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ACHIEVING SUSTAINABLE  
AGROFORESTRY DEVELOPMENT

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## ACHIEVING SUSTAINABLE AGROFORESTRY DEVELOPMENT

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## Introduction

Over 16 million people live in the uplands of the Philippines. They earn a living from farming, harvesting minor forest products, and working as laborers; their gross income and standard of living are well below the poverty line. Furthermore, their agricultural and land use practices are resulting in severe soil erosion and loss of forest cover; given these conditions, there is little hope of increasing their agricultural production and incomes or in reversing the negative environmental impacts. Logging operations opened up much of the uplands; and settlers followed, resulting in extensive forests converted to unsustainable agriculture and eventually to a relatively unproductive grass cover. In fact, the situation becomes even more ominous considering the country's expanding population and the increasing number of people migrating to the upland in search of a livelihood. People move to the upland because they can make a living, albeit, a low standard of living.

The best development approach is for the rural economy to create an increased demand for labor by establishing high productive, labor-intensive agriculture or industries which could attract upland farmers to move down from the steep slopes, and then to place these areas under protection and production forest. However, this is a long-term goal; and since progress towards this goal appears quite slow, it is necessary to stabilize and improve current upland agricultural practices in order to minimize the further loss of forest cover and top soil and to raise the farmers' standard of living. One approach aimed at achieving this objective is to work with the upland farmers in promoting sustainable agroforestry or upland development.

This report is written for upland development workers in the Philippines; however, the concepts may also apply to upland development efforts in other developing countries. Accordingly, the authors have presented their ideas on how to promote sustainable agroforestry development both as a guide to development workers and as a way to stimulate discussion in this critical area. The authors draw heavily on the experience of many individuals and organizations, in particular, Mr. William Granert, World Neighbors Project; the Reverend Harold Watson, Mindanao Baptist Rural Life Center; the Department of Environment and Natural Resources; and the U.S. Agency for International Development. This report, first defines sustainable agroforestry development, second, discusses critical elements of sustainability, and, finally, looks at applied techniques for encouraging sustainable agroforestry development.

### I. What is sustainable agroforestry or upland development?

Upland Development is a long-term, dynamic series of risks and changes aimed at improving the livelihood of upland farmers. In essence, sustainable upland development occurs when the upland farmers have the technical and managerial skills to make rational changes which will improve their lives. The farmers and their communities must provide the energy, direction, and resources for development to be sustainable.

Nevertheless, Government agencies, development organizations, donors and others can, and often must, play a crucial role in promoting sustainable

upland development. For example, they can provide the catalyst for starting development activities, and they can support farmers' ongoing efforts to develop their farms and communities. However, development agencies must plan with the farmers from the start on how to strengthen local capability and how to phase out external assistance. There are two reasons for this, first, farmers need to be able to manage change for development to be sustainable, and, second, to have a significant impact on the country's problem, development programs need cost-effective approaches which can be easily replicated.

In general, development agencies work through discrete, multi-year projects aimed at helping a target clientele achieve specific outputs. Thus, this report looks at how a typical development project may promote sustainable agroforestry development.

## II. Promoting Sustainable Agroforestry Development Through Projects

Development projects can encourage sustainability by identifying and addressing critical elements in the various project steps: planning, implementation, phase out, and evaluation. The following section discusses some of these critical elements.

### Planning

Planning a project begins when the farmers and the new staff meet, the staff presents its development approach, and the farmers agree to participate. It is important for the staff to establish their credibility and commitment. Ideally, a respected farmer or local person should introduce the staff. Also farmers from an ongoing agroforestry development project could accompany the new staff to share their experiences with the new farmers. A farmer/lecturer can show a few slides which illustrate positive accomplishments (i.e., tall corn, green contour hedgerows, stall feeding of healthy livestock, and rich soil from composting) and speak of personal experiences. In general, an experienced farmer's credibility will greatly outweigh any deficiencies in public speaking. As part of the introductory session, the staff should help the farmers identify a priority need, i.e., soil conservation or livestock production, and then the staff could demonstrate some activities immediately using locally available materials; however, other activities may require more time for preparation. For soil conservation, the new staff can show the farmers how to construct an A-frame from local materials, find contour lines, plow the lines and plant contour hedgerows. Other activities could include: budding/grafting of fruit trees, constructing/improving a graded trail, building compost pits, or planting livestock fodder.

Project staff must work with the target farmers in designing the project strategy and activities. Thus, the staff should help the farmers identify their priority needs and discuss activities which could address these needs. It is important for the staff to listen to the farmers'

discussion of farm production constraints in order to help plan responsive activities and strategies. The farmers and staff should agree upon a work plan for the year which includes activities and their cost, and which identifies responsibilities of the farmers and staff. A practical tool for planning and budgeting is a blackboard and chalk. The blackboard can clearly show to the community the planned activities and the project's budget. Encouraging the farmers to use the blackboard in planning monthly activities will help them develop planning skills. For example, at an agroforestry project in Jose Panganiban, Camarines Sur, the farmers operate in six work groups of about ten farmers each, and they plan these activities on a monthly basis using the project's blackboard. After two years, the farmers are planning and implementing activities with only limited assistance from the staff.

If the farmers own the project, as in the example above, they will work to make it successful. Most importantly, by planning activities, farmers learn how to manage resources and promote change.

In order to prepare a realistic budget, planners should consider the cost per beneficiary and cost per hectare to ensure that the total cost is reasonable and, if successful, that the project can be replicated. (Attachment A contains an illustrative budget for an agroforestry development project.)

#### Implementation

The project should start only a few activities initially which could show some immediate impact; i.e., community spring, vegetative terracing or graded trails. This will strengthen both farmers' confidence in their ability to change and the project staff's credibility with the farmers. Project staff must live at the site and be willing to work side by side with the farmers in order to demonstrate their sincerity and commitment to development.

"The project will use a participating approach in implementation" is a common axiom which is easier said than done; encouraging farmers to participate in an active and constructive way requires considerable time and effort. Through practical experience, the staff can teach the farmers how to express themselves in public, analyze information, set realistic targets, solve problems and use money wisely. Farmers cannot learn to run an agricultural development project immediately; thus, there is a need for outside assistance. Although this assistance should focus on helping the community manage local development with minimal external assistance, there will always be a need for new ideas in technology, marketing, etc.

In order for farmers to develop their farms, they must have land tenure security. The form of land tenure security may vary from a title to a long-term lease agreement. However, to encourage site development, a long-term lease agreement should specify the responsibilities of each party.

### Phase Out

A viable phase out plan may be the most critical element in promoting sustainable agroforestry development. At the start of project planning, the farmers and staff should agree that the project is a short-term effort aimed at strengthening their capability to manage change; hence, they must agree on the steps required for phasing out the project staff and the project's dependence upon external funds. In order to reduce the role of the staff in implementation, yet continue or expand activities, farmers and staff could identify farmer leaders who have demonstrated the enthusiasm and capability for working with other farmers in planning and managing activities. However, these farmer-leaders require additional training in extension, management, and technical skills, and they should also receive financial compensation for their efforts. Eventually, local income-generating activities should finance their salaries and the project staff should help the farmers in establishing this source of income. Such income-generating activities must produce a high value product, an activity which the farmers can easily manage, and, most importantly, the farmers must agree that a portion of this income will finance the farmer-leaders' salaries and other operating expenses agreed upon by the farmers. Such activities might include: raising of livestock, coffee production, aquaculture, or bamboo production. The staff and the farmer should agree upon the selection criteria and process, and upon the responsibilities and salaries for the farmer-leaders as a means of ensuring the farmers' acceptance of the farmer-leaders.

### Evaluation

The general purpose of an evaluation is to determine if the project has achieved or exceeded its goals and objectives, i.e., establish a farmer-managed agroforestry development process, raise farmer incomes by 20% after four years, and help 100 farmers develop 150 hectares with sound agroforestry techniques. Hence, the project must have baseline data for comparison. Regarding sustainability, the evaluation should look at the cost per hectare developed and cost per farmer-beneficiary; are these reasonable costs? DENR budget: approximately ₱15,000/ha for three year agroforestry projects while a non-government organization, the World Neighbors, plans on ₱10,000/ha. In addition, the evaluation should look at how the project achieved its outputs, their impact in the area, and the role of the farmers and staff in the project. For instance, did farmer incomes increase due to direct project payments (paid labor) or did the increase come from income-generating activities financed by the project (i.e., livestock production)? What were the roles of the farmers and staff in identifying and implementing activities and in managing funds? Have the staff and farmers followed the agreed upon phase out plan? Have the farmers demonstrated the ability to manage change, and can they generate sufficient resources locally to continue the development process? Most likely, four years is not sufficient to achieve the project goals completely, and additional

assistance may be required; thus, the evaluation should consider the need for additional assistance, balancing the need for low-cost, replicable models with the need to maximize project investments.

One approach for conducting the evaluation is to have an individual(s) from outside the project site work with a few local farmers. Thus, the outsider could provide analytical skills and an objective view while the farmers can contribute their detailed understanding of the project and local culture.

### III. Activities for Encouraging Sustainable Agroforestry Development

A key role for the staff is in helping the farmers design and implement activities. Initially, the project should undertake only a few activities which have a high probability of success, produce a highly visible output, and address an immediate need of the farmers. The previous section discussed the critical elements or framework for promoting sustainable agroforestry development; accordingly, the next section looks at a variety of activities and approaches aimed at achieving the overall objective of sustainable agroforestry development. This is an illustrative list designed to help practitioners identify other activities as well.

#### Build on Farmers' Technology

In order to improve their standard of living, upland farmers need to produce a surplus of agricultural crops/livestock as well as high value cash crops. Accordingly, the project should encourage the farmers to adopt changes in existing practices and/or new technologies. However, improvement should build on the farmers' existing level of technology. After analyzing the farmers' current agricultural practices, the staff should recommend improvements or new technologies which the farmers can readily apply. For instance, in a typical upland field of corn, rows are planted up and down the slope, thus, the staff could work with a few interested farmers in establishing contour hedgerows to control soil erosion and provide organic fertilizer. In cases where farmers grow only one or two crops a year, it may be possible to introduce a third crop, planted at the end of the rainy season which can produce a harvestable crop during the dry season, i.e., mung bean. Although it is more difficult to introduce a complete agricultural production system, the staff can modify systems based on the farmers' practices and preferences. For example, the Sloping Agricultural Land Technology (SALT) involves a series of contour hedgerows with agricultural and tree crops grown in between. This system can accommodate a wide range of production techniques within the cropping areas, including single crops, multicrops, and intensive tree crop production.

### Finance Income-Generating Activities

A project could finance the cost of activities which could generate either (1) immediate benefits to the farmers in terms of paid labor or a useful service and/or (2) products which the farmers can use or sell for cash. It is important to stress that these are limited project investments designed for the farmers to manage the products and cash generated by these activities. Furthermore, these activities can provide funds for continuing promising activities and for other priority needs. The farmers and staff should identify and agree upon the activities to be funded by the project and each party's responsibilities. An example of activities which can pay farmers for their labor and produce a useful output including: soil and water conservation structures, local water supply systems, multi-purpose cement pavements, tree planting, and graded trail construction. Income generating activities could include: livestock production, propagation of fruit trees.

Projects should budget funds for these types of activities, i.e., 30% of total budget over three years, since these activities can provide tangible benefits to the farmers and can generate funds to finance development activities after the project ends. Financing priority activities, identified by the farmers, is also an effective way of increasing farmer participation and commitment to development.

### Local Production of Planting Materials

Helping the farmers obtain high quality planting materials -- high yielding fruit cultivars and improved and or new crop varieties -- can be an excellent way to increase agricultural production and farmer incomes. However, the project must also help the farmers propagate high quality planting materials locally in order to maintain a steady supply of planting stock and high production yields. The staff should establish a propagation garden/nursery as a means of protecting the project's investment in seeds, cuttings, and seedlings. Following this, the staff could work with interested farmers in developing backyard nurseries.

The staff should avoid giving high-quality plant materials away at no cost; instead, they should sell the valuable plant materials at actual cost as a means of instilling a value to the seedlings. One objective is to create a local nursery industry which produces seeds/seedlings of high quality trees and agricultural crops for sale to local farmers at a reasonable cost.

### Livestock Dispersal System

Livestock act as a "living bank", offering farmers a source of either cash or food when needed. The farmers, however, require training in the care and raising of livestock, the production of livestock food and marketing. They also need veterinarian services and, of course, high quality and hardy mother stock. The project should initially plan on

providing all of the above as part of a livestock dispersal system. Accordingly, this system would provide for the propagation and distribution of livestock to eligible farmers at no additional cost to the project. Nevertheless, the project should continue to budget for livestock training, veterinarian services, and the purchase of new mother stock.

The main element of a livestock dispersal system is sustainability. For instance, a project may train interested farmers in production techniques and once they've met the distribution criteria, i.e., pen construction and livestock fodder planted, they receive a female animal. This animal remains the property of the project but future offspring are the property of the farmer or a farmers' organization. Sale of these animals can purchase veterinarian services or new mother stock.

### Tool Dispersal Program

Upland farmers use a variety of hand tool in their agricultural practices. Providing new and/or improved hand tools can increase the farmers' productivity and make many laborious tasks easier. Development projects commonly purchase tools as they are a tangible investment, a commodity easily defended and accounted for. However, the selection, purchase and distribution of hand tools requires considerable planning.

The farmers and staff must agree on a tool procurement and distribution program which provides the farmers with an initial set of durable, high-quality tools and which can generate sufficient funds for purchasing additional tools as well as for replacing broken tools. First, the farmers and staff agree on the priority tools for the initial procurement and their source(s). This is an opportunity for the staff to advise the farmers on new or improved tools, i.e., long handled weeder, long handled shovel, mattock and budding knife. Of course there are an endless variety of tool dispersal systems; however, a simple approach is for a farmer to purchase a tool at cost from the project with the funds going into a tool procurement fund, managed by the farmers and staff. In addition, if a farmer owns a tool, he or she is more likely to take care of it.

### Innovations and On-Farm Testing

Encouraging farmers to try new technologies and practices is essential to development, but, the risks must be minimized and the farmers must play a key role in testing the innovations. One approach is to work with a few interested farmers in setting up on-farm research plots (e.g., 10 sq. m.). For example, the staff and farmers can demonstrate (1) the effectiveness of various soil and water conservation techniques; (2) the ability of organic fertilizers, including leguminous plants, to improve the soil; and (3) the performance of various crops and cultivation techniques. This will help identify promising innovations as well as train the farmers in how to change and improve their agricultural practices.

### Work Groups

In the Philippines, farmers readily organize themselves to accomplish specific activities which benefit individuals and/or the overall community. Accordingly, many project activities are labor intensive and require a group effort in order to achieve significant progress quickly. Thus, it is logical to build upon traditional work groups for identifying and implementing activities. However, in developing work groups, the staff may work with one or two interested farmers who, if they believe that the project's technologies are viable, will often convince other farmers to participate.

The incentives for joining a work group varies over time and with individuals. For instance, some farmers may work together to minimize soil erosion, construct graded trails, and plant tree crops with no outside payment. On the other hand, the staff may work with the farmers in planning work group activities with the understanding that the project will provide food, pay for the end product, or supply materials. This is usually an excellent project investment since it motivates farmers to work together, produces a valuable output, and can provide money directly to the farmers. One project paid the farmers P15,000 for constructing two km of graded trails. The farmers then used this money to buy two carabaos and to pay for extending electrical lines to the community. As a general rule, a project should not pay farmers to develop their own farms since this may encourage farmers to be dependent upon outside assistance. Thus, the staff should help farmers develop their farms through work groups without creating a dependence upon project assistance. Consequently, the staff must stress that project funds used to finance work group activities are finite and part of a short-term assistance effort.

Work groups may also be the nucleus for managing long-term development activities. For instance, a project site may have eight work groups of ten farmers each, or a total of eighty farmers, with work groups based on family ties and/or geographical location. Although some work groups may cooperate well with other groups, some groups may prefer to work alone. Thus, a project could establish livestock and tool dispersal programs based on work groups, with different work groups managing their own livestock, tool dispersal, and farmer leader programs.

### Farmer Leaders/Extension Agents

Hardworking and successful farmers can be extremely effective trainers and extension agents for working with other farmers. Such farmer leaders have more farm management experience and credibility with local farmers than most government extension agents. Furthermore, farmer leaders can continue to train farmers and provide technical advice after a Project ends. Accordingly, it is important to look at some key factors in selecting, training and paying farmer leaders.

Project staff and farmers should discuss the concept of farmer leaders, and, if acceptable, they then should agree upon the selection criteria, responsibilities, and salaries. Ideally, the farmers should nominate the lead farmers based on several factors, i.e., industriousness, respect within the community, and willingness to learn and share information. Accordingly, the project should train the farmer leaders in agroforestry technologies and extension methods, including how to hold a farmers' meeting, encourage participation, and make a simple presentation, as well as knowing where to obtain technical assistance and information on new technologies. Trainees should also visit other projects with farmer leaders.

Farmer leaders must practice what they teach; thus, their farms should demonstrate sound soil and water conservation practices and diversified crop production (annual and perennial crops). Accordingly, these farmers can only be away from their farms and working as farmer leaders one or two days a week; hence, they should receive payment sufficient to pay for laborers to work on their farms while they are training other farmers. The World Neighbor's Project recommends that a project hire two laborers per work day of a farmer leader since a farmer-owner will generally work harder on his farm than hired labor. To be sustainable, the local farmers should pay for the farmer leaders, for instance, through income-generating activities. This would ensure that the farmer leaders provide a useful service to the local farmers.

#### IV. Conclusion

Acting as a catalyst, development workers can promote sustainable agroforestry practices. By living and working with upland farmers, listening to farmers' views, and providing limited financial and technical resources at critical times, development workers can help upland farmers improve their lives and learn how to manage change. The challenge of upland development is tremendous; but the potential benefits and opportunities are even greater.