Forest Gardens - Sustaining Rural Communities around the World through Holistic Agro-forestry

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Abstract

By modelling human-managed agro-forest ecosystems upon the structure, function and diversity and of native forests, local rural communities can reduce land degradation, conserve water resources, increase family incomes and provide an array of subsistence products that taken together, will increase family incomes, foster improved family nutrition and restore native biodiversity. The Forest Garden Programme, based on the principles of Analogue Forestry and Community-based Ecosystem Management, offers appropriate, sustainable technologies that improve local rural environments and community well-being.

Figure 1
This monoculture pine plantation in the uplands of Sri Lanka looks lush and green from a distance but supports little native biodiversity, provides minimal economic opportunity for local communities, and is not beneficial to soil and water conservation

Introduction

Natural forest lands around the world continue to disappear at the hand of humankind. In addition, among human-dominated landscapes, degraded environments today greatly outnumber those that are sustainably managed. It is thus clear that the future well-being of the earth will depend on environmental restoration of degraded ecosystems on a large scale and development of human-managed ecosystems that are environmentally self-sustaining.

For many years, the world's foresters have engaged in a debate that addressed only one aspect of a forest – its timber. This narrow view has allowed the massive economic discounting of all other forest values. Forests have long been recognised as providing many environmental and cultural benefits which have been ignored in national and international resource management plans, resulting in a higher relative value being placed on wood, creating devastating effects world-wide.

Most of the dialogue on forests demonstrates this narrow vision. From the International Tropical Timber Organisation to the Intergovernmental Forum on Forests, the focus has been the same: "Forests are wood". The rate of extraction, management and trade relations have dominated the discussion. Consequently, the counter-arguments mounted by the environmental non-governmental community have followed this narrow focus – with forest land tenure being the main point of contention. A full vision that addresses the multidimensional and biodiverse reality of forests is required to address the broader goals of the Convention on Biological Diversity.

Science reveals the forest as an ecosystem of tremendous complexity. The trees, while providing the essential framework of a forest, constitute only a fraction of its total biodiversity. By contrast, the forest contains a huge array of organisms that form countless communities with diverse forms and functions. The non-timber biodiversity is what gives a forest most of its identity.

Anyone who has walked through a well-tended twenty-year-old monoculture plantation of *Pinus caribea* and observed its structure and uniformity is strongly resistant to call such a system a "forest". Most of the characteristics that define a forest are absent from that tree farm. Conventional forestry and agricultural systems focus on the creation of monocultures of mainly exotic species. There are many long-term economic and environmental costs of these conventional monoculture systems, especially in rural communities in both developed and developing countries.

The international response to the loss of natural forest ecosystems can be seen in the massive global investment in traditional monoculture forestry. A great majority of these revegetation programmes around the world create farms of trees, not forests. We believe there are better ways of addressing deforestation, and one of these remedies is Analogue Forestry.

Figure 2
Conventional planting of annual cash-crops in hilly uplands of Sri Lanka causes significant soil erosion and often requires chemical inputs to maintain productivity

ANALOGUE FORESTRY

The Analogue Forestry system of environmentally sustainable land management assists rural farmers in developing multi-species plots of both native and exotic crop species that, over time, mature to approximate the structure, ecological functions and environmental integrity found in a natural forest. Using organic principles of production, so that biodiversity will not be compromised, Analogue Forests mature to produce a suite of high-value foods, spices, herbs, and medicinal plants, as well as fuelwood and timber. These Analogue Forests are a logical complement to annual subsistence cropping, with rice, corn, manioc, etc. being farmed in rich bottomland, and the Analogue Forests being created on the erosion-prone hillsides.

Based on the home gardens of Southeast Asia, an Analogue Forest is a tree-dominated farm plot vegetated with a mix of plant species (e.g. nutmeg, mango, cashew, black pepper, coffee, ginger, tea, cardamom, rattan). These Analogue Forests include canopy trees, vines, understorey shrubs and herbs. The choice and placement of each species is determined by its contribution of specific ecological and economic functions. Analogue Forests, with time, provide increased income for the farmer as well as improved habitat for wildlife and a range of native plants. Analogue Forests are thus ideal buffer-zone systems, particularly appropriate to degraded agricultural land adjacent to protected forests. The measurable by-products of a mature Analogue Forest are as follows:

Figure 3
A young Analogue Forest in Sri Lanka exhibits a range of crops, including tea, coconut, banana and other cash and subsistence crops

- **Productive gardens of permanent cash-crops;**
- **Improved individual incomes from agricultural production;**
- **Improved access to fuelwood and local building materials;**
- **Reduced soil erosion;**
- **Improved water and catchment management;**
- **Heightened food security and family health;**
- **Reduced pressure on adjacent forestland;**
- **Increased local biodiversity.**

Counterpart International's Forest Garden Programme employs an enterprise-based, site-stable Analogue Forestry system to recover the natural health of human-impacted rural ecosystems. By restoring the landscape in and around rural communities, the Forest Garden Programme helps to improve the living standards of rural agriculturists and to assist the capacity of local citizenry to renew and sustain their communities in an environmentally sound manner. The Forest Garden Programme constitutes an integrated, multisectoral approach to sustainable development. Specifically, the Programme fosters the introduction of sustainable farming through:

- **A network of seedling nurseries and community seedbanks - locally developed to provide a more diverse range of seedstock and seedlings of useful plant species needed by rural farmers to expand subsistence and cash-crop gardens, woodlots, and local tree shelter belts;**
- **A seeds-and-tools fund - providing the financial leverage to permit rural farmers to purchase the materials necessary to improve their agriculture and land management capabilities;**
- **Technical assistance and training - for the design, planting and maintenance of their Analogue Forests, woodlots, and buffer forests;**
- **Companion rural educational materials - locally adapted educational materials that foster improved farming, farm-based enterprise, community nutrition, family health and management of the local environment;**
- **Certification - which guarantees all products are produced using organic principles and that such products come from systems that benefit rural environments;**
- **Marketing - extension officers, working in partnership with distributors of niche products, foster national, regional and international markets for the products that are produced by Forest Gardeners around the world.**

COMMUNITY-BASED ECOSYSTEM MANAGEMENT

Under the Forest Garden Programme, Analogue Forestry is introduced to rural communities in partnership with an activity known as "Community-based Ecosystem Management" (CEM). This is an array of low-tech methodologies that help local communities better manage their land, water and other natural resources-through landscape planning, watershed conservation,

waste management, environmental education, and local nutrition and health education. The CEM approach integrates participatory landscape management with appropriate indigenous systems of resource husbandry.

BALANCING SUBSISTENCE VERSUS MARKET PRODUCTION

Most poor rural communities today are forced into conventional production systems that both limit economic potential and have strong negative health and nutritional impacts. These production systems are dependent on high levels of pesticides and fertilisers. Low-cost alternative systems are currently available. The Forest Garden system encourages rural farmers to balance subsistence and cash-cropping in ways that rationally respond to market forces. The Forest Garden Programme stresses that subsistence needs must be addressed first and foremost, but also encourages low-input methodologies and diversification of crops. In this system, cash-crop production is based on crop diversification on individual farm plots balanced against economies of scale at the village level, which are in turn fostered by co-operative marketing. For example, in a conventional system, all villagers produce carrots that ripen simultaneously, creating overproduction, low market prices and considerable wastage (from unsold produce that spoils). By contrast, the Forest Garden system encourages the staggered production of 20-30 different crops in a village, with co-operatives marketing the high-value crops (e.g. coffee, cardamom) through improved processing, better grading, and sale at locations where demand is high. This more sophisticated system benefits the farmers through higher returns, but also requires greater planning, more infrastructure, and village-level credit. Thus there is greater need for start-up assistance by outside agencies.

FOREST GARDEN PRODUCT CERTIFICATION AND MARKETING

The Forest Garden Programme includes a certification/marketing component that encourages improved production and processing, creation of economies of scale, value addition to certified products, and access to niche markets. Certified Forest Garden teas, coffees and syrups are being sold in health food stores in Europe and Australia today, though only on a trial basis. The goal of certification is two-fold. First, it guarantees that farmers are using safer production methods that do not harm the community's environment or the farmer or farm workers (through reduced use of toxic chemicals). Second, it guarantees that buyers of a certified product will be receiving a pure product, free of toxic chemicals, and of better quality. Buyers of certified products pay more for their product, but do so with the knowledge that they are getting a better product and that they are making a contribution to the improvement of the global environment. Finally, the forest gardeners who produce Forest Garden Products (FGPs) receive a better return from sale the of their product.

Although the concept of certified FGPs is attractive, the process of making such a system work under real world conditions is a challenge. The two greatest hurdles are, first, market recognition, which usually requires advertisement campaigns (beyond the means of most non-profit groups), and, second, larger scales of production (because of the complexity of developing Analogue Forests, volumes are usually small in the first few years). Lastly, marketing the products internationally requires close co-ordination both with exporters of the product and the commercial wholesalers of the product in the buyer countries. These issues remain barriers to successfully placing FGPs on shelves of health food stores and supermarkets in the developed world.

Figure 4
Creating Analogue Forests requires productive nurseries of seedlings. This nursery in the uplands of Cebu Island, Philippines includes a range of treecrops (a native forest tree species is being examined in the foreground)

COMMUNITY FORESTRY

An Analogue Forest matures to resemble a forest and yet is also a farm plot. Most rural communities in the developing world need Analogue Forests, but also require a system of forestry for re-greening large tracts of degraded and devegetated land that may not be appropriate for Analogue Forestry. We suggest that an important complementary activity to Analogue Forestry is Community Forestry. Whereas Analogue Forestry plots are small, located on the more fertile upland sites, and are individually managed, community forestry is an appropriate land use for less fertile land, community common land, and large tracts of under-utilised 'waste' land. Instead of national forest departments developing industrial pine or eucalyptus monocultures on this land, it is more appropriate for governments to encourage communities to design, plant, and manage for community benefit, multi-species forest plantations that mix native tree species with environmentally appropriate exotic timber species. These can be designed to produce timber, fuelwood, and to encourage restoration of wildlife populations. These, too, can form important buffers protecting remnant tracts of native old growth forest. Using Community Ecosystem Management, village planning groups can plan the strategic placement of

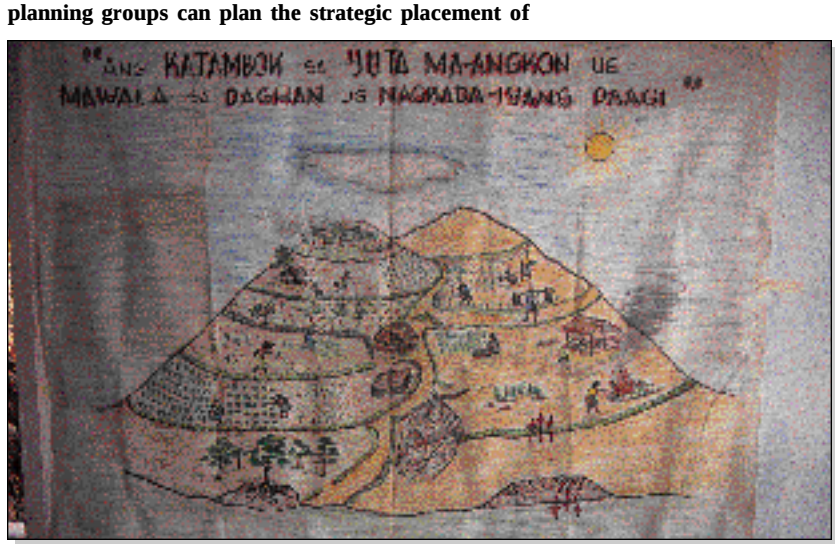

Figure 5
Locally organised mapping and land-use planning are key components of a successful Forest Garden Programme

Analogue Forests, plots of staple crops, Community Forests, and remnant native forest in ways to benefit both the community and the natural environment.

THE FUTURE OF COMMUNITY-BASED AGRICULTURE AND FORESTRY

Using Analogue Forestry, the Forest Garden Programme contributes to reforestation while establishing sustainable farming practices. Future rural communities will boast fewer hectares of cleared and tilled land and more forest cover, through the creation of Analogue Forests and community-managed forests. Multi-species fruit orchards, woodlots, Analogue Forests, and home gardens will be integrated in a greener, lusher, richer rural landscape. The principle of integrating various land uses will guide farmers in planning their production systems. Monoculture forestry will be a thing of the past, and the community benefits from forested land will be greatly enhanced (sustainable extraction of fuelwood, timber, nontimber forest products, medicinals, and game) under the enlightened supervision of community councils. Subsistence production of rice, maize and rootcrops will be accomplished through greener practices, reduced use of toxic chemicals, and will follow more polycultural principles. Local stewardship of land, forest and waters will be the norm and not the exception.

How the tens of thousands of poor rural communities of the world will get to this more enlightened state remains one of the central challenges of development in the next millennium. We believe a first step will be the decentralisation of government departments that oversee agriculture and forests. A second step will be the devolution of tenure over rural agricultural and forest lands to the community. A third step will be greater investment in NGO-led community development initiatives that focus on land use and land-and-water-management. A fourth and final step will be the introduction of complex and integrated farming and forestry systems that are based on multi-cropping and integrated land use, such as Analogue Forestry. We believe this is a viable pathway for the developing world, and that it will become the system of choice in a greener and less regimented agriculture system for the developed world.

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