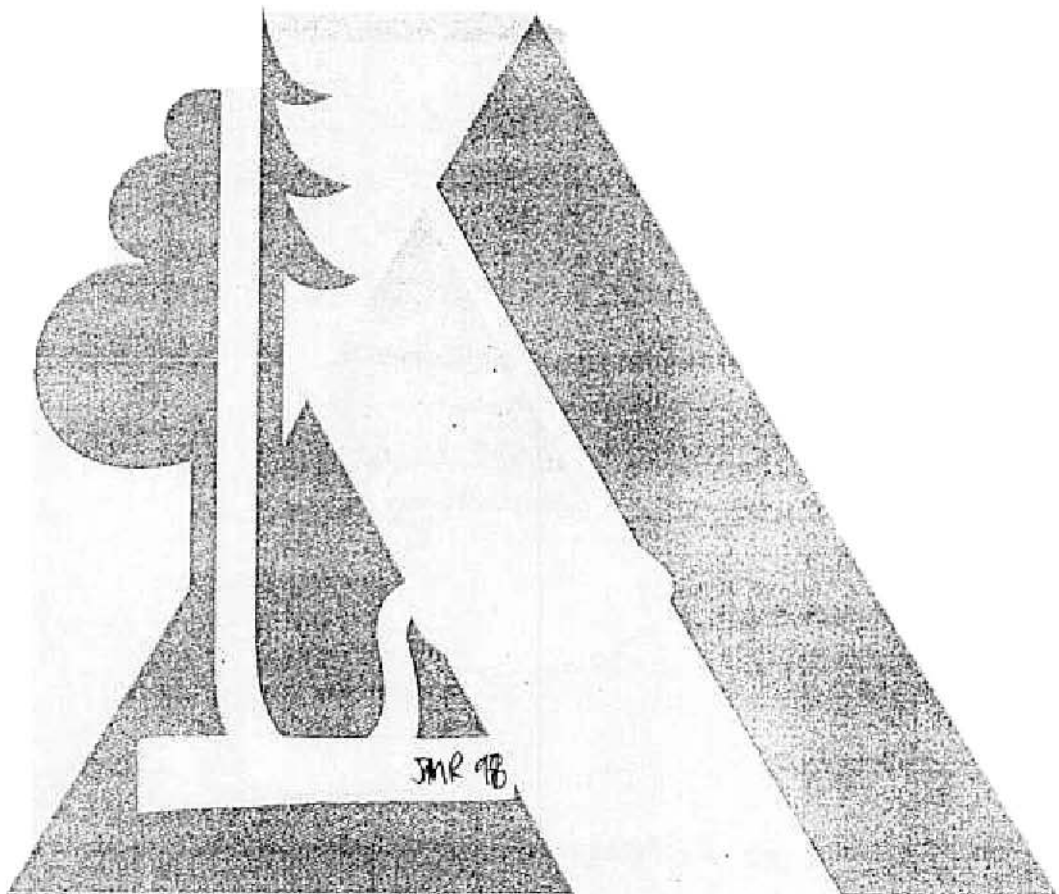


PROCEEDINGS

**INDONESIA FOREST SEED PROJECT
INTRODUCTORY WORKSHOP**

BOGOR, 26-27 AUGUST 1998



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INDONESIA FOREST SEED PROJECT INTRODUCTORY WORKSHOP

26 – 27 August, 1998

NOVOTEL – BOGOR



Bandung, October 1998

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ANNEX IV – PRESENTED PAPERS

SUMMARY OF ICRAF'S GERMPLASM RELATED ACTIVITIES IN SOUTHEAST ASIA¹

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ICRAF-Winrock Tree Domestication Program
Bogor, Indonesia
August 24, 1998

ICRAF

The International Centre for Research in Agroforestry (ICRAF) is an autonomous, non-profit, international organization established by charter and headquartered in Nairobi, Kenya. ICRAF's purpose is "to work towards mitigating tropical deforestation, land depletion, and rural poverty through improved agroforestry systems." It established a *Southeast Asia Regional Research Program* in Bogor, Indonesia in 1992. The objective of the regional program is to implement ICRAF's mission in the context of the unique agroecological and institutional circumstances of southeastern Asia. In working towards this goal ICRAF's activities are organized into five program areas: Natural Resources Strategies and Policy (internally designated as Program 1.); Domestication of Agroforestry Trees (Program 2), Ecosystem Rehabilitation (Program 3); Agroforestry Systems Evaluation and Dissemination (Program 4); and Capacity and Institutional Strengthening (Program 5).

DOMESTICATION OF AGROFORESTRY TREES PROGRAM

The Domestication of Agroforestry Trees is the ICRAF program most directly interested in questions of tree germplasm. At ICRAF the 'domestication of agroforestry trees' is *the accelerated and human-induced evolution to bring species into wider cultivation through a farmer-driven or market-led process* (Simons 1996). It is an iterative process which includes a wide range of activities - exploration and collection of natural populations; evaluation and selection of suitable species and provenances; breeding; development of propagation techniques; multiplication and dissemination of germplasm; development of management techniques; utilization and tree product marketing; and the development and dissemination of relevant technical information. These various activities are represented in Figure 1. Any activity that improves the ability of people to grow and utilize trees can be considered domestication.

At the regional level the Domestication of Agroforestry Trees is ICRAF's newest program. It was initiated in 1997 through joint efforts of ICRAF and Winrock International an US-based NGO. An objective of the joint domestication program is to work with smallholder farmers to develop agroforestry systems appropriate for their

¹ Presentation given at the Indonesia Forest Seed Project Introductory Workshop held in Bogor, Indonesia August 26-27, 1998. Parts of this presentation were taken from the Working Group Reports of the 'Regional Workshop on the Domestication of Agroforestry Trees in Southeast Asia' held in Yogyakarta, Indonesia November 4-7, 1997 (Roshetko, in press).

specific environmental, social and economic conditions. As regional forest resources decrease smallholders grow more trees to meet their household needs as well as market-demands for wood products. We feel that smallholders have a significant role to play in reforestation, natural resources management and the cultivation of tree products. Smallholder farmers are the primary target group of the joint domestication program.

To help set an agenda for the joint program, a regional workshop on the 'Domestication of Agroforestry Trees' held in Yogyakarta November 3-7, ~997. The workshop was sponsored by ICRAF; Winrock International; the Australian Centre for International Agricultural Research (ACIAR); the Forest, Farm, and Community Tree Network (FACT Net); the Taiwan Forestry Research Institute (TFRI); and the Council of Agriculture, Taiwan.

GERMPLASM RELATED ACTIVITIES

Outputs of the Regional Workshop. Sixty participants attended the workshop representing international research organizations, private companies, international and local NGOs, development organizations, national government agencies, community organizations and individual farmers. What brought this diverse group of people together was an active interest in assisting smallholders with tree domestication activities. During the workshop the participants summarized the current status of domestication in the region and identified priority topics for intensification. There was strong consensus among participants concerning tree domestication priorities. Smallholder tree production systems with particular emphasis on timber and fruit species were clear priorities across the region. It was confirmed that both indigenous and exotic species have important roles to play in these systems. Germplasm production, quality and pathways were also identified as priority regional concerns, as were both seed-based and vegetative propagation methods. An all-encompassing priority for the region was additional training in and information dissemination of relevant tree domestication topics in forms appropriate for various target audiences - researchers, field workers and farmers.

Participants also met in working groups, one of which addressed the regional germplasm pathways. This working group developed Figure 2 as a general model of germplasm pathways in Southeast Asia. The model depicts international research organizations, international seed companies, national research organizations, and large private plantations as closely linked and primarily concerned with seed quality. National NGOs, national extension organizations, small private nurseries, and farmers and farmer groups are depicted as closely linked and more concerned with seed quantity. Quality focused organizations are concerned with identifying the best germplasm available for a specific situation. Among the strengths of these organizations are the evaluation of species and provenances, and the development of protocols for commercial timber plantation. Quantity focused organizations are very concerned with meeting the seed demand for the programs. They are good at promoting new species or provenances, and at developing 'tree planting cultures' among local communities. If linkages are adequate these organizations form a good partnership to develop, evaluate and promote species and provenances.

While this model found general acceptance in the group it was acknowledged that pathways vary greatly with location and are often broken into sub-pathways that operate in semi-independence. For example, quality focused organizations often have a

propensity to interact among themselves, as do quantity focused organizations. Similarly, seed may be regularly exchanged between research organizations, extension organizations, and NGO within the same country (or local area), with periodic infusion of germplasm from outside organizations. Also, exchange linkages may develop between organizations based on personal or professional relationships of their members.

The sub-pathways characteristic of the model strengthens individual linkages, but has some negative impact on the seed supply function of the pathway. All organizations have limited time and resources, which tend to be concentrated within the sub-pathways. This is particularly true for high quality seed, which is always in short supply. Sub-pathways across the quality-quantity divide tend to be weak then those on either side. Thus the NOOs, extension organizations, and private nurseries working at the local level, with farmers, have less access to quality seed.

Farmers and farmer groups generally have the weakest links to germplasm pathways. This is indicated by the dotted lines between them and the organizations in the upper portion of the figure. Even linkages with NGOs and extension organizations may be weak for a number of reasons: remote location of farms, lack of information, or paucity of capable organizations. A study of the farmer-managed germplasm pathways in Lantapan, Philippines (Koffa and Roshetko, in press) indicates that farmers most often acquire seed from informal sources collection from local forest, woodlots, and farms or exchange with family, friends and acquaintances. These local germplasm pathways operate in recurrent isolation. Some quality seed enters the systems, but access is infrequent and uncontrolled. The quality germplasm is planted locally where it interbreeds with local varieties diluting its superior traits. Because farmers are generally unfamiliar with seed collection protocol local management is often inappropriate. Seed is commonly collected from only a few trees resulting in seed lots of a narrow genetic base.

There is ample room to improve the germplasm pathway described above. Particularly at the farmer level where the number of individuals interested in planting trees is high and access to quality seed is low. By improving the quality of germplasm available to them, smallholders could improve their tree planting activities, making them more effective agents of reforestation and producers of tree products. This could be achieved by linking farmers with germplasm pathways that distribute quality seed. The working group members thought it might be best to market quality seed through farmers, NGOs or entrepreneurs who operate local germplasm pathways. This arrangement would avoid the restful development of a parallel pathway that would compete with local enterprises or, as an outside entity, might not develop access to the target beneficiaries. If quality seed is marketed through local individuals or organizations it would be important to improve their seed management skills through training. Studies have shown that in areas where tree planting is a relatively new endeavor, tree seed management skills are generally low.

SEED ORCHARD RESEARCH

The program is currently working with three universities - the University of Gadjah Mada in Yogyakarta; the University of Udayana in Bali; and the Visayas State College of Agriculture in Leyte, Philippines - to establish seed orchards *Gliricidia sepium*. The objectives of these collaborations are to produce seed of this valuable species and develop seed production guidelines for farmers and NGOs. *Gliricidia sepium* was selected for these studies because of its popularity and usefulness

in agroforestry systems. It is widely used in many areas, including many ICRAF's sites in East Africa, in Nusa Tenggara (Indonesia) and parts of the Philippines. There is strong international demand for *Gliricidia* seed. Depending on location and provenance, seed price varies from \$2 to \$120/kg. Seed shortages, particularly for superior provenances, indicate that seed production may be a profitable endeavor for farmers and NGOs.

Gliricidia is widely established in most of Southeast Asia. Regional studies have shown that local land races are inferior in growth and biomass production to provenances from Guatemala (Retalhuleu) and Nicaragua (Belan Rivas). These Guatemalan and Nicaraguan provenances are those being tested in the program's collaborative seed orchards.

Treatments included in the seed orchard trials include: germplasm source (seed versus cutting); spacing; intercropping systems; fertilization; and coppice management.

EXPECTATIONS OF IFSP

While the Indonesia Forest Seed Project (IFSP) was devised to assist the state and industrial organization involved in the official forest seed sector in Indonesia, it is hoped that the project will also be able to assist NGOs and smallholder farmers that are involved in tree planting activities. Such assistance may include:

- Help facilitate farmer and NGO access to high quality seed
- Consider marketing seed through established local pathways
- Include NGO and farmers groups in technology and skill transfer activities (IFSP Output 3)
- Strengthen cooperation and coordination between the major institutions involved in tree seed procurement/production with NGOs and farmer groups (IFSP Output 4)
- Facilitate information sharing between the major institutions involved in tree seed procurement/production with NGOs and farmer groups (IFSP Output 4)

It is hoped that this workshop will present an opportunity to discuss the possibility of such assistance. The ICRAF tree domestication program would be a willing collaborator in such activities.

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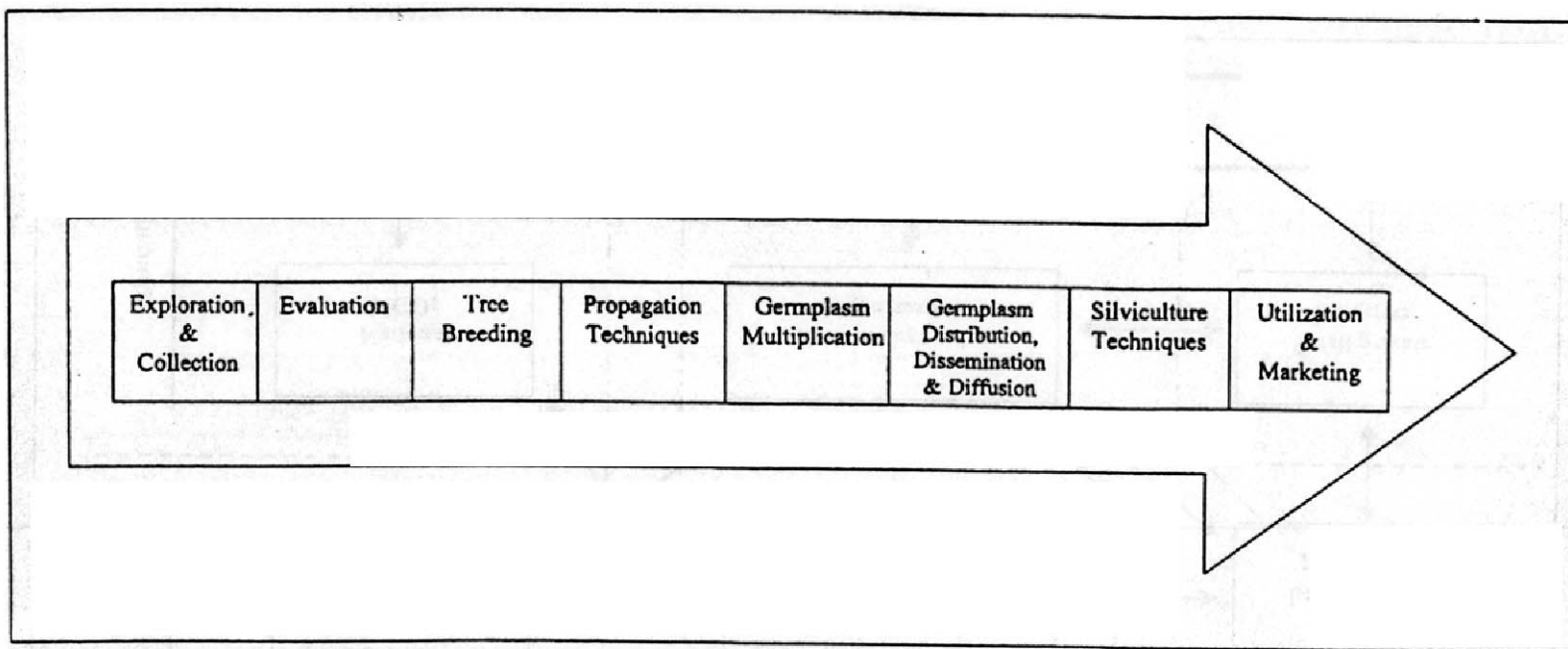


Figure 1. Tree Domestication Continuum. The various activities within the domestication continuum represent a general progression from the wild to genetically transformed state. However, the domestication of any given species will not necessarily follow a sequential flow from left to right. Some steps (activities) in the continuum maybe by-passed during the domestication process. Similarly, progress may flow back to earlier steps in the continuum as interest in or the economic value of a species develops further.

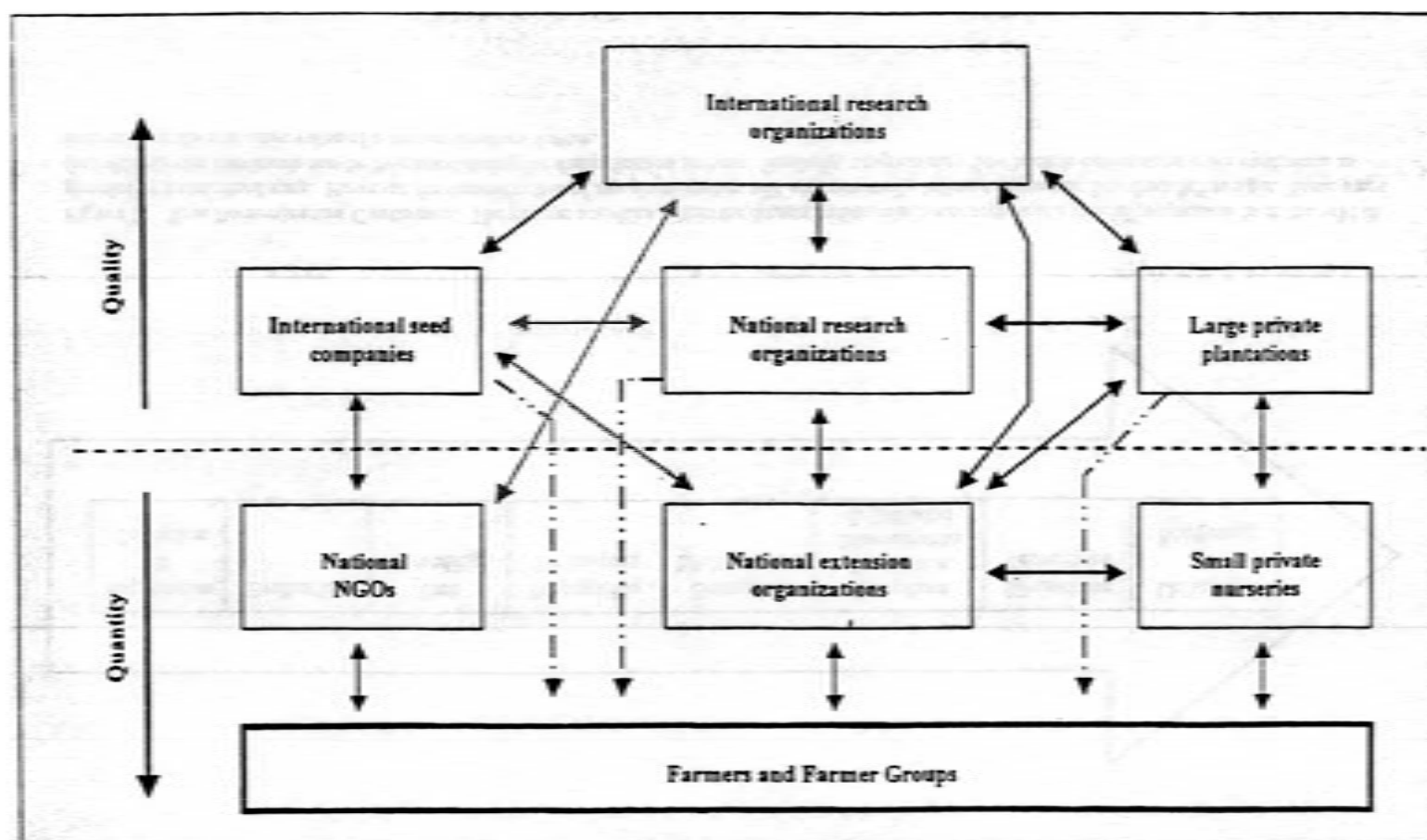


Figure 2. Model of general germplasm pathways operating in Southeast Asia