

SCHOOL NURSERIES  
AN INNOVATIVE WAY TO  
DECENTRALIZE REFORESTATION

S&T/FENR Agro-forestation  
SERIES # 30  
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## SCHOOL NURSERIES:

### AN INNOVATIVE WAY TO

### DECENTRALIZE REFORESTATION

#### INTRODUCTION

Massive deforestation and a decline of food production in the developing countries, as well as vast and often inaccessible areas in need of reforestation, dictate the need for innovative mechanisms to combat these problems.

- o There is a need to institutionalize tree planting and agroforestry in existing social systems and communities, and within local cultures.
  
- o A need also exists to train and field a large number of extension agents who live in the rural areas, know local customs and practices, and can mobilize the people there.

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Centralized nurseries are expensive to build and run, and transporting tree seedlings to planting sites is costly and cumbersome. Inadequate road systems and lack of transportation during the brief period when ground moisture is available make it difficult to deliver seedlings and other plant materials to planting sites, especially in countries with a short-bimodal rainfall pattern.

Though peasants in developing countries know how to grow food crops, very few know how to grow trees. Trees are taken for granted and are viewed as a naturally occurring phenomenon, and their growth is entrusted to Diety or Mother Nature.

The widespread paucity of genetically superior plant materials, especially woody perennials, in rural areas overshadows the lack of know-how by peasants. The rate of reforestation and food production in developing countries would increase markedly if quality plant material of appropriate tree and food crop species were available at the local level.

The innovative mechanism that can help solve these problems is school and backyard nurseries.

### SCHOOL NURSERIES

School nurseries serve as an effective teaching media through which a dispersed population can learn about the importance of trees and agroforestry in maintaining the quality and supply of water; reducing soil erosion; improving soil fertility and structure; and providing wood and forest products, livestock forage, fruits and nuts, and a habitat for wildlife. At the same time, school nurseries can serve as a source of income for the school and students to pay for school projects and improvements.

REFORESTATION AS A TEACHING MEDIUM--Schools can also serve as focal points through which to introduce new technologies, conduct demonstrations and carry out extension. Nurseries, mini-parks, fuelwood plantations and fruit orchards are "living laboratories" where lessons on many subjects, such as basic science, biology and environmental studies, can be taught through demonstration and experimentation. With an appropriate selection of fast-growing agroforestry species, one site may serve all these functions.

SEED PRODUCTION- Schools are an excellent medium through which to multiply seeds and other plant material for sale, for use in expanded forestation projects, and for sharing with parents and villagers. Seeds of fast-growing trees can be given to the students for propagation, and the seedlings can be planted

and nurtured as a required school activity or as part of their regular school curriculum. In this way, schools can produce vast quantities of seeds to be purchased by the government, voluntary agencies, or others for use in expanded reforestation activities.

Students and villagers can also be contracted to gather seed from forest trees. However, careful education and supervision must be provided to assure that seed is gathered only from trees that have desired characteristics, such as form and height.

#### STUDENTS

Unlike their parents, who have mindsets, well-developed attitudes and behavioral patterns, students have open minds. They are eager to learn new things. They are readily accessible. They're a captive audience. And they relish outside activities. Students like to show their parents what they learn in school. They'll take home tree seedlings and other improved plant material to plant around their houses or in their kitchen gardens. They will influence their parents to plant trees. In this way, each student is a potential extension agent. In farming communities, rapport is created between the school and the parents when they see their children learning practical and useful things that relate to their everyday life.

Students are very effective extension agents. Extension agents coming from outside the villages often lack sensitivity to local norms. But students, who are from the villages, know how to work within the established local norms and social system and can easily influence their parents and other adults in the community. Students and their parents can be trained to use appropriate technologies. Provided with adequate resources, they can be contracted to grow tree seedlings for larger reforestation projects. This helps support the schools and stimulates the economies of villages.

#### TEACHERS

A major weakness of current extension programs is the inaccessibility of farmers who are often out when agents arrive in the village. School teachers live in the villages where they teach and can be easily located by extension agents who commute from centralized areas.

#### LOCAL PARTICIPATION

The establishment of school nurseries would increase interaction among host-government agencies, private voluntary agencies, project planners, students and villagers and would promote joint project planning and reforestation site selection. Thus, students and villagers are involved in projects from their inception and reforestation efforts are transformed from third party or government projects to grass-roots efforts in which local people have major roles and responsibilities.

### VOLUNTARY AGENCIES AND HOST GOVERNMENT'S ROLE

Voluntary agencies are most likely to be involved in school tree nursery projects and their participation should reinforce the role of the government. When feasible, training should be conducted by government forestry personnel, or under their auspices. This format enhances government's credibility and creates a much better rapport between the government and the voluntary agencies that help administer and implement projects. This, in turn, will create rapport with villagers, inject revenue into local communities and make available an on-site supply of plant materials. Thus, project costs and transportation problems are reduced.

### THE SCHOOL AS A CENTER FOR INFORMATION TRANSFER

Schools are an excellent medium for information transfer. School teachers and education are held in high regard in developing country villages. Teachers, with their relatively high level of education, are more receptive to innovative concepts. They usually live in the village where they teach, so they are available for contact by villagers and farmers on a day-to-day basis, while extension agents, who communicate from central areas, only occasionally come to the village. Thus, the school is a natural center for collecting and disseminating information and new ideas to villages. Through them, improved agroforestry technologies can be taught, and improved plant

material, techniques and information on ways to increase food crop production can be disseminated. Villagers and farmers who benefit from assistance from the schools and teachers, often will share what they reap from their harvest with the teachers and students. This can help supplement the often-low pay that the teacher gets from his educational efforts.

Improved child care, nutrition, hygiene, and disease control information can also be made available through the schools once the information transfer pattern is established.

**HOT LUNCHESES AND FUEL CONSERVATION**--To demonstrate fuelwood conservation, more efficient stoves can also be introduced, especially where hot meals are served at schools. And students can grow the fuelwood needed to cook their meals, and if needed heat their school. Basic science concepts, such as combustion and heat exchange, can be taught, and fuelwood conservation, in terms of real monetary savings, can be calculated and verified. Such information is then easily disseminated through the schools and students to parents and other villagers. The entire program can be linked to school lunch programs, using U.S. Food For Peace (PL-480) or World Food Program commodities, to improve the nutritional intake of the students.

A SOURCE OF INCOME AND NUTRITION FOR SCHOOLS--Nurseries should not be limited to traditional forest species, but should include fast-growing agroforestry species for fuel and forage, green manure, construction materials, fruit-nut trees, and even ornamentals. Seedlings can be sold by the students to other members of their village, or to nearby villagers. Additionally, fuelwood (or charcoal), fruit, and forage can be sold and the revenue used to purchase school supplies or to pay for school or village improvements. Schools can also grow firewood to sell at the roadside or to villagers, and fruit harvested from school orchards could be added to the school lunches as a nutritious dietary supplement.

YOUTH CONSERVATION CORPS--Students can be organized in a Youth Conservation Corps. In fact, many developing countries already have scout organizations similar to the U.S. Boy Scouts and Girl Scouts. Such organizations can be developed or expanded, and used to teach tree-growing techniques. A series of badges and awards can be designed for student recognition in tree planting programs. A general badge can be given for planting a basic number of trees; for planting a basic number of different types of trees (fuelwood, fruit, forage, ornamental, construction wood, etc.); for getting parents to plant a basic number of trees; for motivating other community members to plant trees; or for planting trees as part of an agricultural system (e.g., soil

erosion control barriers or green manure). Incremental awards can be given for planting more trees than the required basic amount. The necessary equipment and supplies, such as plastic bags, shovels, hoes, fertilizer, and pesticides (if needed), can be furnished to youth corps members through schools and shared with their parents and fellow villagers.

As an additional element of the program, a person living near the school can be trained as a tailor. This individual can be furnished with a sewing machine and cloth to sew uniforms and badges for students who participate in the tree planting program. The tailor can pay for the sewing machine in-kind by donating the labor involved in producing the uniforms. A small loan or grant can be provided to the tailor for the purchase of cloth, patterns, thread, and other supplies needed to start a small tailoring business, and can include funds to construct a small shop.

The Youth Conservation Corps uniform would vary to suit the climate and local apparel customs (such as skirt and blouse or shorts and shirt and a beret). About three months after planting the trees, the Corps' members can be given a uniform as an incentive to continue participation in the program and maintain the trees they have planted.

DEMONSTRATION CENTERS--Villagers and community councils would very likely provide land to schools for the creation of such projects as school and community wood lots, energy plantations, fruit orchards, parks, and forage production areas. The planting and maintenance of these areas can be part of the school curriculum, as well as special school and community projects.

#### A MORE EFFECTIVE USE OF SCARCE RESOURCES

Governments and voluntary agencies often misallocate scarce financial and material resources by creating expensive tree nurseries, which give a poor return on the money, material, and time invested, while local inhabitants suffer. Wells are dug and irrigation systems are installed to provide water for tree nurseries while villagers are without water to drink, water to irrigate their crops and water for their livestock. Outside laborers are brought in to work in the nurseries when there is under-employment in nearby villages. These real, basic, felt needs of villagers overshadow the perceived needs of the project planners--that is, infrastructure to service the project.

By decentralizing tree nurseries and by creating school nurseries, costly project overhead can be reduced and scarce resources can be more effectively utilized.

A much greater number of trees would be planted by villagers and farmers, even without project support, if seedlings were available within close walking distance to where they are to be planted. Traditionally, nurseries run by voluntary agencies or the government have been the primary source of tree seedlings in rural areas. These nurseries are usually centrally located and seedlings have to be transported over long distances. When grown in plastic bags, the weight of soil surrounding the seedlings limits the number that can be carried; if transported bare-rooted (without soil), a high incidence of plant mortality results. Thus, distribution to and reforestation of remote areas is impeded. School nurseries in rural areas can minimize this problem, and trees would be available at any time for planting.

POTABLE WATER FOR SCHOOLS--Wells dug at schools, or the development of other water sources such as springs, would provide water not only for the nurseries, but potable water for the school children and villagers as well. Low-maintenance windmills can be installed to pump water into a reservoir for drinking, washing clothes, and irrigating vegetable gardens. Agricultural tools and equipment can be given to the schools and used by both the school children and the villagers.

DISSEMINATING FRUIT TREE PROPAGATION KNOWLEDGE--One of the reasons that a greater quantity and a wider variety of fruit is not grown in the rural areas of developing countries is that quality planting stock of the right species is not available. School nurseries are an excellent medium through which this plant material can be introduced. Skill in grafting techniques and care of fruit trees is lacking in rural areas. Traditionally, this knowledge is kept by a small handful of people, and not made available to everyone. Through schools, farmers and home owners can be taught these skills and techniques. Villages would continue to benefit from this new knowledge long after projects supporting these activities are over.

#### Philippine Experience

A school tree-seed reproduction program was undertaken by a district school supervisor in Cebu in the Philippines. The supervisor required that every school teacher in his district plant and care for five Leucaena leucocephala trees in the school yard before they could collect their monthly salary. The trees were inspected each subsequent month to ensure that they were still growing. If a tree died, a new one had to be planted. The district school supervisor said, "No trees, no pay!" This seed reproduction program served as the basis for an expanded school tree-planting project.

The district supervisor persuaded the Philippine government to set aside a parcel of land at each school to be used for creating mini-energy plantations and parks. The school official met with local villagers and got them to agree to protect these areas, and prohibit livestock grazing and wood poaching. Where materials were available, the villagers helped the school children to construct a fence around the planted areas. An agriculturalist then came to the school to assist in teaching the pupils how to propagate and care for the Leucaena trees. At that time, each student was required to plant and care for 10 trees and was graded on his or her efforts. "No trees, no grades." Trees that died had to be replaced. Competitions were held between different classes within a school and different schools, and awards were given to the top students, classes, and schools. Part of the competition was to determine which student, class and school could plant the most trees, and also influence the greatest number of parents, family and community members to also plant trees.

AGENCY FOR INTERNATIONAL DEVELOPMENT

WASHINGTON, D.C. 20523

INFORMATION MEMORANDUM

SUBJECT: Availability of Other S&T/FENR Agro-forestation  
TECHNICAL SERIES Publications

Information on other subjects is available in the S&T/FENR Agro-forestation TECHNICAL SERIES given below. The numbering of this series has little relevance to the chronological order of the articles, publications or compilations. Rather, this is a list of subjects that I put together based on information that I feel is not easily available to field people. At that time, I gave a SERIES # to each subject on my list, and when I have enough information to cover the subject adequately, I complete the compilation. As new subjects come to light, I add them to the list.

As of this date, TECHNICAL SERIES # 1, 2, 4, 6, 7, 10, and 14 through 31 are available. If you desire additional copies or a copy of one which you have not received, or would like me to mail copies to host country technicians or others, let me know and I will send the copies requested.

- #1. Selected Tree Seed Sources in Australia, India, Holland and the United States. However, this publication is dated, and I suggest that you send for a copy of Multipurpose Tree & Shrub Seed Directory (May 1986), International Council for Research in Agroforestry (ICRAF), P.O. Box 30677, Nairobi, Kenya.
- #2. The Potential of Starch Graft Polymers "Super Slurpers" for Forestry and Agriculture
- #3. Minimizing Livestock Damage to Trees Through the Use of Trenching, Living Fences and Game Repellant
- #4. The Comparative Advantages and Disadvantages of Root Trainers, Dibble Tubes, Plastic Bags and Bare-Rooting
- #5. Neem (Azadirachta indica juss): The Cornucopia Tree
- #6. Windbreak and Shelterbelt Technology for Increasing Agricultural Production
- #7. Growth Yield Increase of Trees Through Fertilization
- #8. Ground Preparation: Hillside Ditching, Catchment Systems, Trenching, Placement of Trees on Terraces to Increase Establishment and Growth Rate of Trees
- #9. Advantages of Vegetative Propagation and Tissue Culture for Seed Orchard Establishment
- #10. Casaurinas: Trees of Promise
- #11. Termite and Rodent Protection for Seedlings and Trees

- #12. Agroforestry Systems Using Contour Hedgerows for Soil Erosion Control, Plant Material Reproduction, Soil Improvement and Forage and Fuelwood Production (S&T/AGR Tech Series Bull. #26)
- #14. Jojoba: A Promising New Crop For Arid Lands
- #15. Solar Curing Barns, Fast-Growing Trees and Agroforestry Offer A Solution to the Deforestation Caused by Tobacco Production in Thailand, Tanzania, Sri Lanka, Nepal, Philippines and Other Developing Countries
- #16. Excerpts from: Evaluation of and Recommendations for Research on Fast-Growing Tree Species for Wood Energy Production in the Dendro-Thermal, Charcoal Production and Gasification for Irrigation Projects in the Philippines
- #17. Leucaena leucocephala: A Tree That "Defies the Woodcutter"
- #18. State-of-the-Art: Acacia albida
- #19. Guide Book for Rural, Cottage and Small and Medium Scale Industries and Paddy Rice Cultivation
- #20. Soils, Crops & Fertilizer Use (Peace Corps)
- #21. Handbook of Tropical and Subtropical Horticulture (USAID)
- #22. World Literature on Leucaena
- #23. Paulownia, "The Princess Tree," an Excellent Candidate for Agroforestry
- #24. Utilization of Neem (Azadirachta indica juss) and Its By-Products
- #25. Leucaena leucocephala: An Excellent Feed for Livestock
- #26. Living Yam Poles (English or French)
- #27. Moringa: A Tree That Purifies Water and Whose Leaves and Fruits Are Rich in Vitamins A & C, Protein, Calcium, Iron and Phosphorus
- #28. Fertilizing Fruit Trees with Leucaena and Other Legumes Results in Increased Growth and Yields
- #29. Contour Hedgerows for Fodder, Planting Stock, Fuelwood and Increased Food Production and for Minimizing Soil Erosion in Highland Regions
- #30. School Nurseries: An Innovative Way to Decentralize Reforestation
- #31. Fertilizing Fruit Trees With Leucaena and Other Legumes Results in Increased Growth and Yield

If you have any comments on the relevance of this information, I would like to hear from you.

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