

Smallholder Farmer Seed Orchards: Producing Quality Tree Seed On-Farm

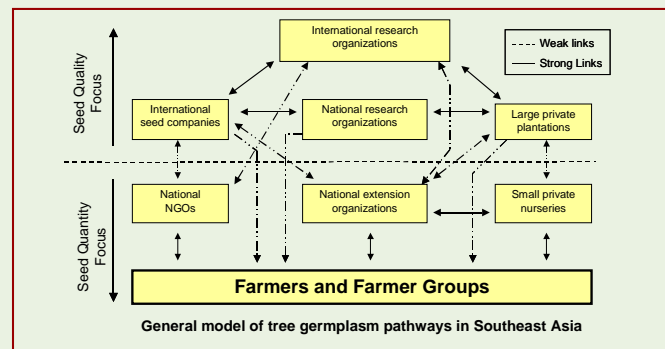
James M. Roshetko, Mulawarman and Meine van Noordwijk

Background

Smallholders' & NGOs' tree planting activities are successful and benefit local livelihoods and the environment, but ...

Seed is often an Obstacle to Local Tree Planting

- Seed shortages are an annual problem
- Farmers & NGOs use whatever seed is available regardless of quality
- Farmers & NGOs have no direct access to high quality seed



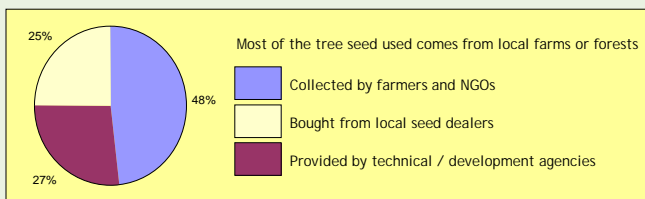
Materials & Methods

Between 2000-2004, ICRAF, Winrock International, and the Danida-funded Indonesia Forest Seed Project (IFSP) implemented a project to enhance the tree planting activities of farmers and NGOs in Indonesia by strengthening their technical awareness and skills regarding tree germplasm collection and management.

Activities included: participatory appraisals; training courses and workshops; the distribution of high quality tree seed; the production of farmer-level technical documents; and the establishment of farmer demonstration trials.

Results & Discussion

Sources of Seed for Farmers & NGOs ¹



¹ Results from a survey of 45 Indonesian NGOs and farmer groups active in tree planting activities (2000).

Seed Quality Aspects of Importance

- Genetic quality at the individual tree level
- Genetic quality at the population level
- Physical and physiological quality of the seed

Local Tree Seed is often Poor (below-average) Quality ²

- Local stands established with seed of narrow or unknown genetic origin
- Farmers, NGOs and local dealers do not use seed collection guidelines
- They collect seed from trees that are easy to access - regardless of quality
- They often collect seed from only 3-5 trees, sometimes from a single or **isolated** tree
- Such unselected seed sources yield seed of **below-average quality**

² Compiled results of 3 surveys of NGOs and farmer groups active in tree planting activities in the Philippines and Indonesia (1997 - 2002).

How to address the problem

- Enhance local tree seed collection & management through training & information
- In-flow of high-quality seed to establish farmer tree systems / farmer seed orchards
- Incentives! Assist NGOs / farmers develop seed businesses, with linkages to national tree seed dealers and seed customers



Farmer Seed Orchards versus Seed Orchards

Seed Orchards are stands of trees established for the specific and *sole purpose of seed production*. They are generally monocultures. Management excludes the production of other products. Objective: maximize seed production from trees of the best proven genetic quality.

Farmer Seed Orchards are integrated into farmers' existing multi-species, multi-product, risk adverse smallscale farming system. Management must be flexible to address farmers land, labor, capital, and time conditions. Seed is one of many products. Objective: produce seed of above-average genetic quality compared to local stands to support farmer and NGO tree planting activities.

Relative quality of various seed source



Plantations

- One or a few species, often timber species
- Design: block, strips or border plantings
- Segregated component of farming system
- Products: seed (major), timber, fuel, others



Hedgerows

- One or a few species, often leguminous species
- Design: contour strips, borders or other strip plantings
- Integrated with annual crops or other tree crops
- Products: seed (major), fodder, green manure, fuel, stakes, annual and other tree crops
- Services: soil conservation and enrichment



Polyculture Gardens

- Multiple species, not all intended for seed production
- Design: traditional garden design, with standardized spacing, deliberate management and fewer species (relatively low population of target trees)
- Integrated fully with other tree crops and possibly annual crops
- Products: seed one of many tree or other crop products

Conclusion

By starting with seed of the best genetic quality, FSOs will produce seed of superior genetic quality compared to SSs and USs. Deliberate management of FSOs will produce larger quantities of seed compared to SSs or USs. FSOs seed is adapted to local environments (both biophysical and socioeconomic) and owned by farmers/NGOs. Management of FSOs for multiple products supports farmers' livelihood needs.

Extrapolation Domain

FSOs are appropriate for areas: with limited tree resources; strong demand for tree products (including tree seed); and farmers who are interested in tree planting.



Authors

James M. Roshetko, Trees and Markets Specialist, ICRAF - The World Agroforestry Center and Winrock International, Southeast Asia Office, Bogor, Indonesia
Mulawarman, Senior Silviculture Researcher, Riau Forestry, PT RAPP, Riau, Indonesia
Meine van Noordwijk, Regional Coordinator, ICRAF - The World Agroforestry Center, Southeast Asia Regional Office