroforestry Research

Volume I. Biophysical Concepts and Methodologies.

Volume II. Management of Research and Extension Activities

Volume III. Management of Research and Extension Activities

- | | | | |
|-----|--|-------------|----------|
| 16. | Information Distribution and Establishment of Documentation Centers. Provide a core library of literature relevant to MPTS research. Provide access to bibliographic material available through electronic linkages to large bibliographic services and sponsor a documentation center workshop for participating institutions. | Ongoing | \$43,000 |
| 17. | Network Trials Meeting. Make final preparations and begin to implement pilot network experiments at Asian institutions. Ten participants will establish sixteen research sites, each planting <u>Acacia auriculiformis</u> and <u>A. mangium</u> provenances from Australia and Papua New Guinea and psyllid resistant <u>Leucaena leucocephala</u> cross with <u>L. diversifolia</u> . A manual on standardized experimental methodology and a training video will be used to ensure data collected from the experiments is comparable. | 12/14-18/86 | \$54,165 |
| 18. | Continuation of Services of Management December Information Specialist, Terence W. Linkletter. Mr. Linkletter will be sponsored for one half of his salary to develop further the silvicultural and socioeconomic tree crop data base at CATIE. | 12/87 | \$42,000 |

- | | | | |
|-----|---|---------|-----------|
| 19. | A trip to Australia by MPTS Network Specialist MacDicken and Global Research Director Cady to establish a collaborative research agreement with ACIAR and CSIRO. A focus of this trip was procuring <u>Acacia</u> seed for the 1987 field trials and a plan to work together in collecting seed of F/FRED species beginning in the fall of 1987. Establishing field trials and support of related activities. | Ongoing | \$127,000 |
| 20. | Computer Hardware for Kasetsart University. To provide microcomputer capability to utilize network data base software, teaching and research. | 3/87 | \$7,100 |
| 21. | Applied Social Science Workshops and Training. To develop cooperation between social and biological scientists. Workshops will be conducted in each F/FRED participating country to identify key forestry issues and to design a program for implementing research. To set up short courses and training sessions that will enhance the programs of social scientists and forestry researchers. | Ongoing | \$185,000 |
| 22. | Biotechnology assessment. Perform six studies to determine the role of biotechnology in the F/FRED project. Studies will be: Potential of tissue culture for MPTS improvement and propogation; potential of mycorrhiza to increase growth and yield; potential of improved Rhizobium technology for increasing growth and yield of nitrogen fixing MPTS; possibilities for producing gums, resins and exudates from MPTS on the small farm; socioeconomic factors affecting access of biotechnology on the small farm; and the potential socioeconomic impact of adopting biotechnology on the countries in the region. | Ongoing | \$73,000 |

23.	Land and Forest Management Workshop. To frame a LFM network program for Thailand. Review the role of social sciences in forestry in Thailand with leading scientists from universities, government agencies and other research institutes.	03/13/87	\$1,250
-----	---	-----------------	----------------

Framework of the F/FRED Research Network

Para 1: Membership

1.1 Membership in the F/FRED Research Network, hereafter referred to as the Network, shall be open to Asian forestry departments, forestry and agricultural research institutes, schools of forestry, forestry or agricultural colleges or universities that have signed or have expressed the intention of signing a Memorandum of Understanding (MOU) with Winrock International Institute for Agricultural Development (hereafter referred to as Winrock) or which participate in any F/FRED research activity through the Lead Institution in a country. A sample MOU is attached.

1.2 Observer status in the network is open to institutions that are invited to attend meetings of the network or to exchange information with network members.

Para 2: Organization

2.1 The governing body of the F/FRED Research Network is the Network Steering Committee. The Steering Committee is composed of a representative from the Lead Institution from each participating country. A Lead Institution is a member institution from a country chosen by the member institutions from the country to represent them.

2.2 The Lead Institution in each country shall act as a coordinator of F/FRED activities within the country, and keep all member institutions in the country informed on F/FRED activities.

2.3 Other member institutions could be invited to be members of the Network Steering Committee, if considered necessary.

2.4 The F/FRED Research Network shall be deemed established when six (6) institutions have signed the MOU.

2.5 The Steering Committee could invite specialists to advise the Steering Committee as and when considered necessary.

2.6 The Steering Committee shall oversee the activities of the Network through Research Committees which shall be formed by the Steering Committee as and when necessary. Initially, there shall be two Research Committees, namely the Multipurpose Tree Species (MPTS) Research Committee and the Land and Forest Management Research Committee.

80

2.7 The Steering Committee shall appoint appropriate scientists from member institutions to be members of Research Committees, taking into consideration country representations and expertise required.

Para 3: Rules and Terms of Reference of the Steering Committee

3.1 The Steering Committee shall meet annually or as needed. Meetings of the Steering Committee shall be called by the Network specialists at the F/FRED Coordinating Unit at Kasetsart University in Bangkok.

3.2 The Steering Committee shall elect a Chairman for each meeting from among its Asian members. The F/FRED Coordinating Unit shall provide secretarial support.

3.3 Decisions of the Steering Committee shall be by a majority of at least two thirds of members present at any meeting.

3.4 The Steering Committee shall:

- a) plan Network programs
- b) review progress of Network activities
- c) guide and assist the Network specialists in Network activities
- d) promote Network programs and activities
- e) establish Research Committees and be responsible for their performance
- f) approve annual Network activity reports
- g) promote linkages with other related networks
- h) carry out other functions as deemed necessary to implement F/FRED programs

3.5 Network specialists at the Network Coordinating Unit shall be members of the Steering Committee.

3.6 Chairmen of Research Committees shall be members of the Steering Committee.

Para 4: Rules and TOR of Research Committees

4.1 Research Committees shall report and be responsible to the Steering Committee.

4.2 The Chairmen of Research Committees shall be appointed by the Steering Committee.

4.3 Research Committees shall meet regularly as and when required.

4.4 Research Committees shall (for their own fields):

- a) plan research studies

- b) review and approve research studies
- c) coordinate research and other related activities
- d) ensure that standard methodologies are used in research and other activities
- e) ensure that research reports are submitted when due
- f) carry out any other functions as deemed necessary to ensure that success of F/FRED activities

Para 5: National Policies

The implementation of the F/FRED Research Network framework shall take cognizance of national policies.

Para 6: Changes to the Network Framework

The Steering Committee may make changes to the Network Framework as and when considered necessary.

APPENDIX VI

Announcement of Establishment of a Research Network for MPTS

More than 60 forestry research and information specialists from 10 countries of Asia and the United States, meeting at the Ambassador Hotel in Bangkok, Thailand September 24-27, took action to establish a research network for MPTS. They did this after reviewing benefits expected to arise from such networking. Anticipated benefits include improved information management and systems for control and validation of experimental data from field trials.

The network, to be known as the F/FRED Research Network, came into being as participants in this week's workshop witnessed the sixth cooperating Asian research institute sign a Memorandum of Understanding adhering to membership.

The network was recommended by an ad interim planning group of Asian forestry research scientists. That group, along with international agencies active in forestry research, have proposed expanding productivity and availability of improved fast-growing tree species for fuelwood and other household and commercial uses by rural farmers.

Winrock International, a U.S.-based not-for-profit technical assistance institute for agricultural development, provides secretariat, technical, and staff support and administers a small grants program to facilitate network activities. Funding for this has been provided for an initial five-year period by the Agency for International Development (AID), Washington.

Network membership and/or observer status is open to Asian forestry departments, forestry and agricultural research institutes, and schools of forestry and agriculture. This week's workshop participants drafted and adopted an organizational framework for the network.

A Steering Committee was created to provide overall direction and plan network programs. The network offices, staff and communications facilities are located on the campus of Kasetsart University in Bangkok, the host institution for headquarters of the network.

Much of the work of the inaugural meeting was devoted to defining the research agenda, adopting tree species appropriate for network research and examination of techniques for collection storage, sharing and utilization.

82

of the large volume of data to be processed through the network. The network will make use of state-of-the-art micro-computer hardware and software to support a DBMS designed for the network.

With due regard to proprietary interests, data is to be shared on a global basis with other national and international organizations, and to provide ready access to many established data bases of interest to network members. Expertise for design of data sets and information management systems is being provided by specialists from the University of Hawaii. Implementation of research network activity is expected to draw upon consultants from the Asian region, as well as from cooperating U.S. schools of forestry.

A full day of the workshop was devoted to coordinating experimentation for developing predictive growth models. Equipment and computers for the demonstrations of computer application were made available courtesy of IBM Thailand. Activities of the network will be carried out through research committees designated by the Steering Committee. Dr. Salleh Nor, Director General of the Forest Research Institute of Malaysia, was elected as the first chairperson of the Steering Committee.

The Steering Committee designed two Research Committees: Multipurpose Tree Species (MPTS) Research Committee and the Land and Forest Management Research Committee. These committees focus attention respectively on the biophysical and the socio-economic dimensions of achieving the network objectives.

Future activity of the Land and Forest Management Research Committee will be concerned with application of biological improvements through village-level outreach and extension programs. This will require multidisciplinary interaction between biological and social scientists and economists based on a broad knowledge of sites and local conditions. In addition to developing a better understanding of conditions under which local communities and private individuals will choose to adopt the improved MPTS species, this group will examine the environmental implications and benefits of various MPTS species.

Next steps in implementing the network program will be a meeting of the MPTS Research Committee scheduled to be held in Kepong, Malaysia in December of this year. At this meeting, final decision will be reached on the data sets to be used for experimental trials and arrangements will be considered for selection and processing of germplasm and other requirements for field trials in 1987.

A field trip to MPTS provenance trials and community forestry sites in Thailand was useful in constructing plans

84

for the F/FRED network trials. On a day's visit to these sites, the workshop participants were able to review a large selection of multipurpose tree field trials involving species of interest to the new research network (see Appendix III).

The new research network builds upon work by the International Union of Forestry Research Organizations (IUFRO). Specifically, a set of recommendations arising from a meeting of IUFRO members in Kandy, Sri Lanka in 1984 has provided the basis for network activities. The new network is also designed to complement other research networks and activities of a number of multilateral and bilateral agencies that provide assistance in forestry development programs in the Asia region.

APPENDIX VII

Summary of Person Months from September 19, 1986 to March 1, 1987.

Project Director	14
Administration Support Staff	13
Project Specialist	13
Winrock Consultants	1.5
Winrock Field Office Staff	1.8
Documentation Editor	8
Consultants - U.S.	19.6
U.H. Subcontract	22
Field Specialists	14
Field Local Hires	39
Field Consultants	4.7
<hr/>	
Total Person Months To Date	150.6

APPENDIX VIII

BUDGET SUMMARY FOR THE PERIOD ENDING JANUARY 31, 1987

Forestry/Fuelwood Research and Development Project; AID Project No. 936-5547

<u>Budget Line Item Detail</u>	<u>Project Budget 1985-90</u>	<u>Total Claimed To Date</u>	
		<u>Amount</u>	<u>% of Budget</u>
I. Salaries and Wages	\$ 1,901,994	\$ 211,234.09	11.11
II. Fringe Benefits	549,799	79,365.84	14.44
III. Consultants	349,866	100,829.42	28.82
IV. Overhead (57.09%)	1,285,588	178,157.06	13.86
V. Travel and Transportation	722,789	181,084.79	25.05
VI. Allowances and Per Diem	509,654	72,950.77	14.31
VII. Nonexpendable Equipment	77,252	47,561.80	61.57
VIII. Participant Training	898,340	0.00	0.00
IX. Workshops, Conferences and Studies	115,565	9,439.84	8.17
X. Research Grants	354,755	1,001.51	0.28
XI. Subcontracts	2,029,613	71,907.60	3.54
XII. Other Direct Costs	152,770	39,124.50	25.61
TOTAL COSTS	\$ 8,947,985	\$992,657.22	11.09

87

The Forestry/Fuelwood Research and Development Project (F/FRED) was developed in response to the documented fuelwood needs of developing countries. Its goal is to meet the basic needs of these countries for fuelwood and other tree products; for improved land, water, and human resource management; and for increased employment and income. The purpose of F/FRED is to enhance forestry/fuelwood research and research capabilities through improved planning and management of forestry/fuelwood and agroforestry research; development and support of networks of scientists and institutions in developing countries to address their critical forestry/fuelwood needs through better use of forestry, on-farm forestry, and agriculture-related research information.

Winrock International Institute for Agricultural Development was established in 1985 through the merging of the Agricultural Development Council (A/D/C), the International Agricultural Development Service (IADS), and the Winrock International Livestock Research and Training Center. Winrock International's mission is to improve agriculture for the benefit of people — to help increase the productivity, improve the nutrition, and advance the well-being of men, women, and children throughout the world. Winrock International's main areas of emphasis are human resources, renewable resources, food policy, animal agriculture and farming systems, and agricultural research and extension.

F/FRED Project Management Office
Winrock International
1611 N. Kent St., Suite 600
Arlington, VA 22209
USA
(703) 525-9430

F/FRED Global Research Unit
University of Hawaii
P.O. Box 186
Paia, HI 96779
USA
(808) 579-8481

F/FRED Coordinating Unit
Faculty of Forestry
Kasetsart University
P.O. Box 1038
Kasetsart Post Office
Bangkok 10903, Thailand
579-0113 ext. 413