



**Summary Report
of
Refresher Course for Agroforestry
Trainers
in Asia-Pacific**

held 26 April - 9 May, 1992 in Cisarua, Indonesia

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**Agroforestry Systems Research and Development
in the Asia and Pacific Region (GCP/RAS/133/JPN)**

**Bogor, Indonesia
May 1992**

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Introduction

The Refresher Course for Agroforestry Trainers in Asia-Pacific was held from 26 April to 9 May, 1992 in West Java, Indonesia. The primary venue for the course was the Cisarua Mountain Hometel, with field exercises and a field trip in several locations in West Java. In attendance were 22 participants from 10 countries in Asia-Pacific, representing research and extension agencies, NGOs and universities involved in the Asia-Pacific Agroforestry Network, as well as Fiji. Most of the participants in this course are involved in directing, managing or teaching training courses for farmers, extension personnel, research organizations or universities.

This training course was organized by the Asia-Pacific Agroforestry Network (APAN) and the Indonesian Agency for Forestry Research and Development (AFRD), in collaboration with the International Centre for Research in Agroforestry (ICRAF), the FAO Regional Wood Energy Development Programme (RWEDP) in Asia, and the Forestry/Fuelwood Research and Development (F/FRED) project. Additional funding for this course was generously provided by the United States Department of Agriculture through its Forest Service Tropical Forestry Program. A total of 17 resource persons (about 12 on a full-time basis) facilitated the course, representing APAN, ICRAF, RWEDP, F/FRED, AFRD and other Indonesian institutions. Support staff from APAN and RWEDP formed the backbone of the course secretariat.

Indonesia is the host country of APAN, whose first phase (1991-92) is executed by the Food and Agriculture Organization of the United Nations (FAO) with financial support from the Government of Japan. APAN member countries are: Bangladesh, India, Indonesia, Lao PDR, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Vietnam.

A brochure on the conclusions from the training course has already been printed and disseminated to course participants, APAN members, research and extension agencies, universities and policy-makers involved in agroforestry.

The purpose of this summary report is to provide a synthesis of the training course proceedings -- what the participants and resource persons collectively shared and learned together -- and make this information available quickly and widely.

A more detailed "resource book" on agroforestry training approaches in Asia-Pacific is also being produced, based on examples, materials and experiences provided by participants at the training course.

Interested readers should write to the APAN Secretariat to obtain copies of the course conclusions brochure, the summary report, or the resource book.

Session 1: Workshop Objectives; Basic Concepts and Overview of Agroforestry in Asia & Pacific

Diag. 1 Initial Workshop Objectives

1. To review agroforestry training approaches, tools and materials used in APAN countries and South Pacific.
2. To exchange and compare training approaches and materials.
3. To provide a forum for the exchange of ideas and experiences in agroforestry.
4. To produce an outline for a compendium of agroforestry training resources in Asia & Pacific.
5. To plan future agroforestry training activities in Asia & Pacific (at regional, national and local levels).

Participants from 10 countries in the Asia-Pacific region briefly introduced themselves and their organizations (see Appendix 1 for list of participants).

Workshop objectives were discussed. It was agreed to interpret these as guidelines for monitoring and evaluation of the workshop process, and amend them as necessary. Participants suggested the following additional objectives during the discussion; to better understand:

- * relevancy of agroforestry research programs to agricultural needs;
- * monitoring and evaluation of agroforestry training; and
- * mechanisms to link research and training to end-user (especially farmer) adoption.

In an attempt to create common ground for the discussions during the workshop, *Ken MacDicken* presented some basic agroforestry concepts. He emphasized the need to clearly distinguish between the *characteristics* of agroforestry as a land use and the *objectives* guiding agroforestry activities of the various categories of actors (farmers, extensionists, researchers and planners) involved.

Though the latter may all strive to realize the potential advantages and avoid the potential disadvantages of agroforestry, it is ultimately the analysis of the resultant land use that determines whether they succeeded or not. He presented an overview of the (potential) biological, economic and social advantages and disadvantages of agroforestry land-use systems.

Diag. 2 Priorities for Agroforestry (AF) Development in APAN Countries

<u>BGD:</u>	homestead agroforestry; AF on denuded forest lands;
<u>IND:</u>	AF for soil conservation in semi-arid areas; wasteland development; intensive AF on productive farmland;
<u>INS:</u>	AF for soil conservation, watershed and upland development; rehabilitation of degraded forest areas;
<u>LAO:</u>	AF to improve shifting cultivation
<u>NEP:</u>	AF to meet fodder needs in the hills; farm forestry in the Terai;
<u>PAK:</u>	irrigated farm forestry development; marginal land development;
<u>PHI:</u>	AF in Integrated Social Forestry program and upland development;
<u>SRL:</u>	AF on degraded uplands (incl. abandoned tea areas); home garden development;
<u>THA:</u>	AF R & D in watersheds in the North & North-East;
<u>VIE:</u>	AF in land allocation program; multistory cropping systems in hills; silvofishery development in mangrove areas.

Chun Lai presented an overview of the various ways in which trees are used in farming systems in Asia-Pacific, in various agroecological zones, and under different levels of population density. He pointed out that there is a rich diversity of traditional agroforestry systems in the region. Agroforestry R & D and extension is of much more recent date, though the oft cited example of *taungya* indicates that there are long-standing types of agroforestry development introduced by government agencies.

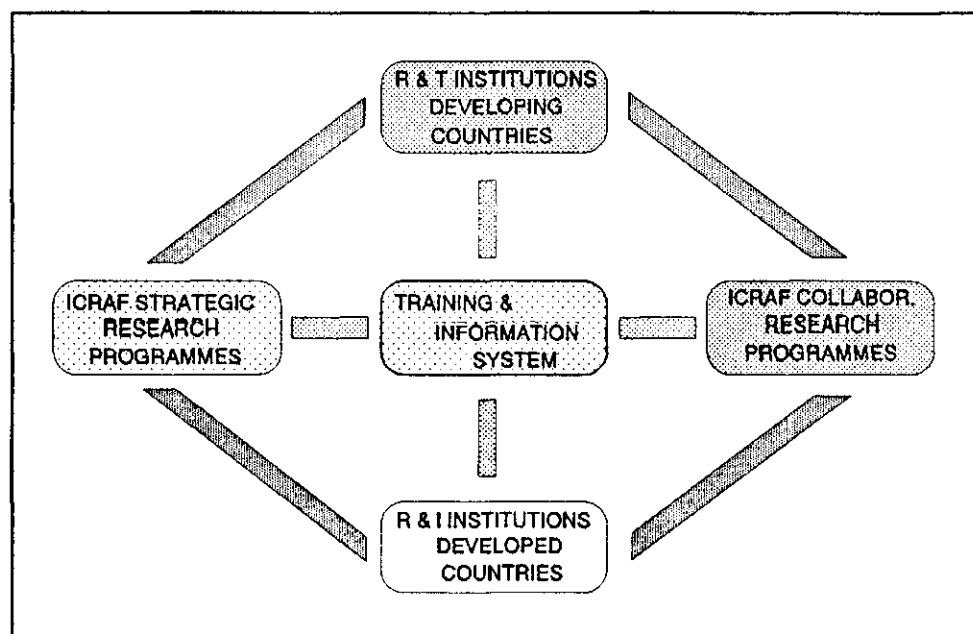
Examples of improved collaboration between different agencies in Asia-Pacific were quoted (GO-NGO; research-training-implementation, etc.). Based on initial exploration of agroforestry problems and potentials, countries participating in the Asia-Pacific Agroforestry Network (APAN) had indicated their priorities for agroforestry development, reflecting the variations in agroecological and socioeconomic conditions, and in population density.

Support for agroforestry training development is one of four major APAN activities. The emphasis in training development will be on improving the linkages between training on the one hand, and research and extension on the other hand. It was proposed to address these linkages as one of the key issues in the workshop.

Session 2: Overview of Agroforestry Training

Ester Zulberti, in presenting ICRAF's Training & Information Program, illustrated how such linkages between training, research and development had taken concrete shape in some African countries, and will be extended to Asia and Latin America in the near future. She explained how ICRAF's Dissemination Program (comprising training, education, information and documentation, and communication) is related to its research programs and to institutions in both developed and developing countries in the AgroForestry REsearch Network in Africa (AFRENA).

Diag.3 Linkages between Training & Information; Strategic and Collaborative Research



The above sketch (Diagram 3) demonstrates that ICRAF's training strategy is based on the integration of research and training, and focuses on collaborative programs. Training activities comprise group and individual training, supported by the production of training materials that are also made available to other interested institutions.

Complementary to the training activities is the education program comprising support for curriculum development at diploma, B.Sc. and M.Sc. levels; training of trainers and development of instructional material; exchange of information and facilitating fellowships; and strengthening agroforestry research at the university level. The African Network for Agroforestry Education comprises at present 26 universities in 16 countries in Africa, as well as 11 colleges in eastern and southern Africa.

To assist in curriculum development a set of core courses for a M.Sc. in Agroforestry has been proposed. In most universities these courses have to be inserted in an adapted form in existing curricula (e.g., agronomy, animal husbandry and forestry).

Training and Education Programs are complemented by the 'Information & Documentation' and 'Communications' Programs. In the Information and Documentation Program, databases such as the Multi-Purpose Trees and Shrub Database are being developed, library and question-answer services provided, publications disseminated, and support to national agroforestry information services provided. In the 'Communications' program, publications are produced and translated, as well as audiovisuals and graphics.

Diag.4 Core Courses

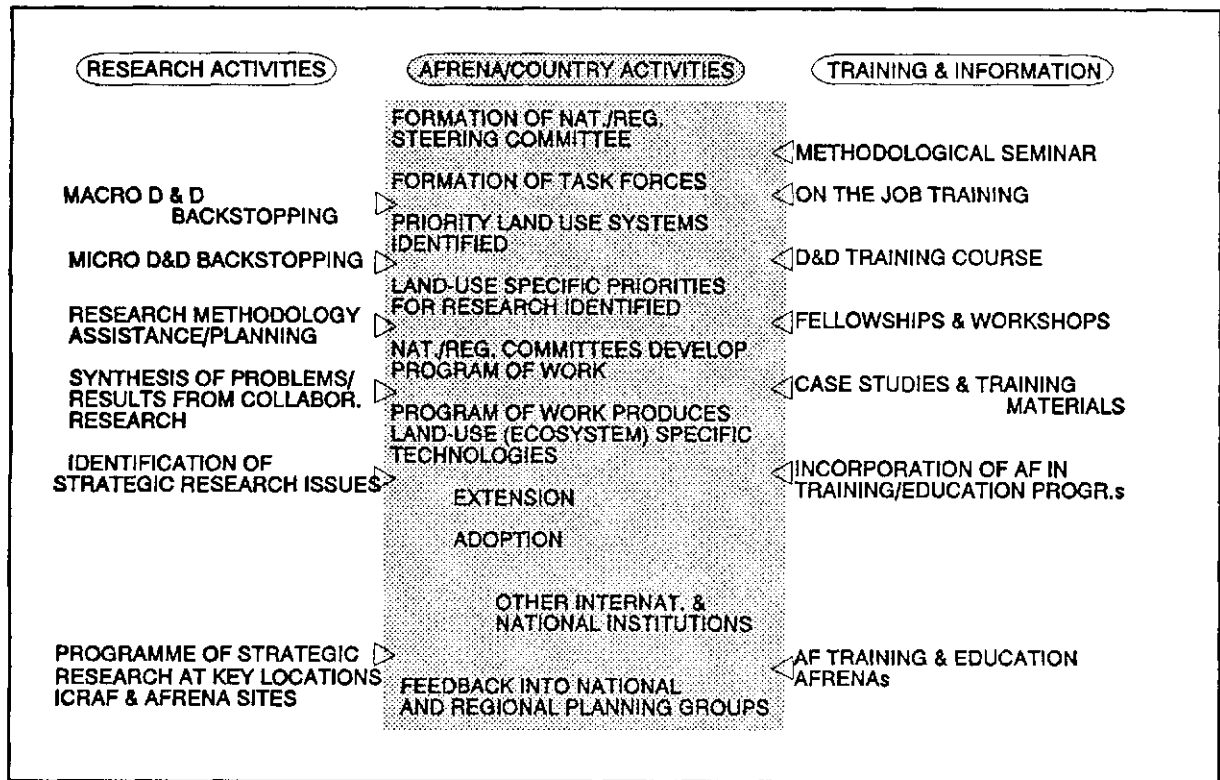
- * AF Concepts, Systems and Practices
- * AF Research Methodology (D & D)
- * Statistical Analysis & Experimental Design for AF
- * AF Component Interactions: MPTs, Crops & Animals
- * Soil Management and Productivity in AF
- * Socioeconomics of AF
- * Special Topics/seminars in AF

Diagram 5 below illustrates how all of these various activities are orchestrated to support the activities in the Agroforestry Research Network in Africa.

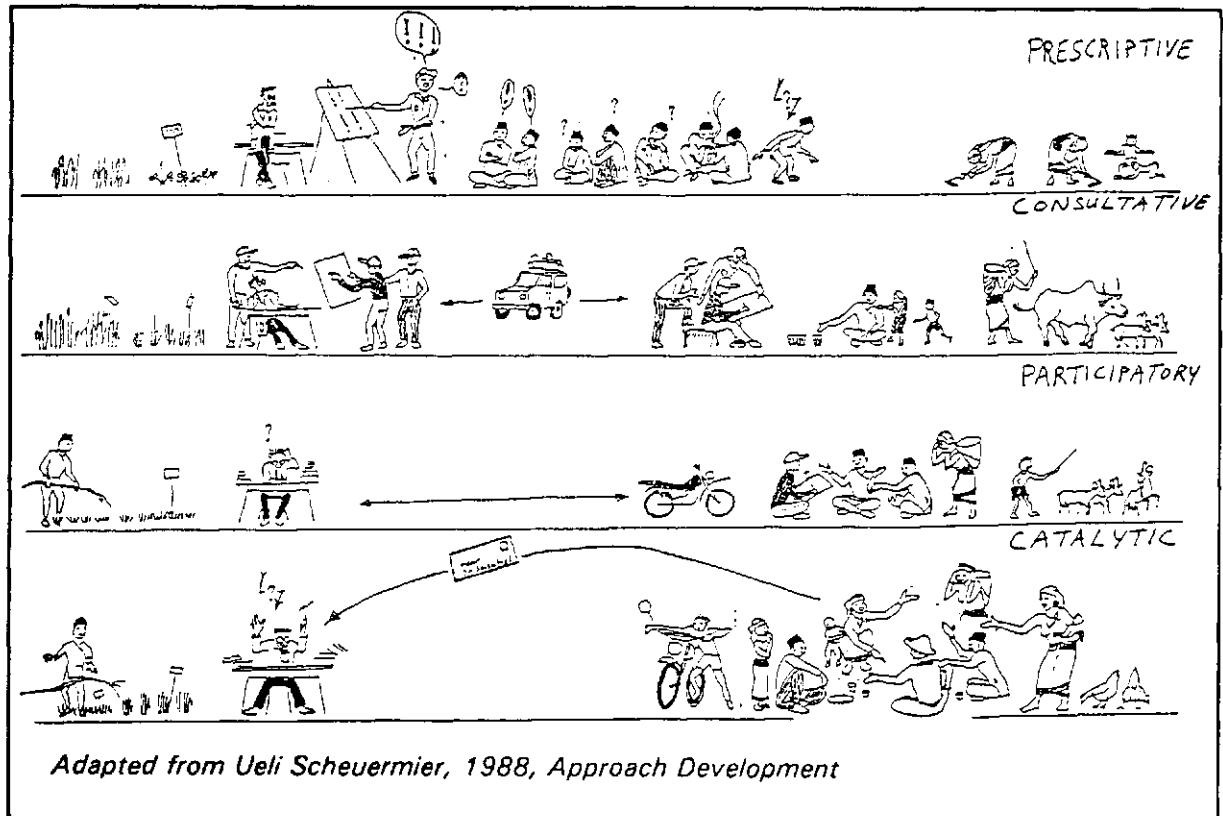
John Raintree pointed out that there are great differences in approaches to 'farmer training' and these various approaches entail different sets of methods and tools. He sketched the differences as prescriptive, consultative, participatory and catalytic modes of operation at the field level. In the prescriptive mode the professional (researcher or extensionist) tells villagers what to do. This leaves the professional in control and the villagers (often) puzzled. In the consultative mode, such as many farming systems R & D approaches, the professional tries to find out what the villagers problems are, takes this knowledge with him/her to the research station and comes back with a solution that may leave both puzzled. It is in the participatory mode, and even more in the catalytic mode, that professional agendas need to be radically adapted to meet the needs of the farmers. This may often leave the professional quite a bit more puzzled than the farmers, but may be of more use to the latter and more exciting for the former.

Diagram 6 demonstrates graphically the various ideo-types that may in reality, as participants observed during the discussion, be combined to various degrees.

Diag.5 Coordination of Research and Training Activities in AFRENA



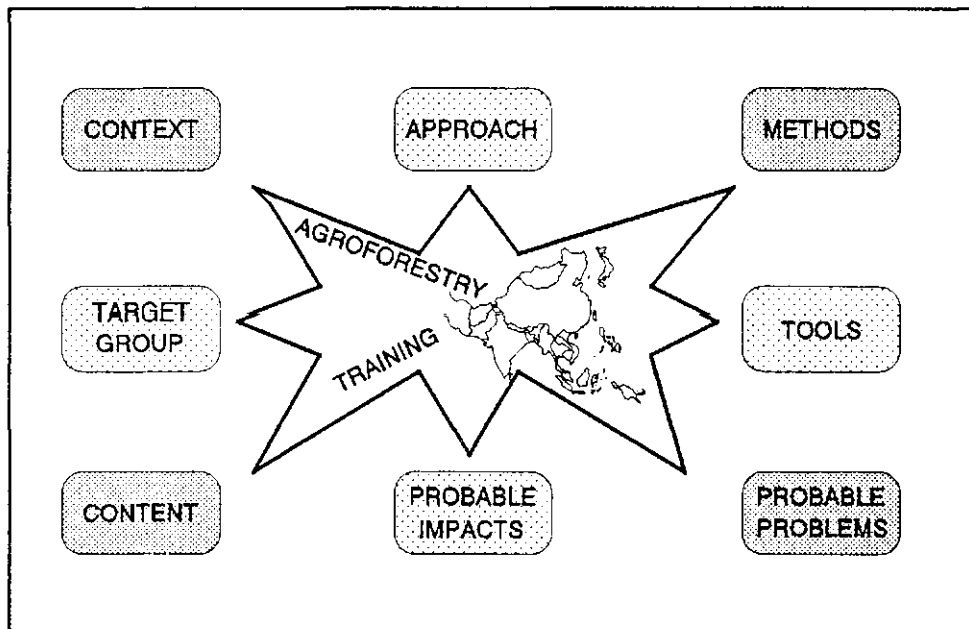
Diag.6 Modes of R & D Approaches at the Field Level



Cor Veer discussed a simplified framework for the comparison of training approaches in agroforestry, in which: the work context of the trainees is taken as the starting point for identifying the contents or focus of the training; and adequate attention is paid to the variation in both agroforestry extension approaches at field level (as illustrated in Diagram 6), as well as their varying implications for training approaches or modes. These considerations should precede the identification of training tools and methods so as to improve the 'match' between desired approaches in the field with those applied in training.

P.M. Shingi later expanded this skeleton as below in Diagram 7. However, it was not until in Session 4 that *Ester Zulberti* lucidly demonstrated how to diagnose training needs and design training activities, and the logic hidden in the framework became clear to all.

Diag.7 Issues for Consideration in Planning Agroforestry Training

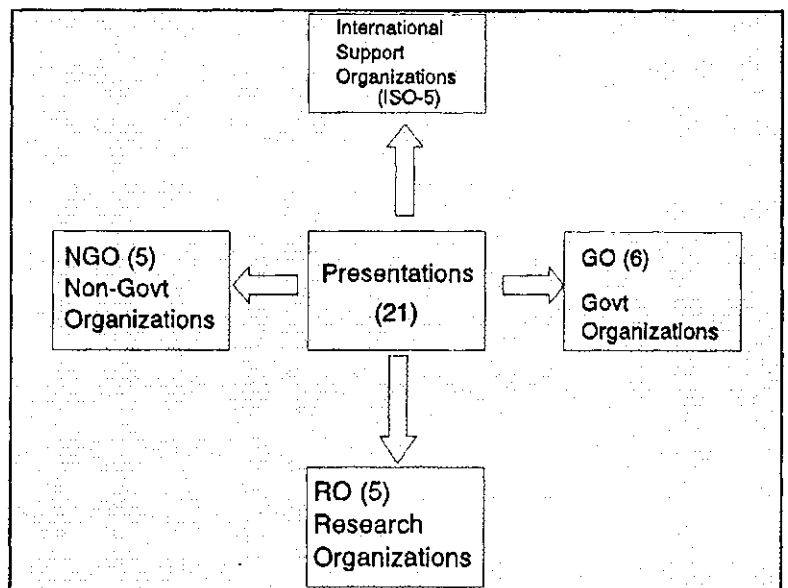


Session 3: APAN Country Experience

Jagdish Ghimire (Nepal) presented a profile of the agroforestry training activities of the Nepal Agroforestry Foundation (NAF), an NGO working in the middle hills region. NAF works through a network of local NGOs and user groups of small and marginal farmers. To achieve the broader objective of promoting agroforestry in Nepal, NAF organizes short-duration training courses for a variety of participants, such as NGO volunteers, farmers, nursery entrepreneurs and trainers. The sequential process of exposure, training and follow-up is generally adopted. Depending on the course objectives and participant backgrounds, approaches like focus group discussions, PRA, D & D, and farmer-to-farmer communications are used. The content of the courses include: exposure to agroforestry, nursery management, exposure to tree species, livestock management, methods of vegetative propagation, and seed production. Flip charts, film strips, posters, pamphlets, booklets, demonstrations, and farmer cross-visits are used as training tools.

Abul Kalam (Bangladesh) presented information on CARITAS, an NGO which promotes tree plantation programs in 28 sub-districts. Since 1986, CARITAS has trained field staff and partner group members in social forestry. The training focus is on promoting improved nursery management practices and kitchen gardening, tree plantation campaigns and annual rallies. Field visits and demonstrations are some of the agroforestry extension techniques used. Most of the training programs are technique-oriented and motivational in nature. Flip charts, posters, leaflets, and handbills are used as training and promotional tools. Formal evaluations have indicated that CARITAS' training activities have resulted in the spread of nursery activities and improved techniques, preparation of educational materials and creation of environmental awareness.

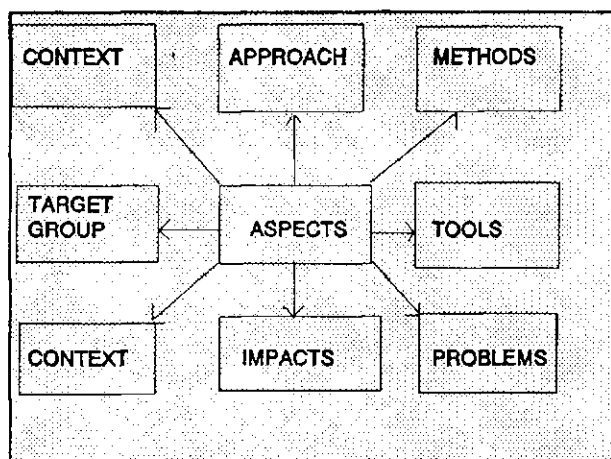
Diag. 8 Training Organizations Represented at the Meeting



Flip charts, posters, leaflets, and handbills are used as training and promotional tools. Formal evaluations have indicated that CARITAS' training activities have resulted in the spread of nursery activities and improved techniques, preparation of educational materials and creation of environmental awareness.

Ghulam Jilani (Pakistan) described training activities of the Aga Khan Rural Support Program (AKRSP) which operates in the mountainous terrain of northern Pakistan. Besides upgrading the knowledge and skills of the local population, structured courses have been organized by AKRSP for village specialists dealing with agriculture, livestock, poultry, forestry and marketing. Classroom lectures are followed by field visits. Major courses like village forest management and village forest nursery cover topics such as: introduction to village forestry, tree grafting techniques, nursery management, and fodder production and management. These courses use discussion, brainstorming and briefing as methods. Tool kits are given to participants during the training. The duration of courses vary: two days

Diag.9 Training Focus



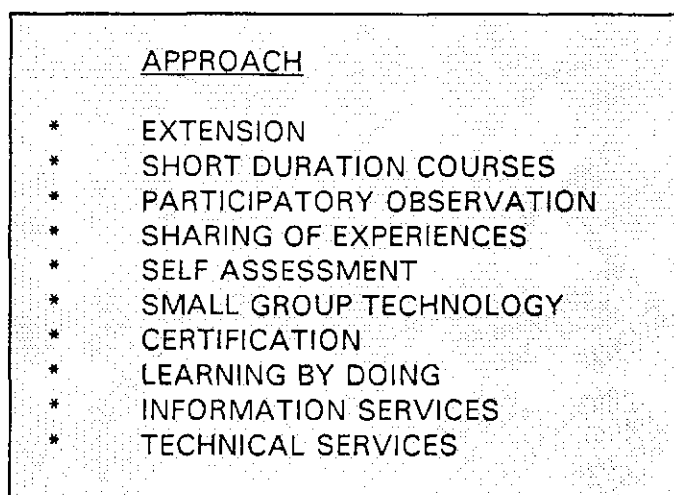
for staff orientation; five days for refresher courses for specialists; seven days for study tours of village organization managers; and ten days for regular courses for village specialists. Certificates are distributed to the participants.

Y. Arihadi (Indonesia) explained the role of Yayasan Bina Swadaya (YBS), an NGO, in providing training inputs to the state social forestry program in Indonesia. The training mainly focusses on exposing the operational level staff of *Perum Perhutani* or the State Forestry Corporation (SFC) to a community development approach. Two types of training are regular training and orientation for SFC field staff

and periodic training aimed at improving particular skills. Training curricula were modified several times to suit field conditions. With the increase in forest farmer groups, a need for training of trainers was also identified to multiply skills. Training components cover both technical and social aspects of social forestry through techniques such as simulation, role playing, case studies and field practices. The training duration ranges from one to four weeks. The topics covered include introduction to social forestry, agroforestry techniques, personality development, communication, functional management and shared learning.

Giving background on the social forestry program in Indonesia, *Dadan Machfud* (Indonesia) highlighted the problems encountered and hinted at probable training needs. *Perum Perhutani* had experimented with the Prosperity Approach (1972) followed by MALU (1974) and Forest Village Development Program (1985). But its most recent effort to undertake social forestry on state-owned degraded forest lands was through active partnership of people in forest management. The formation of forest farmer groups (KTH) was envisaged as a mechanism to achieve the objective. The success of the pilot project phase led to the expansion of the program in 1987. The training support, as earlier described by *Arihadi* in his presentation, was provided by the NGO Bina Swadaya. *Machfud* indicated that (a) program understanding at different levels of staff still differs and needs better communication support; (b) KTH members are still hesitant to adopt technical innovations; (c) other department heads need to be encouraged for their full participation; and (d) involvement by poorer segments of the community is still problematic. Various agroforestry models currently in use were also described.

Diag.10 Training Approaches



Carol Stoney in her presentation reviewed the agroforestry training activities of the Java Social Forestry Project. She indicated that the training program significantly reorientated forest guards and higher officials to be more responsive to farmers' needs and involve them in the decision making process. Training responsibilities were divided among different institutions. While staff members enthusiastically participated in training programs, the technical sessions received more attention than the more difficult social aspects of creating a lasting partnership with local communities in joint management and protection of forests. Technical training packages consisted of four core sessions: (a) basic agroforestry principles; (b) agroforestry design planning; (c) agroforestry implementation; and (d) agroforestry monitoring and evaluation. Four additional sessions covered specific topics like: (a) soil and water conservation; (b) management of KTH nursery; (c) vegetative propagation methods; and (d) shade-tolerant crop species. Each module consisted of a lesson plan giving comprehensive and systematically documented information to the trainers.

Somchai Manopiroonporn (Thailand) outlined the agroforestry education and training activities carried out by universities and the Royal Forest Department (RFD) of Thailand. Many universities and institutions have included agroforestry with agricultural subjects. The Faculty of Forestry at Kasetsart University, for example, offers four courses in: principles of agroforestry, agricultural components of social forestry, applied agroforestry, and the management of agroforestry. Textbooks and teaching materials have been prepared. The RFD also organizes various training programs, seminars and workshops to share knowledge and agroforestry practices among foresters, government officials, extension workers and farmers. Techniques used include study tours, forest camping, demonstration plots and field visits. Some constraints include: (a) shortage of qualified trainers; (b) transfer of officers after training; and (c) lack of farmer-to-farmer training. The involvement of other development departments in agroforestry training programs was a noteworthy feature.

Saiful Islam (Bangladesh) highlighted the features of a training course offered in Bangladesh to "enhance the capability of professionals involved in agroforestry research and development". The Bangladesh Agroforestry Plan 1990-95 emphasizes human resources development through training. Around 60 professionals have been trained in collaboration with ICRAF in agroforestry practices and research techniques. The Forest Department course designed for six days includes five days of lectures and one day of field exercise.

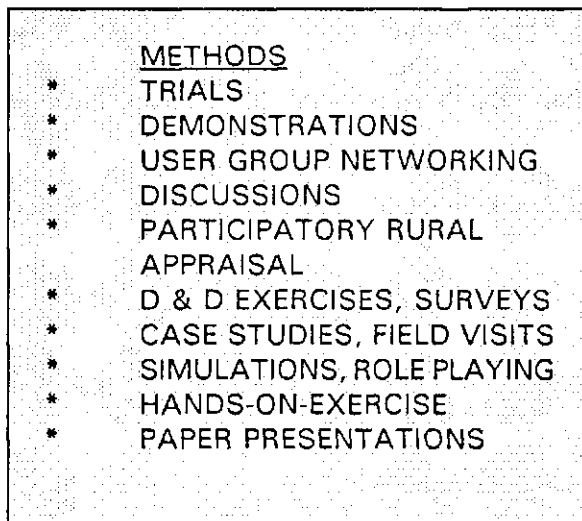
Diag.11 Training Tools Used

<u>TOOLS</u>	
*FLIP CHARTS	*CAMPAIGNS
*FILM STRIPS	*RALLIES
*POSTERS	*OHPS
*PAMPHLETS	*VIDEOS
*BOOKLETS	*SLIDES
*CASSETTES	*FARMER VISITS
*LEAFLETS	*HANDBILLS
*VILL. MEET.	*BLACKBOARDS
*CARTOONS	*TOOL KITS
*CUT&PASTE	*BUILD. MAT.

P.K Sen (India) in his presentation described the past and present status of agroforestry practices in Bihar, a state in India, and current plans of the Forest Department vis-a-vis management of degraded forest lands by village committees. Agroforestry has been long practiced traditionally in the northern part of Bihar, the tribal belt that predominantly depends on natural forests. *Taungya* cultivation was practiced in pockets of natural forests during the 1950s, but did

not produce encouraging results. Presently farm forestry has shown positive results from farmers. Training tools used by the Forest Department include information dissemination, seedling distribution, demonstrations and field visits. Other tools include handbills, pamphlets, audio-visual aids, drama and song sequences, and technical and financial assistance. In collaboration with an experienced NGO, the department now has plans to improve less productive lands by introducing multilayer cropping systems.

Diag.12 Training Methods Used

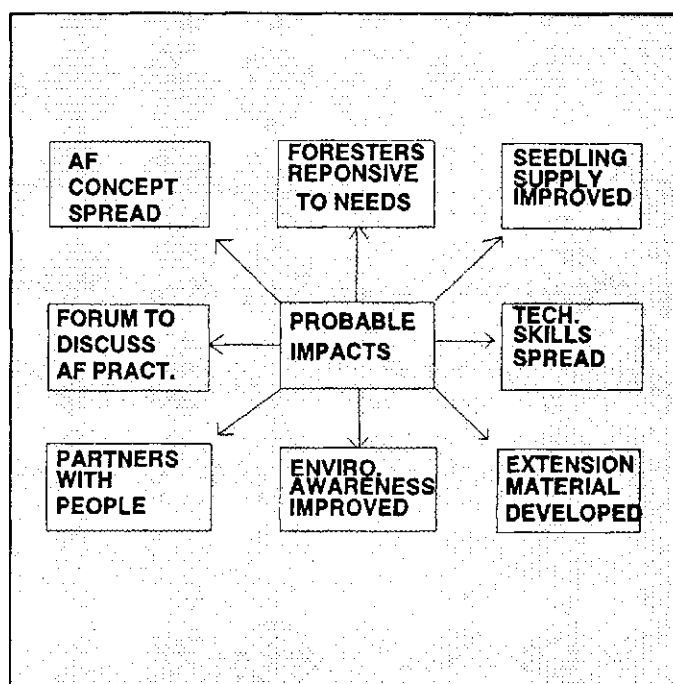


Amar Singh (Fiji) briefly introduced the salient features of Fiji and then elaborated on the experiences of agroforestry training in the country. He pointed out that organized agroforestry in Fiji is of recent origin. Five research plots and 24 extension plots have been established. Training is a major component of the project. Two workshops were organized to: (a) create awareness of agroforestry concepts; (b) discuss agroforestry experiences; and (c) provide training on agroforestry systems, principles and practices. Participants carried out field operations themselves to gain hands-on experience. A group of 20-30 participants was considered to be the ideal size. Group discussions and presentations were emphasized. Brainstorming session,

project planning, preparation of action plans and extension material were used to enhance effectiveness. Field trips and visits to research stations and laboratories were planned. Training tools included: blackboard, OHP, slides, cut-and-paste material. Innovative methods included a "talking ball" technique to obtain feedback and evaluate course content.

Diag.13 Impact of AF Training

Vien Ngoc Hung (Vietnam) presented a status review of the six-year research project started in 1989 by the Forest Science Institute of Vietnam on the transformation of impoverished forests by interplanting *Pinus keyisia* with coffee and other farm crops. A table of site classification was prepared by establishing 40 temporary plots and carrying out scientific measurements. The spacing for the selected tree species was modelled by estimating the projection of the tree crown with its diameter to determine the theoretical density of trees per hectare, initial spacing and spacing after thinning. The first model of three hectares of *Pinus keyisia*



interplanted at 5m by 3m spacing along with coffee indicated promising increases in productivity. The research project is expected to show: (a) interaction effect of agroforestry practices during tree development; (b) soil dynamics; and (c) economic effects.

Hoang Minh Giam (Vietnam) shared experiences in developing agroforestry models on barren lands and denuded hill areas along with a number of agroforestry models practiced by farmers in the mountainous and mid-land areas of North Vietnam. Systematic agroforestry models used: (a) *Acacia mangium* with groundnut or soyabean; (b) eucalyptus with groundnut or sweet potato; and (c) *Acacia mangium* with tea. Initial results have pointed out that growth of tree species was 1.5 to 1.8 times greater in agroforestry models than in control plots. Traditional agroforestry models practiced by farmers included: (a) eucalyptus with sesame plus cassava; (b) jackfruit with tea and pineapple; (c) apple with maize and soyabean; and (d) apple with pumpkin. Results are encouraging. The state has launched a movement to encourage farmers to create an ecological system consisting of fruit garden, vegetables, fish, cattle and pigs.

Wilfredo M. Listones (Philippines) summarized the experience of agroforestry training of the Upland Resource Management Outreach Project of the Mag-uugmad Foundation, an NGO in the Philippines. The training project offers "experiential learning" opportunities to farmers and technicians of both government and NGOs. During training the farmers and technicians work together. Sixteen to 20 is considered as an ideal number of participants. Besides training officers, a number of farmer-trainers are used to handle sessions. The farmer-to-farmer training approach was found to be effective. Practical, hands-on field experience, small group discussions, farm tours, slide shows, and follow-up visits after six months are some of the methods used. The training focusses on (a) life sustaining processes of basic resources; (b) causes of soil erosion; (c) soil and water conservation practices; (d) soil fertility management; (e) cropping systems; and (f) extension approaches. Workshops, technology exchange, reflection sessions, role playing, and post-training evaluations have been adopted as techniques to enhance learning. General experience with these techniques has been quite satisfactory.

Claudia S. Payawal (Philippines) outlined the training activities of the UPLB Agroforestry Program, which besides its regular agroforestry-related activities, also implements two outreach programs to enhance the capability of NGOs involved in upland development through agroforestry land capability mapping, technology impact assessment and other professional services. The program offers five courses dealing with: (a) agroforestry production and post-production systems; (b) seed technology and nursery management; (c) soil and water conservation; (d) integrated pest management; and (e) technology verification through on-farm trials. These courses are one to three weeks in duration and employ methods such as lectures, panel discussions, laboratory practices, field visits, workshops, paper presentations, and audio-visual aids. An elaborate process of evaluation is followed that differentiates between pre-course, in-course, and post-course evaluations. Resource persons evaluation is also conducted. Day-to-day learning, reactions and complaints are assessed through a training journal.

P.K Mishra (India) took stock of the development of agroforestry in the forest-rich state of Madhya Pradesh (MP), which annually contributes a revenue of US\$143 million. Though farmers have practiced farm forestry on a limited scale, agroforestry is yet to be established in MP. Farmers are planting trees on field boundaries, and the Forest Development Corporation has taken up intercropping of legume crops such as gram and

soyabean along with teak. Training and extension efforts in agroforestry by and large remain limited to large landholders. Distribution of seedlings from a large network of around 3500 decentralized nurseries, extension efforts, and monetary incentives are widening the scope of including small and marginal farmers. Some training is imparted to village leaders. Eucalyptus is the preferred species. Cost-benefit analysis, better communication techniques, choice of alternate agroforestry models, and training of forestry personnel and women are some of the steps proposed to strengthen agroforestry in MP.

Soontorn Khamyong (Thailand) drew attention to some of the important issues in agroforestry research and education in Thailand, where forest land has been reduced from 53 percent of the total land area in 1981 to a present level of 20 percent. In northern Thailand agroforestry interventions are needed to restore watersheds in upland areas. Relevant research is being conducted in the region. Research dealing with the influence of three shade trees on coffee plantations interestingly showed that no tree species has a specific advantage, and that agroforestry systems required several complementary tree species. More research is in progress. Unless good agroforestry models are developed and demonstrated in certain ecological zones, extension efforts with the farmers will not be effective. Selection of agroforestry systems should be based on the effect trees have on: (a) site temperature and moisture; (b) crop production; (c) nutrient cycling and balance; and (d) soil properties. The tree should also be able to meet other requirements such as wood for construction, furniture, fuel, resin, oil, gum, medicine, fruit and fodder.

Fazli Subhan (Pakistan) gave an account of research programs in farm forestry carried out by the Pakistan Forestry Institute in collaboration with other Pakistani institutes. The research program covers: (a) species selection and seed supplies; (b) tree-crop interface studies; (c) wood technology and utilization; and (d) wood supply and demand. Realizing farmers' needs for fast-growing, economically valuable species, research studies were initiated on eucalyptus and poplar. Both species have been planted extensively by farmers under the farm forestry program. It was observed that net gains from growing trees on farmlands depended upon the nature of the agricultural crop, tree species and orientation of tree rows. The research and documentation in the field of economic benefits of agroforestry are limited and piece-meal. Studies have been conducted on wood technological properties and utilization of tree species commonly grown by farmers. Household energy survey, wood industry survey, farm land tree growth survey and other studies were conducted to determine the wood supply and demand situation in the country. Overall trends indicate that farmers depend to a great extent on farmlands for their fuelwood and other requirements, and that agroforestry activities need further strengthening.

M.A Khan (Pakistan) presented information regarding the Government of Pakistan's Farm Forestry Project. The project is implemented by the office of the Inspector General of Forests with technical assistance provided by USAID. The aim of this project is to increase energy self-sufficiency and reduce deforestation. The project uses a social forestry approach to motivate farmers to produce fuel, fodder and timber through farm forestry. The project also provides training to foresters, farmers and industry personnel through short courses, study tours and outreach programs. Training is provided on forest policy, planning, administration, monitoring and evaluation, extension, communication, motivation and outreach. A farm forestry curriculum has been designed and is being offered at the Pakistan Forest Institute for bachelor's and master's degree students at the institute. *Khan* mentioned that 71 million saplings have been planted on over 112,000 farms, over 115

officers have been sent overseas for training, and nearly 70,000 farmers have been trained in various aspects of forestry.

Swoyambhu Amatya and *Rajendra Joshi* (Nepal), research officers from the Forest Research Division, presented a status report on agroforestry training in Nepal. Agroforestry activities in Nepal include traditional practices such as raising trees for fodder, nuts, timber and fuelwood and intercropping and boundary planting of trees. Training in agroforestry is provided by government and NGOs. The Forest Research Division conducts research on government forest lands, and on-farm and on-station research. In-service training is provided to rangers and professional foresters on soil conservation and watershed management, and to village-level staff on tree and grass establishment on terrace risers. Several NGOs such as NAF, CARE and World Neighbors provide village-level training on nursery establishment. The Institute of Forestry (IOF) at Pokhara provides a certificate course for diploma-level students on social forestry. Agroforestry training provided so far by these institutions has been limited. Training needs should be evaluated at professional and sub-professional levels. A working group on fodder trees has been established since 1986 to coordinate activities between FRD, NGOs, IOF, and agricultural institutions. The scope of this group's activities will be expanded to include agroforestry and to coordinate APAN activities in Nepal.

Bounsay Saphangthong (Lao PDR) presented a brief statement on the status of forestry development in Lao PDR. The government is currently emphasizing the need to rehabilitate and protect forests. Current forestry development strategies include: forest conservation; alternative agricultural systems for shifting cultivators; forest utilization and non-wood products, and research and training on forest management. Specific programs include: forest inventory and land-use planning; watershed protection; creating alternative jobs for shifting cultivators; forest administration and monitoring; rehabilitation and reforestation; and research on flora and fauna. Basic information on aspects of forestry is lacking and training is required in this area.

Session 4: Appropriate Tools

Ester Zulberti emphasized that training is an expensive business, and people's time is precious, therefore training activities need to be carefully and creatively designed based on a solid assessment of training needs.

She proposed an iterative process for the diagnosis of training needs and the design of training activities, similar to the agroforestry D & D method.

The four main categories of clients for agroforestry training are farmers, technicians, professionals, and program managers/policy-makers. For each category, some ideas on the 'what, how and where' of agroforestry training were presented.

Diag.14 Iterative Training Design

- * diagnose needs
- * define content
- * prepare macro design
- * prepare micro design
- * define appropriate M & E and follow-up

Diag.15 Agroforestry Training for Farmers, Technicians, Professionals, Policy/Planning

	FARMERS	TECHNICIANS	PROFESSIONALS	POLICY MAKERS & PLANNERS
WHAT	<ul style="list-style-type: none"> *Basic principles *How-to's & hands-on knowledge *Self-help & problem-solving skills *Specific topics 	<ul style="list-style-type: none"> *Extension methods *Bio-physical principles *Socioeconomic principles *How to find resource materials & people 	<ul style="list-style-type: none"> *Extension principles *Bio-physical principles *Socioeconomic principles *Systems approach *Interdisciplinary 	<ul style="list-style-type: none"> *Research results *Technologies
HOW	<ul style="list-style-type: none"> -Team approach -Involve community members -One-day field tours -One week -Access farmers' knowledge -Materials appropriate to culture, gender, literacy, language 	<ul style="list-style-type: none"> -Multi-disciplinary team -Practicums & hands-on work -Classroom work -Follow-up courses -Access trainees' knowledge 	<ul style="list-style-type: none"> -Short courses, workshops -Field observations -Medium & long term 	<ul style="list-style-type: none"> -Briefings by recognized leaders -Concise overviews -Tours -Field demonstrations -Videos
WHERE	<ul style="list-style-type: none"> #On-farm sites #Village training centers #Demonstration centers 	<ul style="list-style-type: none"> #Extension sites #Research sites #In-country #Regional 	<ul style="list-style-type: none"> #In-country #Out-of-country #Training centers (basics) #Field locations (applied) 	<ul style="list-style-type: none"> #In-country #Out-of-country

In designing training activities, the overall objectives of the training would have to be taken into account in addition to the factors mentioned above. The following continuum of learning objectives was presented:

awareness -> understanding -> application -> analysis -> judgement.

It was suggested that the need for participatory methods would increase, as one moves along the continuum of training objectives, from awareness towards judgement.

Similarly in the diagnosis of training needs, it was pointed out that the designer's input needed to be greater when new ideas were to be introduced, whereas the learner's input would have to increase in refresher courses.

Papers by *Grandstaff* and *Chambers* formed the basis for *Cor Veer's* brief introduction to concepts, principles, methods and tools in Rapid Rural Appraisal. In view of the later presentations on household activity analysis (including the use of Participatory Rural Appraisal tools) and the Agroforestry Diagnosis & Design presentations and exercises, only general principles were presented. It was pointed out that, just as earlier speakers had mentioned for agroforestry, rural appraisal is not a new phenomenon. Examples of similar activities are mentioned in old literature, in which the same basic concern of improving the accuracy of information about rural conditions is addressed. In 'modern' RRA this concern focuses on the need to improve the interaction between data acquisition and analysis; between scientists and rural inhabitants, and between different disciplines. RRA is often referred to as a 'toolkit' with methods for oral learning from rural inhabitants, and observation and learning from pre-existing information.

It was emphasized that RRA does indeed include such methods, but it is much more than that: It is a learning process in which **concepts, principles and organizational methods guide** the selection and use of tools and techniques and make the whole process work in an interactive, integrated manner to produce accurate and useful results. Examples of these concepts, principles, and organizational methods, as well as an overview of the tools and techniques were presented, referring to the RRA training material that is presently being prepared by Khon Kaen University.

Asmeen Khan, in her presentation of household activity analysis, explained the use of some RRA and, particularly PRA, tools and techniques. She emphasizes that it is most important to understand **who** in the household makes which decisions; who provides labor for what activities; who controls land resources; who uses which products; who controls the outputs: and who has knowledge about what.

The Diagram 16 to the right is more of an RRA tool; Diagram 17 represents the results in stylized form of a PRA exercise in which household members themselves made up the drawing on the courtyard to explain to researchers 'who did what' in the household.

Diag.16 Household Activity Analysis

	MALES*	FEMALES*
CROP PRODUCTION		
FIELD 1:		
LAND PREP. TASK 1	MA	
WEEDING TASK 2	MC	FC
TRANSPLANT. TASK 3	MA	FA
FIELD 2		
LIVESTOCK		
CATTLE		
milking		FA
feeding		FA/FC
GOATS		
PIGS		
POULTRY		
HOUSEHOLD PROD.		
WEAVING MATS		FA
COOKING		FA
CHILD CARE		FA/FC
KITCHEN GARDEN		FA
OFF FARM PRODUCTION		
COLLECTING FOREST		
PRODUCE	MC	FA/FC
WORKING IN TOWN	MA	

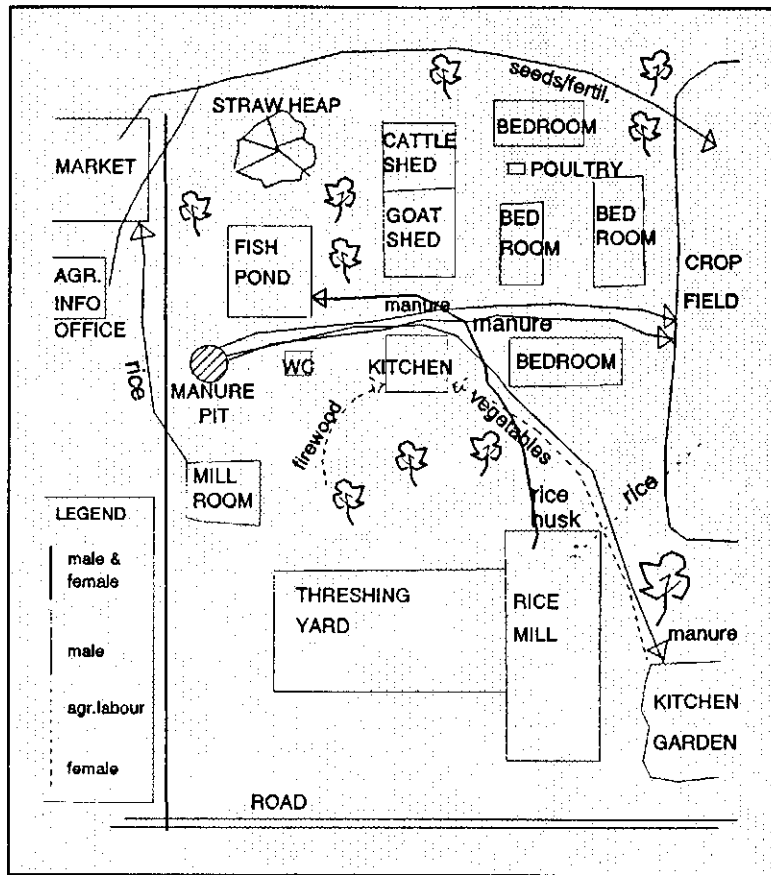
* MC/FC = MALE/FEMALE CONTROL ; MA/FA = MALE/FEMALE ACTIVITIES

Session 5: Agroforestry Diagnosis and Design

John Raintree introduced the principles and methods of Agroforestry D & D for the purpose of the field exercise. The basic principle of D & D is borrowed from the medical profession's maxim that "diagnosis should precede treatment" ; and the common sense principle that a clear statement of the problem goes a long way toward finding a solution.

Farming systems R & D and Rapid Rural Appraisal have both inspired the specific combination and application of common sense, logical framework, set of methods, and specific discovery procedures that together make up Agroforestry D & D. Moreover, D & D can serve as a *lingua franca* across disciplines and the research-extension continuum and incorporate a growing body of knowledge.

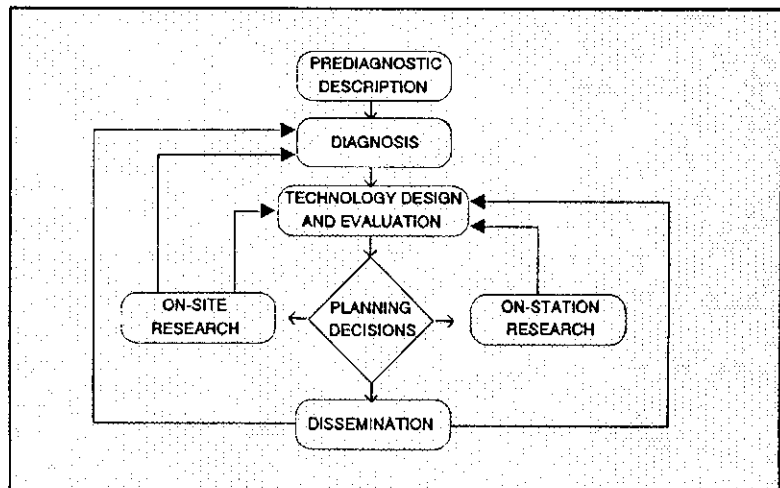
Diag.17 Household Activity Sketch Map, made by household members



D & D has been applied at different scales: Micro D & D at the level of a household management unit (family farm, household herd, or other elementary land management unit); Meso D & D at the level of a local community or ecosystem (neighborhood, village or small watershed); and Macro D & D at the level of a region, country or ecozone.

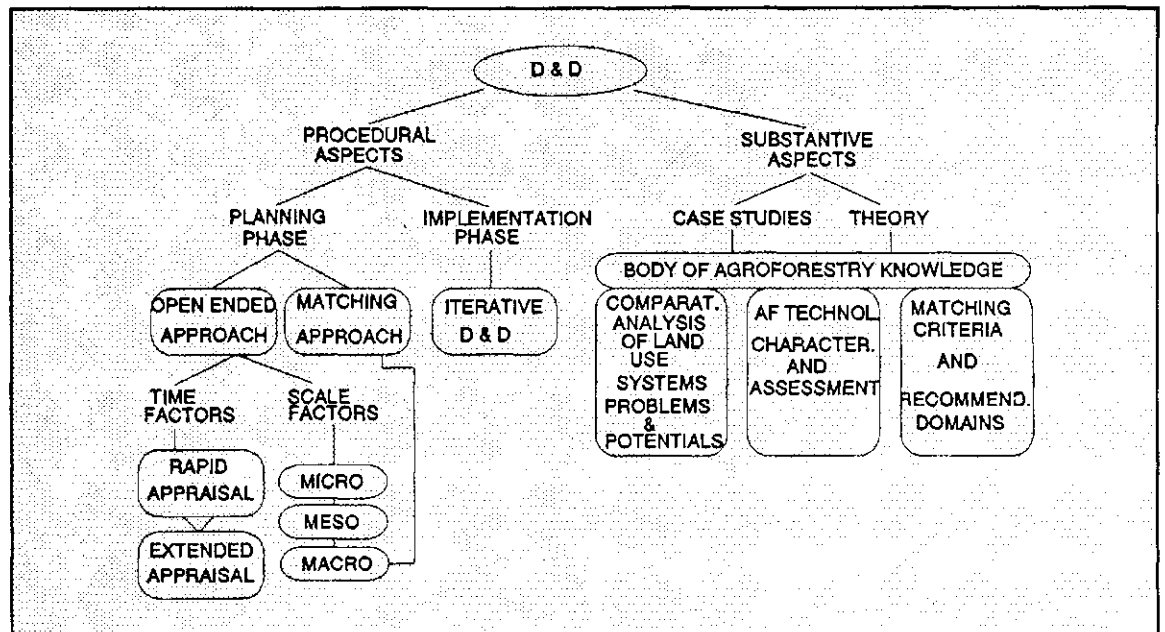
For the field exercise with Agroforestry D & D, it was proposed to focus on the micro level with the use of a simplified list of topics for diagnostic interviews.

Diag.18 D & D: An Iterative Process



The procedural and substantive aspects of Agroforestry D & D are illustrated in Diagram 19.

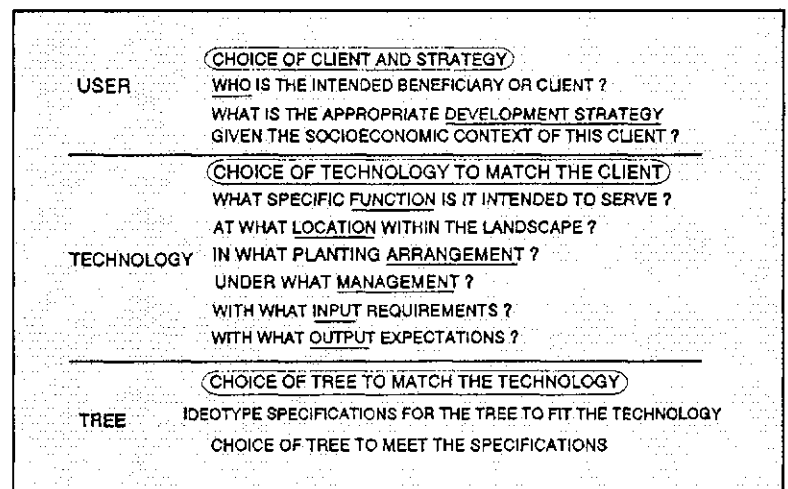
Diag.19 Procedural & Substantive Aspects of D & D



Based on the simplified 'basics of D & D' (see Diagram 20) the following topics for the field exercise were proposed: land use history; land resources; labor; off farm employment; water; livestock; water; trees (location and uses); limiting factors. This formed the basis for focusing on diagnosis of the main production subsystems and basic needs: cash, food, feed, fuel, shelter, and raw materials for cottage industry.

In the diagnostic summing up, an attempt was to be made to identify the main problems, and the priorities of household members to address these problems. The next step was proposed to be the identification of some design criteria, particularly the functions and locations of agroforestry interventions based on the diagnostic findings.

Diag.20 D & D; Basic Algorithm

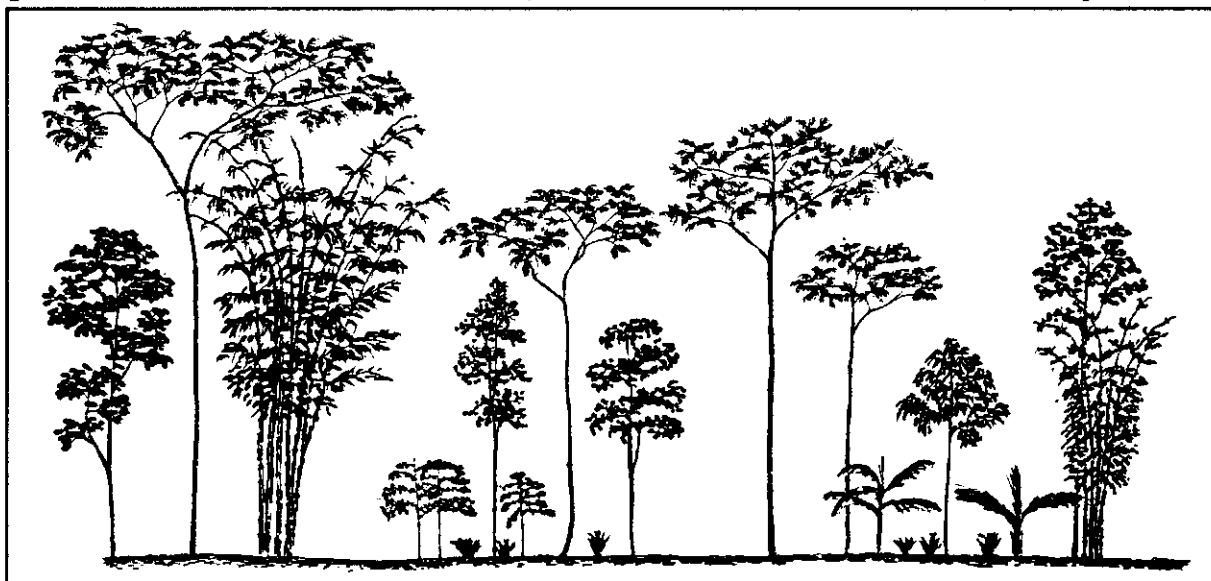


D & D Field Exercise

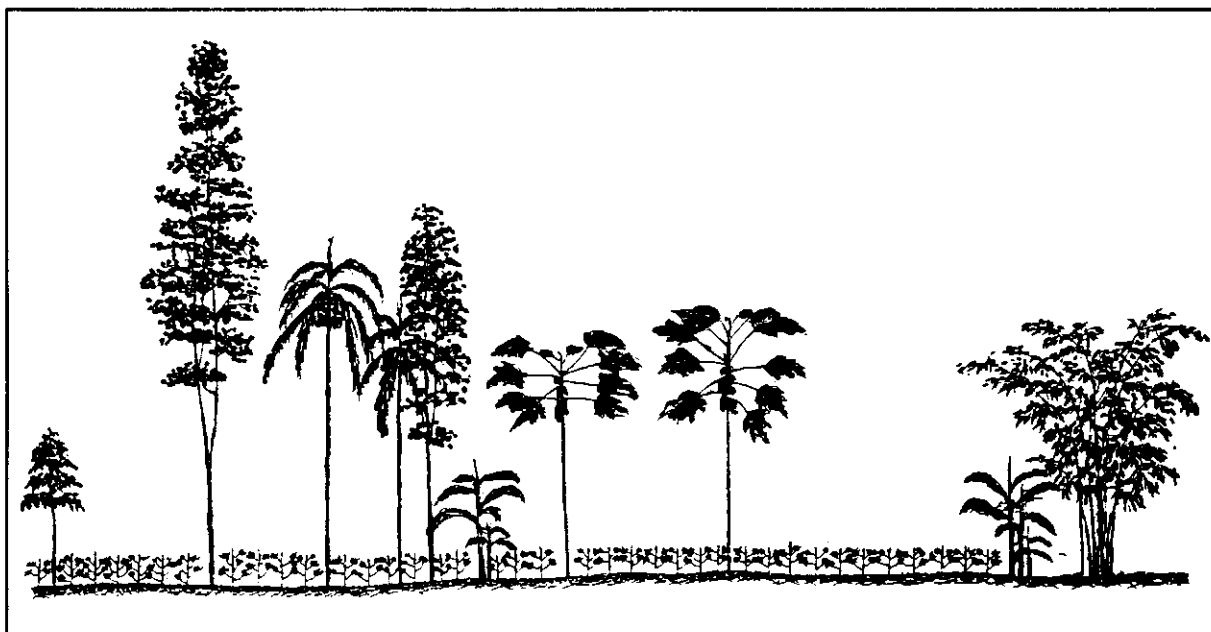
Participants were divided into five groups for a half-day D & D field exercise. Each group visited two to three farmers at a site that was selected for a soil conservation demonstration plot.

It appeared that most of the farmers interviewed were share croppers on 10 ha of land owned by one family. It was this land that would form the bulk of the planned soil conservation demonstration plot.

As the land use sketches from one of the groups demonstrate, landscapes at the site varied considerably. The first sketch below represents a present *kebun-talun* (forest garden), a form of land use that was predominant in the area until 10 years ago.



The landowner informed that at that time he needed money for the education of his children, and cut and sold his trees. After that he invited sharecroppers to cultivate most of his land. Some trees (such as *Mlinjo* or *Gnetum gnemon*) were left and their produce belongs to the landowner. Trees planted by the tenants, such as papaya, belong to the tenant.

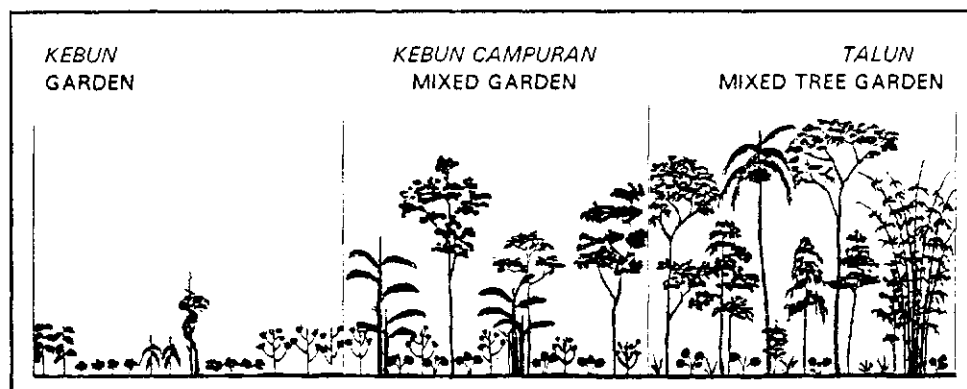


The groups did find some indications of land-use problems that might have been alleviated by agroforestry, such as reports on declining soil fertility in the maize/cassava fields. It was, however, clear that more information needed to be collected in a follow-up exercise. Some of the participants felt, however, that the land-use history and the present land tenure situation would be important obstacles for agroforestry interventions. It was also felt that the opportunities for off-farm employment contribute to rather high labor opportunity costs.

One problem that all groups experienced arose from the well-publicized nature of the training activity, resulting in a large number of neighbors and officials from various departments being present during the farmer interviews. As they were all eager to help provide the information the groups were ostensibly seeking, it was sometimes hard to get the views from the farmer respondent himself.

Session 6: Agroforestry in Indonesia

Dr. Yunus Kartasubrata and Mr. Mulyadi Bratamihadja presented an overview of traditional and modern agroforestry systems in Indonesia.



Pak Yunus illustrated the dynamics of traditional agroforestry systems developed by farmers with the sequence that is often found in West Java. Gardens (*kebun*, dominated by annual crops with a few fruit and other trees) may gradually be developed into mixed gardens (*kebun campuran*, with less annual crops and more trees) and further evolve into forest gardens (*talun*, in which trees are predominant). As the participants had found during their D & D exercise, such change could also take place in the opposite pattern. He also discussed the structure and functions of the well-known homegardens (*pekarangan*) in Java, and multi-storied agroforests and *Shorea* spp. agroforests in Sumatra.

Introduced agroforestry systems in Indonesia include: agroforestry model farms for soil and water conservation; alley-cropping and improved fallow systems in Nusa Tenggara province; and the Three Strata System developed by the livestock department in Bali, which has an important fodder shrub and tree component in it to improve the feed situation of livestock.

Pak Mulyadi provided more details on the efforts by the State Forest Corporation (*Perum Perhutani*) to develop agroforestry systems on state forest land in Java, in the framework of the social forestry program. He explained that the 3 million ha of state forest land in Java and Madura (comprising about 22 % of total land area) are surrounded by over 6000 villages with about 30 million people in their immediate vicinity. Over half of these people depend on very small farms (0.3-0.5 ha) and many have to look for supplementary sources of income such as forest produce. The pressure on the forest land has resulted in about 230,000 ha of forest land in various states of degradation.

In 1986, *Perum Perhutani* with support from the Ford Foundation established 13 Social Forestry Pilot Project sites, in which one set of activities aimed at developing the prevailing *taungya (tumpang Sari)* plantation establishment system in a manner that agricultural cropping could continue during the full cycle of the timber tree rotation. This requires both adaptations in silviculture such as wider spacing (from the usual 3m x 2m to 6m x 2m), as well as agricultural innovations such as the introduction of shade-tolerant crops.

Initial results from the 13 pilot sites indicate that such agroforestry systems can be beneficial from both the agriculture (farmers') and forestry (*Perum Perhutani's*) point of view. Expansion of these experiences to other areas is accompanied by research to further improve and adapt the new agroforestry systems.

Session 7: Sketch Mapping as a Diagnostic Tool

The same groups as in the earlier D & D exercise were introduced to a sketch mapping exercise at a different site.

Pearmsak Makarabhirom and *Chun Lai* presented the principles underlying sketch mapping and the steps involved in preparing them. It was pointed out that maps in general are most useful tools in any situation where spatial information is important, and that this also applies to social forestry and agroforestry. Maps in general and sketch maps in particular are methods in which information is selectively gathered and documented in graphical form. They can be used for: data collection; orientation and reorientation; interviewing and communication purposes; and conflict resolution and management implementation.

Two types of sketch maps are distinguished: planar view of land uses based on an aerial perspective and transect maps representing land use in a vertical perspective. Both types of maps were made in the field exercise for data collection/ recording purposes and, to a lesser degree, as tools for communication and interviewing. The other potential uses, for orientation and reorientation of field staff and for conflict resolution and management implementation, could not be practiced in this training exercise.

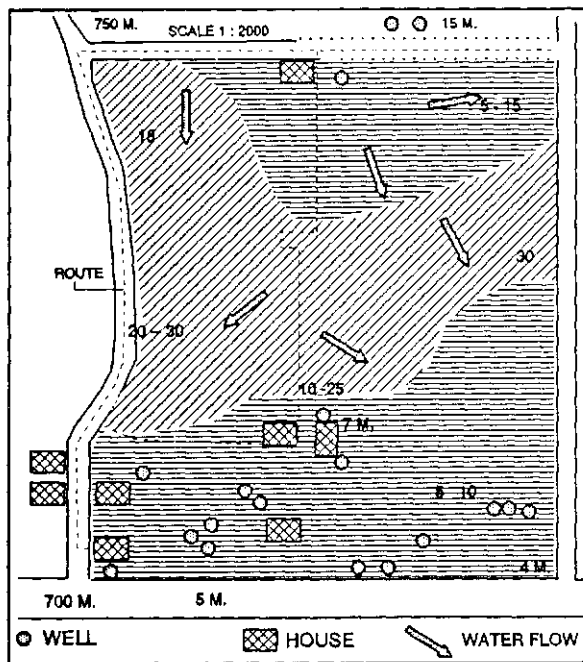
One group was given the task to make a 1:2000 scale planar sketch map showing the topography and hydrology of the selected area of about 6 ha. Two groups were to make a transect map of the land use, and the two remaining groups a planar farm enterprise sketch map.

Diag.21 Steps in Sketch Mapping

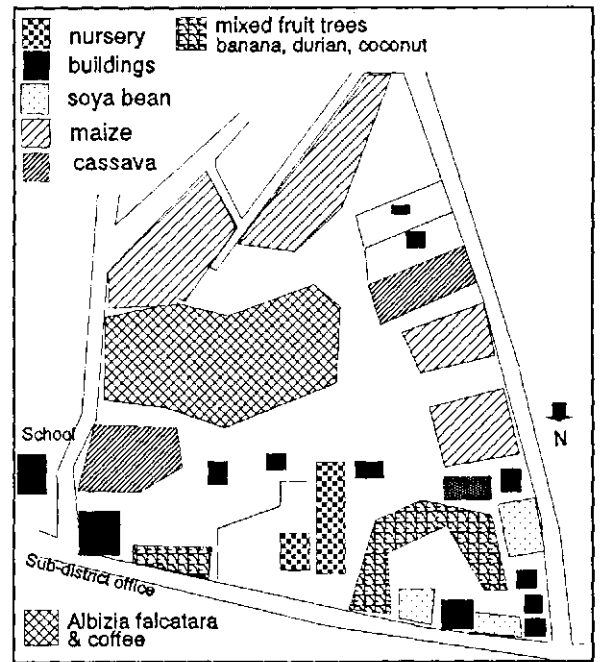
- * Define and state objectives
- * Obtain base map
- * Observe
- * Communicate with local people
- * Select representative site
- * Categorize information
- * Extract main points
- * Create single issue map
- * Draw the map
- * Annotate the map
- * Interpret results
- * Consult local people
- * Present the results

Some of the experiences that the groups reported include the problem that the topography and hydrology group experienced in keeping its sense of orientation. It was only at the end of their first round through the area that the group got a feel for the relative positions of the various landmarks in the area, and by inference for their own position and the positioning of the phenomena they wanted to record. Also the other groups felt that the lack of a base map did indeed complicate the procedure. But it was also pointed out that in the situations in which most participants work base maps are often hard to find, and in that sense the exercise fitted well with reality.

Diag.22 Topography & Hydrology Sketch Map



Diag.23 Enterprises Sketch Map



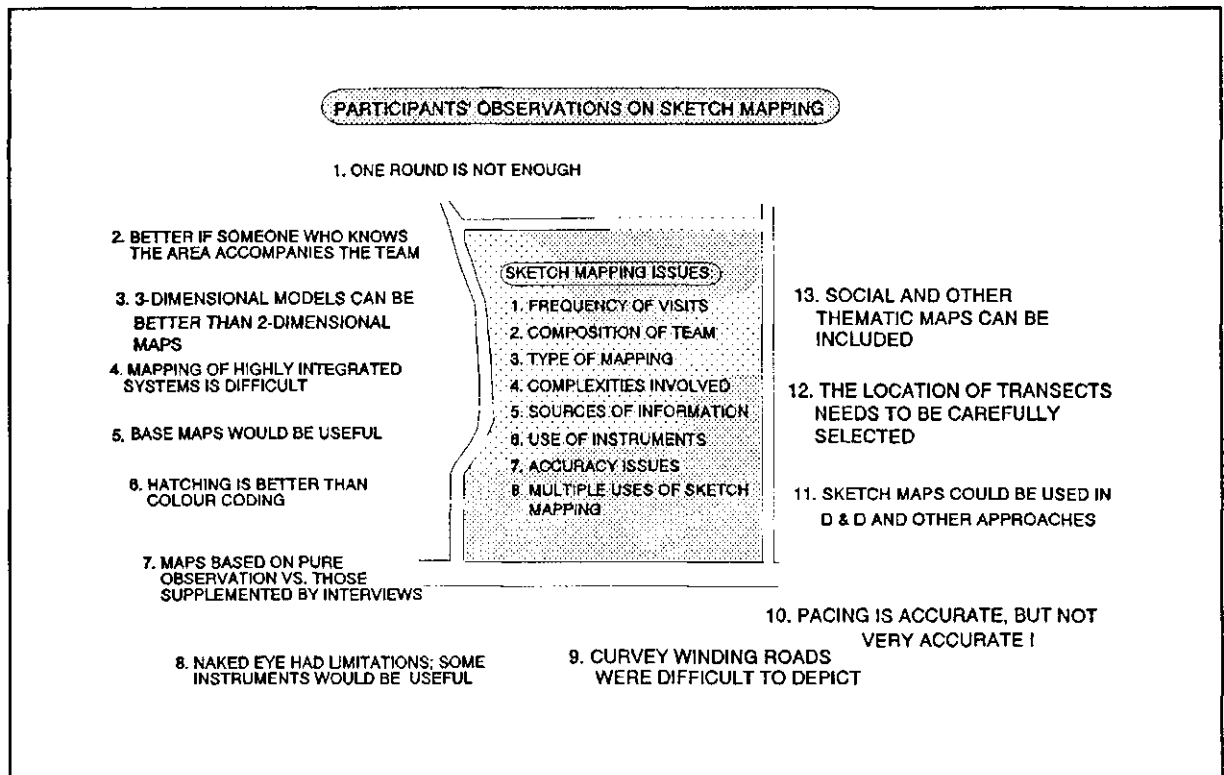
Both the topographic map (on the left above) and the enterprise maps (on the right) are planar representations. Differences in the shape of the area illustrate the need for a base map if greater accuracy were required. The other type of sketch map (the transect) is presented on the next page.

Diag.24 The Transect Sketch Map

crops		corn, cassava, taro, carrot	cassava, taro, carrot	coffee	rice	corn, soybean, peanut	
timber trees	<i>Pinus</i> sp. <i>Albizia</i> sp. Others	<i>Gliricidia</i> sp. <i>Auracaria</i> sp.	<i>Albizia</i> sp. <i>Agathis</i> sp. <i>Maesopsis</i> sp. <i>Pangium</i> sp.	<i>Albizia</i> sp.		<i>Ceiba pentandra</i>	
fruit trees		banana, papaya	avocado coconut jackfruit bamboo	citrus----- clove	----->	jackfruit, guava, coconut, banana	
live-stock						goats, chicken	
soils	podzolic	podzolic (loam)	podzolic--- (clay loam)	-----	-----	----->	
elevation	upland > 800 m		medium land 750 m.			lowland 700 m.	
slope	> 40 %	20-30 %	20 % -----	-----	----->	<10 %	
rain	-----	> 3000 mm/yr-----	-----	-----	-----	----->	
problems		Irrigation ! <----- cost of land : \$ 5000/m ² ; \$ 25 000/ha	--erosion !			cost of land \$150 000 per ha \$ 30 000 per m ²	

Experiences and opinions expressed by participants are summarized in Diagram 25.

Diag.25



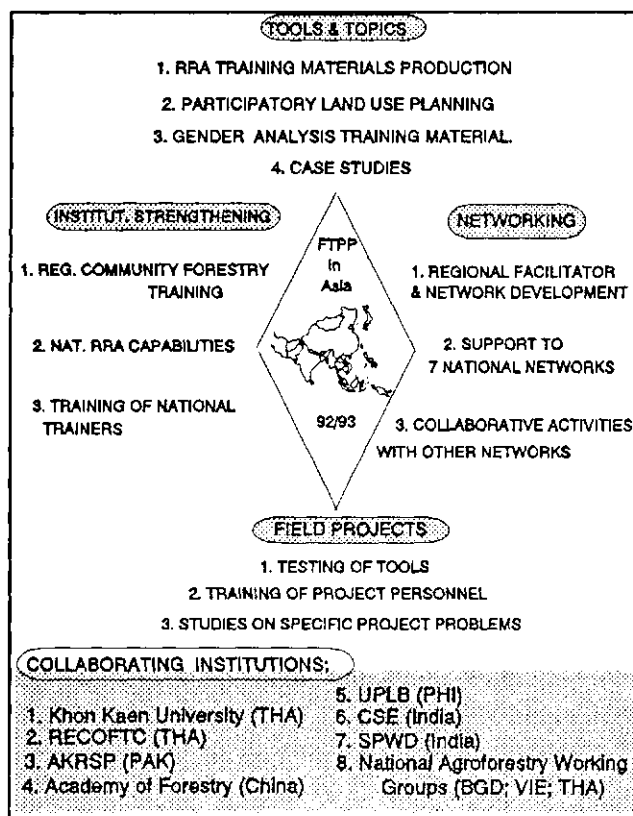
Session 8: Related Networks and Information Management

Cor Veer presented the information services available on request from the FAO Regional Wood Energy Development Programme (RWEDP) in Asia and introduced the Forests, Trees and People Programme (FTPP). Also, referring to the experiences in RWEDP with problems in intersectorial activities with forestry and energy agencies, the importance of establishing firm linkages between forestry and agriculture for agroforestry development was emphasized.

The history of FTPP was presented by referring to Community Forestry Note No. 7: "Review of Community Forestry", in which the evolution of international thinking and action in community forestry development is described. The present emphasis is on a strategy whereby the development of new knowledge and tools is combined with efforts to institutionalize these new approaches in selected institutions. The new tools and approaches are tested and adapted in field projects prior to dissemination of innovations through a rapidly expanding global community forestry network.

The present phase 2 of FTPP comprises a global programme, including development of communication strategies and methods, and regional networking activities in East and

Diag.26 Planned FTTP Activities in Asia ('92-'93)



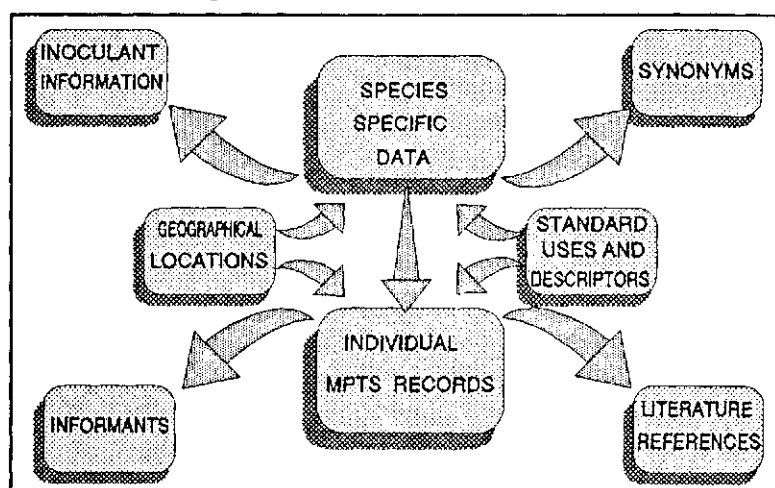
West Africa, Central and South America, as well as the planned activities in Asia. As Diagram 26 shows, implementation of the FTTP strategy in Asia focuses: on the development and dissemination of RRA and participatory land-use planning activities; the strengthening of regional community forestry training, and information dissemination activities; and the field testing of selected tools and approaches.

The collaborative activities with APAN in regional agroforestry training and support to national agroforestry working groups were highlighted, particularly in those countries where agroforestry activities are carried out in the framework of community forestry programs.

Michael Hailu from ICRAF, complemented Ester Zuberti's earlier presentations with an overview of information services that are available from ICRAF. These include literature

searches on request from AFBIB, the ICRAF in-house bibliographic database, and/or on any of the external databases available at the Centre on CD-ROM (including FAO's AGRIS, SESAME, USDA Agricola). ICRAF has on-line access to other external databases.

Diag.27 Structure of MPTS Database



Other services include selective dissemination of information to scientists based on their specific interests; specialized annotated bibliographies; bi-monthly accession lists; co-publishing of *Agroforestry Systems* and *Agroforestry Abstracts*; and document delivery services on request. ICRAF also provides training and advice to national institutions in managing and disseminating agroforestry information.

In addition to the bibliographic database of agroforestry information (AFBIB) and the Agroforestry Systems Inventory (AFSI) database, ICRAF has produced a Multipurpose Trees and Shrubs (MPTS) Database. Participants had an opportunity to practice hands-on searches with the database for appropriate species and technologies for the conditions

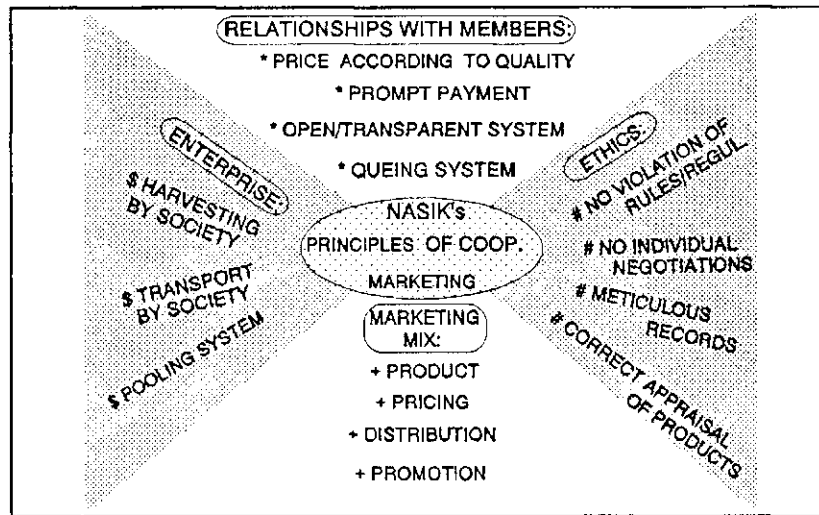
they had observed during field exercises in West Java, as well for the conditions in their home countries.

Shingi illustrated the need and potential for improved marketing arrangements in agroforestry with the presentation of the Nasik District Eucalyptus Growers' Cooperative Society.

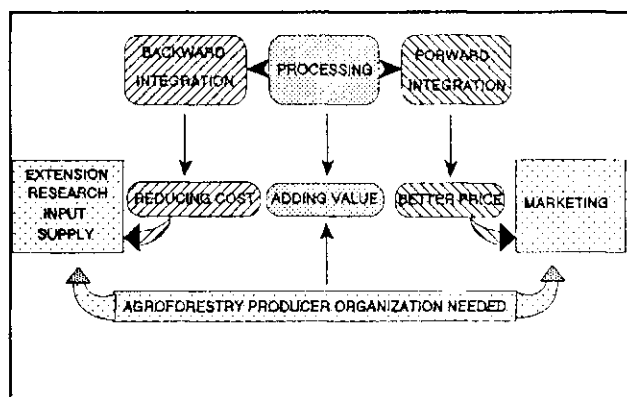
He described the background of the society, which was initiated by a former politician who after returning to farming decided to increase the value of farm-grown

eucalyptus through the creation of a pulp processing plant. This proved to be impossible and instead he took the initiative to form a tree growers' society that would concentrate on marketing of the eucalyptus to existing markets through depots and assistance in harvesting. *Shingi* described the various administrative obstacles that had to be overcome to form the society. As the above diagram demonstrates, the success of the society hinges on the observance of a number of principles that guide the operations of the society. The members are satisfied by the prompt payment according to the quality of the product. The queuing system also prevents 'favoritism' and the whole system of operations is kept sufficiently transparent so that members know and understand what is happening. This is reinforced by the adherence to a number of ethical principles that include the non-violation of existing rules and regulations, the avoidance of individual negotiations, a correct appraisal of the products, and meticulous record keeping that allows for retrieval of information on request so that members can always check what has happened. Based on these organizational principles, the economic performance of the society is enhanced by a number of enterprise management and marketing principles that immediately benefit the members. These include the principle that harvesting and transport

Diag.28 Marketing Principles applied by Nasik Cooperative



Diag.29 Agroforestry Marketing Linkages



of eucalyptus wood is carried out by the society, and the use of a pooling system (through the depots) that improves the society's bargaining power.

These three sets of principles (guiding relations with members, management of the enterprise, and a code of ethics) form the basis for the professional marketing principles that comprise efforts to add value through grading of the wood (at present), and the earlier efforts in processing, which may be revived in the near future. Also the distribution and promotion of the product

through the usual professional marketing strategies is undertaken. Based on this example, *Shingi* argued convincingly that there is a great potential in agroforestry to better exploit the opportunities of forward and backward linkages of agroforestry product processing. To ensure that benefits do indeed accrue to the agroforestry producers a strong organization is needed. He also quoted the rule of thumb of the initiator of the Nasik Cooperative Society that it is worthwhile for producers to become involved in processing if the value of the raw material represents at least 50 % of total processing cost.

Session 9: Follow-up and Planning Activities

Session 9 provided participants with an opportunity to break into seven small working groups to discuss training follow-up and planning activities within their own national and regional context. As one of the initial objectives identified by the course organizers and participants was to develop an outline for a "Compendium of Agroforestry Training Approaches", the working groups were set the task of developing topic areas corresponding to sections of the compendium, and to suggest improvements and additions to the proposed outline (see Diagram 30).

This session provided an opportunity for lively discussion and feedback. The working groups worked independently and each prepared reports that synthesized their thinking and experience on the specific topic assigned. These reports were finalized and then presented to the rest of the participants. The following is a brief summary of the presentations and feedback from other participants.

Diag.30 Working Group Topics

- | | |
|---|-------------------------------------------------|
| * | Farmer Training Needs and Attributes |
| * | Farmer Training Methods and Visual Aids |
| * | Extension Worker Training Needs |
| * | Extension Worker Training Needs and Visual Aids |
| * | Researcher Training |
| * | University Curriculum Development |
| * | Training of Policy Makers and Planners |

Working Group 1. Farmer Training Needs and Attributes (*Wilfredo Listones, Jagdish Ghimire, Bounsay Saphangthong*) :

Using farmers as trainers is an effective technique because of the following characteristics of farmers: he/she has a farm, speaks the local language, and has local knowledge and experience of the community. Farmers are also the end-users of agroforestry systems; using a member of the user-group as a trainer increases the adoptability of a particular technology. See Diagram 31 for an illustration of this process. The training site should also be as close as possible to farmers' fields; and the training culture should be congenial with information presented in the local language. The type of farmer chosen as a trainer should display the following characteristics: he/she should be

a good example of an innovative farmer, display self-awareness, and possess good communication, conflict management and leadership skills.

Working Group 2. Farmer Training Methods and Visual Aids (*Ghulam Jilani, Dadan Machfud, Abul Kalam*) :

Formal methods for training farmers include a number of techniques such as: cross visits, short courses, and meetings, and employ a number of visual aids.

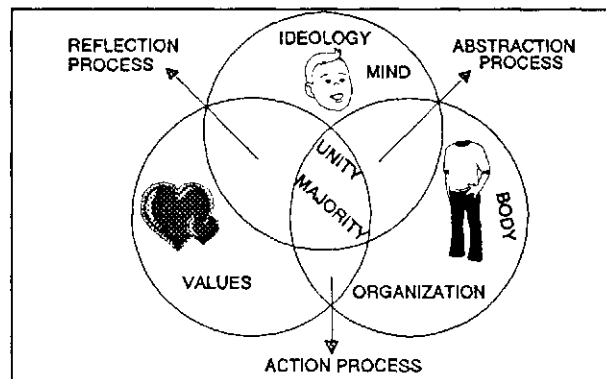
(a) Cross visits: These can occur at different levels: within farmers' fields (in the village or between villages); on demonstration plots; or in-country visits to agroforestry-based industries. The purpose of such visits is to develop and share interest on a particular topic between farmers groups.

(b) Short courses: These should primarily focus on improving farmers' skills in particular technical areas such as nursery and tree management. The courses should be conducted in local institutions for a maximum of 15-20 farmers, and be supplemented with field visits to local farm sites. Pre- and post-course evaluation of the course should be a requirement.

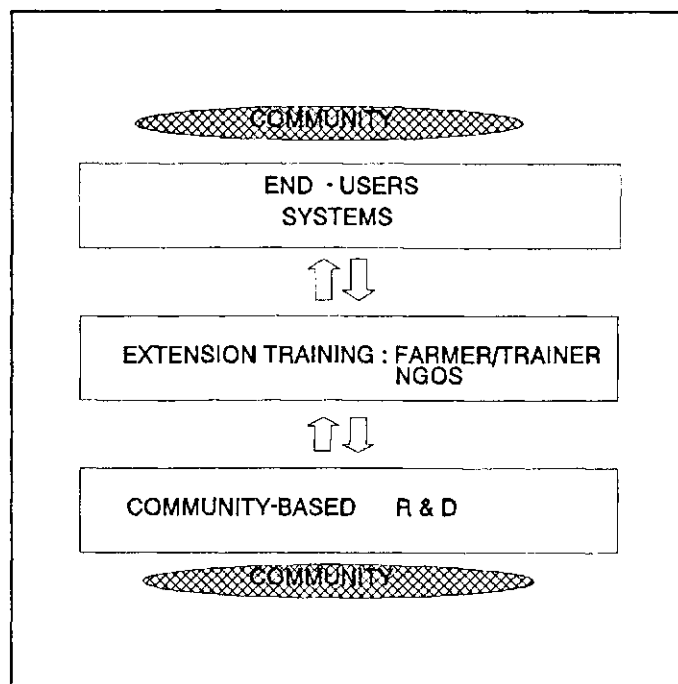
(c) Meetings: Regular meetings at different levels should be held to exchange knowledge. These include: farmer-to-farmer sharing of experiences; farmer-extensionist quarterly meetings; and farmer-consumer/end user meetings for farmers to gain information on market requirements and trends for agroforestry products. Such meetings, particularly those between farmers, leads to empowerment and self-confidence building.

Visual aids used for training can include: posters; flip charts (small enough so they can be carried to the field); crop calendars; TV and radio programs; and popular theater using villagers as actors to promote agroforestry concepts within the community. These visual aids should whenever possible be in the local language.

Diag.31 Mag-uugmad Foundation's Approach to Farmer Training



Diag.32 Linkages Between R & D, Extension and Farmers



Working Group 3. Extension Worker Training Needs (*Amar Singh, Somchai Manopiroonporn, Rajendra Joshi*):

Extension workers of both government organizations and NGOs were identified as the target for training as they are the ones who transfer technology to the farmers. In most APAN countries few persons have received training in agroforestry. The following training needs were identified as priority areas:

- *Training in identifying needs and problems
- *Assessing farmers problems and needs through D & D and other means
- *Technical training in agroforestry
- *Exposure to agroforestry systems and practices in other countries
- *Strengthening knowledge of tree and crop cultivation
- *Knowledge of multipurpose tree species and their uses
- *Exposure to extension methods and technology transfer
- *Knowledge of socioeconomic aspects of agroforestry
- *Knowledge of training tools and resource personnel suitable for farmer-level training

The group also identified the following constraints to effective extension:

- *Shortage of qualified trainers
- *Limited knowledge in the field of agroforestry
- *Lack of interdepartmental collaboration
- *Lack of structured courses in agroforestry
- *Lack of facilities for agroforestry training
- *Communication gap between agroforestry researchers and extension workers
- *Lack of clear national policy on agroforestry
- *Lack of marketing facilities for agroforestry products
- *Lack of capital for small farmers to invest in agroforestry
- *Lack of land availability and land tenure problems

Unique aspects of agroforestry extension identified by the group include: its multidisciplinary nature; the need for foresters, agriculturalists and social scientists to work together; and its emphasis on rural development while maintaining sustainability of land use.

Working Group 4. Extension Worker Training Methods and Visual Aids (*Y.Arihadi, Lamphone Khammounhevang, Saiful Islam, Iman Budiman*):

Group 4 expanded the definition of extension workers to include: government field staff, NGOs, local leaders, volunteers, and farmer leaders, all of whom take complementary roles in extension activities. A participatory training technique should be used as this generates more effective learning. Techniques include: discussion; group work; problem-solving workshops; role playing; field visits and exercises; demonstrations; case studies; games; and study tours. Training tools should include visual and audio-visual aids and printed material. The training management cycle was also described as well as follow-up planning, which included regional and national-level forums for networking trainers and trainees.

Working Group 5. Researcher Training (*S.M. Amatya, Hoang Minh Giam, Vien Ngoc Hung*):

Working Group 5 tackled the issue of dealing with the unique aspect of agroforestry research. Training needs for researchers include skill development in agriculture, horticulture, animal husbandry and social science. The following subjects should be incorporated in agroforestry researcher training courses: sampling methods; survey procedure; growth pattern of trees and crops; harvesting techniques; tree-crop interface; shading and root competition; and spatial arrangements of trees with crops.

Researchers should also identify client needs in terms of tree and crop preferences. Training methods for researchers include short courses and degree programs. Short courses should include workshops and field visits. Researchers should also receive training in information presentation skills, to help disseminate research results in a useful form. This working group also developed a short follow-up plan for local and regional training activities.

Working Group 6. University Curriculum Development (*Fazli Subhan, Claudia Payawal, Soontorn Khamyong*):

Group members identified the following factors as constraints to agroforestry curriculum development in universities: rigid institutional structure; insufficient information on research techniques; limited written material; lack of trained teachers; and poor curriculum development.

Within the APAN countries only a few universities have integrated agroforestry curriculum into forestry and agricultural education. A few universities such as the *College of Forestry, University of Philippines at Los Banos* and *Faculty of Agriculture (Department of Forestry) Chiang Mai University, Thailand* offer courses in agroforestry concepts and practices. At the *Pakistan Forestry Institute (affiliated with University of Peshawar, Pakistan)* both graduate and undergraduate courses are offered in agroforestry management and planning.

The group also identified suggested agroforestry topics to be included in existing MSc forestry and agriculture courses as a mechanism to develop agroforestry curricula. Discussion from other participants included the usefulness of student thesis research in on-going agroforestry projects, and an example of this was given from the Java Social Forestry project which has used MSc students from IPB and Gadjah Mada University to conduct field studies on agroforestry sites. Mention was also made of India's experience in incorporating agroforestry within state-level agricultural universities and colleges.

Working Group 7. Training for Policy Makers and Planners (*P.K. Mishra, M.A. Khan, P.K. Sen*):

Training of policy makers and planners should aim to : strengthen policies and plans for both agricultural and forest production; identify market needs of farmers; coordinate interagency collaboration; update knowledge of extension systems and latest agroforestry ideas from other countries.

Target policy makers identified for training included Heads of Forest, Agricultural and Horticultural Departments at national and state levels. The duration of the training course should be limited to one week as senior policy makers tend to have a busy

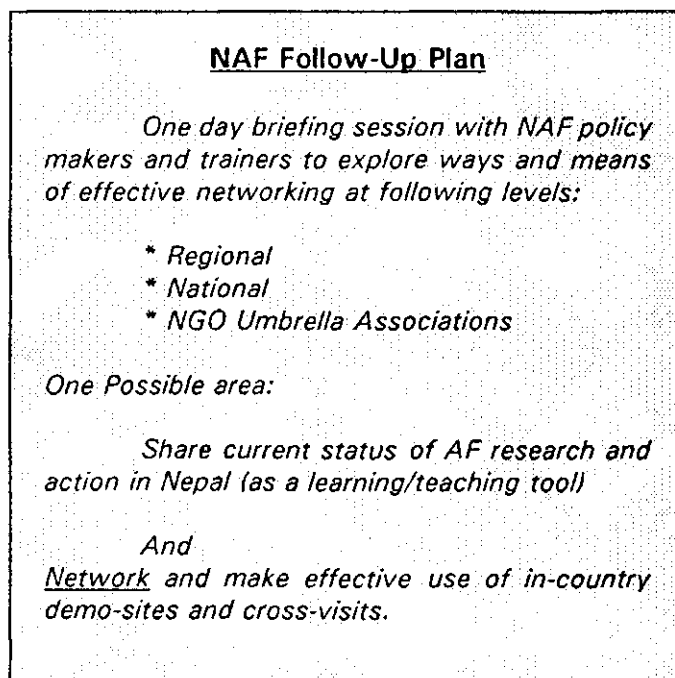
schedule. Topics to be covered by training include; agroforestry production and marketing; soil and water conservation and nursery management; information and database; for MPTS; and field visits to agroforestry sites.

Follow-up training should also be conducted at state, national and regional level on RRA, D & D, and experimental designs for agroforestry by respective Forest Departments and other agencies.

Individual Follow-up Plans

Jagdish Ghimire presented an individual follow-up plan of action that he planned to pursue with NAF upon his return to Nepal (Diagram 33). Other participants were urged to develop similar follow-up plans for their particular organizational or country context.

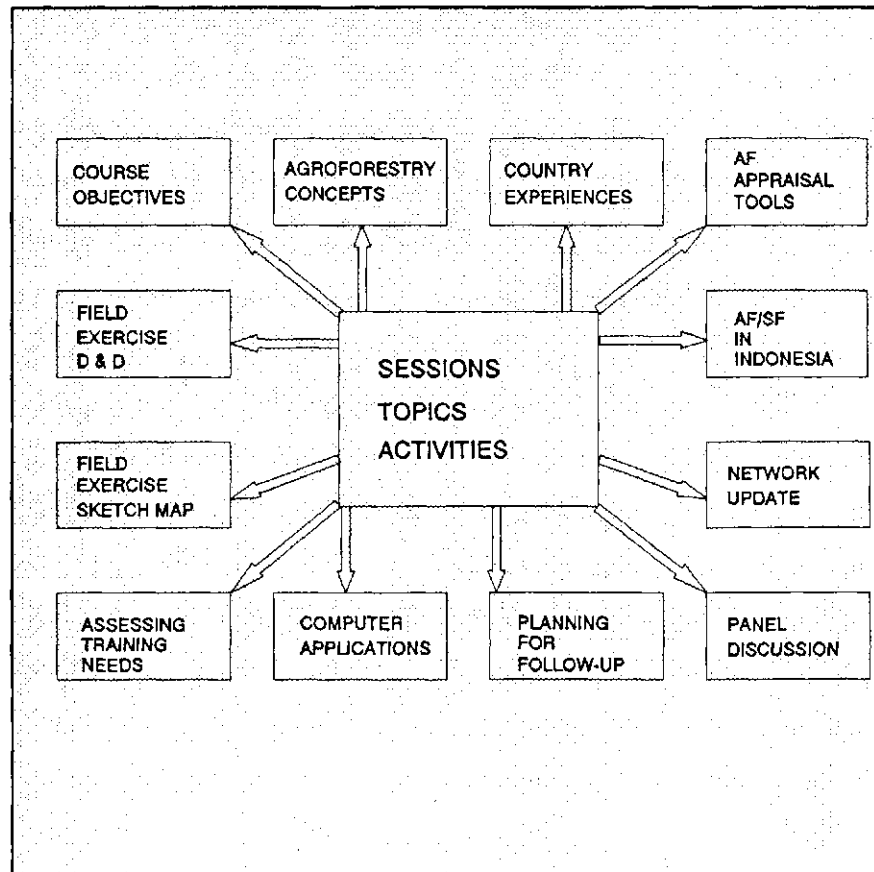
Diag.33 Nepal Agroforestry Foundation
Training Follow-Up Plan



Session 10: Synthesis of Earlier Sessions

Professor Shingi presented a summary synthesis of the topics covered during the workshop as summarized by Diagram 34 below.

Diag.34 Sessions and Topics Covered



Synthesis of topics covered during the workshop are presented in earlier sessions of this document.

Session 11: Panel Discussion

Session 11, the final panel discussion, took place at *Manggala Wanabakti* in Jakarta. This session was chaired by *Dr. Setijati Sastrapradja* and attended by senior officials from the Agency for Forestry Research and Development, and other departments of the Ministry of Forestry, as well as representatives from the Indonesian Institute of Sciences (LIPI), NGOs and the Japanese Embassy.

Panel discussants were: *Claudia Payawal (Philippines)*, *Jagdish Ghimire (Nepal)* and *Professor P.M. Shingi (India)*. *Claudia Payawal* started the session by reading the conclusions drawn from the refresher course (see Diagram 35).

Jagdish Ghimire stated that research on agroforestry should be based on practical experience and local users should be informed of the latest findings. Farmers should be involved in the design process from the earliest stage, hence, the importance of developing farmer-trainers.

Professor Shingi stated that there are two types of people: those who want to grow and cut trees (farmers) and those who want to grow and preserve them.

Agroforestry should be focused on the former. There are three types of risks associated with agroforestry marketing: production, marketing, and asset risks. Land tenure and tree tenure have a bearing on the third type of risk. Legal arrangements and producer support groups can help alleviate such risks.

Professor Sukiman (Board of *Manggala Wanabakti*) stated that the aim of agroforestry should be to find compatible woody perennials and food crops that not only increase productivity but sustain soil fertility. Agroforestry is applied on two types of lands: forest lands to produce wood products; and privately owned farm lands. Most agroforestry farm lands are associated with poor and marginal farmers, hence the need for agroforestry systems to provide food and income to the farmers as well as maintain soil fertility. Farmers can be trained through demonstration plots, and by training provided by multidisciplinary groups.

Pak Ombo Sastrapradja (FRDC) mentioned that Indonesia has a very successful demonstration program for regreening and soil conservation in Java and Sumatra.

Diag.35 Conclusions of Refresher Course for Agroforestry Trainers in Asia-Pacific

- * *There is a shortage of qualified trainers in AF in the Asia-Pacific region.*
- * *AF training is best done by people with field-based experience.*
- * *Trainers should have both practical and scientific experience in AF.*
- * *Assessment of training needs is crucial prior to training.*
- * *A variety of organizations currently conduct AF training in the region.*
- * *Tools such as RRA and D & D are useful for defining land use problems.*

Demonstration plots of 10 ha have farmer groups of 10 farmers associated with them. They meet routinely with extension workers for technical discussions. This type of approach is considered to be the farmer-back-to-farmer system.

Pak Didin Sastrapradja (LIPI) stated that coordination among the different institutions involved in agroforestry can be very difficult, and often depends on locating individuals within the different institutions who have common interests.

Course Evaluation

Training course evaluations can be useful tools for individual trainers, course coordinators and institutions or projects with training components. The traditional form of evaluation is a written form completed by participants at the end of the course. These are often done at the end of the course and filed in a course completion report, but are seldom used to improve methods or course content.

The evaluation methods used for this course should be seen as a process rather than a format, although the process ends with a brief written form which meets both administrative needs and professional interests of trainers and coordinators. The evaluation process followed these steps:

- * Setting initial pre-course objectives
- * Revising objectives jointly with participants, coordinators and resource persons at start of course
- * Checking progress through:
 - A. Daily resource persons team meetings
 - B. Periodic feedback from participants
- * Written evaluation at end of course

An evaluation report of the course was compiled by *Ken MacDicken*. Participants generally rated the course as successful in substantially achieving each of the objectives set and in providing an appropriate venue for the exchange of ideas and information. The APAN Secretariat was highly praised by participants and resource persons for the quality of services provided both before and during the course. The completed written evaluation forms suggested a number of strengths and a few weaknesses that can be learned from and corrected for future courses. In general, participants and resource persons found all of the sessions to be either very useful or useful, with very positive ratings given to nearly all of the presentations. Most participants felt there should have been more time scheduled for the field exercises and visits.

Based on participant feedback and evaluation, two sets of recommendations can be made for improving training courses of this nature:

1. Schedule enough planning time to allow for the assessment of training needs. The schedule for this course was of necessity driven by external factors which prevented the timely identification of participants. In some cases, participants were not identified by host governments until the very last minute. It is suggested that the nomination process be initiated at least six months before the course is scheduled to begin and that participants be identified at least three months before the course starts. This would allow course coordinators to obtain an idea of the background and training needs of each of the participants, either through a short written form to be submitted with the nomination or through follow-up correspondence after the nominations are received.

2. Use the course structure to reinforce course content. If the course is structured in a way which demonstrates the logic or conceptual basis for each major topic, participants can more readily see and understand the concepts being presented. The primary example in this course was the structuring of RRA, D&D and sketch mapping sessions which were not grouped logically due to other considerations.

Following the written evaluation, an informal discussion and feedback session was held with the aid of the "talking ball", which was introduced by *Amar Singh* as a technique successfully used during agroforestry training in Fiji to obtain participant feedback and evaluation. A "talking tennis ball" was thrown amongst participants and resource persons. Whomever caught the ball had to give his or her frank views on the training course, while everyone else was required to remain silent and listen. This process produced vivid, lively and honest expressions of opinion, and was very helpful in drawing out ideas, suggestions and constructive criticism for improving future training activities.

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ACRONYMS

AF	Agroforestry
AFRD	Agency for Forestry Research and Development
AFRENA	Agroforestry Research Network in Africa
AKRSP	Aga Khan Rural Support Programme
APAN	Asia-Pacific Agroforestry Network
D & D	Diagnosis and Design
FAO	Food and Agriculture Organization
F/FRED	Forestry/Fuelwood Research and Development project
FTPP	Forests, Trees and People Programme
GO	Governmental Organization
ICRAF	International Centre for Research in Agroforestry
KTH	Forest Farmer Group (in Indonesia)
LIPI	Indonesian Institute of Science
MPT	Multi-Purpose Tree
NAF	Nepal Agroforestry Foundation
NGO	Non-Governmental Organization
PRA	Participatory Rural Appraisal
R & I	Research and Information
R & D	Research and Development
R & T	Research and Training
RFD	Royal Forest Department (in Thailand)
RRA	Rapid Rural Appraisal
RWEDP	Regional Wood Energy Development Programme
SFC	State Forestry Corporation (in Indonesia)
UPLB	University of the Philippines at Los Banos
USAID	United States Agency for International Development
USDA/FS	United States Department of Agriculture/Forest Service
YBS	Yayasan Bina Swadaya