

PN-ACB-435

National Program for Agroforestry in Haiti

Volume One:

- ***Project Identification Document***
- ***Project Paper***

DESFIL

Development Strategies for Fragile Lands

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Development Alternatives, Inc. • Tropical Research and Development, Inc.
in association with: Earth Satellite Corporation • Social Consultants International

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FOREWORD

Development Strategies for Fragile Lands (DESFIL) is a centrally funded project of the Bureaus for Science and Technology and Latin America and the Caribbean, United States Agency for International Development. DESFIL assists those Bureaus in their regional programs to arrest the degradation of natural resources while encouraging the increased production of food and fuel for income generation. Strategic environmental and natural resource planning, including project design, is perhaps the most fundamental purpose of the DESFIL project.

Volume One of this report comprises edited versions of the draft Project Identification Document (PID) and the Project Paper (PP), both prepared by DESFIL at the request of USAID/Haiti. David Gow was Team Leader for both studies. The Project Paper synthesizes the contributions of the whole design team: Laura Bergner, Editor, Development Alternatives, Inc. (DAI); LeRoy Duvall, Agroforester, USDA Forest Service/USAID Forestry Support Program; Frans Van Eysinga, Economist, DAI; Raul Hinojosa, Forage/Livestock, Bureau for Latin America and the Caribbean, A.I.D.; Kenneth Koehn, Institutions, DAI; Ira Lowenthal, Anthropologist, DAI; Jack de Mooy, Agronomist, DAI; June Magnaldi, Training, Social Consultants International; Richard Pellek, Forester, USAID/Haiti; Richard Scott, Extension, Social Consultants International; and James Talbot, Environment, ERM, Inc.

The PID and PP trace the development of the USAID/Haiti National Program for Agroforestry, an uninterrupted follow-on to the highly successful Agroforestry Outreach Project, which was authorized in September 1981 and ended in December 1989. In and of themselves, these documents are of primary interest to project design specialists and managers because of the way in which the social sciences are integrated with agriculture and forestry, to arrive at a clear understanding of the role of trees in the local economy.

As part of the PP design process, several supporting technical documents were prepared. Four of these have been selected and edited for inclusion in Volume Two. The documents in both volumes were written in 1988/89.

Volume Two contains technical reports on four key topics: social soundness, Ira Lowenthal; agroforestry, LeRoy Duvall; environmental assessment, James Talbot; and economic and financial analyses, Frans Van Eysinga. Each report examines the project from a different viewpoint, integrating the approaches used and lessons learned from the preceding eight years and refining the main components to build upon the previous achievements, which benefited 200,000 peasant farmers.

The Social Soundness Analysis is a masterfully written model of its genre, clearly pinpointing the constraints (for example, capital investment and nurseries) and opportunities (such as land ownership and fuelwood markets) for agroforestry interventions. It is hard to imagine any project failing for technical reasons after receiving such a penetrating analysis.

In addition to delving into the technical details of tree nurseries and on-farm tree growing, the Agroforestry Component report makes the strong recommendation to retain flexibility — which was so important in the first phase — in the activities and direction of grantee programs and to continue the production of seedlings for distribution to farmers.

The primary concern of the Environmental Assessment is pesticide use, beginning with nursery operations and extending to the management of trees on the farm. Positive environmental effects of tree planting are noted, including reduction in soil erosion, cutting of wild trees, and grazing pressure.

Project costs and benefits are addressed in the Economic and Financial Analyses. Calculations make clear that producing trees is an attractive enterprise for farmers. The report concludes that from an economic point of view the project is fully justified.

All too often, technical reports such as these are difficult to locate or, if located, to access, thereby hindering technicians, development specialists, and academicians attempting to understand the detailed planning underlying a project. This opportunity to provide full documentation is not to be missed. When the history of 20th-century agroforestry is written, the Agroforestry Outreach Project by itself will unquestionably rank as one of the most important achievements; its accomplishments and the lessons learned significantly enhance the chances of success for the follow-on National Program for Agroforestry.

DESFIL wishes to acknowledge the guidance, assistance, and encouragement of USAID/Haiti personnel in the design of the National Program for Agroforestry in Haiti.

Dennis Johnson
DESFIL Program Coordinator

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LIST OF ACRONYMS

ACTEC	Belgian Association for Cultural, Educational, and Technical Cooperation
ADO	Agriculture Development Office
A.I.D.	U.S. Agency for International Development
AOP	Agroforestry Outreach Project
ARD	Associates in Rural Development
CA	Cooperative Agreement
CAFTCEN	CARE Agroforestry Training Center
CATIE	Tropical Agriculture Research and Training Center (Costa Rica)
CDSS	Country Development Strategy Statement
CICP	Consortium for International Crop Protection
CIDA	Canadian International Development Association
CRWC	Christian Reformed World Council
DAI	Development Alternatives, Inc.
DESFIL	Development Strategies for Fragile Lands
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FA	Farm Agent
FAC	Fonde d'Aide et de Cooperation (France)
FAO	Food and Agriculture Organization of the United Nations
FRLC	Federal Letter of Credit
FSN	Foreign Service National
FY	Fiscal Year
GOH	Government of Haiti
IPM	Integrated Pest Management
IRD	Institute for Rural Development
IRG	International Resources Group, Ltd.
IRR	Internal Rate of Return
LAC	Latin America and the Caribbean
LD50	Lethal dose of a pesticide required to kill 50 percent of test organisms
LOP	Life-of-Project
LRD	Local Resources Development
NGO	Nongovernmental Organization
NPA	National Program for Agroforestry
ODH	Operation Double Harvest
PADF	Pan American Development Foundation
PID	Project Identification Document
PP	Project Paper
PSC	Personal Service Contract
PVO	Private Voluntary Organization
RFP	Request for Proposals
RSC	Research Steering Committee
SECID	Southeast Consortium for International Development
STAB	Technical Secretariat for Watershed Management (French acronym)
TCU	Technical Coordinating Unit
TDY	Temporary Duty
TWMP	Targeted Watershed Management Project

**UNICORS
WHO**

**Union of South Region Cooperatives
World Health Organization**

**National Program for Agroforestry in Haiti:
Project Identification Document**

by

**David Gow
Development Alternatives, Inc.**

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SECTION ONE

PROGRAM FACTORS

CONFORMITY WITH HAITIAN NATIONAL STRATEGY/PROGRAMS

The thwarted Haitian elections of November 1987 resulted in U.S. congressional mandates that bar any U.S. Agency for International Development bilateral activities with the Government of Haiti (GOH). The U.S. government, as well as other donors, did not recognize the subsequent elections of January 1988 as being fully free and open. The ban on U.S. bilateral assistance will continue until such time that the Haitian government institutes the provisions of what is now referred to as the old Haitian constitution. This suspension of assistance is directed at the government — not the people — of Haiti, and as such does not include a ban on humanitarian assistance. A broad definition of humanitarian aid has been adopted, which permits continued assistance through nongovernmental organizations (NGOs).

There will not be any direct U.S. bilateral aid under the National Program for Agroforestry (NPA). However, the NPA will still provide indirect support to the GOH's goals of improved management in both the agricultural and natural resource sectors. At this time, the GOH has no clearly defined policy or strategy concerning reforestation, hillside agriculture, or watershed management. However, this project does reflect general GOH concerns about deforestation and hillside agriculture in Haiti.

RELATIONSHIP TO THE CDSS AND THE 1989/1990 ACTION PLAN

The 1984 Country Development Strategy Statement (CDSS) called for a development strategy that included a comprehensive restructuring of the rural and agricultural sectors. The decision was made to include natural resource management and conservation as part of that strategy. Subsequent action plans took into account the decline in per capita productivity and income for rural Haiti, the rapid deterioration of the natural resource base, and threats to the agricultural areas in the plains from hillside erosion, in the form of siltation, flash flooding, and damage to irrigation systems. The U.S. Agency for International Development (USAID) concluded that agricultural development efforts in Haiti had to focus on what constitutes the bulk of Haitian agriculture — hillside farming.

This awareness gave rise to the hillside strategy, with its objectives of increasing farm income through changing production patterns; reducing rural to urban migration; and supporting small farmer agricultural production units, the majority of which are located on hillsides. The hillside strategy was, in fact, a strategy led by natural resource conservation. The constraints to be addressed by the strategy included:

- The problem of soil erosion and the need to conserve agricultural productivity in the years to come;
- Identification of low-level technologies that would be appropriate for rural Haiti;

- The weak institutional base in rural areas, including both indigenous NGOs and the GOH; and
- A relative lack of knowledge and experience in dealing with the complex, regionally varied farming systems found in Haiti.

The NPA will directly support three general areas of emphasis of the FY 1989/1990 Action Plan, as well as related Latin America and the Caribbean (LAC) Bureau objectives. These are to:

- **Increase sustainable agricultural production.** The soil conservation, soil improvement, and moisture-retention benefits of nitrogen-fixing trees and shrubs in hedgerows and fields, increased organic matter in the soil, contour farming, and other NPA interventions will directly respond to this priority. This incorporates LAC objective 1: to increase agricultural production; and LAC objective 2: to preserve and manage natural resources;
- **Strengthen the private sector.** The cash returns from increased crop yields, increased supplies of marketable wood products, and related benefits address this concern. This incorporates LAC objective 2: to strengthen the private sector; and
- **Strengthen human resources.** The training to be provided to farmers, NGOs, and the staff of implementing institutions addresses this priority. This incorporates LAC objective 12: to improve educational opportunities; and LAC objective 13: to increase participant training.

In addition, the proposed NPA will directly respond to the 1988 *Policy Paper on the Environment and Natural Resources* by, first, providing support for the development of agroforestry as an alternative to unsustainable patterns of intensive agriculture; and, second, supporting extensive "tree planting to help meet work, energy, food, fodder, crop enhancement and soil protection needs, and to replenish the productivity of both degraded areas and agricultural lands."

In assessing constraints, the 1987 *Agriculture Sector Assessment* states unequivocally that: "Soil erosion is the obvious and indisputable major constraint to sustainable crop production in hillside farming in Haiti." Soil and water are the two most basic factors of production. The thrust of USAID's current and planned project activities is to develop and extend improved agricultural production systems for application on Haiti's hillsides. These improved production systems are based on the increased integration of perennial crops of various kinds — including trees, shrubs, and grasses — into present farming systems.

Appropriate perennial vegetation, properly deployed on hillside plots, helps maintain soil fertility, minimizes soil erosion, assures maximum infiltration of rainfall, and generally preserves the upper watersheds, thereby protecting downstream areas from destruction by excessive runoff and siltation. On-site benefits extend to yield improvements of intercropped annual food and cash crops. Moreover, the perennials being promoted are themselves harvested periodically, providing fuelwood, charcoal, lumber, fodder, green manure, fruit, and other industrial crops, such as cacao and coffee, thereby increasing productivity and income.

RELATIONSHIP TO HOST COUNTRY AND OTHER DONOR PROGRAMS

The NPA will have a complementary relationship — conceptual rather than institutional — with other programs. The National Forestry Project being implemented by the GOH is now in its fifth and final year. The GOH has provided approximately 10 percent of the funding, and the balance has come from the Canadians, the French, and the World Bank. The focus has been on creating the necessary human resources to undertake forestry activities in Haiti. Consequently, there has been a heavy emphasis on the training of forestry technicians. There have been three substantive components: an energy component with the planting of 500 hectares of trees on state lands; a research component that has focused on species and provenance trials, with some agroforestry and demonstration sites; and a management component of 29,000 hectares of pine forest for energy needs.

At the present time, a follow-on project is being designed with assistance from the World Bank, which will build on these experiences, but with a heavy emphasis on classical reforestation of state lands. Interestingly enough, however, the project proposes to incorporate an NGO component, modelled very much along the lines of the Agroforestry Outreach Project (AOP) experience.

The Food and Agriculture Organization (FAO) has undertaken reforestation activities in the north but its most important contribution has been the creation of a training school at Lambi, in which farmers are given instruction in reforestation and soil conservation. AOP staff and farmers participated in these training sessions.

Finally, CIDA, the Canadian aid agency, is in the process of financing a small agroforestry project outside Jacmel — also modelled on the AOP experience. This project will produce and distribute 3 million seedlings and will be implemented by NGOs, both international and local.

SECTION TWO

PROGRAM DESCRIPTION

PERCEIVED PROBLEM

With a surface area of 2.8 million hectares, Haiti covers the western third of the mountainous island of Hispaniola. Originally heavily forested, rapid population growth — with resulting land pressures and deforestation — has reduced the forest cover to an estimated 185,000 hectares, or 6.7 percent of the total land area. Even if open degraded forest and savanna are included, the figure only increases to 9.2 percent. By 1978, 12 of Haiti's 30 major watersheds were completely deforested. The indications are that unless this uncontrolled deforestation is checked, the country could be completely deforested by the turn of the century.

An estimated 67 percent of Haiti's land area is mountainous and 60 percent has slopes of 20 percent or greater. According to the 1987 *Haiti Country Environmental Profile*, only 29 percent of the land area comprises slopes of less than 10 percent. Recent estimates place the total population at somewhere between six and seven million. Over 80 percent of the population is rural, deriving their livelihood mainly from the marginal agricultural sector. The poorest country in the western hemisphere, per capita GNP in Haiti has been estimated at slightly more than \$300. This falls to \$50 per capita in rural areas. The World Bank and A.I.D. have estimated that 78 percent of the rural population live at or below the poverty level. While most Haitian farmers are land owners, most individual land holdings consist of several small parcels, often scattered over a large area, with extreme variation in quality. Agricultural production units operated by individual farmers consist of three to seven plots, with 71 percent of all units having a total area of less than 1.3 hectares.

The perceived problem, then, is increased human deprivation caused, most immediately, by environmental degradation and depletion of the productive natural resource base — a consequence of demographic growth, increasing pressure on the land, few off-farm employment opportunities, and dedicated neglect on the part of the GOH.

Although the provision of services in agriculture and soil conservation, forestry and reforestation, tree nursery establishment, and seedling production is traditionally a function of national governments, this has not been the case in Haiti. While the Ministry of Agriculture, Natural Resources, and Rural Development (MARNDR) does have nominal responsibility for providing these services, its active involvement in rural Haiti has been sporadic and superficial. Prior to the AOP (number 521-0122), the vast majority of the limited activities that were undertaken in the agricultural and natural resource sectors were initiated by NGOs. The GOH has had neither the means nor the initiative to undertake many such activities in rural Haiti.

The proposed NPA will address this problem by building on the experiences and lessons learned from the ongoing, successful AOP. The NPA will address the key constraints of environmental degradation and GOH lack of interest through:

- The development and dissemination of sustainable technologies;
- The strengthening of local institutions;
- The training of Haitians — from farmers to agronomists; and
- Engaging in policy dialogue with the GOH — both formally and informally — when the occasion presents itself.

PROJECT GOAL AND PURPOSE

The goal of the NPA is to maximize the productive potential of Haitian hillside agriculture by reducing the ongoing degradation of the country's natural resource base through sustainable land use interventions.

The primary purpose of the project is to achieve sustainable increases in on-farm productivity and farmer income through the integration of appropriate soil-conservation measures and trees and shrubs, grasses, and other plant materials that will enhance soil fertility, into existing farming systems.

A secondary purpose is to continue the institutionalization of farmer-led demand for such appropriate land use interventions. This proceeds on the assumption — shared by both Haitians and expatriates working on the AOP — that the NGO community should **not** function as a permanent, long-term shadow government, responsible for providing many of the services normally provided by a national government, in such areas as health, education, reforestation, and roads. What NGOs can do, and what the AOP is in the process of demonstrating, is to create a demand for such services, which eventually the GOH will have to satisfy. This requires a long-term commitment by both USAID and the implementing NGOs to establish an effective demand in the rural population, and to give the GOH time to accept its responsibilities and to act accordingly.

Specific objectives include the generation and dissemination of appropriate technological packages in agroforestry and soil and water conservation; production and supply of tree seedlings, extension materials, and other inputs; decreases in the rate of soil erosion; improvements in soil quality; and increased awareness and concern for the rural environment on the part of the GOH and the citizens of Haiti.

EXPECTED ACHIEVEMENTS/ACCOMPLISHMENTS

By the project assistance completion date (PACD) in 1995, project outputs will include the following:

- An increase in the number of hillside farmers planting trees;
- An increase in the number of hillside farmers who are effectively managing their trees, shrubs, and grasses;

- An increase in the number of farmers who are effectively implementing a variety of agroforestry techniques through the introduction of new, multipurpose trees and forage species, and new provenances of currently planted species;
- An increase in the volume and variety of wood products produced by hillside farmers;
- Strengthened Haitian capability in agroforestry through the intensive training of agronomists, agricultural technicians, and extension agents;
- An increase in the number of community-level, potentially sustainable nurseries using appropriate technological methods for the production of seedlings;
- A continued improvement in the local genetic resource base for tropical forest species through the production of seed by the seed orchards established under the AOP;
- The effective operation of the central seed processing and storage facility established by the AOP in the greater Port-au-Prince area;
- Strengthened institutional capability of selected NGOs through the provision of resources, training, and technical assistance;
- Establishment of an effective environmental education program in selected schools; and
- Strengthened applied research capability of the grantee institutions to assess and continuously upgrade program effectiveness through the provision of technical assistance and intensive on-the-job-training. Special emphasis will be placed on the generation, field testing, and dissemination of a variety of appropriate agroforestry techniques with demonstrated impact on soil erosion control, soil fertility, productivity, and income.

PROJECT OUTLINE AND HOW IT WILL WORK

Rather than institute significant changes, new directions, or sweeping new initiatives, the NPA will refine and build upon the successful interventions that have been developed under the AOP. The project will also continue the development and promulgation of new, but closely related, interventions and activities that will advance the project purpose of increasing on-farm productivity and farmer income through the integration into present farming systems of improved soil-conservation measures and appropriate agroforestry techniques, using suitable tree, shrub, and grass species.

The primary purpose of the AOP has been to motivate the hillside farmers of Haiti to plant and maintain trees, by following a strategy which views the harvesting of wood as an acceptable, positive type of economic behavior. The project explicitly acknowledges the rights of farmers to expect reasonable, medium-term returns from their economic activities. The basic argument is that wood can be treated as a cash crop — a product which the farmer has a right to plant and harvest in the same fashion that he plants and harvests corn, millet, sugar cane, and other traditional crops.

The two outreach grantees work with small farmers in the Northwest and throughout the rest of the country. They were charged with establishing outreach programs that provide small farmers with

extension services that promote and support the planting of substantial numbers of trees and other environmentally sound land-use practices. The sine qua non of both outreach programs is that the trees are actually managed by the farmers themselves, who are encouraged to make their own, informed decisions about such matters as where to plant and what to harvest. The benefits from trees planted accrue directly to the farmers.

The grantee in the Northwest operates its own nursery program and extension network, based on four regional teams headed by Haitian agronomists and staffed by agricultural technicians, animators, monitors, and nursery workers. This grantee has 300 people on its payroll. The other grantee, in contrast, works primarily through local intermediary organizations, assisting them to establish nurseries and extension programs of their own. Five regional agroforestry teams, two of which are headed by Haitians, provide grants, training, and technical assistance to local NGOs interested in offering agroforestry services to their constituents. This grantee has 800 people on its payroll. To date, the AOP has distributed 40 million trees, 50 percent of which have survived, to 150,000 small farmers, 30 percent of whom are estimated to be repeaters.

The NPA will continue the tree production and distribution, introduce tree management techniques, and intensify agroforestry activities. By the end of 1995, these will have been refined and institutionalized so that there will be noticeable improvements in production, income, and the productive natural resource base. Furthermore, more of the responsibility for implementation will be assumed by the NGOs, which will be less dependent on grantee financial support. Finally, the strategy followed, the technology generated, and the results achieved will affect the way in which the donors and the GOH tackle the problems of hillside agriculture and sustainable natural resource management in Haiti.

The five-year project will consist of five components. The first is nursery production, the linchpin which holds the other components together, by producing the necessary plant material. This is reinforced by the second component, seed and germplasm improvement, which will strengthen the NPA's capacity to supply the nurseries with high-quality seed and plant material. The third component — applied research, monitoring, and technology generation — will enhance the impact of the NPA, particularly in terms of the technologies to be disseminated. This will be particularly important in hedgerow technology as the NPA will be right at the cutting edge of what is practically possible within a project context. The remaining components — extension and training — are focused on disseminating these materials and technologies to hillside farmers and improving and strengthening their capability to exploit them to the full. Each of these will be described below.

Nursery Production

The NPA will require a regular, seasonal supply of large numbers of seedlings. Initially, nursery production will be maintained at the current levels of approximately eight million seedlings per year, in order to meet the demand that the NPA cannot possibly hope to meet in the near term, given the resources at its disposal. The bulk of nursery production will come from approximately 50 large-scale nurseries, established under the AOP, which use small-container systems for the production of hardwood and fruit tree species. The fruit tree component will continue to be a relatively small proportion of the total production, presently about 200,000 trees per year. Efforts, begun under the AOP, will continue for identifying and producing other suitable fruit tree species that will permit even greater diversification of the fruit trees produced under the NPA. The objective of the fruit tree component is not to develop fruit tree orchards, but rather to address individual household needs.

The present system of seedling production will continue. In the case of one grantee, this is straightforward since it controls and manages its own nurseries. In the case of the other, the system is more complex. The grantee signs a seedling purchase agreement with an NGO interested in establishing and operating a small container nursery. The grantee provides credit in the form of material, equipment, and working capital, as well as technical assistance and training in nursery management. In return, the NGO provides the site, nursery personnel, and management oversight. Each subsequent season, the grantee purchases a specified number of seedlings produced in the NGO nursery at the fixed price of eight cents per seedling, subject to quality control by the purchaser. Criteria for quality control of such production must be established and enforced. Part of the proceeds from the sale are applied to the outstanding NGO debt — usually paid off in two to three years — and the balance is used by the NGO for its own activities.

Nursery production will include fruit trees, forest trees and shrubs, grasses, and other non-woody vegetation. As centers of production and distribution, the nurseries should be able to supply the whole spectrum of vegetative materials that are used by the project. Production of grass seed requires a lot of space. Hence, only a limited amount of grass seed will be grown in the nurseries — more for demonstration than production. Direct seeding of grasses, ramie, and velvet beans should be targeted for demonstration areas, which can also be used for seed multiplication and thereby provide a dispersed network of production points.

The species to be produced will be largely determined by farmer demand, within the limits of existing nursery technology, and will differ between regions. The NPA will attempt to be responsive to these demands, though the evidence to date strongly indicates that there is "no quick fix through species mix." It is anticipated that a broader array of species will be produced under the project as plant propagation techniques continue to become more refined and successful, and as the demand for forage crops, trees, shrubs and non-woody species, agroforestry species, and other forest tree species increases.

To refine nursery production techniques on new species will come at the cost of lost production and nursery space until such time as these methods are refined. Thought should be given to devoting a substantial part of selected nurseries to refining these techniques.

The seedling production from the main nurseries will be supplemented by smaller, low-technology, community-level nurseries, which one grantee is already establishing under the AOP in the Northwest. Seedling production in these nurseries will rely upon plastic bag technology and locally available materials wherever possible. The reason for this low-technology approach is to avoid the high cost of imported, high-technology materials. Such an approach may make these nurseries more sustainable should outside funding be eliminated in the future.

An earlier program with community nurseries was canceled after project staff concluded that people viewed such nurseries as an opportunity to earn money, and not as a much needed community service. The new community nursery program is a recent initiative, and has yet to be evaluated on its potential for success or failure. The NPA design should be flexible enough to allow the grantees to initiate similar initiatives on their own. During the design phase, the project paper (PP) team will carefully evaluate this earlier experience.

As part of the environmental education program, small-scale school tree nurseries and demonstration sites will be established. Seedlings produced in the school nurseries can be planted in school woodlots and used to establish demonstration sites at the schools. Students will be encouraged to attempt to raise seedlings at home as well, using the techniques learned at school.

In addition to nursery production at various levels of technological sophistication, the potential role of direct seeding, cuttings, stumps, and other propagative techniques will be investigated by the new project. The future success of direct seeding will require continuing development of the necessary extension packages, and cultural details for each species — efforts already begun under the AOP. Production levels in these nurseries are anticipated to be from 1,000 to 3,000 seedlings per season.

Bare-root seedlings pose special problems in terms of more difficult cultural requirements, such as root pruning and lifting, and the very real hazards of drying of roots if exposed to direct sunlight or drying winds during transport — a serious threat to post-planting survival. Bare-rooting trials should be successfully completed before this technology is disseminated. Even if successful, bare-root culture may be too difficult for many nursery personnel to learn. Success is likely to be species-specific. Direct seeding can be a straightforward, practical option, with the proper species. For the appropriate species, stumps offer relatively easy-to-transport and sturdy outplanting materials. Direct seeding and stumps should be investigated and, where appropriate, supported.

Seed and Germplasm Improvement and Multiplication

The AOP's nascent seed and germplasm improvement and multiplication program will continue and be expanded under the NPA. This activity will be responsible for coordinating and handling all international seed procurements, quality control and management of local seed collection, the establishment and maintenance of seed orchards, vegetative propagation of selected species, and the location and identification of superior trees and stands of indigenous Haitian species of value for NPA activities. The efforts of this program will be directed first at serving the needs of the grantees and local NGOs, while also examining how the benefits of this and other components of the NPA can complement the reforestation and related forestry efforts of other donors and the GOH.

The PP team will address the following questions:

- How will this component be integrated into the ongoing nursery and outreach programs?
- Administratively, where should this component be located? With an outside contractor as is presently the case under the AOP? Within a Title XII institutional arrangement? Or should it be folded in with one of the other project components? and
- What is the income-generating potential of this component? What would be the associated costs and feasibility of developing this activity to the point where it would be able to produce adequate quantities of seed of known provenance and quality for various species used by the NPA, other reforestation efforts, and export to the international market?

Applied Research, Monitoring, and Technology Generation

A multidisciplinary team will continuously monitor and assess the various components of the NPA through an ongoing applied research program. This program will be oriented primarily toward measuring, enhancing, and expanding on-farm impact of the NPA, in terms of productivity, income, and soil and water conservation. The research component of the AOP has experienced significant implementation problems, a result of misunderstandings about the proper role of adaptive and applied research in an ongoing implementation project. As a result of the experiences with the first Title XII

contractor and the fact that this component is presently being implemented by an academic institution with no prior experience in either Haiti or agroforestry, considerable reservations have been expressed by project personnel concerning what can be realistically expected from this effort.

The performance of the present research team should be carefully evaluated during the process of project design. The PP team will address how, under the NPA, this component should be developed, strengthened, managed, and where it will be housed. Specific questions to be addressed include:

- How can the information needs of the NPA grantees, the NGOs, and USAID/Haiti best be identified and addressed?
- What is the most effective way — in terms of administration and cost — to structure this component? Do viable alternatives to a Title XII institutional arrangement exist? and
- How can/should this component be used to improve the overall management of the NPA?

Two major drawbacks to the present arrangement are the high cost, relative to the other components, and the lack of provision for any specific on-the-job training and knowledge transfer for Haitian technical staff. A possible alternative would be to simplify the present institutional arrangement by contracting an agroforester/research manager and providing him/her with sufficient funds to contract the necessary short-term technical expertise. The grantee research coordinators would be provided with sufficient funds to hire a small research staff and to cover basic research expenses.

Outreach, Extension, and Environmental Education

The outreach and extension program will continue to be refined and expanded to include both adults and children. Adult extension efforts will build upon the existing basic extension activities and seedling distribution program developed under the AOP. The technical extension packages within the adult extension program will be refined to better reflect regional environmental and social differences, the different levels of experience and sophistication of the individual participants, and the content of the different technical interventions being offered. These packages will be developed under the guidance of the grantee training officers, working in close collaboration with their respective regional directors.

Farmers with little or no prior tree planting experience will continue to need the basic, intensive extension and follow-up package developed under the AOP. Improved technical packages will be developed to better address the needs of the more sophisticated participants, and especially the needs of former and repeat participants. Of special concern are those farmers who planted during the early years of the AOP, and whose trees have matured and now require different, more sophisticated management strategies for maximum benefit. Extension efforts for these individuals should include a greater emphasis on the management requirements and strategies for their existing trees and hedges, including proper pruning and thinning techniques, harvesting schedules and conversion techniques, and coppice management.

A more integrated agroforestry approach will gradually be developed for those farmers who have been involved with the AOP or the NPA for several seasons. The purpose of this effort will be to promote activities that go beyond simple tree planting and hedgerow schemes to include, among others, systematic efforts to lead participants towards accepting and undertaking more difficult interventions, such as contour farming; incorporation of grass and shrub antierosion bands for soil conservation; soil

improvement; fodder production needs; utilization of green manures in agricultural systems; improved livestock management; and other interventions that will be developed or further refined in cooperation with the applied researchers. It is anticipated that these long-term participants will have developed a certain level of confidence in the project personnel, which, if capitalized upon, would allow for a more directed extension approach — possible only with intensive training and upgrading of the better extension agents. Some of this has already begun.

Will different extension agents have to be trained to work with different groups and will they necessarily follow the same extension methodology? The argument has been made that if the technologies disseminated by the NPA are to stick, then they must be easily comprehensible to the paratechnician — farmer-cum-extension agent — who will disseminate them. This would argue for training project extension agents who can deal with all three groups. In addition, it implies that such paratechnicians — given their increased responsibility — will be better employed working full time. This is already the case with one grantee, which is already proposing a careful selection of the better paratechnicians for these more intensive activities. With the other grantee, the extension staff work on a part-time basis, performing the same five tasks, year in and year out.

By the end of 1988, the project will have worked with approximately 100,000 farmers. To date, one grantee has pursued a geographically dispersed extension approach, while the other has pursued a more focused one. The dispersed approach offers the advantage of exposing more people to the project activities, but requires a greater time commitment on the part of the extension staff. In the short run, fewer people are directly affected by the project. A focused approach offers the advantage of enabling extension personnel to concentrate their efforts more efficiently in a relatively small area.

Should future extension efforts be directed towards a more focused, concentrated approach? What are the cost implications if a change in extension methodology were attempted? How would the project deal with those farmers "abandoned" in the process of consolidation? If unchanged, would the dispersed approach eventually evolve into a more concentrated strategy as more people begin participating in project activities because they see their neighbors benefiting from project participation? What are the implications for NPA if it wishes to pursue a broader strategy within selected watersheds? How will the NPA go about locating these 100,000 farmers in order to provide them with training in tree management?

Although realizing that there is no one, single blueprinted approach to extension in Haiti and that much of the AOP's strength lies in its flexibility and diversity, there is strong evidence to indicate that a somewhat more rational, concentrated use of project resources and personnel will be more effective in the long run.

Also to be considered is the role of local groups in the implementation of NPA activities. Both grantees now work with local groups of various sorts and structures. While these groups are often informal and loosely structured, their involvement can greatly facilitate extension efforts while cutting down on overall costs. A one-on-one extension service is a luxury that the NPA can ill afford.

As it is under the AOP, the continuous development and refinement of extension materials will be an ongoing activity. Simple manuals, booklets, technical sheets, and other materials will be developed in Creole, for distribution by project staff, nursery personnel, and school teachers.

Children will be included through an expanded environmental education program in rural schools, an activity that was initiated under the AOP. This program will work to develop increased environmental awareness among students and their teachers. This will be encouraged through the development and

incorporation of environmental and conservation education course materials into the curriculum, and the establishment of small-scale nurseries and demonstration sites. The environmental education program will provide all of the materials needed for this effort.

Activities will also include training in the use of direct seeding, cuttings, and other simple techniques, when suitable species are to be grown. An important activity in the conservation education program will be a "training of trainers" component for teachers. This will include curriculum development, themes dealing with ecology and the environment, and techniques for motivating students.

The school nurseries will serve as important educational tools, both for raising the students' environmental awareness and for teaching them simple nursery production, tree planting, tree maintenance, and agroforestry techniques. This school program will supplement the adult education efforts and, more importantly, will raise the environmental awareness of the children — future farmers and rural decision makers. In more practical terms, it must be remembered that children are responsible for tending livestock — the number one destroyer of young trees. Initially, the program will focus on NGO and church-sponsored schools. However, an effort will also be made to work with schools in the national school system.

Short- and Long-Term Training

Training will consist of two components: long-term training for selected members of the grantees' Haitian technical staff and short-term training for the Haitian technical staff, NGO staffs, teachers, students, farmers, and local groups.

During the five-year life of the NPA, up to 10 Haitian NPA technicians will receive training at the MA degree level. The trainees will be selected from the grantees' technical staff. One person will be trained at the Masters level in seed technology and tree improvement. The remaining programs will be reserved for advanced training in agroforestry, agricultural extension, environmental education, and rural sociology. Long-term training will take place at suitable institutions in the United States and international institutions in the region.

Short-term training will be provided for a variety of subjects, using a combination of informal and formal sessions, short courses, seminars, and workshops. The short-term training programs will make use of appropriate opportunities in Haiti and also bring in special trainers or specialists to present specific programs. Opportunities will also be provided for training at appropriate institutions outside Haiti, such as the Tropical Agricultural Research and Training Center (CATIE) in Costa Rica, the University of Florida at Gainesville, and perhaps the Rodale Institute in Emmaus, Pennsylvania. Project staff will have to contact these institutions, as well as identify and contact other appropriate institutions, to determine the types of short-term training opportunities available, and their suitability to overall NPA objectives.

Project staff will receive extensive practical and theoretical training in the advanced extension packages developed for the NPA, including improved agricultural techniques, soil and water conservation, low-input organic and biointensive gardening, hedgerow and woodlot management, pruning and thinning, coppice management, and harvest cycles.

Farmers who have already planted trees will receive training in various aspects of improved management of their agricultural lands, including soil erosion control techniques, hedgerow and green

manuring technologies, tree and hedgerow management, low-input organic and bio-intensive gardening, and other topics as appropriate. Farmers planting for the first time will continue to receive intensive, elementary tree establishment and maintenance training, after the AOP model. Repeat planters — together with nonrepeating planters still interested in NPA activities — will receive more superficial establishment and maintenance training to reflect their more advanced skills in this area, but will receive more intensive training on tree and coppice management, to reflect their changing needs.

Selected NGOs will also receive training to strengthen both their technical and managerial capabilities. Specific types of assistance and training will be determined in consultation with NGOs, farmers, and the grantees. Possible topics should include the following:

- Group organization and group dynamics;
- Elementary bookkeeping and accounting;
- Planning, learning from experience, and accountability; and
- Potential income-generating activities, fund raising, and lobbying.

SECTION THREE

FACTORS AFFECTING PROJECT SELECTION AND FURTHER DEVELOPMENT

SOCIAL CONSIDERATIONS

Sociocultural Context

The NPA is designed to build on the successful track record of the ongoing AOP and specifically addresses the needs of the rural poor living in a steadily deteriorating physical environment. At the present time, the AOP is responsible for various types of development activities usually directly financed and implemented by the national government. In contemporary Haiti, after the *déchoukage* and abortive elections of 1986, followed by the rigged elections and finally the military coup of 1987, the major constraints to project activities and eventual NPA success are political. In addition, however, the project has been obliged to deal with and overcome what were once regarded as endemic constraints within small farmer society.

First, a certain degree of political stability is critical to the achievement of the project goal and purpose. Events over the past two years have indicated that in periods of political unrest, violence has been directed against AOP installations, in particular selected nurseries. In addition, such conditions can make working in rural areas — for both Haitians and expatriates alike — tense, hazardous, and sometimes dangerous. Members of the research team were evacuated on the orders of the Embassy, setting back their activities considerably. The indications are that periods of political unrest will continue, perhaps with increasing intensity as living conditions — and the overall economy — continue to deteriorate.

A second factor that may adversely affect the NPA is government policy regarding NGOs and local groups. The GOH is becoming increasingly resentful of the fact that many of the donors, following the example set by USAID, have stopped all development assistance to the government, preferring to channel it through the NGO community, international and local. The GOH would like to have some control over both the NGOs and the funds they receive. It is highly unlikely that the NGOs, particularly the stronger, better organized ones, would brook much interference of this sort. But continued government threats could lead to a standoff between the GOH and the NGO community, an eventuality that could adversely affect the NPA.

A third factor, which has worked in the AOP's favor, has been some illuminating anthropological insight into small-farmer attitudes and behavior, particularly the attitude towards trees. The economy of rural Haiti, as discussed earlier, is under considerable stress — a combination of demographic growth, increasing pressure on the land, lack of off-farm employment opportunities, and dedicated neglect on the part of the GOH. This has resulted in more intensive exploitation of the productive resource base, leading to reduced productivity and more severe human deprivation on the one hand, and increasing soil erosion and environmental degradation on the other.

The genius of the AOP has been to address these twin problems simultaneously through the introduction of a "lean, mean, tree-planting machine" that offered farmers trees as a cash crop. The project has successfully forged an alliance between two traditional enemies — the wood tree and the urban

charcoal and lumber market — by motivating farmers to plant trees and grow wood to supply this market, rather than to simply mine and scavenge the wood as is traditionally done. While farmers were used to planting trees for fruit, there was no tradition in Haiti of planting trees for lumber and charcoal until the advent of the AOP.

Beneficiaries and Participation

The NPA will continue to work with the rural poor of Haiti. How many farmers the project will work with over the life of the project has not yet been decided, since this will depend on funding levels as well as the capacity of the extension services to work effectively with the different groups of farmers discussed earlier: the new planters — 20,000 a year; the harvesters — out of a potential pool of 100,000, 10,000 a year; and the agroforesters — 5,000 a year. The effectiveness of this diversification will also be a function of the extension methodology to be followed — geographically dispersed or geographically concentrated. A concentrated approach will make it possible to reach more farmers in the short term, as well as selectively reduce the awe-inspiring pool of 100,000 potential harvesters.

Throughout the life of the AOP, concern has been expressed about equity and who actually participates in the project. On the basis of various anthropological studies, it is possible to provide a profile of the typical participant. Synthesizing available information generated by the project, the 1986 PP Amendment pointed out that landless members of the rural poor are, by definition, excluded from the direct benefits of the project. Fortunately, the vast majority of farmers own some land and, according to the 1987 *Agricultural Sector Assessment*, citing data from a single community study in the south, only 14.3 percent are truly landless. Of these, 11.9 percent have entered into some kind of tenancy arrangement. Such people may, of course, benefit indirectly since their labor may be required when the trees planted are to be harvested and processed.

In 1986 (and there is no reason to believe that the situation has changed significantly in the intervening years), farmers planting trees were found to be relatively older, and to dispose of relatively greater land resources, than those who did not plant. In addition, they were predominantly male. According to the 1986 *Agroforestry Outreach Project: End of Project Evaluation*, this age difference is partially explained by the fact that size of landholding correlates directly with age. More specifically, the purchase of land and the division of inherited land are a function of age, increasing in likelihood as people grow older. And security of tenure is more conducive to land improvement. In addition, the evidence indicates that planting trees may be a management strategy employed by farmers whose major constraint is labor, rather than land, since the cropping of trees requires less labor than the growing of annual crops.

But the reality of who actually participates is more complex. While the sheer number of seedlings distributed per farmer still implies a certain minimal holding size to accommodate outplantings, farmers circumvent this problem in a number of ways, including the sharing of seedlings with interested neighbors. Two years ago, the AOP estimated that there were 30,000 unofficial planters about whom nothing is known. The indications are that trees travel much more widely than the records indicate.

The preponderance of men among project beneficiaries is explained by the residence patterns that prevail after marriage. Although men and women inherit land equally and share in many of the agricultural tasks, a significant number of farm units are operated by men. Upon marriage, a woman is more likely to move to her husband's community. As a result, her land — because of the distance involved — is more likely to be sharecropped or rented out. If worked directly, it is less easily monitored and controlled with respect to animal trespass, one of the key constraints to plant survival.

This analysis of who participates indicates that those most able and most disposed to take advantage of AOP services will do so — in contrast to others who are constrained by circumstances beyond the control of the project. Nevertheless, the 1986 PP amendment proposed two ways in which this situation could be improved upon so that the AOP could serve a more representative constituency:

- First, lower the minimum number of trees provided to participating farmers; and
- Second, continue to explore, elaborate, and extend agroforestry options that promise to enhance staple crop production, provide relatively rapid returns, and may be implemented effectively on even the smallest plots. The best example is the *Leucaena* hedgerow/alley-cropping system.

The first proposal to lower the minimum number of trees has been done. The second proposal is under way and the NPA will expand upon this agroforestry option because it can simultaneously have a positive impact on soil erosion, moisture retention, soil fertility, and the production of animal forage. Hedgerows can provide concrete results sooner than trees, particularly on the more marginal agricultural lands worked by poorer farmers. Hence, under the NPA, the project may appeal to a broader cross-section of the rural population.

This will be reinforced by the introduction of a new component into the project, already being implemented in selected regions — that of environmental education, directed specifically at the children of participating and nonparticipating farmers alike. If the program is effective, it is reasonable to expect that children of nonparticipants will pressure their parents into trying at least some of the interventions offered by the NPA.

Sociocultural Feasibility

The basic premise underlying the AOP has been the emphasis on trees as a cash crop that hillside farmers can plant, manage, and harvest on a sustainable basis. This has stood the test of time, although the reasons why farmers plant trees and hedgerows go well beyond simple economics. They are well aware of the environmental impact that such additions to their farming system can play. The NPA will build upon this successful experience, diversifying into more tree management and agroforestry activities. This is in response to opportunities identified by project personnel and requests made by participating farmers.

What is apparent, even to the most hardened and cynical of development specialists, is that the AOP is a resounding success that has far exceeded the expectations and dreams of the original project designers and implementers. The fact that 100,000 Haitian farmers have planted trees on the hillsides of Haiti, that they have done so without any material incentive other than the plants themselves, and that the demand for trees far exceeds the capacity of either the AOP or the NPA, surely proves that this proposed project is socially feasible — little short of miraculous in the context of contemporary Haiti.

Impact

While anecdotal evidence is available on the economic returns to individual farmers who started harvesting their trees early, the plantations of the vast majority of beneficiaries are only now reaching a harvestable state. Over the next year, data should be available indicating the economic value to those who planted project trees. The project will also have a positive environmental impact and this will be documented and analyzed by the research component of the NPA. By broadening the scope and diversifying the activities, NPA should be capable of providing benefits to a broader, more representative cross-section of the rural population.

There is strong evidence that the AOP has stimulated a spread effect, since there has never been a lack of demand for trees and, as a result, production and distribution have steadily increased on an annual basis, now 8 million trees per year. There is no reason to believe that this heavy demand will change under the NPA.

In terms of replicability, both the World Bank and CIDA are interested in using the AOP as a model. The World Bank and the MARNDR have expressed interest in doing agroforestry, using NGOs as the intermediaries for reaching farmers. As discussed earlier, CIDA is financing an agroforestry project in the Jacmel area, modelled on the AOP experience. It should start next year. Replicability of the provided NPA will depend on a variety of factors, including government policy and funding level, as well as the key issue of sustainability, to be discussed in more detail below.

ECONOMIC CONSIDERATIONS

Given the changes in Haiti's natural resource base, the relatively disadvantaged sector of the population that is to benefit from the NPA, and the productive record of the AOP to date, most observers agree that the probability is high for the proposed NPA to be an economic success. Nevertheless, it is important to reflect about the economics of this undertaking.

Quantifying several of the economic benefits of the NPA is difficult or impossible at the present time. Some impacts of the proposed interventions such as improved soil productivity, the result of reduced erosion or enhanced soil structure, depend upon physical processes which take time and require careful measurement. These impacts may result in changes in resource use or cropping patterns that, in turn, may bring about farm organizational changes. These may, finally, result in the desired improvements in farm incomes or other aspects of the quality of life of the farm family.

Other impacts of agroforestry are widely dispersed geographically, such as reduced siltation downstream. While such effects are important, monitoring them is costly because they occur off-site from the project and their measurement requires expertise different from that available to the project. Even the direct impact on farm incomes resulting from the sale of forestry products is not easy to obtain, as Haitian farmers are not accustomed to keeping financial records or disclosing such information to outsiders.

The NPA has, however, two strengths that make economic analysis and evaluation more feasible than would otherwise be the case. First, the NPA will continue, in a major way, the work done under the AOP. Some economic analysis was done under that project and it can be expanded and updated to

include more emphasis on the harvesting aspects of agroforestry production. These will lead to better estimates of the direct benefits to be expected on the farm from the agroforestry enterprise.

The second strength of the proposed project also derives from the AOP under which an institutional structure was developed that, to a considerable extent, assures the economic effectiveness of the project. For example, the planting of trees, the major focus of the AOP, has been accomplished without bribing farmers. So far, farmers have not been asked to pay for the trees. They have, however, been willing to make considerable sacrifices to obtain the seedlings, bring them to their farms, and plant them. These efforts can be viewed as a measure of the value of the seedlings. Farmers would not have undergone these costs had they not expected the trees to yield benefits at least as great. Similarly, species selection in the nurseries is driven by specific requests from farmers. This eliminates the need for elaborate species trials.

Although it would be inappropriate to argue that incentives in either the AOP or the NPA can be structured in such a way as to always guarantee an economically efficient outcome, it is true that the requirements for detailed economic evaluations are much less stringent because of the existing and proposed project structures. Furthermore, the economic analysis in the project paper should concern itself to a large extent with the incentive structure that exists within the project and how this structure can be designed to sustain project efforts in the future when outside support is partially or entirely withdrawn.

Earlier mention was made of the need to decide the geographic distribution of this national project. While this is primarily a question of equity, it is also one of efficiency in the delivery of project services. The fairness of leaving some localities out of the project cannot be decided by economic reasoning. It is worth knowing, however, if project benefits differ greatly from one region compared to another. This could be the result of differences in the natural resource base, NGO strengths, or other characteristics. The costs of making project services available will also vary among regions. The PP economic analysis should address this issue.

Finally, a broader scope has been suggested for the NPA, and the benefits of these new initiatives will be difficult to estimate. It will be necessary to describe the expected outcomes from these new initiatives in as much detail as possible. Also the negative impacts of each of the new initiatives on traditional project outputs must be spelled out. In this manner, it will be possible to make an informed judgement about the worthiness of the new project goals relative to the sacrifices required in the old ones.

In summary, economic analysis in the project paper should concern itself primarily with the following issues:

- The direct impact on farmers from the proposed interventions;
- The overall incentive structure that will lead to efficient and sustainable outcomes;
- The geographic distribution of project services; and
- The economic analysis of trade-offs among economic goals.

RELEVANT EXPERIENCE WITH SIMILAR PROJECTS

USAID has a potentially rich experience with similar projects on which to draw in the design of the NPA, the most relevant being the ongoing AOP. To the greatest extent possible, the experiences and lessons learned from this project have been incorporated into the PID. Other projects of relevance include two ongoing watershed management projects, the CARE-supported Local Resources Development II (LRD II) project in Leger, near Arcahaie, and the Targeted Watershed Management Project (TWAMP) in the Les Cayes region, being implemented by Associates in Rural Development. Both have been underway for one year. LSD II is of particular interest because of its work with local groups, which are responsible for running the nurseries. The project supplies all the material and training, while the group is responsible for providing land and labor; producing the seedlings; and distributing them to group members and other interested farmers, on condition that they contribute labor. There are no payments of any kind involved.

The on-farm research and experimentation undertaken by TWAMP and the collaborating NGOs is potentially of great interest to the NPA, if appropriate technical interventions can be generated in the medium term. Relevant areas of interest include the following:

- Alternative cultivation practices, particularly minimum tillage and contour furrowing;
- Diversified and intensified home gardening; and
- Intensification in the establishment and management of hedgerows and strip crops on the contour, using multipurpose trees, permanent and semipermanent crops, grasses, and multipurpose shrubs.

One of the collaborating NGOs is conducting ongoing research on a variety of themes that are also of potential interest to the NPA, including ramie, elephant grass, and the intercropping of maize and velevet beans.

Also of relevance is the Local Resources Development I Project (LRD I) being implemented in Maissade, on the Central Plateau, by the Save the Children Foundation (SCF). The project started late in 1985 with the specific purpose of reversing the environmental degradation on the hillsides of the commune through developing, field testing, and adopting effective participatory approaches to soil conservation and technology transfer. Specific accomplishments of interest to the NPA include a program of soil conservation and protection based on soil capability and the establishment of a successful demonstration site that vividly illustrates the technical interventions being disseminated.

Of more general relevance is the experience with the Technical Secretariat for Watershed Management (STAB), established within the MARNDR with USAID funding in 1987. Although direct USAID support was terminated at the end of the year, some funding still continues. STAB was created to provide guidance and direction to the overall program of reversing the degradation on the hillsides of Haiti. This broad charge was interpreted to mean strategy development, policy analysis, information collection and dissemination, training, research, and the planning, design, and evaluation of individual watershed management projects.

Of primary technical concern have been soil conservation, hillside agriculture, reforestation, and the integration of agriculture, livestock, and forestry. STAB's most important accomplishment has been

to inventory most of the ongoing, broadly defined, natural resource management projects in Haiti, which now total more than 200, and to make this information available to all interested parties, both public and private. It has also served to create a forum for the exchange of ideas and opinions concerning how to more effectively address the problems of sustainable hillside development in Haiti.

PROPOSED GRANTEES AND IMPLEMENTING INSTITUTIONS

Based on the experiences and lessons learned from the successful AOP, the NPA will build upon the institutional structure created by the present AOP grantees, CARE and the Pan American Development Foundation (PADF). Much time and effort have been directed towards developing the essential contacts and community presence in those regions where the grantees are working. In addition, the grantees have an established, functioning, network of 1,100 trained and experienced professional staff, extension agents, and animators.

The rapidity and success of NPA efforts to build upon past AOP activities will be maximized if the AOP grantees also undertake the implementation of the NPA. If the grant to implement the NPA is awarded to another institution(s), whether through a direct grant or open bidding, many of the past advances made by PADF and CARE in developing a local presence and establishing community-level credibility, will be temporarily, if not permanently, lost. A new grantee will require an extended transition period — up to one year or more — for orientation of new personnel, development of a network of competent and trained extension agents, and for reestablishing community-level credibility and presence, before any significant on-the-ground activities would be possible.

The continued involvement of the present AOP grantees will also minimize the risk that the GOH may object to the practice of the United States and other donors of bypassing official GOH channels and agencies to work directly with local NGOs. Both grantees, as well as the NGOs that participate in project activities, have complied with the requirements that they register with the GOH. In brief, sole-sourcing the NPA to the present grantees is fully justified on two grounds: first, both have demonstrated particular competence in implementing development activities under the difficult conditions that presently prevail in Haiti; and, second, contracting with a new institution would cause serious disruption that, at best, could put a brake on development activities for at least a year and, at worst, stop the NPA dead in its tracks, stillborn, and thus abort one of A.I.D.'s more exciting, innovative, and challenging projects in the Latin American and Caribbean region.

This recommendation is supported by A.I.D. guidelines and competition requirements for grants and cooperative agreements. According to the revised version of A.I.D. *Handbook 13*, competition is not required for: "Mission funded grants and cooperative agreements to registered Private Voluntary Organizations and cooperatives for umbrella programs, field programs, institutional development/strengthening, and collaboration among NGOs and cooperatives." In addition, competition is not required when one or more of the following conditions — relevant to the present situation — prevail:

- Assistance awards for which one recipient is considered to have exclusive or predominant capability, based on experience, specialized facilities or technical competence, or based on an existing relationship with the cooperating country or beneficiaries; and

- Follow-on assistance awards intended to continue or further develop an existing assistance relationship.

At this time, it is not recommended that a noncompetitive waiver be granted to the other two participating institutions. As discussed earlier, serious consideration should be given during the PP design to alternative institutional and contractual mechanisms that may be more effective, both technically and financially.

USAID SUPPORT REQUIREMENTS AND CAPABILITY

Support requirements will consist of the project manager, a USAID direct hire employee within the Agriculture Development Office, with the full-time support of an experienced foreign service national program assistant. The newly named assistant agricultural development officer (ADO) is a forester by training and he should also be actively involved in monitoring the technical components of the NPA. Careful thought should be given to the overall management of the NPA. The AOP does not necessarily provide a viable model for the NPA. The Technical Coordination Unit is gradually disappearing — a deliberate move by USAID — and the present focus is on simplification and streamlining, which is not an easy undertaking with such a complex project. At the present time, USAID deals with the collaborating institutions, both grantees and contractors, on a one-to-one basis. Most of those involved appear to favor this approach, and, if all parties are in agreement, it should be continued.

But in terms of collaboration and information exchange, on both managerial and technical levels, the AOP leaves much to be desired. Although there are regular monthly management meetings and, more recently, technical committee meetings, it is difficult to see what purpose they serve. The basic idea behind such meetings is good, but there is need for more structure, more substance, some decision-making power, and some written record of what is discussed and decided. And such meetings could occur at various levels and geographical locations. For this to become a reality, USAID must take the lead. This should be addressed during the PP design.

ESTIMATED PROJECT BUDGET

Present Mission thinking calls for maintaining the present funding level of \$5 million per year. Inflation alone, running at 8 percent, dictates that without a funding increase, project activities will decrease. The project seeks to promote a national program, but that implies having national coverage, and adding new areas that are not being served. That means more cost. The project's main function has been to persuade hillside farmers to accept and plant trees. The target has always been to get more new participants and more people means more trees, which ultimately means more cost.

PROPOSED NPA BUDGET — 1990-1995

Proposed PADF Budget

Resource Center

Expatriate salaries and expenses	\$ 3,750,000
Local hire salaries and expenses	2,250,000
Material support	1,500,000
Training program	500,000
Home office direct	220,000
Documentation, evaluation, reports	75,000
Overhead (25.8%)	2,200,000

Subproject Outreach

NGO personnel	\$ 1,500,000
Vehicles	500,000
Consumables — seedlings and supplies	2,500,000
Promotion, education, materials	500,000

Total Proposed PADF Budget — 1990-1995 \$ 15,500,000

Proposed CARE Budget

Personnel and operations	\$ 6,250,000
Material and equipment	1,750,000
Training	500,000
Overhead (9.2%)	800,000

Total Proposed CARE Budget — 1990-1995 \$ 9,300,000

Proposed Budget for Applied Research and Seed Improvement

Research manager	\$ 500,000
Tree improvement specialist	400,000
Overhead (100%)	900,000
Short-term technical assistance	2,500,000
Operating expenses	1,000,000

Total Proposed Research and Seed Budget \$ 5,300,000

Total \$ 30,100,000

The AOP has far exceeded its original objectives and has created an enormous demand for trees that it must continue to satisfy. In addition, however, the project has a responsibility to those farmers who planted trees earlier, and are now at the stage in which they can begin harvesting them in a sustainable manner. Finally, the project is now in a position to expand further into agroforestry technology — particularly the increasing introduction of hedgerows, shrubs, and forage grasses. This latter component is the most exciting and challenging since it offers ways to control soil erosion, increase soil fertility, and feed livestock — all at the same time. In brief, the NPA will be dealing with the following three groups of farmers, not necessarily mutually exclusive:

- Those farmers who are planting for the first time — **the planters**;
- Those farmers who wish to learn about tree management and harvesting on a sustainable basis — **the harvesters**; and
- Those farmers who wish to learn more about hedgerows, forage grasses, and other aspects of agroforestry — **the agroforesters**.

Field trips to visit AOP activities indicated that this is the strategy preferred by many project technicians, on the grounds that since the AOP is helping participating farmers to improve the quality of their soil, it should also help them to take full agronomic advantage of these improvements. *Il faut valoriser la terre* was a refrain heard in many of the AOP regions. The PID has been written with this objective in mind and of the five proposed components in the NPA, training is new, but complementary to the other four. They are designed to focus on the dissemination of planting material and technologies to hillside farmers, thus improving and strengthening their capability to exploit them to the full. The NPA is an **agroforestry** project, designed to address the problems of hillside farming systems as a whole. To achieve this, it is strongly recommended that the funding level be increased to \$6 million per year, as outlined in the budget proposal below.

DESIGN STRATEGY

The key to a successful design will be the active collaboration of the present grantees, particularly their Haitian personnel, and the participating NGOs and local groups. During field visits, the sincerity, credibility, and seriousness of the PID team was questioned when it came to eliciting the views and opinions of field staff regarding the NPA: "What do our opinions matter when we know very well that the project will be designed by the experts in Port-au-Prince?" This could degenerate into a barrage of criticism and noncooperation once a full design team is fielded. Such criticism can be dealt with in two ways.

First, once the PID is approved by USAID, a workshop should be held with the grantees and more important NGOs to elicit their views on the proposed components and how they should be implemented. As views vary considerably on the relative importance of certain components, those for and against should be invited to present their perspectives, thereby sparking debate and discussion among participants. The objective of the workshop would be to reach some consensus regarding these components. In cases where no consensus is achieved, the PP design team will be asked to exercise its considered judgement. The second way to handle this criticism is to make sure that both grantees have a member on the design team — preferably a Haitian professional with the authority to speak on behalf of his/her institution.

It is recommended that USAID contract with a consulting company to provide the necessary technical expertise for the PP design team. This can be done either through an IQC or through a buy-in into the centrally funded Development Strategies for Fragile Lands Project (DESFIL). The latter is designed specifically to assist Missions in Latin America and the Caribbean in addressing the problems associated with the sustainable development of fragile lands, such as the deforested hillsides of Haiti. The advantages of DESFIL are that it can provide some continuity, it has already worked in Haiti with STAB, and it can use core resources to help with workshops and dissemination of information on both the AOP and the NPA to a much wider audience than is presently the case.

The design team will be composed of the following:

- Design specialist/team leader (7 weeks)
- Agroforester (4 weeks)
- Tropical forester (4 weeks)
- Extension specialist (4 weeks)
- Wood products specialist (2 weeks)
- Ecologist/environmental assessment specialist (4 weeks)
- Social scientist (4 weeks)
- Extension/environmental education specialist (4 weeks)
- Agricultural/natural resource economist (5 weeks).

The design will be completed in six weeks at an estimated cost of \$150,000. Detailed scopes of work for the design team are provided in Annex A.

Recommended Environmental Threshold Decision

A positive determination is recommended. The proposed project components will result in significant positive impacts, in both the short and long term. Among the project goals is a decrease in the current level of environmental degradation through improved agricultural and land-management practices, and the development of alternative sources of fuel and other wood resources for the rural population. These will result in reduced pressure on the remaining indigenous flora and fauna habitat. All anticipated project impacts are seen as positive influences on the Haitian environment. Given that the NPA should have a significant positive impact and that specific activities will entail the use of pesticides and fertilizers, an environmental assessment will be conducted as part of the PP design.

A.I.D. POLICY ISSUES

In the preparation of this PID, two critical policy issues have emerged: funding level and sustainability. In theory, the planned funding level for the NPA will not exceed current levels for the AOP — \$5 million per year. Inflation is running at 8 percent and indications are that it will get worse. Hence, if this budgetary constraint is immutable, then the NPA has no choice but to cut back the activity level over the next five years. This would be acceptable if the NPA were to continue simply as a follow-on clone of the AOP, restricting itself to a reduced level of tree production and distribution. If this were done, then the NPA would indeed become a "lean, mean, tree-planting machine."

But the underlying premise has been that the AOP is but the first phase of what will continue to be an innovative **agroforestry** project, designed to address the problems of hillside farming systems as a whole, particularly the symbiotic relationships among trees, hedgerows, grasses, soils, crops, and livestock. As already emphasized, the AOP has created an enormous demand for trees that it must continue to satisfy. In the process of distributing trees, the AOP has developed a new clientele — those farmers who planted in the past and now have large trees ready for harvesting. The AOP has a responsibility to help them. Finally, the project is now in a position to expand further into agroforestry technology — the cutting edge of sustainable land-use systems for the hillsides of Haiti — since it offers ways to control soil erosion, increase soil fertility, and stimulate productivity. Such a strategy will take full advantage of the developmental base already created by the AOP. The most effective way of doing this is by increasing the finding level to \$6 million a year.

From the perspective of USAID, long-term sustainability will depend on two factors. One is the extent to which local NGOs are willing and able to assume some, or all, of the costs of the nursery, outreach, and extension activities. No one is particularly sanguine about hillside farmers' willingness to pay for seedlings or the NGOs interest in allocating some of the profits generated by selling seedlings to the AOP to underwrite part of the program's recurrent costs at the local level. It is for this reason that the NPA should bring pressure to bear on the more capable NGOs to start paying some of the recurrent costs at the local level. In addition, the more sustainable should be encouraged to find their own funding sources, and to break their dependency on the NPA. Also, farmers should be encouraged to pressure the NGOs for better, more comprehensive, services, and thus begin the process of institutionalizing the demand for sustainable land use practices.

A second factor is the extent to which appropriate, low-input techniques can be developed for independent on-farm application. The project must emphasize those agroforestry technologies that, once mastered, can be implemented by farmers on their own, without continued reliance on subsidized nursery production and extension services. This is where the proposed training component of the NPA will play a crucial role at the local level. Nevertheless, much of this technology will be generated through the process of trial and error and modified on the basis of experience. A case in point is hedgerow technology which is one of the newer areas in agroforestry and about which a great deal has still to be learned.

The successful implementation of the proposed technical packages depends on the availability of seed and planting material. It is highly unlikely that the present central nurseries will become sustainable — particularly financially — over the five years of the NPA. One of the reasons is that it is highly unlikely that farmers will start paying for their plants. To lessen this dependency on these centralized nurseries, the NPA proposes to investigate cheaper methods of providing planting material, and, specifically, the establishment of community-level nurseries on an experimental basis and ways for farmers to produce their own plants through, for example, direct seeding. But these are not panaceas. Rather they are alternatives for reducing dependency and increasing local capabilities.

In brief, a realistic appraisal of what the NPA can do in terms of working towards sustainability — financial, technical, and institutional — within a developmental context in which the central government has effectively abnegated all responsibility includes the following:

- Increasing the managerial and technical capacity of participating NGOs through intensive training, obliging them to pay their share of recurrent costs from profits generated by the sale of seedlings, and encouraging the more sustainable to find their own funding sources for NPA activities;

- Provision of intensive training to participating farmers in order to increase their technical and managerial capability in seed production, planting, harvesting, and agroforestry; and
- Institutionalizing local demand for sustainable land use interventions by having farmers lobby their respective NGOs for more effective and comprehensive services.

ANNEX A
SCOPES OF WORK

ANNEX A

SCOPES OF WORK

General Scope of Work for All PP Team Members

All PP team members will have a minimum FSI S-3/R-3 in either Creole or French. Team members will review relevant technical, design, and evaluation documentation in the AOP files as well as other available documentation on Haitian farming systems. Team members will meet with A.I.D. staff and a wide range of AOP staff to discuss technical and design issues. Visits will be made to field sites in the different zones to meet with AOP field staff, farmers, NGOs, and local groups; to observe present farming practices; and to view and assess the scope and impact of activities undertaken during the AOP. Previous design experience on a large multidisciplinary team preferred.

Design Specialist/Team Leader (7 weeks)

This person will do the following:

- Manage and provide overall direction to the team while in Haiti;
- Serve as the principal liason between the team, A.I.D., and the staff of the AOP;
- Prepare the section of the PP dealing with the proposed management, coordination, and implementation of the NPA; and
- Prepare, edit, and produce both first and final drafts of the PP in Haiti.

The preferred candidate will be an experienced team leader, with several years of experience leading large, multidisciplinary teams. He/she will also have had considerable experience with the design and implementation issues frequently encountered on complex agricultural and rural development projects. In addition, he should have had previous Haitian experience. A social scientist with a PhD degree is preferred.

Agroforester (4 weeks)

This individual will do the following:

- Assess the range of soil/water conservation, agroforestry, and forestry interventions that are currently being employed under the AOP;
- Identify priority areas and directions for the NPA in agroforestry, soil and water conservation, and hedgerow/tree management;
- Identify research directions and priorities for the NPA; and

- Identify possible positive and negative environmental impacts, both on-farm and downstream, of the proposed agroforestry interventions.

The preferred candidate will have an MS degree in agroforestry and at least two years of experience in the LAC region, preferably working with complex farming systems such as those found on the hillsides of Haiti.

Tropical Forester (4 weeks)

This individual will undertake the following:

- Assess the managerial and technical capabilities of the AOP central nurseries and recommend ways in which they can be improved;
- Assess the experience with community-level nurseries and, on the basis of what is learned, design an experimental program — determining criteria for success and rate of expansion;
- Assess the extent to which direct seeding, bare rooting, and stumping are viable alternatives for the NPA;
- Develop a school nursery trial program for the NPA;
- Identify research directions and priorities for the NPA; and
- Identify possible positive and negative environmental impacts, both on-farm and downstream, of the nursery and seed production component of the NPA.

The preferred candidate will have an MS degree in tropical forestry, hands-on experience of nursery management and technology, and five years of experience working in the Third World.

Extension Specialist (4 weeks)

This individual will do the following:

- Assess the effectiveness of extension activities to date;
- Identify extension needs in tree planting, harvesting, and agroforestry;
- Design an extension system(s) to meet these needs, paying particular attention to the following: the different farmers to be served — planters, harvesters, and agroforesters; the methodology to be followed — extensive or geographically concentrated; and the type of extension agent — full-time or part-time/able to deal with all three types of farmers or restricted to one;
- Develop manpower requirements and cost figures for future extension activities; and
- Identify research directions and priorities for the NPA.

The preferred candidate will have a Masters degree in agricultural extension or some related field and at least five years of experience working in the LAC region and the Third World.

Wood Products Specialist (2 weeks)

This person will do the following:

- Develop tabular information on wood properties and characteristics of the most important AOP species;
- Review the range of wood products presently being sold by farmers in the AOP — fuelwood in the form of charcoal and firewood, construction material in the form of poles, posts, and wattle, and lumber in the form of planks and wood for crafts — and the problems associated with their harvesting, processing, and marketing;
- Investigate farmer interest in processing additional wood products; and
- Identify markets for additional wood products and detail the factors involved in processing and marketing.

The preferred candidate should have an MS degree in forestry and at least five years of experience working with small farmers in the Third World on the processing and marketing of wood products.

Ecologist/Environmental Assessment Specialist (4 weeks)

This individual will do the following:

- Describe the environment to be affected by the NPA;
- Identify the possible environmental consequences of proposed interventions — paying particular attention to proposed pesticide and fertilizer use;
- Recommend mitigating measures that should be undertaken by the NPA; and
- Identify research directions and priorities for the NPA.

The preferred candidate will have at least an MS degree in ecology, forestry, geography, natural resource management, or some related discipline. Prior experience in conducting environmental assessments for A.I.D. is required, in addition to at least five years of work in the Third World, with a minimum of two years in the LAC region, some in the Caribbean.

Social Scientist (4 weeks)

This individual will do the following:

- Assess the present institutional capability — financial, technical, and managerial — of a representative sample of NGOs that participate in the AOP;
- Specify ways in which this capability can be strengthened and mechanisms through which such a component could be implemented;
- Identify mechanisms through which the NPA can reach a broader, more representative cross-section of hillside farmers than is presently the case under the AOP; and
- Identify research directions and priorities for the NPA.

The preferred candidate will have a PhD degree in sociology, rural sociology, or anthropology, prior experience in conducting social soundness analysis, and at least a working understanding of Creole. At least five years of working in the Third World is required with a minimum of two years of experience in Haiti.

Training Materials Specialist in Extension/Environmental Education (4 wks)

This person will do the following:

- Identify and describe the training needs for the NPA — for technical staff, extension agents, farmers, school teachers, and school children;
- Describe the content of the various training components; and
- Detail the types of training materials to be used and how the NPA should go about preparing them.

The preferred candidate will have an MA degree in extension education, rural sociology, or a related field and five years of experience working in the Third World, with at least one year working on similar activities in the LAC region. Prior experience working in countries with low literacy rates and linguistic diversity preferred.

Agricultural Economist/Natural Resource Economist (5 weeks)

This person will do the following:

- Conduct a cost-benefit analysis of the proposed NPA;
- Perform a financial analysis of the technical interventions proposed under the NPA;
- Analyze the internal economic incentive structure of the NPA and propose mechanisms which may strengthen the capability for financial sustainability of certain project components;

- Identify research directions and priorities for the NPA;
- Propose methodologies for evaluating in economic terms the impacts of the NPA on soil erosion, soil fertility, and productivity; and
- Collaborate closely with the team leader in the preparation of the PP.

The preferred candidate will have a PhD degree in economics, agricultural economics, or natural resource economics and at least five years of experience working in the Third World. Prior experience in preparing PP economic analysis is required.

ANNEX B
LOGICAL FRAMEWORK

ANNEX B LOGICAL FRAMEWORK

Life of Project
From FY 1990 to FY 1995
Total U.S. Funding \$30 Million
Date Prepared: 9/11/88

Project Title and Number: HAITI AGROFORESTRY PROGRAM (521-0217)

INFORMATIVE SUMMARY

Program or Sector Goal:

To maximize the productive potential of Haitian hillside agriculture by reducing the ongoing degradation of the country's natural resource base.

Project Purpose:

A) To achieve sustainable increases in on-farm productivity and farmer income through integration of appropriate, sustainable land use interventions measures into existing farming systems.

B) To institutionalize delivery systems and farmer demand for such appropriate land-use interventions.

OBJECTIVELY VERIFIABLE INDICATORS

Measures of Goal Achievement:

A brake on the steady decrease in per capita agricultural production

Conditions that indicate that purpose has been achieved:

1. An increase in the number of participant farmers who are effectively implementing and managing a variety of agroforestry techniques in their farming systems.
2. An increase in the number of participant farmers receiving outreach training and monitoring.
3. Increased volume and variety of marketable wood products.
4. Increased number of low-tech, community based nurseries.
5. Establishment of seed orchards in each of the major regions of Haiti.
6. Strengthened institutional capability of selected PDOs and local groups.
7. Establishment of an effective environmental education program in the school system.
8. Strengthened applied research capability in Project grantees.

MEANS OF VERIFICATION

Project Statistics

Survey Data

Quarterly and Annual Reports, Evaluations

Field Visits

Production and marketing data

Soil surveys measuring change over time

IMPORTANT ASSUMPTIONS

Political stability and decrease in political violence.

Climatic conditions do not vary unduly.

AID support to Haiti continues.

Project receives local support and participation.

Technologies generated are financially and technically feasible.

The HAP strategy is effective in solving the problems of sustainable development of Haiti's hillsides.

Project receives local support and participation.

Farmers not required to pay for inputs too soon.

Training is designed to satisfy both project & local needs.

OH accepts PDOs and local groups.

Outputs:

- A) Appropriate land-use technologies generated and disseminated.
- B) Seed and plant nurseries established and functioning.
- C) Environmental education curriculum incorporated into selected private schools.
- D) All levels of Project staff appropriately trained.
- E) Local PDO's strengthened.

Magnitude of Outputs:

1. Grasses and shrubs sufficient to cover 400,000m and 250,000m respectively (linear meters) of hedgerows, and 40 million trees, distributed to 250,000 farmers.
2. One central seed storage facility, 20 seed orchards, 50 centralized nurseries, and 50 community based nurseries in place.
3. Environmental education curriculum established in 10 percent of the Nations private schools.
4. Ten MA's, 25 short-term courses overseas, 100 short-term courses in country, plus annual retraining.
5. 25 PDOs and 200 local groups strengthened.

Quarterly Reports

Field Visits

Evaluations

AID support to Haiti continues

ORE & PAUF continue to implement project.

Inputs:

- A) Technical Assistance
- B) Commodities
- C) Training

Implementation Target (Type and Quantity):

	21,550
	6,950
	1,500
10P total (\$000)	30,000

National Program for Agroforestry in Haiti:
Project Paper

by

David Gow
Development Alternatives, Inc.

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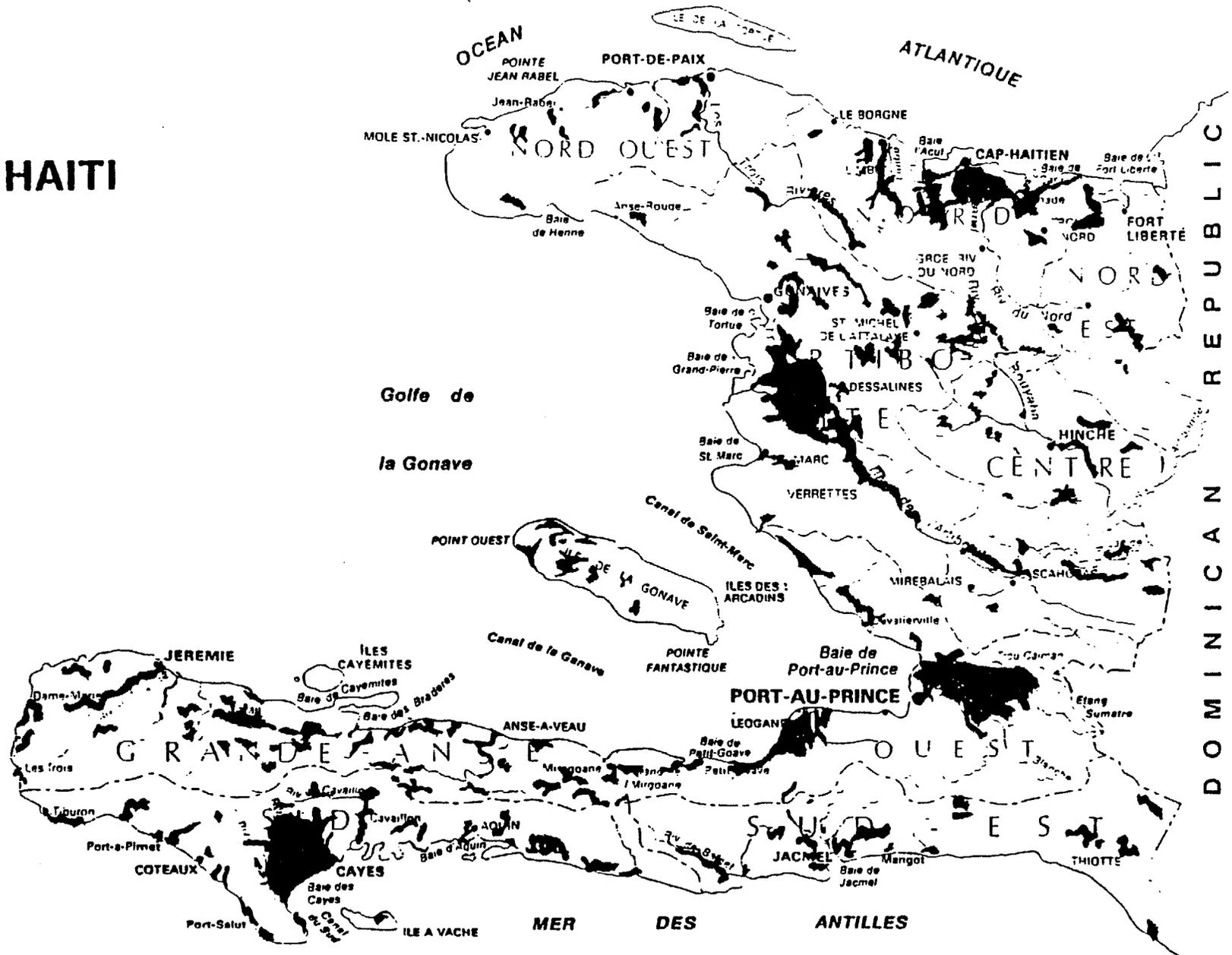
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HAITI



Source: Ehrlich et al., 1987. Haiti: Country Environmental Profile, A Field Study. Washington, D.C.: IIED. p. 38.

Map 2

Areas Suitable for Intensive Agriculture

EXECUTIVE SUMMARY

The Rationale for the National Program for Agroforestry (NPA)

The rationale for the continuation of U.S. Agency for International Development support to agroforestry activities under the NPA is fivefold.

1. **Congruence with A.I.D. strategy.** The NPA fully reflects the development strategies of both the Mission and the Latin American and the Caribbean (LAC) Bureau and is the Mission's flagship project.
2. **Looking toward the future.** The national attention and public interest generated by a project of this scope, even when it is implemented entirely by private sector agencies, will serve to keep the door open for policy dialogue opportunities with the Government of Haiti (GOH). Using the NPA as a platform, the Mission should be able to leverage — or at least to influence — important policy reforms and public planning decisions in the area of natural resource legislation.
3. **Responding to the peasants' needs.** The resource transfer has significantly expanded the production and management options of the hard-pressed Haitian peasants. Their deeply ingrained predisposition to the novel, the interesting, and the useful encourages the nondirective transfer of new resources to them, and stimulates their maintenance of innovation in the absence of external support.
4. **Building on success.** The design of the NPA was based on the belief that development is an evolutionary process that builds on lessons learned in the process of implementing the Agroforestry Outreach Project (AOP). The AOP stimulated peasant interest in tree production and hedgerow technology. The time has come to capitalize on this success and to diversify the resources and services available, thereby increasing the range of technical options available to the hillside farmers of Haiti.
5. **Accepting responsibility.** Given the present political and developmental climate in Haiti, there is no viable alternative to the continued USAID support of agroforestry activities. USAID helped create the very successful AOP and has a responsibility to continue this commitment under the NPA.

WHY THE NPA IS DIFFERENT

The proposed project is similar to the AOP in its fundamental orientation to outplanting multipurpose trees on private farms, providing the peasant with an economically viable crop. The project differs from the AOP in that it will:

- Continue the seedling production and distribution program in terms of the technology, but will include a broader selection of perennial species of forages, grasses, and non-woody vegetation. This emphasis on vegetation other than trees will necessitate some additions to the present nursery production system;
- Introduce a program of on-farm propagation techniques, tree management, and harvest schemes that will serve the needs of the more experienced farmers, who have participated in the AOP and who want to go beyond the present technologies and practices;
- Diversify interventions beyond simple hedgerow installation and management as a viable method of soil conservation and into development of stable alley cropping systems, improvements in soil fertility by use of green manures, mulch, and livestock forage, and more use of indigenous seed and germplasm; and
- Identify ecologic, topographic, and soil conditions where rehabilitation of the soil — reversing erosion and increasing fertility — is possible by better management on the farm, and, where it is not possible, perhaps opting for more extensive use of forestry on those poorer sites.

PROJECT GOAL AND PURPOSE

The goal of the NPA is to maximize the productive potential of Haitian hillside agriculture by reducing the ongoing degradation of the country's natural resource base through sustainable land use interventions.

The primary purpose of the NPA is to achieve sustainable increases in on-farm productivity and farmer income through the integration of appropriate soil conservation measures, and trees and shrubs, grasses, and other plant materials that will enhance soil fertility, into existing farming systems.

A secondary purpose is to continue the institutionalization of farmer-led demand for such appropriate land use interventions, plant materials, and extension services. This purpose is based on the assumption that the stimulation of a recurrent demand for such materials and services will ultimately move project participants in two distinct directions. First, they will be eager to master those aspects of introduced technologies — such as hedgerow technology, management practices, and plant propagation — that are susceptible to on-farm or local-level replication. Second, they will come to expect, and, indeed, to demand, that such external support services as are necessary be provided on a continuing basis by either the NGO community or the public sector. It is through some combination of these two impulses among the peasant beneficiaries that the NPA will seek to ensure long-term sustainability, even after the termination of direct project support.

THE CASE FOR AN INTEGRATED PACKAGE

This five-year project will consist of five components. The first is **nursery production** of the necessary seedlings. This is the motor that drives the other components. The major achievement of the AOP has been to establish a chain of 45 regional and 30 community-level nurseries. This chain extends

the length and breadth of Haiti. Many of the nurseries are owned and operated by local NGOs; they have operated relatively successfully over a period of years and will continue to do so under the NPA.

Nursery production is reinforced by the second component, **seed and germplasm improvement**, which will strengthen the NPA's capacity to supply the nurseries with high-quality seed and plant material. This component provides the fuel to keep the nursery motor running well. Two of the principal objectives are, first, to establish seed orchards, one in each of the major regions of Haiti, and, second, to organize a central seed processing and storage facility for the NPA. In this way, the project will assure the availability of high-quality seed for use in the nurseries.

The third component — **applied research and technology generation** — will enhance the impact of the NPA, particularly the technologies to be disseminated. This will be particularly important in promoting hedgerow technologies for soil conservation on individual farms and selected subcatchment basins. There is a growing awareness and appreciation that the AOP was at the cutting edge of agroforestry approaches to natural resource management, particularly on fragile lands such as those found in Haiti. There are many technical questions to be answered and the NPA will focus on the most crucial. The results of this research will provide more technical options for hillside peasants.

The fourth component, **outreach and extension**, will distribute the material produced by the nurseries and disseminate the technologies produced by the research component. The wide-flung extension network will function as the wheels for the NPA nursery motor. This transfer of resources to the peasants will provide them with additional options for management and production on their plots. The key, to date, has been the nondirective nature of this transfer — the individual peasant is free to accept or reject what is offered. The project proposes, and the peasant disposes.

Training, the final component, is directed primarily at the extension service, which is responsible for training the project coordinators and animators who work directly with the peasants. The messages these agents carry are only as good as the results of the applied research and the practical manner in which they are presented. The materials the agents offer, primarily seedlings, are direct products of the nurseries, which, in turn, are affected by the seed and germplasm component. As the project matures, there is growing awareness of the increasing importance of training, particularly as the project diversifies and becomes more complex.

EXPECTED ACHIEVEMENTS AND ACCOMPLISHMENTS

By the project assistance completion date (PACD) in 1995, project outputs will include the following:

- An increase in seedling survival rate — to 60 percent after one year;
- An increase in the number of hillside farmers planting trees, shrubs, and grasses, from the estimated 200,000 who presently do so to 600,000;
- 300,000 farmers who are effectively managing and harvesting their trees;

- 125,000 farmers who are effectively implementing a variety of agroforestry techniques through the introduction of new multipurpose trees, hedgerows, forage species, and new provenances of planted species;
- 50,000 project participants who are practicing proven and appropriate methods of on-farm plant propagation, such as direct seeding, stem and root cuttings, stump propagation, and bare rooting;
- A continued improvement in the local genetic resource base for tropical forest species through the production of seed by the seed orchards established under the NPA;
- Effective operation of a central seed processing and storage facility for each of the grantees;
- Strengthened Haitian capability for better management of their productive natural resource base through the intensive training of agronomists, agricultural technicians, extension agents, and peasants;
- An increase in the volume and variety of wood products produced by hillside farmers, which will contribute to household income. At the present time, reliable data on either volume of production or household income are nonexistent;
- Development and implementation of a plan to conserve the endangered oil palm, *Attalea crassipatha*, and other species as appropriate, to preserve biodiversity in Haiti; and
- Establishment, by both grantees, of pilot environmental education programs in selected, interested regions.

SECTION ONE

BACKGROUND

THE AGROFORESTRY OUTREACH PROJECT

The National Program for Agroforestry (NPA) is best understood as a follow-on project to the current Agroforestry Outreach Project (AOP), terminated at the end of 1989. Both projects are supported by the U.S. Agency for International Development. The NPA is explicitly intended to refine and to build upon the successful outreach methodologies and farm-level interventions developed under the AOP. However, the new project also represents an evolution — rather than a simple extension — of current activities, for it is grounded in the recognition that the time has come to capitalize on the AOP's successes by expanding the range of services provided to farmers through the existing extension network.

This nationwide network is primarily engaged in the production and distribution of fast-growing hardwood seedlings for outplanting on peasant farms, and in promoting the establishment of contour hedgerows for erosion control on fragile agricultural lands. It also provides some basic agroforestry information and technology to participating farmers.

The AOP is implemented by four agencies: two grantees responsible for field-level operations — CARE and the Pan-American Development Foundation (PADF); a Title XII contractor responsible for research — SECID/Auburn University; and a fourth contracted institution responsible for seed and germplasm improvement — the International Resources Group (IRG). CARE works directly with peasants in the Northwest, while PADF operates throughout the rest of the country. They are charged with establishing and maintaining outreach programs that provide small farmers with extension services and plant materials in support of tree planting and other environmentally sound land use practices. The two institutional contractors — Auburn and IRG — provide research and technical support services to enhance the efficiency and impact of grantee outreach programs.

By the end of 1989, after eight full years of implementation, the AOP produced and distributed more than 50 million trees to 200,000 peasants, 30 percent of whom are planting for the second time. Some 40 percent of the trees will survive outplanting. In addition, the AOP carries out a comprehensive program of soil conservation in which live vegetative barriers, litter terraces, and gully plugs are promoted and monitored. Some 1 million meters of hedgerows have helped stabilize soil on the hillsides. There are also demonstration gardens where soil conservation, agroforestry, and biointensive gardening techniques are being shown to peasants.

In the Northwest, CARE implements field-level activities directly, operating its own nursery program and extension network, based on four regional teams headed by Haitian agronomists and staffed by agricultural technicians, animators, monitors, and nursery workers. This grantee has approximately 300 people on its payroll. In contrast, PADF works primarily through local intermediary organizations (presently more than 80), assisting them to establish nurseries (currently 30) and extension programs of their own. Five regional agroforestry teams, two of which are headed by Haitians and three by expatriates who are grooming Haitian counterparts to assume these leadership positions in the future, provide material support, training, and technical assistance to local NGOs interested in offering agroforestry services to their constituents. PADF supports a national network of 800 people, either directly or indirectly, in its outreach program.

The two basic approaches to field-level implementation reflect the possibilities and constraints of operation in each of the outreach areas. Direct implementation is, in effect, required in the Northwest, where viable and credible local-level NGOs are neither common nor widespread. Such direct implementation is facilitated by the fact that CARE has an established grassroots presence in the area, based on more than 30 years of continuous, field-level development activity throughout the region.

Conversely, a strong local-level NGO presence across the remainder of the country offers the possibility of collaboration with intermediary organizations of this kind, while the geographic scope and sheer magnitude of operations of PADF operations demand it. Thus, although these two distinct approaches to agroforestry outreach were originally conceived as pilot alternatives to each other, representing competing models for providing extension services in rural Haiti, time and experience have conclusively demonstrated that each is well-suited to the particular region in which it is deployed. Neither can simply be replaced by the other, given the significant differences between the field-level circumstances each confronts — unless, of course, one of the grantees decides to radically change the focus of its activities.

The fundamental premise of the AOP was that farmer motivation is a function of the realistic expectation of a reasonable economic return in the relatively near term. The basic strategy of the project was to promote the planting and maintenance of substantial numbers of hardwood seedlings — by individual peasant participants, on their own land — as an economically viable crop; a product, in effect, which the farmer has a reason to plant, and a right to harvest, in the same fashion that he/she plants and harvests corn, millet, sugar cane, and other traditional crops.

The economic utility of tree planting and related agroforestry activities, and the informed self-interest of the planters, have received primary stress from the outset, as opposed to the more abstract ecological or social benefits of natural resource management, reforestation, or conservation. The same motivational approach has worked equally well in encouraging the establishment of contour hedgerows, with their multiple utility as a source of forage and green manure, in addition to their soil-conserving effect.

KEY AOP DESIGN ASSUMPTIONS

The AOP design in 1981 was closely guided by some key insights about the Haitian peasantry and the developmental context in which they operate. Many of these were made explicit in the original social soundness analysis, while others were implicit in the overall design. These assumptions can be briefly summarized as follows:

- Haitian peasants are the managers of complex farm enterprises;
- The unit of production and consumption is the peasant household;
- The overwhelming majority of peasant households have secure access to one or more plots;
- Peasants are not subsistence farmers, but are fundamentally market-oriented producers;
- Peasant lands are underutilized in certain respects, particularly in terms of their potential for the cultivation of hardy, deep-rooted, perennial species;
- Peasants are risk averse, but seek to spread risk through the diversification of the farm enterprise;
- For most peasants, labor is the least scarce factor of production;
- Peasants are staunchly self-interested and will work hard to improve their own lot; and
- Trees have always occupied a special place in peasant life and culture.

LESSONS LEARNED FROM THE AOP

Although these assumptions have stood the test of time and implementation well, experience indicates that both designers and implementers have much to learn from peasant participants. These key lessons learned, which have a direct bearing on the design of the NPA, are briefly summarized below.

1. **Diversity of peasant production goals.** Relatively near-term, regular cash returns are not the primary peasant production goal in planting project trees. Very few planters appear to be growing trees exclusively for charcoal production. Even in parts of the Northwest, a major commercial charcoal production zone, some trees within each plot are being retained and managed for the production of higher-value end products such as poles, posts, and saw timber. In addition, trees have replaced pigs in the overall domestic economy as an interest-bearing store-of-value to be used to cover major unforeseen or periodic expenditures. Finally, significant numbers of participants are planting project trees primarily or exclusively for domestic use.
2. **Beyond wood production objectives.** According to Conway, the primary motivation for at least some of those planting trees was to improve soil conditions. Others were using them as key elements in an effort to transform on-farm production; for example, deploying project trees to establish or reestablish coffee groves on land that might otherwise never have been put to, or returned to, this relatively sustainable use. Still others are using project trees as an alternative strategy for dealing with relative and absolute labor shortages within the production unit.
3. **Trees do not a garden make.** Browsing by free-ranging livestock — particularly goats — remains the single most important cause of seedling mortality and hedgerow damage within the project. The seemingly logical progression from the recognition that "trees are a crop"

to the definition of the land upon which trees or hedgerows stand alone as a "garden" has simply not occurred. Some farmers, when outplanting trees or hedgerows, also broadcast a handful of crop seed — not in any expectation of harvest, but solely for the purpose of defining the space they share with the seedlings or hedgerows as a "garden," to protect the latter from free grazing.

4. **Soil conservation and diversification.** Peasants are interested in a variety of low-input soil conservation and land improvement techniques. A case in point is hedgerows. Peasant response to hedgerows has been positive because, first, hedgerows are neither land-extensive initially nor capital-intensive; second, soil retention results are usually visible relatively quickly, as soil and organic material build up behind each contour row; and, finally, they are living barriers that generate trimmings for on-farm use as green manure, mulch, forage, and firewood.

To the extent possible, these lessons were incorporated into the design of the NPA.

SECTION TWO

PROJECT RATIONALE

RELATIONSHIP TO A.I.D. COUNTRY STRATEGY AND OBJECTIVES

The 1984 Country Development Strategy Statement (CDSS) called for a development strategy that included a comprehensive restructuring of the rural and agricultural sectors. The decision was made to include natural resource management and conservation as part of that strategy. Subsequent action plans took into account the decline in per capita productivity and income for rural Haiti, the rapid deterioration of the natural resource base, and threats to the agricultural areas in the plains from hillside erosion, in the form of siltation, flash flooding, and damage to irrigation systems. USAID concluded that agricultural development efforts in Haiti had to focus on what constitutes the bulk of Haitian agriculture — hillside farming.

This awareness guides the USAID/Haiti agricultural development strategy, which emphasizes increased agricultural production through the promotion of environmentally sound agricultural practices and farm management on Haiti's fragile hillside lands. The success of this strategy hinges on:

- Promoting the increased use of perennial species to enhance soil fertility, minimize soil erosion, and maximize infiltration and retention of rainfall; and
- Achieving sustainable increases in yields for annual food crops and in overall on-farm productivity to alleviate the overexploitation of fragile lands.

The proposed project directly supports these objectives by making agroforestry technologies and inputs accessible to substantial numbers of small farmers nationwide. It also enhances farm income and promotes the involvement of local, Haitian nongovernmental organizations (NGOs) in agricultural development.

The NPA directly supports three general areas of emphasis of the FY 1989/1990 Action Plan, as well as related Latin America and Caribbean (LAC) Bureau objectives. These are:

- **To increase sustainable agricultural production:** NPA interventions such as soil conservation, soil improvement, and moisture-retention benefits of nitrogen-fixing trees and shrubs in hedgerows and fields; increased organic matter in the soil; contour farming; and others directly respond to this priority. This incorporates LAC objective 1: to increase agricultural production; and LAC objective 2: to preserve and manage natural resources;
- **To strengthen the private sector.** Haiti's rural population represents the country's largest single bloc of private sector producers and consumers. The cash returns from increased crop yields, increased supplies of marketable wood products, and related benefits will augment both the productivity and buying power of this bloc. This incorporates LAC objective 2: to strengthen the private sector; and

- **To strengthen human resources.** The training to be provided to farmers, NGOs, and the staff of implementing institutions addresses this priority. This incorporates LAC objective 12: to improve educational opportunities; and LAC objective 13: to increase participant training.

In the mission's *Strategy Paper for FY 1989/1990*, the AOP and its successor, the NPA, form the linchpin of USAID's strategy in agriculture and natural resources.

In addition, the proposed NPA directly responds to the 1988 *Policy Paper on the Environment and Natural Resources* by:

- Promoting and providing support for the development of programs specifically designed to maintain and enhance natural resource productivity while protecting the environment; and
- Supporting extensive activities in risk-reducing and resource-conserving aspects of peasant farming, integrated pest management systems, ecological processes such as water conservation and soil retention, agroforestry research, and environmental education.

In assessing constraints, the 1987 *Agriculture Sector Assessment* states unequivocally that: "Soil erosion is the obvious and indisputable major constraint to sustainable crop production in hillside farming in Haiti." Soil and water are the two most basic factors of production. The thrust of USAID's current and planned project activities is to develop and extend improved agricultural production systems for application on Haiti's hillsides. These improved production systems are based on the increased integration of perennial crops of various kinds — including trees, shrubs, and grasses — into present farming systems.

Appropriate perennial vegetation, properly deployed on hillside plots, helps maintain soil fertility, minimizes soil erosion, assures maximum infiltration of rainfall, and generally preserves the upper watersheds, thereby protecting downstream areas from destruction by excessive runoff and siltation. On-site benefits extend to yield improvements of intercropped annual food and cash crops. Moreover, the perennials being promoted are themselves harvested periodically, providing fuelwood, charcoal, lumber, fodder, green manure, and fruit, thus increasing productivity and income.

RELATIONSHIP TO HOST COUNTRY AND OTHER DONOR PROGRAMS

The NPA will have a complementary relationship — conceptual rather than institutional — with other programs. The National Forestry Project being implemented by the Government of Haiti (GOH) is now in its fifth and final year. The GOH has provided approximately 10 percent of the funding, and the balance has come from the Canadians, the French, and the World Bank. The focus has been on creating the necessary human resources to undertake forestry activities in Haiti. Consequently, there has been a heavy emphasis on the training of forestry technicians. There have been three substantive components: an energy component with the planting of 500 hectares of trees on state lands; a research component that has focused on species and provenance trials, with some agroforestry and demonstration sites; and a management component of 29,000 hectares of pine forest for energy needs.

At the present time, a follow-on project is being designed with assistance from the World Bank. This project will build on these experiences, but with a heavy emphasis on classical reforestation of state lands. Interestingly enough, however, the project proposes to incorporate an NGO component, modelled very much along the lines of the AOP experience, though recent reports indicate that the World Bank is considering dropping this component, preferring to leave funding of such activities to USAID.

The FAO has undertaken reforestation activities in the north but their most important contribution has been the creation of a training school at Limbé, where farmers are given instruction in reforestation and soil conservation. AOP staff and farmers have participated in these training sessions. They have also used these facilities for mounting their own training activities.

The NPA, like the AOP, will leverage other donor funding to supplement USAID resources within and beyond the framework of the project itself. For example, one important local-level NGO in the south, the Union of South Region Cooperatives (UNICORS), initiated an AOP-sponsored nursery and extension activity several years ago. After only a few years of operation under the AOP umbrella, UNICORS was able to procure independent funding for its agroforestry program from the Canadian government. Both financing and technical assistance for this significant outreach program in the southwestern portion of the southern peninsula continue to be provided by the Canadians.

More recently, PADF was able to sign a parallel project assistance agreement with the Belgian Association for Cultural, Educational, and Technical Cooperation (ACTEC), for \$500,000, to expand its agroforestry operations in the north. Likewise, CARE has been able to find additional funding for the construction of its training centers. Such supplementary financing, leveraged from other donors by NPA grantees, will continue to play an important role in building the agroforestry resource base necessary to mount a credible and effective response to Haiti's pressing agricultural and natural resource constraints.

FIVE KEY REASONS FOR THE NPA

The rationale for continuing to support agroforestry activities under the NPA is fivefold.

1. **Congruence with A.I.D. strategy.** The NPA fully reflects the development strategies of both the mission and the LAC Bureau and is the mission's flagship project.
2. **Looking toward the future.** The national attention and public interest generated by a project of this scope, even when it is implemented entirely by private sector agencies, will serve to keep the door open for policy dialogue opportunities with the Government of Haiti (GOH). Using the NPA as a platform, the Mission should be able to leverage — or at least to influence — important policy reforms and public planning decisions in the area of natural resource legislation.
3. **Responding to the peasants' needs.** The resource transfer has significantly expanded the production and management options of the hard-pressed Haitian peasants. Their deeply ingrained predisposition to the novel, the interesting, and the useful encourages the nondirective transfer of new resources to them, and stimulates their maintenance of innovation in the absence of external support.

4. **Building on success.** The design of the NPA was based on the belief that development is an evolutionary process that builds on lessons learned in the process of implementation. The AOP stimulated peasant interest in tree production and hedgerow technology. The time has come to capitalize on this success and to diversify the resources and services available — thereby increasing the range of technical options available to the hillside farmers of Haiti.
5. **Accepting responsibility.** Given the present political and developmental climate in Haiti, there is no viable alternative to the continued USAID support of agroforestry activities. USAID helped create the very successful AOP and has a responsibility to continue this commitment under the NPA.

SECTION THREE

KEY DESIGN ISSUES

THE PROJECT FOCUS

Trees Forever

During the development of both the project identification document (PID) and the project paper (PP), it was debated whether or not to continue with the status quo by funding only the AOP's current activities such as tree planting, hedgerow technology, and basic training for farmers in tree planting, maintenance, and harvesting. This was viewed as one viable alternative route for the project to pursue. "If it ain't broke, don't fix it!" is the commonly heard epithet.

Because the project is a success, as attested in the PID and other documents, the temptation is either to continue at present levels or to increase funding to do more of the same, but on a wider geographic basis. Some current project staff even believe that the project would be more successful by focusing additional resources on one or two key catchment basins in each region of the country. The intensification of similar, proven techniques and training modules can be justified as a viable alternative to the proposed project.

The justification for this conservative approach was that the AOP managed to do what no other project has achieved — establish a system of centralized nurseries that produces seedlings in an efficient and timely manner, create an extension service that distributes these seedlings to hillside farmers, and succeed in interesting farmers sufficiently so that a large number of trees have survived over time. In the context of contemporary Haiti, this is regarded as little short of miraculous and there are those who, knowing the AOP well, would argue passionately and articulately for an NPA whose principal objective would be to fine-tune this "lean, mean, tree-planting machine."

Diversify or Die

At the other end of the spectrum are those who argue that the AOP just scratched the surface in terms of its potential for establishing sustainable agriculture on the hillsides of Haiti. From the perspective of the peasant, crops are more important than trees — since you can eat the former, but not the latter. The AOP has helped reduce soil erosion and improve the fertility of the soil that remains. Hence, it is incumbent upon the NPA to capitalize on these gains. And this means moving much more into agriculture and annual crops.

Furthermore, the problems the peasant faces are multifaceted and their resolution calls for an integrated approach that moves far beyond the planting of trees and the establishment of hedgerows, into widespread alley cropping, improved seed, production credit, and marketing assistance. Without such diversification, it is felt that the NPA will gradually wither away — partly because it is not responding to the peasants' needs and partly because it is still heavily dependent on the provision of external inputs, which are simply not sustainable on a long-term basis.

BUILDING ON EXPERIENCE

The PP design team proceeded on the assumption that development is an evolutionary process that is dynamic, subject to change, and based on previous experience. As the earlier section on lessons learned from the AOP underlined, participating peasants have taken the germplasm ball and run with it — demonstrating that they are interested in aspects other than the purely economic. The resource transfers undertaken — both biological and informational — have significantly expanded the production and management options of hillside peasants. An experiential base has been created upon which the NPA can incrementally build with confidence.

Field trips to observe AOP activities indicated that this expanded, more comprehensive approach is the strategy preferred by many project technicians, on the grounds that since the AOP is helping participating farmers to improve the quality of their soil, it should also help them to take full agronomic advantage of those improvements. "*Il faut valoriser la terre*" was a refrain heard in many of the PADF regions.

WHY THE NPA IS DIFFERENT

The proposed project is similar to the AOP in its fundamental orientation to outplanting multipurpose trees on private farms, providing the peasant with an economically viable crop. Where the project differs from the AOP is that it will:

- Continue the seedling production and distribution program in terms of the technology, but will include a broader selection of perennial species of forages, grasses, and non-woody vegetation. This emphasis on vegetation other than trees will necessitate some additions to the present nursery production system;
- Introduce a program of on-farm propagation techniques, tree management, and harvest schemes that will serve the needs of the more experienced farmers who have participated in the AOP and who want to go beyond the present technologies and practices;
- Diversify interventions beyond simple hedgerow installation and management as a viable method of soil conservation and into development of stable alley cropping systems, improvements in soil fertility by use of green manures, mulch, and livestock forage, and more use of indigenous seed and germplasm; and
- Identify ecologic, topographic, and soil conditions where rehabilitation of the soil — reversing erosion and increasing fertility — is possible by better management on the farm, and, where it is not possible, perhaps opting for more extensive use of forestry on those poorer sites.

THE PROPER ROLE OF RESEARCH

AOP Research to Date

The AOP identified the need for research that was "adaptive and practical" and implemented two phases through Title XII mechanisms. Phase I, executed by the University of Maine, undertook a characterization of traditional agroforestry systems, silvicultural studies, improvements in nursery techniques, species trials analyses, marketing studies on consumer preference for wood products, cost-benefit analysis of tree planting, and socioeconomic analyses of key farmer decision making for project trees. These studies were quite useful.

Phase II, conducted by a team from Auburn University, covers:

- Cost-efficient and appropriate systems for the production of vigorous planting stock;
- Establishment and maintenance of trees on small farms; and
- Economic and social aspects of crop and livestock association with trees.

Due to the slow start-up, a consequence of the political troubles in late 1987, the Auburn team has been in-country less than a year and, not unexpectedly, has little to show at this time.

In addition, a seed and germplasm improvement component was designed and funded to address the problem of "garbage seed" and poor species performance in some areas. The goal of this component is to improve and control the quality of seed outplanted through the nursery production system. Because of the progress to date and the crucial importance of this component in maintaining and improving both the quality and quantity of germplasm available for the nurseries, the PP team was unanimous in recommending increased support under the NPA.

The Need for Focused, Applied, Technical Research

The design team was also unanimous in its insistence on the need for focused, applied, technical research. As the social soundness analysis demonstrates, there are no social issues to be addressed at this time, because the strategy followed by the AOP, to be continued under the NPA, is nondirective — the peasants decide for themselves whether or not they wish to take advantage of the resources offered by the project. In addition, they are free to do what they like with these resources. At the present time, there is every indication that the NPA will be socially feasible, and that equity will not be a problem.

Consequently, the NPA will refocus the research needs toward applied research that will measure, enhance, and expand on-farm and off-farm impacts of the various technical interventions. The major elements of the research are described below. In summary, new directions will include research directed at (1) understanding hedgerow technology as a viable and practical means of soil conservation on steepplands; (2) characterizing appropriate alley cropping systems in terms of crop management practices, spatial distribution, planting density, and other farming practices that will improve soil fertility on steepplands; and (3) developing a range of recommended ecological, topographic, and soil conditions in which rehabilitation of farmlands is possible, as well as areas where the investment is best made with only trees.

CARE'S FARM PROPOSAL

Background

In November 1988, CARE presented an unsolicited proposal to USAID for funding under the NPA. This proposal, entitled the Farmers' Resources Management (FARM) Project, states that the residents of the Northwest are trapped in a closed socio-economic-ecological system, which provides little way out from the dual entrapments of poverty and low food production. Soil degradation and low crop yields are consequences of this cycle of poverty, the principal causes of which, according to CARE, are the following:

- Lack of knowledge and inappropriate attitudes concerning resource management;
- Limited community organization; and
- Inadequate access to basic farm inputs.

FARM proposes to address these constraints through a six-pronged project incorporating training, extension, community organization, agroforestry, complementary agricultural practices, and staff development.

The PP design team was asked to review this document and found it flawed in several aspects. These doubts were confirmed during visits to the Northwest during more detailed interviews and conversations with CARE's expatriate staff, the Haitian Regional Managers, extension agents, and the peasants of the region who have benefited significantly from the AOP. The team as a whole was impressed by CARE's achievements, but downright skeptical of certain key elements of the FARM proposal — particularly training and extension, community organization, and local nurseries. A more detailed critique is included as an annex to the social soundness analysis, published as a separate report in this document. The comments that follow here draw partly on that document, but also reflect the concerns of the design team as a whole.

Training and Extension

Much of the FARM proposal is based on an elaborate training program for cohorts of 125 farm agents (FAs) in four successive training cycles. The training plan comprises both classroom work and field practica, and includes a number of relatively long-term field exercises in the trainees' home communities, with reflective follow-up and structured self-evaluation. All other components of the project depend upon techniques and information taught to these select groups of trainees, who in turn are expected to transfer these resources to peasant farmers in their own communities, at a rate of approximately one farm agent per 60 farmer participants.

Little is said about how these agents will be selected. Of concern is the fact that the evidence to date indicates that consensual community identification of leaders systematically reflects, reproduces, and reinforces existing social hierarchies and local inequities in the distribution of wealth and power. What is known, however, is that most of the present extension agents, approximately 160 in number, will be let go at the end of the year, though the better ones will be rehired under the NPA.

At the end of each proposed training cycle, the 125 graduates will be dropped from the CARE payroll, and are expected to return to their home communities. Moreover, the proposal suggests, they will continue to perform extension, community organization, and monitoring functions essential for the continued success and sustainability of the project. This raised three questions for the design team:

- What is the rationale in spending 30 months training these agents, dropping them, and then repeating the procedure elsewhere?
- What evidence is there for believing that they will continue to work as volunteers? and
- Even supposing, for the sake of the argument, that they do continue, what support will they receive from CARE in terms of training and material resources?

As this project paper makes clear in a later section, the design team recommends that CARE continue with its extension system as presently structured, with careful selection of those extension agents who will continue with CARE, and will form the permanent backbone of its extension system. In certain parts of the Northwest, this service has been extremely effective. As one member of the design team commented after visiting Desforges: "I have seen the gateway to the sustainable future of Haiti and it works!"

Community Organization

The extension activities of the FAs will be targeted to farmer groups. These groups are ambiguously defined in the proposal, but are putatively based on agricultural exchange-labor gangs known locally as *konbit*. The community organization component centers on the formation and strengthening of these farmer groups — four per farm agent; on their education and inculcation with more appropriate attitudes toward resource management than those CARE seems to feel are now held by the peasants of the Northwest; and on their establishment of group-based local nurseries, under the stimulation and oversight of the FA.

Group formation has long been known to be an extremely difficult proposition in rural Haiti. While a small number of proven methodologies exist for this purpose — at Maissade, Gros Morne, and the Central Plateau, for example — they require painstaking and careful application by specially trained animators. The rare instances of the successful deployment of such methodologies in Haiti have been linked to certain identifiable characteristics or capacities of the implementing agency. Chief among these are:

- A relatively small scale of operations;
- Community organization as the preeminent goal, rather than as an intermediate step, in the development process; and
- A careful avoidance of motivational carrots, such as Food-for-Work or free inputs, for an extended initial period, in the service of group maturation and self-reliance.

Under the best of circumstances, the process of group formation among marginal or disenfranchised people is inherently political, grounded, as it must be, in interlocking notions of cooperation, collective action, constraint analysis, autonomy, and empowerment. Under current

circumstances in the Northwest, the merest intimation of group formation objectives is foolhardy and potentially dangerous. FARM's implicit suggestion that such a strategy can be pursued apolitically is disingenuous, at best.

The PP team recommends that CARE continue working with stable training classes of farmers. This is an efficient approach, and a logical choice in terms of training methodology, since the preceding points suggest that attempting to elevate such classes to the status of permanent, polyvalent action groups is both strategically ill advised and methodologically unfeasible for CARE in the Northwest.

Local Nurseries

The term local nurseries is used in the proposal to refer to a relatively broad array of decentralized, group-based, and individual tree propagation efforts, employing technologies that are appropriate for — and able to be appropriated by — peasant farmers themselves. The hope is that these propagation technologies, being both less high tech and less capital intensive, will be more sustainable than those now practiced in the AOP's centralized, containerized nurseries. Indeed, the express intention of the FARM proposal is to replace centralized nursery production with alternative tree propagation systems at the community and on-farm levels.

The proposal sketches a typical group-based local nursery as follows: 15 peasants, organized in a functional group, cooperate to produce 3,000 seedlings per season in plastic sacks, using locally available materials. The seedlings are divided among group members, in shares of approximately 200 per planter for outplanting on their farms. No payments are involved. This process, presumably, would be duplicated each successive season and sustainability would thus be achieved.

As a later section of this PP points out, it takes much more time and effort to train staff and provide the technical and administrative support required to set up and run 15 small nurseries, which produce 10,000 seedlings each, than it does to set up one nursery to produce 150,000 seedlings. In addition, plastic sacks — the low tech approach favored in such nurseries, have several important limitations. To maintain a given level of seedling production, a nursery would need at least three times the surface area, three times the amount of potting mixture, and would require significantly more labor than a similar Roottrainer nursery. Consequently, this low tech approach is considerably more expensive.

There are also certain sociological constraints that must be dealt with. At some point — actually quite quickly — the group members' demand for seedlings will be satisfied. Between two and three seasons' worth of production would likely saturate most participants' land with tree seedlings. Once the absorptive capacity of the group is exhausted, what rationale exists for continued production? It is well known that there is essentially no cash market for hardwood seedlings anywhere within the peasant sector.

Socially, the same local nursery concept faces two insurmountable problems. First, the assumption that peasants are willing to work cooperatively in groups, on a common activity, focused on a shared resource, is optimistic in light of the evidence. Second, the strong, traditional preference for fruit tree, as opposed to hardwood, seedlings, combined with the marginal but nonetheless extant local market for such seedlings, will immediately bias local nursery production heavily toward such species as coffee, cacao, breadnut, grapefruit, and mango. Not surprisingly, local nurseries of the type favored by CARE have a very spotty record in Haiti.

For these reasons, the PP team is convinced that the main seedling production should continue to come from the centralized, containerized nurseries, for the simple reason that they function well and are relatively cost-effective. A sudden attempt to change to other types of nurseries or production technologies would risk seriously disrupting the tree production and distribution system of the NPA.

SUSTAINABILITY

What the PID Said

During the preparation of the PID, one of the key design issues identified was sustainability. At that time it was argued that, from the perspective of USAID, long-term sustainability would depend on two factors. One was the extent to which local NGOs would be willing and able to assume some — or all — of the costs of the nursery, outreach, and extension activities. A second factor was the extent to which appropriate, low-input techniques could be developed for independent on-farm application. In brief, a realistic appraisal of what the NPA could do in terms of working toward sustainability — financial, technical, and institutional — within a developmental context, in which the central government has effectively abnegated all responsibility, included the following:

- Increasing the managerial and technical capacity of collaborating, local-level NGOs through intensive training; obliging them to pay their share of recurrent costs from profits generated by the seedling purchase agreements; and encouraging the more sustainable to find their own funding sources for NPA activities;
- Providing intensive training to participating farmers to increase their technical and managerial capability in seed production, planting, harvesting, and agroforestry; and
- Institutionalizing local demand for sustainable land use interventions by having farmers lobby their respective NGOs and, ultimately, the GOH, for more effective and comprehensive services.

During the design effort, it became apparent that farmer training and institutionalizing local demands were the more relevant and important points, given the prevailing institutional and political situation in Haiti.

What Do We Mean By Sustainability?

On one level, the NPA is a subsidized, resource-transfer activity and as such should not itself be assessed in terms of sustainability. Rather, the question is whether the NPA can stimulate self-sustaining processes within the society at large that will continue, following the termination of project assistance. The most promising focus for sustainability is the peasant household production unit. The NPA will succeed in setting the stage for the relatively long-term sustainability of both multipurpose tree cropping, and soil and water conservation measures, at the level of the individual farm enterprise.

The resources and services to be offered by the NPA include the following:

- A cumulative total of at least 50 million multipurpose trees, their naturally occurring progeny, and their sustained production of fertile seed, shoots, and cuttings;
- A similar biological resource of indigenous and exotic grasses and leguminous forages and their progeny, on a somewhat smaller scale;
- Validated and demonstrated information on species propagation, performance, and management, and on biologically based soil conservation/soil amendment/moisture management technologies; and
- Validated and demonstrated information on the additional, economically useful by-products of such biologically based conservation measures.

The Haitian peasant is no fool. To the extent that these biological and informational resources are indeed effective in improving on-farm productivity, they will be appropriated by the peasantry and sustained at the farm level. Conversely, to the extent that they are not useful, or not in keeping with the broader constraints confronting the peasant, they will be abandoned. AOP participants in several regions are already experimenting with the on-farm propagation of project trees, on their own, with little or no direct stimulus from the project. Similar behavior was reported for several planters by Conway, working in other regions, as early as 1986.

These spontaneous developments — though they are clearly a result of project interventions in the broadest sense of that term — obviously bode well for the long-term sustainability of relatively large-scale agricultural tree-planting beyond the life of the project. The concepts, the experience, and the biological resources necessary to facilitate such peasant behavior that have begun to accumulate help ensure this sustainability.

It should be noted that the biologically based soil conservation programs hold precisely the same prospect of being sustainable in this most important of senses — by introducing concepts, techniques, and living germplasm. Their continued presence and spread in local farming systems are not dependent upon the continued presence of the project itself, but upon the extent to which they help peasants respond effectively to particular farm-management and productivity problems.

The Institutionalization of Demand

The sustainability question is an important design and implementation concern. What behavior, activities, and action might and should be sustained? Second, what institutional capacity is required for these activities to continue in the future?

As discussed above, tremendous strides have been made by the AOP in persuading farmers to plant a large number of trees on their own farms. Farmers understand that trees are a production crop, one that can be farmed and incorporated into improved farm management practices. As a result, there is already a large, unmet demand for seedlings, by both new planters and repeaters. The continued stimulation of a **strong, permanent demand** by the rural, hillside farmer for hardwood seed and seedlings, including hedgerow species, is the bottom line of sustainability within the NPA.

If such a demand continues after NPA, the project will have achieved something few other projects have been able to do in Haiti — create an environment where farmer demand will become an important force in shaping the type of assistance and extension that is directly relevant to his needs.

Continuing to stimulate this demand for hardwoods and hedgerows and their incorporation into present hillside farming systems demonstrates that farmers can influence what happens to their soil. This engenders the need, acceptance, adaptation, and utilization of new and different approaches to land use, some generated externally, but others by the farmers themselves. This **process of demand** creation will become more sustainable through NPA activities. A critical mass of trees and hedgerows will create the physical setting necessary for the process to really take hold.

Efforts that assist the movement toward cheaper — read sustainable — seedling production in centralized nurseries include better seed quality and the testing and use of locally made potting mixes. In addition, research in bare-rooting planting stock may reduce the dependence on imported containers.

By working through local NGOs for nursery production and extension activities, PADF is contributing directly to a transfer of knowledge, and building responsibility and expertise within these NGOs. These two elements, knowledge and responsibility, are key elements that allow for greater sustainability if other resources are adequate. PADF should work seriously with the best local NGOs to increase their capacity to find and exploit external resources, such as other donors. Sustainability of seedling production and seedling distribution is directly tied to improving this capacity. Such improvements are expected under the NPA.

The training activities of CARE and PADF are geared not only to increasing the technical knowledge of their staffs and that of the NGOs, but also to strengthening individual capacity to contribute to agroforestry work in Haiti. These trained people will form part of a growing and permanent human resource base that will remain available to participate in and contribute to agroforestry work in Haiti.

The seed and germplasm improvement activities of NPA will establish seed orchards to be used as points of improved seed collection and gene conservation banks. This activity will help sustain biodiversity in Haiti and guarantee quality seed for many species of hardwoods. Improved seed technology will be one of the outputs that will be available from this component. Seed processing and storage facilities are to be built and will contribute to sustaining better seed supplies for agroforestry work throughout Haiti.

Will Peasants Ever Purchase Seedlings?

The answer to this question, which has sometimes mistakenly been put at the center of the sustainability issue, remains a qualified "yes." Some peasants, at some time in the future, will likely be willing to purchase some kinds of tree seedlings at some price. More to the point are the following observations, offered in summary form here in an effort to put this question to rest:

- Asking peasants to purchase seedlings, even at nominal or token prices, raises serious equity concerns. The poorest segments of the landed population, now able to benefit significantly from fully subsidized seedling distribution, will effectively be driven out of participation in this aspect of the project. In other words, those who need the trees most will be denied access to them;

- Expecting peasants to purchase seedlings, essentially because their own government is unwilling or unable to foot the bill, is another form of what can politely be called regressive taxation in the Haitian context. The rate of public sector investment in the peasant agricultural sector has remained at relatively constant, criminally low levels throughout most of Haiti's postrevolutionary period; and
- Once on-farm propagation techniques have been developed to a point where their efficiency and scale of application promise outputs comparable to those of the containerized nurseries, it may be reasonable to try to produce seedlings for sale, at an acceptable profit, within the nurseries. At that point, at least, all peasants interested in continued, extensive tree-planting will face an acceptable pair of options — either purchase or produce the desired commodity.

SECTION FOUR

PROJECT DESCRIPTION

PROJECT GOAL AND PURPOSE

The goal of the NPA is to maximize the productive potential of Haitian hillside agriculture by reducing the ongoing degradation of the country's natural resource base through sustainable land use interventions.

The primary purpose of the NPA is to achieve sustainable increases in on-farm productivity and farmer income through the integration of appropriate soil-conservation measures and trees and shrubs, grasses, and other plant materials that enhance soil fertility into existing farming systems.

A secondary purpose is to continue the institutionalization of farmer-led demand for such appropriate land use interventions, plant materials, and extension services. This purpose is based on the assumption that the stimulation of a recurrent demand for such materials and services will ultimately move project participants in two distinct directions. First, they will be eager to master those aspects of introduced technologies — such as hedgerow technology, management practices, and plant propagation — that are susceptible to on-farm or local-level replication. Second, they will come to expect, and, indeed, to demand, that such external support services as are necessary be provided on a continuing basis by either the NGO community or the public sector. It is through some combination of these two impulses among the peasant beneficiaries that the NPA will seek to ensure long-term sustainability, even after the termination of direct project support.

THE CASE FOR AN INTEGRATED PACKAGE

This five-year project will consist of five components. The first is nursery production of the necessary seedlings. This is the motor that drives the other components. The major achievement of the AOP has been to establish a chain of 45 regional and 30 community-level nurseries that extend the length and breadth of Haiti. Many of the nurseries are owned and operated by local NGOs; they have operated relatively successfully over a period of years and will continue to do so under the NPA.

Nursery production is reinforced by the second component, **seed and germplasm improvement**, which will strengthen the NPA's capacity to supply the nurseries with high-quality seed and plant material. This component provides the fuel to keep the nursery motor running well. Two of the principal objectives are, first, to establish seed orchards, one in each of the major regions of Haiti, and, second, to organize a central seed processing and storage facility for the NPA. In this way the project will assure the availability of high quality seed for use in the nurseries.

The third component — **applied research and technology generation** — will enhance the impact of the NPA, particularly in terms of the technologies to be disseminated. This will be particularly important in promoting hedgerow technologies for soil conservation on individual farms and selected subcatchment basins. There is a growing awareness and appreciation that the AOP is at the cutting edge

of agroforestry approaches to natural resource management, particularly on fragile lands such as those found in Haiti. There are many technical questions to be answered and the NPA will focus on the most crucial. The results of this research will provide more technical options for hillside peasants.

The fourth component, **outreach and extension**, will distribute the material produced by the nurseries and disseminate the technologies produced by the research component. The wide-flung extension network will function as the wheels for the NPA nursery motor. This transfer of resources to the peasants will provide them with additional options for management and production on their plots. The key, to date, has been the nondirective nature of this transfer — the individual peasant is free to accept or reject what is offered. The project proposes, and the peasant disposes.

Training, the final component, is directly primarily at the extension service, which is responsible for training the project coordinators and animators who work directly with the peasants. The messages these agents carry are only as good as the results of the applied research and the practical manner in which they are presented. The materials they offer, primarily seedlings, are direct products of the nurseries, which, in turn, are affected by the seed and germplasm component. As the project matures, there is a growing awareness of the increasing importance of training, particularly as the project diversifies and becomes more complex.

The PID proposed a sixth component, institution building, which, after careful reflection, the design team decided to drop. The idea was to develop a systematic plan for strengthening the intermediary, local-level NGOs collaborating with the NPA, and increasing the role of formal and informal farmer groups in outreach activities. During the preparation of the PID, it was believed that local-level institutional viability was a key component in overall project sustainability. Consequently, selected collaborating NGOs were to receive NPA support in training, resources, and technical assistance, to enhance not only their agroforestry capabilities, but also their administrative and managerial capacities.

While the PP team accepted that there is certainly a need for this type of support, it also realized that effective institution building at the grassroots level in Haiti is a long-term proposition requiring considerable commitment of time and resources. Even participating NGOs agreed that the AOP is not in the business of building institutions — only working through intermediary NGOs and building their capacity to produce and distribute seedlings, and to extend low-input soil conservation techniques to peasants.

EXPECTED ACHIEVEMENTS AND ACCOMPLISHMENTS

By the completion date in 1995, the project outputs will include the following:

- An increase in seedling survival rate — to 60 percent after one year;
- An increase in the number of hillside farmers planting trees, shrubs, and grasses, from the estimated 200,000 who presently do so — to approximately 600,000;
- 300,000 farmers who are effectively managing and harvesting their trees;

- 125,000 farmers who are effectively implementing a variety of agroforestry techniques through the introduction of new multipurpose trees, hedgerows, forage species, and new provenances of planted species;
- 50,000 project participants who are practicing proven and appropriate methods of on-farm plant propagation, such as direct seeding, stem and root cuttings, stump propagation, and bare rooting;
- A continued improvement in the local genetic resource base for tropical forest species through the production of seed by the seed orchards established under the NPA;
- Effective operation of a central seed processing and storage facility for each of the grantees;
- Strengthened Haitian capability for better management of their productive natural resource base through the intensive training of agronomists, agricultural technicians, extension agents, and peasants;
- An increase in the volume and variety of wood products produced by hillside farmers, which will contribute to household income. At the present time, reliable data on either volume of production or household income are virtually nonexistent;
- Development and implementation of a plan to conserve the endangered oil palm, *Attalea crassispatha*, and other species as appropriate, to preserve biodiversity in Haiti; and
- Establishment, by both grantees, of pilot environmental education programs in selected, interested regions.

NURSERY PRODUCTION AND ON-FARM PROPAGATION

Centralized and Local Nurseries

The NPA should continue to rely on central nurseries to produce at least 10 million seedlings per year, 7 million from PADF's NGO-operated nurseries and 3 million from CARE's system. Discussions with peasant informants indicated that:

- Virtually everyone is pleased with the trees that they have received from the project;
- The seedlings produced in the central nurseries are perceived to be of higher quality and to perform better than any seedlings that farmers would be able to produce themselves, if they had the necessary skills and materials;
- Seedling demand can be expected to continue at past levels, and will probably even increase for the foreseeable future; and
- The seedlings that have been planted in the past are beginning to furnish usable products that are considered to be both useful and economically beneficial.

The main seedling production should continue to come from the centralized nurseries, for the simple reason that these nurseries function well and are relatively cost-effective, given their levels of production. A sudden attempt to change to other types of nurseries or production technologies would risk seriously disrupting the tree distribution program of the NPA. However, this is not to say that the exploration and development of alternative production techniques and materials should not be investigated and, if possible, developed to provide a complementary source of low-cost seedlings.

Efforts to support the development of local or community-level nurseries, which focus on producing small numbers of trees for local needs, should continue on a small scale. The priority sites for these efforts should be those locations that cannot be serviced through the centralized nursery system. It should be remembered, however, that it takes much more time and effort to train the staff and to provide the necessary technical and administrative support required to set up and run 15 small nurseries, which produce 10,000 seedlings each, than it does to set up one nursery to produce 150,000 seedlings.

Improved Nursery Management

Many of the NGOs and other participants wish to increase annual seedling production under the NPA, but this may not be the best use of project funds, given present resource constraints. Rather than attempting to increase centralized nursery production significantly, it should be maintained at present levels. Rather than just "pumping out the germplasm," the time has come to begin to focus on improving extension efforts that may result in greater survival of the seedlings that are being outplanted and in a greater diversification of existing and proposed activities.

It is preferable, then, to produce seedlings that are of the best possible quality, and to put greater efforts into increasing survival through better control of the tree planting and protection processes.

The NGOs that produce seedlings under PADF's guidance have requested that the seedling payment be increased by one to two cents. This is not an unreasonable request, given that there has not been any price adjustment since 1986 and that the cost of seedling production has risen to a level that equals or even surpasses the price paid by PADF. One option to consider would be to offer a variable price increase, based upon the relative quality of the seedlings produced, the nursery's success at meeting their contracted production targets, and the amount of technical supervision and support required from the regional Team Leader or other team members.

Efficient nurseries that require minimal supervision from PADF technicians and meet the contracted seedling numbers would receive ten cents per tree. Nonperforming nurseries that required repeated, significant guidance from PADF technicians and manifested other performance problems would only receive the current eight cents per tree. Chronically deficient, nonperforming nurseries should be dropped from the PADF nursery production system, if they do not respond to technical recommendations concerning performance.

Alternative Nursery Technologies

Three methods are in use for propagating seed in the nurseries — Roottrainers, Winstrips, and plastic sacks. Both Roottrainer and Winstrip nurseries have greater water requirements than do plastic sack nurseries. They also require a much greater initial investment for material costs. The Roottrainers generally last only three or four seasons, while the Winstrips reportedly last up to 10 years or longer.

The Winstrip was originally developed in Haiti, but both containers are now imported — the Winstrip from Taiwan and Korea and the Roottrainer from Canada. There are significant costs in buying the special holding racks that are needed for the Roottrainers, and periodic maintenance, occasional repair, or replacement.

Plastic sack nurseries are used successfully throughout the developing world. They offer two distinct advantages in areas with poor soils and erratic or limited rainfall. The relatively large amount of potting soil in the sack frequently has a better nutrient status than the soils into which the seedling will be planted. The large soil volume also provides a moist rooting medium that can maintain the plant for several days or more, if the rains should fail briefly following outplanting. Another advantage of plastic sacks is that they are relatively low cost.

Plastic sack technology, however, has several important limitations. Not only do the sacks with seedlings weigh more than Roottrainers or Winstrips, but they also take up approximately three times the surface area that a seedling raised in a Roottrainer does. This means that, to maintain a given level of seedling production, a nursery would need at least three times the surface area, three times the amount of potting mixture, and significantly more labor than a similar Roottrainer nursery. Consequently, seedling production using plastic sacks is substantially more expensive than the other known techniques.

A study currently being conducted by the SECID/Auburn research team at the Operation Double Harvest (ODH) nursery will provide an indication of the actual differences in terms of growth between the Roottrainer, Winstrip, and plastic sack containers and the GRO-mix, Haiti-mix, and CARE-mix potting mixes.

On-Farm Propagation

There is a need to make farmers aware of alternative means of propagating trees. Among the alternatives are direct seeding, stem and root cuttings, stump propagation, and bare rooting. Although farmers know of and practice direct seeding, planting by stem and root cuttings, and bare-rooted transplanting of some indigenous species on a small scale, the level of replacement relative to their needs is inadequate. Furthermore, farmers tend to rely on those species that are the most convenient to work with, or for which adequate germplasm is available.

Due to their relative newness, these alternative means of plant propagation should be undertaken first as a pilot program of modest size. Formal protocols should be established prior to commencement of testing of the techniques, so that the test results can be compared throughout a range of soil and climatic circumstances, prior to extending the techniques to farmers. Once it has been established which species of trees, grasses, and shrubs hold the greatest promise of good survival and growth on peasant lands, the techniques can then be incorporated into a formal extension program.

Expected Outputs

Over the life of the NPA, this component is expected to achieve the following outputs:

- Production at 10 million seedlings a year — primarily by centralized, containerized nurseries;

- Increase in seedling survival rate — to 60 percent after one year;
- Applied research on nursery technologies and appropriate potting mixes;
- Improved nursery management at the NGO level; and
- Extension of proven and appropriate methods of on-farm plant propagation to 50,000 project participants.

SEED AND GERMPLASM IMPROVEMENT AND MULTIPLICATION

Present Situation

The AOP's nascent seed and germplasm improvement and multiplication component — in operation for little more than a year — will be maintained and expanded under the NPA. The goal of this component is to improve and control the quality of seed outplanted through the nursery production system. At this time, the following activities are being pursued:

- Establishment of at least five seed orchard sites, composed of approximately 15 orchards, one in each of the major regions of Haiti. The sites are to be located on private lands, in conjunction with well-established NGOs to ensure stability of site access and protection of the orchards from vandalism. The seed orchards will result in regional production of adequate quantities of seed of selected species for agroforestry activities in Haiti, and the improvement in genetic quality and provenance characteristics of this seed. A medium-term output of the orchards will be timely production and distribution of seed of known origin and provenance to meet the demands of the various NGO-operated agroforestry nurseries;
- Introduction of new multipurpose tree and forage species and new provenances of currently planted species and lesser known indigenous species with potential for use under the project. The germplasm introduced will reflect grantee recommendations and requests for filling a niche in the farming systems peculiar to each of the different regions of Haiti. Species and provenance trials are established to monitor tree species performance and to guide the selection process in future genetic improvement activities;
- Organization of a central seed processing and storage facility for each of the grantees in the Port-au-Prince area. The purpose of such a centralized function is to ensure that all seed procured, either locally or abroad, is of high quality in terms of genetic uniformity, viability, and purity, and of known provenance; and
- Preparation of a document defining a recommended framework for long-term genetic work with agroforestry species in Haiti. Because tree improvement is a long-term proposition, it is necessary to develop institutional commitments so that realized gains are maintained and improved.

Proposed Activities

The continuation of this component under the NPA will build upon the above activities, with a focus on:

- A long-range program for tree improvement and seed multiplication;
- Information systems for tree improvement;
- Seed collection, storage, and international procurement;
- Seed orchard establishment and management; and
- Preservation of biological diversity.

Structure

It is recommended that the present system of implementation be continued and elaborated upon. In other words, the system should be implemented by an independent contractor who will be responsible for all research activities and will collaborate closely with the grantees and USAID. The two long-term positions proposed for this component of the research unit, the seed and germplasm specialist and a database manager, should be funded for five years and two years, respectively.

Expected Outputs

Over the life of the NPA, this component is expected to achieve the following outputs:

- Effective establishment of five regional seed nurseries;
- Effective establishment of a central seed processing and storage facility for each of the grantees in the Port-au-Prince area;
- Institutionalization of tree improvement by sharing the relevant information with NGOs, the GOH, and other donors, by maximizing Haitian and NGO roles in tree improvement, and by training Haitian staff to assume ultimate responsibility; and
- Development and implementation of a plan to conserve *Attalea crassipatha*, and other species as appropriate, to preserve biodiversity in Haiti.

APPLIED RESEARCH AND TECHNOLOGY GENERATION

The Role of Research

The research component of the NPA will provide continued, applied, and punctual support to the grantees. As such, it should remain focused on project-specific applied research activities and continue

to be formulated in conjunction with, and as a direct response to, the expressed needs of the grantees. The possibility exists that the research component of the NPA could become sidetracked or misdirected toward research activities less relevant to project implementation needs. To avoid this, the grantees must be closely involved in the conceptualization, development, and formalization of the research program, through the use of formal research protocols that clearly define the responsibilities of all participants, the goals of the research, and the research design.

Research priorities and future directions should be established by the grantees, in collaboration with the research unit, one of whose major responsibilities will be to assist the grantees in identifying possible topics, as well as provide them with feedback on the feasibility, cost, time requirements, and potential benefits of various research topics and proposals. The research unit staff should bring to the attention of the grantees research topics of potential importance to the NPA. It is only through active interaction and dialogue that a dynamic and mutually satisfactory research program will continue to function under the NPA.

There are three technical areas, investigated under the AOP, that will merit increased research efforts under the NPA. These are nursery technology, hedgerow technology, and alley cropping, which, under the NPA, will also include forage and grasses.

Nursery Technology

Work is under way in the AOP, much of it undertaken by CARE, to quantify the relative performance of the three containers in use — Rootainers, Winstrips, and plastic sacks; and three potting mixes — CARE-mix, Haiti-mix, and GRO-mix — used in the AOP nursery program. The initial studies at the ODH nursery should be followed by similar, comparative studies under the less-controlled conditions found in the centralized nurseries operated by CARE or the NGOs. A study to evaluate field performance following outplanting is being considered, but the protocols have not yet been completed.

There is limited information available concerning appropriate nursery techniques for containerized production of many indigenous Haitian tree species. There is also a dearth of information on techniques for successfully producing indigenous and exotic species through alternative, nonnursery, methods. Of particular interest are direct seeding and stump production techniques for Haitian conditions. Such information is vital before any major initiatives can be undertaken in the areas of alternative production techniques and on-farm tree production. Protocols for these areas have yet to be developed.

Hedgerow Technology

Under the AOP, approximately 1 million linear meters of hedgerows have been established, many of them spontaneously, with no direct project involvement. The hedgerow technology in place requires refinement. The question is not whether it is a positive soil conservation and erosion control practice or whether it produces forage material of nutritional value for animal feed, but, rather, what are the most suitable shrubs and grass/forage species to plant singularly or in combination. Forages are viewed as a means of soil conservation and as a source of improved soil fertility through their use as a green manure crop.

The following topics of interest should be investigated:

- **Planting:** What planting method(s) for hedgerows will have the greatest positive effect in terms of soil conservation?
- **Moisture:** To what extent will the moisture requirements of the hedgerow combinations compete with those of the agronomic crops planted between the hedgerows? and
- **Green Manure:** The material to be used as green manure is the grass/forages produced on the hedgerows, which has different decaying properties than a leguminous green manure crop, such as velvet bean. This implies a longer waiting period for planting between crops. What is the optimum time to harvest the green forage and the most appropriate method of incorporating it into the soil?

Alley Cropping

Alley cropping research for improvement of hillside farming is one of the most complicated tasks imaginable, given the number of variables and possible crop combinations that must be dealt with. It is important, therefore, to restrict the study to the most practical, applied topics. The primary focus should be on crop yield, rate of rebuilding of soil fertility, and erosion control. Experimental treatments agreed upon for each region should be in response to the most pressing local problems, the solutions for which are needed for agricultural decision making.

Field research into alley cropping, with hedgerows as part of the intercropping system, will focus on optimum crop and hedgerow species; planting density and timing of both trees and crops; soil fertility and soil moisture characteristics as influenced by hedgerows; possible measures for soil conservation on the sloping portion of the terraces, such as contour row planting; spatial distribution of all components in the system; crop management practices; extent of shading; potential for improved crop varieties; ways and means of further raising crop yields at a greater distance from the hedgerows; use of animal manure collected and cured elsewhere on the farm; optimum use of hedgerow trimmings for crop mulching and livestock forage throughout the year; and abolishing all burning practices and replacing them by green manuring.

In order to take full advantage of the grasses and forages to be planted between the hedgerows, the NPA will fund two small livestock management activities. Before this can be done, however, research will have to be undertaken on:

- **Feeding packages:** The optimum stage of development of grasses and forages has to be identified to maximize and capture their nutritive value for use as livestock feed. Having achieved this, simple and basic feeding techniques have to be developed to maximize the use of the forage by the animal; and
- **Cut-and-carry:** This practice is limited with regard to its optimum nutritive value. To capture all the nutrients in the forage, it has to be utilized during a predetermined time frame. If this is not possible, then the excess forage should be made into hay, and hay-making techniques have to be investigated within the Haitian context.

With the above information in hand, the NPA can then venture into more daring, applied forage/livestock management interventions, such as:

- **Cattle in the Southwest:** Interest in improving cattle productivity, beef and/or dairy, has already been shown in the Southwest where the demand for beef for the Port-au-Prince market is strong. This activity would be implemented by PADF in collaboration with the Targeted Watershed Management Project, which has already received requests from farmers for technical assistance with their cattle; and
- **Goats in the Northwest:** Since goats predominate in the Northwest, the practice of improved feeding techniques should be extended to interested farmers who are producing grass/forages on hedgerows. Based on the availability of forages, a concentrated feeding trial with 20 to 25 male goats should be tested as an innovative intervention. CARE could implement this activity.

Structure

Funding constraints dictate that the size of the research unit staff be reduced. Continued research activity in the areas outlined above would require the services of an agroforester, a tropical agronomist with knowledge of forages and grasses, administrative support, and up to 10 field research assistants. If detailed research designs and protocols for the nursery studies can be developed during the nine months remaining in the AOP, it should be possible to either eliminate the nursery specialist position completely, or reduce it to an activity that could be completed through regular short-term TDYs.

Once the research design and protocols have been finalized, it may be possible to incorporate many of the nursery studies directly into the existing nursery production program. The agroforester and agronomist positions should be funded for the full five years. Placing the entire research and germplasm team under one institutional contract makes sense from an economic point of view and because most of the applied research is often closely related.

The research unit should be responsible for the hiring, training, and management of their own field technicians. Generally, the grantees should not provide people from their own field staff, nor should they fund people to perform major activities for the research unit. This should not preclude the research unit from hiring grantee field technicians on a part-time basis, who are employed on a part-time basis in the first place. However, the research unit should not hire away grantee field technicians. The two areas where the grantees should actively participate in research implementation and monitoring are for nursery trials that will eventually have to be done in the centralized nurseries under field conditions, and for monitoring any trials that may be set up at the demonstration sites.

Linking Research to Extension

A key assumption justifying the continuation of a research component under the NPA is that there will be a direct and effective linkage with the programs of grantees and their extension activities. Close and frequent interaction, collaboration, and information exchange between the respective technical and administrative personnel will be important for fostering such linkages.

The only way that information exchange will come about is if the reports and documentation developed by the research unit are translated into either French or Creole. Failure to do so significantly limits the value of the information produced by the research unit. The Research Steering Committee (RSC) established under the AOP should continue to function under the NPA and should be used as a sounding board for the identification of research priorities and activities.

The Cooperative Agreements (CAs) and contracts that will be issued under the NPA should stipulate that there continue to be active participation at the monthly RSC meetings by the grantee research and administrative staffs, the research team members, the germplasm improvement staff, and the USAID project manager. The continued use of formalized research protocols that clearly stipulate the activities to be undertaken, the responsibilities of the grantees and the researchers, and the expected outputs will also facilitate such efforts.

Under no circumstances should NPA funds be used for any activities that have not been formalized and agreed to in advance through the preparation of a research protocol.

Expected Outputs

Over the life of the NPA, this component will achieve outputs in the form of proven recommendations concerning:

- The comparative advantages of both containers and potting mixes that can be utilized in the nurseries;
- On-farm plant propagation that will be useful to participating peasants;
- Hedgerow technology — particularly as it relates to planting practices, grass/shrub combinations, and the production and utilization of green manure;
- Intercropping patterns between the hedgerows;
- The best way to utilize the forages and grasses cultivated between the hedgerows.

OUTREACH AND EXTENSION

Specific Objectives

The fundamental purpose of the NPA extension component is to provide the Haitian farmer with both high-quality biological material and high-quality technical information that he or she is free to use as he/she sees fit. The overall goal is to provide this material and information in an efficient, cost-effective, and nondirective manner. The key player in this transfer of biological and informational resources is the individual extension agent.

Specific objectives are to:

- Produce and deliver high quality plant materials;
- Provide current and validated information about tree planting and tree management;
- Provide current and validated information about soil conservation, including information on how to manage hedgerows, alternative species for these hedgerows, and other methods of soil conservation;
- Provide current and validated information about more efficient agricultural practices; and
- Develop relevant visual, audio, and other tools designed to facilitate the transfer of information.

Planters and Managers

The NPA will divide farmers into two categories: the new planters and the farmers/managers. For the new planters, extension will include information on planting methods, spacing, recommended configurations, and the most efficient site-species matches. Information will also be provided on soil conservation and improved farming practices, where applicable.

Farmers/managers are those who have been with the project long enough to plant trees and are now ready to harvest them. For this group, information will be provided on tree harvesting, particularly for those trees which resprout, with specific information on coppice management. In addition, information on stand and tree management will be provided.

In addition to planting trees, many in this group have already implemented soil conservation activities or adopted new farming practices such as bio-intensive gardening. These farmers can be worked with intensively, with the objective of taking a long look at the overall management of their plots and providing them with additional technical information and options. This information will concern improved soil conservation systems; improved species; on-farm tree propagation; improved cultural and gardening practices; and seed selection, collection, and storage. The driving factor is to offer farmers options that may assist them in achieving more consistent crop yields from any agroforestry activity they see as relevant and appropriate to their needs.

Structure

The structure of extension systems used by both grantees should remain essentially the same. Team Leaders in the PADF regions should be encouraged to develop their extension priorities and activities based on the local social, economic, and ecological situation. In the CARE project, the training unit should become more of a technical advisor to Regional Managers who should, like their PADF counterparts, set the agenda for training and extension in their respective regions. The key interface will be the animator/farmer in PADF, and the monitor/farmer in CARE.

The capacity of extension agents to transmit effectively a wide body of knowledge should be considered. It seems likely that a happy medium could be reached somewhere between the PADF system

of one field of expertise for one set of animators, and another for a second set, and CARE's system of hanging all information transfer on the back of the monitor.

Information that is selected to be transferred should be simple. One example is teaching of contour farming. Another is showing people how to use live stakes for ravine stabilization. Information should be relevant to the task at hand, focused, and fit within the defined objectives of the extension activities.

It is recommended that during the NPA a conscious effort be made to establish a feedback mechanism whereby the grantees can be made aware whether their extension services are appreciated by local farmers, and whether they are responding to the needs of farmers. They should be prepared to take remedial action if necessary.

One way to do this is to hold "days of reflection" for farmers, already held twice a year in the Northwest, when farmers get together and speak directly to monitors about their performance during the last six months. Extension agents should be taught ways to elicit comments from farmers regarding the extension component and the project activities. Finally, senior staff in all regions should be encouraged to spend time with farmers and get to know them.

It is quite clear that PADF is under great pressure to continue its geographically extensive type of extension. As the only agency providing support for tree planting in many parts of the country, it cannot easily leave places untouched. It is, however, recommended that, where possible, a more intensive, geographically concentrated approach be tried. A logical place to start would be the Upper Central Plateau where the Team Leader has already expressed interest in intensifying the approach.

The CARE extension project should continue its intensive approach and the intensification of activities may be facilitated by concentrating more effort on repeat planters. The outplanting of trees will continue apace in both projects, but because it is already an efficient system with little waste, efforts to point additional resources in the direction of demonstrably interested farmers may be considered.

Important Grantee Staff

The most important links in the chain are the PADF animators and the CARE monitors. Effort should be devoted to developing their communications skills in order to increase the efficacy of the message transfer. Because these staff members will be the principal long-term contact with farmers, they should be encouraged to transmit messages from the farmers to regional staff regarding their views and desires.

The immediate supervisors of these agents play an important role since they can motivate them and also serve as a preliminary sounding board for the feedback loop running from the farmer to senior staff. They should also have solid technical knowledge and be able to help the agents if the latter have any problems.

Aside from these people, the most important staff members are the CARE Regional Managers and the PADF Team Leaders. It is these senior staff members who will set the agenda for the activities to be undertaken in their respective regions. The NPA should make a concerted effort to decentralize decision making.

Expected Outputs

Over the life of the NPA, this component will achieve the following outputs:

- An increase in the number of hillside farmers planting trees, shrubs, and grasses from the estimated 200,000 who presently do so to approximately 600,000;
- A target of 300,000 (50 percent) farmers who are effectively managing and harvesting their trees;
- A target of 125,000 (25 percent) farmers who are effectively implementing a variety of agroforestry techniques through the introduction of new, multipurpose trees, hedgerows, forage species, and new provenances of currently planted species; and
- A conscientious effort by PADF to implement a geographically concentrated approach to extension wherever possible.

TRAINING AND ENVIRONMENTAL EDUCATION

Overall Purpose

The purpose of training in the NPA is the fostering of improved knowledge and capacities in the extension agents who in turn train the farmers. Whatever materials are produced should be aids and resources for the training process, and not ends in themselves. Training is a support for extension activities and its content should be guided by the practices and knowledge that the extension agents wish to teach. With training the NPA needs to carefully identify training needs through observing farmers' current farming practices; conduct baseline and anthropological studies — the latter dealing with the attitudes behind farmers' practices and how people learn; monitor the effectiveness of past training on farmers, extension agents, school children, and teachers; and monitor all training through small, focused evaluations.

Training Materials

Good materials are already developed and in use, but their impact needs to be carefully monitored. While it is anticipated that new materials will be justifiable, they should be modest in number, born out of the knowledge of past programs, and carefully pretested and monitored. The NPA will not be heavily oriented toward producing books, manuals, and aids, but rather in training people at all levels — from the animators through to midlevel extension staff — who can communicate with farmers effectively and motivate them to try the various technical options offered by the NPA. The animators and midlevel staff will be encouraged to develop simple training materials for their own use, such as songs, drawings, and dramatic presentations.

Just as the Haitian farmer needs to be economical and adaptive in his farming practices, this project will be economical and adaptive in the development of training materials. To the extent possible, portions — pictures, chapters or individual dialogues, and stories — from existing training materials will be used, and then made new and lively by the improved communications skills of the animators.

Nevertheless, during the course of this project, booklets, manuals, filmstrips and other materials will be produced and radio may be used, as needed.

Key Points for Training

To be effective, training under the NPA will be based on the following points:

- Keep it simple, focused and practical;
- Teach only a few messages or practices and add new material only after the basic messages have been mastered by participants. Repeat messages and practices during the training session. Much training errs by being too rich and offering too many messages;
- Make the training as participatory and hands-on as possible. Practical exercises and field training should take up the greater part of the training sessions;
- Use various training methods, but not so varied that seminars become confusing or unfocused;
- Base training design on actual field observation of farmers' needs, practices, and how they learn, as well as on staff needs, knowledge, and performance; and
- Continuously monitor the effects of training.

Training Focus for the NPA

Training under the NPA will be undertaken in four core areas:

- **Effective communication.** All levels of project staff need to effectively communicate with farmers and core staff;
- **Agricultural production techniques.** This is especially important for the extension agents, who will be training the farmers;
- **Monitoring.** Both grantees must establish a monitoring system to make accurate and perceptive field observations and effective verbal reports, and use simple, written reporting techniques; and
- **Administration.** All levels of project staff need to know how to complete the relevant forms required by project management.

Environmental Education

Environmental education has been a basic component of the AOP since its inception. Animators and farmers were inculcated with concepts valorizing the role of trees in their own economies and in the economy of nature. The positive benefits of planting trees have been described in numerous training

courses offered over the LOP. In June 1988, however, PADF undertook a formal pilot program in the Mirebelais area of Region 5 and the initial reaction to the proposal from school directors and teachers was overwhelming.

The basic elements of the program are development and use of a three-year curriculum in environmental concepts; establishment of fruit tree nurseries and demonstration sites for agroforestry species on, or adjacent to, school property; and site visits and training workshops on selected farm or demonstration sites to visit gardens and learn basic principles firsthand.

The target audience is primary school children in rural, nonurban, schools between the ages of 10 and 18. There is a wide variance in the ages of primary school children of the same grade in many rural schools. PADF Regions 1, 2, and 5 will implement an environmental education program based on the lessons learned from the Region 5 experience. A specialist in training materials, who will be hired by PADF to develop materials for all aspects of the agroforestry project, will dedicate a portion of his/her time to the development of course materials. Over 21,000 students are expected to participate.

In terms of staff, one full-time training assistant and three part-time monitors will be needed for each participating PADF region. The training assistant will train school teachers in how to convey the course materials, organize seminars and field days for the students, oversee with the help of monitors the establishment of nurseries, and work with the training material specialist to refine any course materials developed.

Expected Outputs

Over the life of the NPA, this component will be expected to achieve the following outputs:

- Establishment, by both grantees, of comprehensive training programs that reflect the needs of their regional managers and their extension staffs;
- Establishment of a monitoring system that effectively monitors the effects of training under the NPA;
- Establishment, by both grantees, of pilot environmental education programs in selected, interested regions; and
- Strengthening of the collaboration and exchange between the two training programs.

SECTION FIVE
FINANCIAL PLAN
PROJECT FUNDING

The total cost of the proposed NPA is estimated at \$30,446,290. Of this, \$29,946,290 will be financed by USAID. Contributions in kind will be provided in the form of land on which nurseries are set up, plus the know-how and managerial capacities of the participating Haitian NGOs. The estimated value of this contribution is \$500,000 per year.

Of the nearly \$30-million USAID contribution, \$24 million will be used for the production of seedlings, extension, and training; \$4.943 million will be for research; and \$875,000 will be for USAID project management and audit and evaluation costs. A breakdown of the cost is presented in the budget summary below.

PROJECT COSTS

Based on the assumption that over the life of the NPA 50 million seedlings will be produced, the cost per seedling, including all costs, will be \$0.60. The cost per seedling would be \$0.48 if the costs of only seedling production, extension, and training are included. These per-seedling costs are slightly higher than those achieved under the AOP, because the NPA proposes to put more emphasis on extension and training.

Budget Summary

Table 1 illustrates the major cost components of the NPA.

Methods of Disbursement

CAs will be drawn up between the grantees who are presently implementing the AOP — CARE, PADF, SECID/Auburn, and IRG. The method of payment will be the federal letter of credit (FRLC), as Table 2 shows.

Detailed Budgets

On the following pages detailed budgets for USAID's proposed overall financial contribution for the NPA project are presented. For the purpose of this presentation, it is assumed that CAs will be signed between USAID on the one hand, and the present AOP grantees, CARE and PADF, on the other hand. It is also understood that the research contract will be awarded competitively, on the basis of open bidding.

Based on the above assumption, two separate budgets for each of the grantees have been established, as well as a research budget.

The budgets were arrived at using previous grantee spending data, adapted to take into account the additional activities proposed under the NPA. Budget increases reflect additional requirements for personnel and training, as well as adjustments for inflation.

A separate budget was prepared showing how much of the USAID contribution will be spent in the United States and how much in Haiti.

A separate report dealing with the financial and economic analyses provides a brief analysis of historic costs, as well as detailed analyzes of seedling production costs.

The proposed budgets are illustrative only. The grantees and institutions concerned will be asked to present their detailed budgets prior to the signing of the CAs.

TABLE 1

PROPOSED A.I.D. BUDGET FOR THE NATIONAL PROGRAM FOR AGROFORESTRY
(amounts in \$'000)

	1990	1991	1992	1993	1994	Total	Percent
Personnel	1816.20	1967.23	2130.99	2308.56	2501.11	10724.09	36.89
Research	1128.00	1188.12	1203.86	697.12	725.48	4942.58	17.00
Equipment	480.85	181.63	629.99	347.99	217.78	1858.23	6.39
Training and Extension	331.60	362.26	395.86	432.69	473.07	1995.48	6.86
Operations and Maintenance	1136.00	1217.20	1301.20	1388.39	1463.18	6505.97	22.38
Home Office Support	60.00	63.00	66.15	69.46	72.93	331.54	1.14
Contingency	10.00	10.00	10.00	10.00	40.00	0.14	
Overhead	476.55	473.64	564.96	567.81	590.36	2673.32	9.20
Total C.A.	5429.20	5463.08	6303.01	5822.01	6053.91	29071.20	100.00
A.I.D. Audit/Evaluation	100.00		50.00		150.00	300.00	
A.I.D. Project Management	100.00	107.00	114.49	122.50	131.08	575.07	
Project Total	5629.20	5570.08	6467.50	5944.51	6334.99	29946.28	

Note: The cost of research includes all costs associated with this component, such as personnel, O&M, Overhead and Equipment.

TABLE 2
METHODS OF DISBURSEMENT

Method of Implementation	Financing	Amount (\$'000)
CARE: Personnel, Equipment, Training & Extension, O&M, Home Office Support and Overhead	FRLC	9,164
PADF: Personnel, Equipment, Training & Extension, O&M, Home Office Support and Overhead	FRLC	14,988
IRG: Personnel, Equipment, O&M, Consultants, Overhead	FRLC	1,695
SECID/Auburn: Personnel, Equipment, O&M, Consultants, Overhead	FRLC	3,248
A.I.D. Direct Contracts for Evaluation and Audits	Direct Payment	300
Unobligated Balance Planned for USAID Project Management		575
	Total	29,395

TABLE 3

PROPOSED A.I.D. BUDGET FOR THE NATIONAL PROGRAM FOR AGROFORESTRY
(amounts in \$'000)

YEAR	1990	1991	1992	1993	1994	TOTAL	PERCENT
PERSONNEL							
Expatriate	621.20	664.68	711.21	761.00	814.27	3572.36	12.30
National	1195.00	1302.55	1419.78	1547.56	1686.84	7151.73	24.62
Sub-Total	1816.20	1967.23	2130.99	2308.56	2501.11	10724.09	36.91
RESEARCH	1128.00	1188.12	1203.86	697.12	725.48	4942.58	17.01
EQUIPMENT							
Vehicl. & M.bike	332.10	18.00	450.00	150.00	0.00	950.10	3.27
Off. Suppl. & Equi	38.25	42.08	46.28	50.91	56.00	233.52	0.80
Educ. & Ext. Mat.	110.50	121.55	133.71	147.08	161.78	674.61	2.32
Sub-Total	480.85	181.63	629.99	347.99	217.78	1858.23	6.40
TRAINING + EXT.							
Training & Educ.	96.60	103.76	111.51	119.91	129.00	560.78	1.93
Extension	235.00	258.50	284.35	312.79	344.06	1434.70	4.94
Sub-Total	331.60	362.26	395.86	432.69	473.07	1995.48	6.87
OPERATIONS AND MAINTENANCE							
Seedl. Purch.	633.00	664.65	697.88	732.78	769.42	3497.72	12.04
Per Diem/Travel	75.00	82.00	90.00	98.00	85.00	430.00	1.48
Office	115.00	120.75	126.79	133.13	139.78	635.45	2.19
Vehicl. & M.bike	293.00	322.30	354.53	389.98	428.98	1788.79	6.16
Miscellaneous	20.00	27.50	32.00	34.50	40.00	154.00	0.53
Sub-Total	1136.00	1217.20	1301.20	1388.39	1463.18	6505.97	22.39
HOME OFF. SUPP.	60.00	63.00	66.15	69.46	72.93	331.54	1.14
OVERHEAD	472.26	478.80	575.72	569.56	596.91	2693.25	9.27
TOTAL C.A.	5424.91	5458.24	6303.77	5813.76	6050.46	29051.13	100.00
AID AUDIT/EVAL	110.00		50.00		200.05	360.05	
AID PROJ. MNGMNT	100.00	105.00	110.00	115.00	120.00	555.00	
PROJECT TOTAL	5634.91	5563.24	6463.77	5928.76	6370.65	29966.18	

Note: The proposed expenditures for the research component include all costs, such as personnel, logistical support, and overhead.

TABLE 4

BREAKDOWN BETWEEN U.S. EXPENDITURES AND LOCAL EXPENSES
(amounts in \$'000)

YEAR	1990 EXPENDIT.		1991 EXP.		1992 EXP.		1993 EXP.		1994 EXP.		TOTAL EXP.	
	Haiti	U.S.A.	Haiti	U.S.A.	Haiti	U.S.A.	Haiti	U.S.A.	Haiti	U.S.A.	Haiti	U.S.A.
PERSONNEL												
Expatriate	124.00	497.20	132.68	532.00	141.97	569.24	151.91	609.09	162.54	651.73	713.09	2959.27
National	1195.00		1302.55		1419.78		1547.56		1686.84		7151.73	
Sub-Total	1319.00	497.20	1435.23	532.00	1561.75	569.24	1699.46	609.09	1849.38	651.73	7864.82	2959.27
RESEARCH	295.00	833.00	182.00	1006.12	310.00	893.86	100.00	597.12	100.00	628.48	987.00	3958.58
EQUIPMENT												
Vehicle & M.cycl.		332.10		18.00		450.00		150.00			0.00	950.10
Off.Suppl.&Equi	19.25	19.00	21.18	20.90	23.29	22.99	25.62	25.29	28.19	27.82	117.52	116.00
Educ.& Ext.Mat.	110.50		121.55		133.71		147.08		161.78		674.61	0.00
Sub-Total	129.75	351.10	142.73	38.90	157.00	472.99	172.70	175.29	189.97	27.82	792.14	1066.10
TRAINING + EXT.												
Training&Educ.	96.60		103.76		111.51		119.91		129.00		560.78	
Extension	235.00		258.50		284.35		312.79		344.06		1434.70	
Sub-Total	331.60		362.26		395.86		432.70		473.06		1995.48	
OPER. + MAINTN.												
Seedl.Prod.	453.00	180.00	475.65	189.00	499.43	198.45	524.40	208.37	550.62	218.79	2503.11	994.61
Per Diem/Travel	70.00	5.00	77.00	5.00	85.00	5.00	93.00	5.00	80.00	5.00	405.00	25.00
Office	115.00		120.75		126.79		133.13		139.78		635.45	0.00
Vehicle & M.bike	148.00	145.00	162.80	159.50	179.08	175.45	196.99	193.00	216.69	212.29	903.55	885.24
Miscellaneous	10.00	10.00	13.50	14.00	16.00	16.00	17.00	17.50	20.00	20.00	76.50	77.50
Sub-Total	796.00	340.00	849.70	367.50	906.30	394.90	964.52	423.87	1007.09	456.09	4523.61	1982.35
HOME OFF.SUPP.	0.00	60.00	0.00	63.00	0.00	66.15	0.00	69.46	0.00	72.93	0.00	331.54
OVERHEAD @ 14.7%		472.26		478.80		575.72		569.56		596.91		2693.25
TOTAL C.A.	2871.35	2553.56	2971.92	2486.32	3330.90	2972.86	3369.38	2444.39	3619.50	2433.95	16163.05	12891.09
AID AUDIT/EVAL		110.00				50.00				200.00		360.05
AID PROJ.MNGMNT	50.00	50.00	52.50	52.50	55.00	55.00	57.50	57.50	60.00	60.00	277.50	277.50
PROJECT TOTAL	2921.35	2713.56	3024.42	2538.82	3385.90	3077.86	3426.88	2501.89	3679.50	2693.95	16440.55	13528.64

TABLE 5
 PROPOSED PADF BUDGET
 (amounts in \$'000)

YEAR	1990	1991	1992	1993	1994	TOTAL	PERCENT
PERSONNEL^a							
Expatriate	417.50	446.73	478.00	511.46	547.26	2400.93	16.02
National	495.00	539.55	588.11	641.04	698.73	2962.43	19.77
Sub-Total	912.50	986.28	1066.11	1152.49	1245.99	5363.37	35.78
EQUIPMENT^b							
Vehicl. & M.bike			350.00			350.00	2.34
Off. Suppl. & Equi	11.25	12.38	13.61	14.97	16.47	68.68	0.46
Educ. & Ext. Mat.	65.50	72.05	79.26	87.18	95.90	399.88	2.67
Sub-Total	76.75	84.43	442.87	102.15	112.37	818.57	5.46
TRAINING AND EXTENSION^c							
Training & Educ.	46.60	51.26	56.39	62.02	68.23	284.50	1.90
Extension	235.00	258.50	284.35	312.79	344.06	1434.70	9.57
Sub-Total	281.60	309.76	340.74	374.81	412.29	1719.20	11.47
OPERATIONS AND MAINTENANCE^d							
Seedl. Purch.	543.00	570.15	598.66	628.59	660.02	3000.42	20.02
Per Diem/Travel	30.00	35.00	40.00	45.00	30.00	180.00	1.20
Office	70.00	73.50	77.18	81.03	85.09	386.79	2.58
Vehicl. & M.bike	210.00	231.00	254.10	279.51	307.46	1282.07	8.55
Miscellaneous	10.00	17.50	20.00	22.50	25.00	95.00	0.63
Sub-Total	863.00	927.15	989.93	1056.63	1107.57	4944.28	32.99
HOME OFF. SUPP.	40.00	42.00	44.10	46.31	48.62	221.03	1.47
OVERHEAD	319.73	345.58	424.14	401.88	430.48	1921.81	12.82
GRAND TOTAL	2493.58	2695.19	3307.88	3134.28	3357.32	14988.25	100.00

^a When compared with the actual 1988 expenditures of \$2,211,879, the proposed 1990 budget shows an increase of \$281,700. This increase is due to the addition of one expatriate (\$70,000) and 18 Haitian staff (\$167,000). Additional operational expenditures and inflation also contribute to the increase.

^b The vehicles and motorbikes, purchased under the AOP, need to be replaced in 1992. Approximately 16 vehicles and 30 motorbikes will have to be purchased. Office supplies and equipment are regular requirements for the functioning of the office. Education and training materials include printed booklets for farmers, teaching material, and seeds for hedgerows.

^c Training costs are for the training of PADF staff, extension agents, and nursery personnel. PADF pays the participating NGOs for their extension personnel. This reimbursement is calculated on the number of extension visits carried out.

^d The budgeted amount for the purchase of seedlings from NGOs allows PADF to buy approximately 33 million seedlings over the life of the NPA. Per diem and travel costs are primarily for in-country travel. Office expenditures include: rent, utilities, communications, and maintenance of office equipment. Vehicle maintenance costs are based on \$8,000/vehicle/year and on \$1,300/motorbike/year. Miscellaneous expenditures are for various small expenses.

TABLE 6
PROPOSED CARE BUDGET
(amounts in \$'000)

YEAR	1990	1991	1992	1993	1994	TOTAL	PERCENT
PERSONNEL^a							
Expatriate	203.70	217.96	233.22	249.54	267.01	1171.43	12.84
National	700.00	763.00	831.67	906.52	988.11	4189.30	45.93
Sub-Total	903.70	980.96	1064.89	1156.06	1255.12	5360.72	58.78
EQUIPMENT^b							
Vehicl. & M. Bike	332.10	18.00	100.00	150.00	0.00	600.10	6.58
Off. Suppl. & Equi	27.00	29.70	32.67	35.94	39.53	164.84	1.81
Educ. & Ext. Mat.	45.00	49.50	54.45	59.90	65.88	274.73	3.01
Sub-Total	404.10	97.20	187.12	245.83	105.42	1039.67	11.40
TRAINING AND EXTENSION^c							
Training & Educ.	50.00	52.50	55.13	57.88	60.78	276.28	3.03
Extension	costs included in personnel costs.						
Sub-Total	50.00	52.50	55.13	57.88	60.78	276.28	3.03
OPERATIONS AND MAINTENANCE^d							
Seedl. Prod.	90.00	94.50	99.23	104.19	109.40	497.31	5.45
Per Diem/Travel	45.00	47.00	50.00	53.00	55.00	250.00	2.74
Office	45.00	47.25	49.61	52.09	54.70	248.65	2.73
Vehicl. & M. Bike	83.00	91.30	100.43	110.47	121.52	506.72	5.56
Miscellaneous	10.00	10.00	12.00	12.00	15.00	59.00	0.65
Sub-Total	273.00	290.05	311.27	331.75	355.61	1561.68	17.12
HOME OFF. SUPP.	20.00	21.00	22.05	23.15	24.31	110.51	1.21
OVERHEAD @9.24%	152.53	133.21	151.58	167.68	166.43	771.44	8.46
GRAND TOTAL	1803.33	1574.92	1792.03	1982.36	1967.66	9120.30	100.00

^a The actual expenditures from July 1, 1987 to 30 June, 1988 were:

Total 1987-88 expenditures:	\$ 1,369,854
Proposed 1990 expenditures:	\$ 1,803,330
Increase:	\$ 433,476.

The additional budgeted funds are due to increased levels of staffing as a result of the proposed additional activities. Approximately 20 Haitian staff will be added. Total additional costs will be around \$ 200,000. The remainder of the increase is due to vehicle purchases, increased training activities, and inflation.

^b Costs for vehicle and motorbike purchases are for the replacement of those presently in use. Education materials include booklets and other printed matter. Extension costs are primarily for the purchase of seeds, used in the hedgerows, and equipment and agricultural inputs, used for demonstration purposes

^c The costs for extension personnel are included in the budget line for national personnel. The costs for training are for the use of buildings, radio messages, food handed out during training classes, and the like.

^d The costs of seedling production are for the purchase of containers, potting soil, nursery equipment, and consumables. Per diem and travel are primarily for in-country travel. Office expenditures include rent, utilities, communications, and maintenance. Vehicle and motorbike costs are based on 1987-1988 costs.

TABLE 7
PROPOSED RESEARCH BUDGET^a
 (amounts in \$'000)

YEAR	1990	1991	1992	1993	1994	TOTAL
PERSONNEL						
Expatriate:						
Agronomist	120.00	128.40	137.39	147.01	157.30	690.09
Agroforester	110.00	117.70	125.94	134.75	144.19	632.58
Stat./Biometr.	55.00	115.00	60.00			230.00
Germplasm Spec	100.00	107.00	114.49	122.50	131.08	575.07
Sub-Total Expat	385.00	468.10	437.82	404.26	432.56	2127.74
National staff	120.00	132.00	145.20	40.00	42.00	479.20
Total Personnel	505.00	600.10	583.02	444.26	474.56	2606.94
OPERATIONS AND MAINTENANCE^b						
Travel	15.00	10.00	25.00	5.00	8.00	63.00
Logistics	140.00	80.00	85.00	40.00	40.00	385.00
Field Supp.	50.00	60.00	60.00	10.00	10.00	190.00
Miscellaneous ^c	150.00	155.00	160.00	35.00	35.00	535.00
Sub-Total	355.00	305.00	330.00	90.00	93.00	1173.00
CONSULTANTS	60.00	63.00	66.00	40.00	30.00	259.00
OVERHEAD @ 20%	208.00	220.02	224.84	122.85	127.91	903.63
GRAND TOTAL	1128.00	1188.12	1203.86	697.12	725.48	4942.57

^a This budget covers research activities for the development and production of seed and germplasm, as well as research in the fields of agriculture and agroforestry.

^b Travel covers in-country and international travel. Logistics covers vehicle purchases, costs associated with the operation of an office, and vehicle maintenance and operation. Field support expenditures are for the costs associated with field research activities.

^c Miscellaneous expenditures include the purchase of research equipment.

TABLE 8

USAID SUPPORT BUDGET
(amounts in \$'000)

	1990	1991	1992	1993	1994	Total
Audit/Evaluation	110	-	50		200	360
Project Officer	50	55	60	65	70	300
Consultants	30	20	40	20	40	150
Miscellaneous	20	20	20	20	25	105
	200	95	160	105	335	915

Indication of Costs per Proposed Activity

The proposed NPA has six components that are complementary. This section will estimate the cost per component.

1. **Nursery production and on-farm propagation.** This activity is the linchpin of the proposed NPA. An estimated 50 million seedlings will be produced during the life of the NPA. Based on the financial analysis carried out, the total cost of producing these seedlings will be \$ 4 million at \$0.08/seedling. This covers the direct seedling production costs. Four expatriates will be occupied fulltime with this activity and the regional coordinators are estimated to be spending 50 percent of their time on this activity. It is estimated that 30 percent of vehicle costs can be attributed to this activity.

Direct Seedling Production Costs	\$ 4,000,000
Personnel (Managerial)	\$ 3,869,980
Vehicle costs (Purch. + O&M)	\$ 913,000
Total	\$ 8,782,980

2. **Training and Extension.** Four expatriate staff members will be involved fulltime with this activity. A large proportion of the time of the national staff will be devoted to these activities. 50 percent of the costs of vehicles and motorbikes can be attributed to this activity.

Personnel	\$ 7,785,000
Materials	\$ 675,000
Vehicle + Motorbike costs	\$ 1,552,000

Total	\$10,012,000
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3. **Research and seed and germplasm development.** The breakdown of the estimated costs of this component is given in the budget for research, which totals \$4,942,580.

4. **General support and management.**

Personnel	\$ 1,145,400
Office	\$ 869,000
Transportation	\$ 274,000
Home Office Support	\$ 332,000
Overhead	\$ 2,693,250

Total	\$ 5,313,650
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5. **USAID management, audit, and evaluation costs.** The total budgeted amount for USAID direct costs is \$915,040.

Auditing Requirements

Both CARE and PADF are U.S. NGOs and are required to have A-110 audits performed. This should usually be done every year, at a minimum every two years. These A-110 audits should be funded out of the their overhead costs.

To date, A-110 audits have not covered NGO field operations, documentation for which is maintained at the field offices. In the CAs, USAID will require that these audits should also cover field operations.

USAID must, therefore, finance the audits of the field operations. Since USAID tends to do this on a program-wide basis, which in the case of CARE would cover several projects, the costs will be allocated to the projects involved.

This audit will be requested for CARE and PADF in 1990 and 1994. This falls under the jurisdiction of the Regional Inspector General for audit.

For SECID/Auburn and IRG, funds are budgeted for the close-out audit at the end of the contract.

SECTION SIX

PROJECT MANAGEMENT AND IMPLEMENTATION

THE PRESENT INSTITUTIONAL LANDSCAPE

The AOP is implemented by four implementing agencies: the two outreach grantees, CARE and PADF, responsible for field-level operations; a research institution; and an institution responsible for seed and germplasm improvement. Collaboration among these institutional entities has been at least partially achieved, through the Technical Coordinating Unit (TCU), the AOP Management Committee, and the RSC.

PADF

PADF works primarily through local NGOs, assisting them to establish extension programs of their own through a system of subprojects, which are contracts for seedling production and extension support for outplanting. PADF's five regions cover all of Haiti except the Northwest. Each region is relatively autonomous and is headed by a Team Leader. Two managers are Haitian and three are expatriates. These managers work with 80 NGOs through 34 production contracts and more than 80 extension contracts under which 700 agents are employed. Extension activities reach 40,000 farm families annually.

CARE

CARE operates its own seedling production, with production concentrated in 14 centralized nurseries. The extension system throughout the Northwest is directly controlled by CARE's four Regional Managers, all of whom are Haitian. The planned division of one region into two separate regions will give CARE a total of five operating regions. Approximately 300 extension agents work for CARE in the Northwest. Its field activities are managed by the subregional administrator based in Gonaives.

SECID/Auburn University

The research team of six expatriates employed by Auburn University as the lead university for the Southeast Consortium for International Development (SECID) began present operations in June of 1988. This team is assisted by a local staff of six technicians. The SECID mandate is to conduct research and other activities to support and improve the implementation efforts of CARE and PADF.

SECID/Auburn University

International Resources Group

IRG resumed activity under the AOP in May of 1988, concentrating on the collection and multiplication of improved seed and germplasm. The expatriate project manager is assisted by three Haitian staff.

AOP Management Committee

This committee is composed of the USAID Project Officer, his replacement, the directors of the grantee and contractor institutions, and one project-funded personal services contract (PSC) — the AOP Senior Forestry Advisor. This committee meets on a monthly basis and discusses matters and issues of concern to the participating parties.

Research Steering Committee (RSC)

This committee, which also meets on a monthly basis, is composed of the Senior Forestry Advisor, the Chiefs-of-Party (COPs) from Auburn and IRG, as well as the technical heads from the grantees. At these meetings, members discuss the AOP research agenda, upcoming research activities, and proposed field trips.

PROPOSED STAFFING CHANGES

In keeping with the belief that development is an evolutionary process that builds on the lessons learned during the process of implementation, no radical changes are proposed for the NPA at this time. USAID will remain the primary, and possibly the only, funding source. PADF and CARE will have implementation responsibility for direct agroforestry interventions with the same areas of geographic concentration. Certain changes are recommended for the research component — that all research activities be consolidated under one institutional contract.

In order to make sure that what was once designated "a lean, mean, tree-planting machine" continues as a well-oiled, efficient operation, the following staffing changes are strongly recommended:

- PADF should strengthen its technical presence at the regional level, and, at the central level, establish two new positions — a training coordinator and a technical coordinator;
- CARE should decentralize more decision-making authority to the regional level. Failure to do so may have serious implications during implementation of the NPA — as discussed earlier under key issues.
- The level of research effort in the important seed and germplasm component should be increased to two full-time positions — a seed and germplasm specialist for five years and a database manager for two. Given the applied research priorities identified during this design, the level of effort should be reduced to two full-time positions — an agroforester and an agronomist/forage specialist, plus a local-hire administrator, all hired for five years; and

- The USAID expatriate advisor will be replaced by a Haitian professional whose salary, like that of the administrative assistant's, will be paid out of project funds.

USAID SUPPORT FOR THE NPA

The NPA will be located in the Agriculture Development Office (ADO) of the Haiti USAID Mission. Supporting this effort will be a project officer, a project coordinator, a national forester, and an administrative support assistant. The latter three positions will be financed through project funds, with each individual directly responsible to the project officer.

A TCU was established under the AOP in 1981, located outside of USAID, to coordinate AOP activities while maintaining a certain independence from both the grantees and USAID. In 1985, the TCU was physically moved into the ADO, with the result that the coordination and technical support function received less attention, while administrative requirements within USAID took a large part of available time. Because of this situation, the TCU became less useful to the grantees.

The TCU consists of an expatriate technical advisor, a coordinator, and an administrative assistant. The TCU will disappear at the end of the year. The reasons for these changes are as follows:

- Both grantees have much more experience, technical knowledge, and qualified staff;
- A research institution with an established agenda is now functioning;
- Training for extension agents and personnel has improved;
- Mechanisms for coordinating research and exchanging information among the principal AOP actors are functioning;
- Both grantees have improved their monitoring and reporting systems; and
- The documentation flow to USAID has improved.

These improvements, helped in large part by the TCU, mean that more of the management burden is shouldered by the grantees and research institutions. As a result, less is required from USAID. This is not to say that further improvements in communication and coordination among those participating in the NPA are not desirable. Such improvements should be pursued, though without a TCU. These changes have been facilitated by the institutionalization of the two coordinating committees described earlier.

Discretionary funds should be made available to the USAID project officer to enable the ADO to address issues that cannot be addressed by the grantees or the research institution. These funds would be available primarily for short-term technical assistance of various sorts. They could be used for assessing work performed under the NPA, addressing project-related issues that are beyond the scope of the grantees or the research institution, or answering questions of specific interest to USAID.

Responsibilities for the forester attached to the NPA and working in the ADO office should include:

- Regular and extensive field visits to achieve a full understanding of the field programs and activities of the grantees;
- Direct involvement in the RSC as a full participating member;
- Active participation in the NPA Management Coordinating Meeting, a continuation of the present system established under the AOP;
- Presentation of periodic reports to the ADO on issues that face NPA, with an emphasis on options open to USAID and participating institutions;
- Preparation of the terms of reference for short-term technical assistance financed by the ADO;
- Collaboration with the USAID program office to ensure that adequate information is available with which to evaluate and monitor all NPA activities; and
- Collaboration with the GOH, STAB, and the donor community in matters concerning agroforestry in general and the NPA experience in particular.

IMPLEMENTATION SCHEDULE

Detailed implementation plans will be required of all project contractors and grantees. These plans will include explicit schedules and scopes for activities; targeted areas, groups, and objectives; verifiable indicators of progress and achievement; and monitoring, reporting, and feedback mechanisms. Presented below is a truncated schedule of events over the five-year LOP, rather than specific implementation schedules detailing the activities of each separate component.

Fiscal Year 1989, Second Quarter

1. USAID/Haiti approves the PP and the NPA authorization is signed.
2. RFP issued for the research component.

Fiscal Year 1989, Third Quarter

1. Implementation plans for the NPA are prepared and presented by both grantees.
2. Collaborative agreements with CARE and PADF are drafted, negotiated, and signed.
3. Responses to the research RFP are reviewed and a best and final list of possible contractors prepared.

Fiscal Year 1989, Fourth Quarter

1. USAID obligates \$30 million for funding the NPA through 1995.
2. Research contract awarded.
3. The grantees present annual work plans to USAID for review and comment, with particular attention to the monitoring and evaluation requirements of USAID.

Fiscal Year 1990, First Quarter

1. First annual NPA retreat involving all the key institutions and selected representatives to discuss objectives and priorities over the coming year.
2. Research contractor presents five-year implementation plan, annual work plan, and signs the required protocols with the grantees and/or other participating institutions.

Planning, Review, and Evaluation

During the LOP, the three institutions involved will present annual work plans in the fall for discussion and final approval by USAID. These will be followed each January by an annual retreat to discuss the previous year's activities and objectives for the coming year. External evaluations are planned for the fourth quarters of 1992 and 1994. The Regional Inspector General will also require audits of CARE and PADF in 1990 and 1994.

SECTION SEVEN

MONITORING AND EVALUATION

MONITORING NPA ACTIVITIES

There was a consensus on the design team that both the implementing and the research institutions are professional and mature enough to do much of their own monitoring. Therefore, it is their responsibility to present the necessary information in a readable form and on a timely basis. USAID, in its turn, is responsible for reading and commenting upon the information presented.

Monitoring and reporting systems, currently overloaded, are expected to respond by providing more accurate and timely data at the regional level. This will only happen if the participating institutions are given explicit instructions by USAID, specifying its information needs. Should this prove impossible, then a serious reduction in the quantity of data collected should be instituted after the first year of the NPA.

Under the NPA, both grantees must undertake to improve their data and documentation efforts at the central level so that analysis of data received from the regions stimulates greater feedback and information flow. The relevance of collected data will become better understood and its uses clearer as timeliness of data analysis improves.

This point cannot be overemphasized since one of the key resources the NPA will provide to participating peasants will be information — information about available material resources, tree technology, hedgerow technology, alley cropping, forages and grasses, and, to a limited extent, livestock management. This information is also critical for monitoring and evaluating progress in meeting NPA objectives.

Reporting Requirements

No major changes are expected in the way the grantees or the research institution manage their activities. Internal management functions and information flow will remain where they belong, with the grantees and the research unit. USAID should receive adequate information to monitor NPA activities through the following mandated actions:

- Six-month reports from PADF that include a description of activities undertaken, costs involved, and results obtained. A discussion of problems and issues encountered and how they were resolved should also be included. IRG should present similar reports on a six-month basis and CARE on a quarterly basis;
- Six-month reports from the research institution that include a brief description of all protocols signed during the period, a short summary of work performed on all active protocols, a summary of the results coming from the research work and how they have been transmitted to the grantees, and the costs involved;

- Participation by all the implementing institutions at the monthly NPA Management and RSC meetings; and
- The presentation of an annual work plan and corresponding budget to USAID by each participating institution at the beginning of the year. Presentation of the plan in database format will facilitate monitoring activities.

ANNUAL WORK PLANS AND KEY INDICATORS

These annual work plans will be the benchmark for monitoring project progress and the mechanism that relates information to project objectives. The USAID monitoring effort, based primarily on information associated with the annual work plans, will be largely dependent on the time and effort that the participating institutions devote to the development of these plans, as well as their ability to generate timely and adequate information. All reports presented to USAID should show a direct relation to the work plan and its fulfillment.

Such a monitoring approach demands comprehensive, annual work plans that allow progress to be measured against specific activities that are tied directly to overall project goals. For this system to work, these plans should, as far as possible, include quantifiable indicators that are acceptable to USAID. Among possible key indicators are the following, listed in order of importance:

- The number of seedlings produced in the nursery. While no longer very sexy, this is still a key indicator;
- Survival rate for seedlings. This could be a key indicator for measuring improvements in nursery management. Suggested target is 60 percent after one year;
- The number of farmers using on-farm plant propagation methods, such as direct seeding, stem and root cuttings, stump propagation, and bare rooting;
- The number of farmers who are effectively implementing a variety of agroforestry techniques through the introduction of new, multipurpose trees, hedgerows, forages, and new provenances of currently planted species;
- The number of farmers who are effectively managing and harvesting their trees;
- Effective establishment of five regional seed nurseries;
- Effective establishment of a central seed processing and storage facility for each of the grantees in the Port-au-Prince area;
- The number of linear meters of hedgerow established. This is not necessarily a good indicator since, under the present system, animators are paid for the number of meters planted;
- The range of incomes, in cash or in kind, generated on an annual basis by the sale and/or processing of wood products by participating farmers. The economic and financial analysis

performed for this PP calculates the value of production of trees grown under peasant conditions — using a derivation model — to be approximately \$1,900 per hectare per year. The PP team, however, estimates the income generated to be \$857;

- An estimate of the quantity of soil saved — under varying conditions — when the NPA hedgerow technology is effectively implemented. This would call for establishing test sites to measure erosion, using a system somewhat similar to the one at Limbé. This would be expensive, but could have a tremendous pay-off for the project; and
- Development and implementation of a plan to conserve *Attalea crassipatha*.

SECTION EIGHT

SUMMARIES OF PROJECT ANALYSES

SOCIAL SOUNDNESS ANALYSIS

Social Feasibility

To the extent that proposed NPA extension programs target the same set of beneficiaries — peasant household production units — with the same basic extension strategies — nondirective and simple — and offer the same basic extension services — subsidized biological and informational resource transfer as has the AOP — there is no reasonable doubt of its sociocultural feasibility at the peasant level. The peasantry has, for the past eight years, been "voting with its feet" on this issue. In terms of the social acceptability of proposed new technical interventions at the farm level, three simple rules-of-thumb should be consistently applied:

- Land-extensive, capital-intensive interventions will not likely work, certainly not on a widespread basis. Labor-intensive interventions are possible, insofar as labor demands are not overly stringent during periods of peak demand within the agricultural cycle, and labor expended yields visible results and/or usable by-products within a relatively short period of time;
- Interventions that require coordinated group activity beyond the household are unworkable, except insofar as group organization has been the successfully achieved priority development objective of a local NGO over several years preceding any such interventions; and
- Complex interventions, with end results predicted by technicians, are probably over-determined for the idiosyncratic and microclimatic variations characteristic of peasant farm-management strategies. The creative appropriation of relatively simple interventions, and the tailoring of new options to on-farm production objectives, is the peasant's job, and he/she has already proven quite capable of handling it.

Two proposed new technical interventions under the NPA — the on-farm propagation of trees and the introduction of grass and leguminous forage strips into hedgerow systems — satisfy these three criteria.

Political Feasibility: A Cautionary Note

While it is difficult at this point in the evolution of Haitian political culture to predict the future, it is only realistic to stipulate that the next five years are not likely to be passed serenely. There are three different types of potential political constraints to project feasibility:

- General political unrest, most commonly manifest in the contemporary Haitian context in terms of interference with the national transport system, through the blockage of vehicular traffic on major arteries;

- Aggravated anti-American sentiment, both local and national, on the part of the progressive left and its associated populist organizations; and
- Government interference in the operation of local and international NGOs.

Who Is Served: The Beneficiary Profile

With an estimated 400,000 direct beneficiaries under its seedling production and distribution program alone, the NPA will obviously serve an unprecedented proportion of the rural population over the next five years. Still, concerns about the beneficiary profile can and should be raised here.

The age, gender, and resource trends in the AOP planter profile were analyzed in some detail in the brief social soundness analysis prepared in 1986, for use in the second PP amendment. Several points made in that analysis should be reiterated here:

- Truly landless members of the target population are unavoidably excluded from direct project benefits, as they must be in the majority of agricultural development initiatives aimed at peasant freeholders;
- Land-poor peasants are understandably less likely to be able or willing to innovate, at least initially, than their relatively better-off neighbors;
- The sheer numbers of seedlings distributed per participant required a more than minimal holding size to accommodate outplantings;
- The slight age difference between planters and nonplanters was seen as attributable to a number of convergent factors, including land tenure dynamics, relative labor scarcity, and relatively longer time horizons;
- The overwhelming preponderance of men among official participants could be explained by the underlying dynamics of women's roles within agriculture and peasant society in general; and
- The skewing of the planter profile might well be more apparent than real, since the outplanting of up to 25 percent of project seedlings by unofficial, nonregistered participants, on the basis of informal redistribution networks, was not accurately reflected in the planter profile.

The AOP extension (1987-1989) mandated two significant changes in the outreach programs. These changes were designed, among other things, to redress whatever actual skewing remained in the beneficiary profile. The remedial measures were, first, to lower the minimum number of seedlings made available to registered planters and, second, to increase emphasis on the second major component of the outreach program — hedgerow establishment and related soil conservation activities.

All current indications from the field affirm the 1986 analysis, and the effectiveness of the recommended adjustments to the outreach program in relieving whatever systematic skewing the planter profile had revealed. While statistically reliable data are not available, it appears that over the last few years the AOP has indeed served a somewhat wider, less well-endowed, and younger constituency. There

are no plans for program changes under the NPA that threaten to reverse that trend. On the contrary, a continuing reduction in seedling lot sizes — down to between 80 and 125 seedlings per farmer — is projected for several regions. Moreover, the greatly expanded program emphasis on low-cost, biologically based soil conservation technologies and sustainable agriculture promises positive results for virtually any freeholder, regardless of the extent of his or her land resources.

Women in Development: The Hidden Beneficiaries

For the purposes of this analysis, Haitian peasant women either have regular access to male agricultural labor, land, and management skills, through a conjugal relationship, or they do not. That is, women are either in- or out-of-union at any given point in time. In the broadest possible terms, the economic utility of union, from a woman's point of view, is this access it affords to male resources. Furthermore, it is precisely the economic utility of union that is of paramount cultural importance to women.

This is the feature of union that is "marked" or highlighted culturally. Finally, while they are quite capable of living without men entirely — and a not insignificant minority positively choose to do so — most women prefer to participate in a system of conjugality that explicitly makes them, and their children, the primary economic beneficiaries of male agricultural productivity.

For the NPA, the important question is whether there is something intrinsic to the interventions being proposed, or the material resources being transferred, that systematically works to exclude women as beneficiaries or participants, or impacts negatively on their overall status within society. Earlier in-depth field research, and the minimal fieldwork conducted in the course of preparing this analysis, suggest that neither of these reservations is well founded. Women everywhere are benefiting, as active and relatively empowered members of their household production units, from project resources and interventions in the peasant agricultural sector. One of the few things that project trees are not being used for, it seems, is as a tool for leveraging greater male control over agricultural production within conjugal households.

ECONOMIC AND FINANCIAL ANALYSES

Seedling Production Costs

The financial cost per seedling produced under the PADP program from 1982 through 1988 is \$0.30. The cost is \$0.75 per surviving tree, 40 percent of seedlings produced. That costs are rising is evident: the cost per estimated surviving tree, planted in 1989, is \$0.88.

The financial cost to produce one seedling was substantially higher in the CARE regions. This amounts to \$0.49 per seedling or \$1.23 per surviving tree. It must be noted that the CARE area suffered badly from the political turmoil in 1987. The financial cost per CARE seedling produced during 1988 was \$0.52.

The above cost-per-seedling calculations assume that all costs incurred are linked to the production of hardwood seedlings. However, this is not the case. Considerable time and effort are devoted to extension, training, and the planting of hedgerows. Data are insufficiently broken down to

get a clear picture of what can be attributed to which activity. The financial analysis provides a more detailed picture about the seedling production costs at nursery level.

Another explanation for CARE's higher per-seedling cost is the fact that the area in which CARE operates is quite different from the regions in which PADF works. Access to the area is difficult due to the poor infrastructure. CARE handles its own seedling production, while PADF purchases seedlings from local NGOs. These NGOs carry the risk in case of production failures. PADF's seedling purchases have been approximately three times higher than CARE's output over the same period of time, so economies of scale also play an important role.

Nursery Production Costs

During the AOP, a lot of time and energy went into improving centralized nursery production of seedlings with the aim of achieving the lowest possible production cost for the highest quality. Three types of containers are presently in use: Roottrainers, Winstrips, and plastic sacks.

Roottrainers last an average of four production seasons. The present C.I.F. price of this container is \$130 per box of 2500 cells, or \$0.052 per cell. Each cell can produce four seedlings, so the use of this type of container costs \$0.013 per produced seedling. Roottrainers need special racks to hold them that cost approximately \$0.002 per seedling produced.

Winstrips can be used for a minimum of 16 production seasons. The cost of this container amounts to around \$0.005 per seedling produced. Winstrips can be placed on simple tables.

Sacks cost around \$7.50 per 1000. They can be used only once, and the cost per seedling is therefore \$0.0075. Ideally they are placed on concrete slabs, to prevent the roots from growing into the soil. They require three times as much soil, twice as much labor, and are more expensive to transport from the nursery to the farm, when compared with Roottrainers.

Another important cost is the cost of potting soil. Experiments are under way to replace the imported GRO-mix with locally produced soil mixes. These are at present still mixed with GRO-mix, usually in the ratio of one-to-one. One bale of 113 liters of GRO-mix costs \$19 C.I.F. Port-au-Prince, while a similar quantity of so-called CARE-mix costs \$5.60 to produce. CARE tests have shown that seedlings produced with the CARE-mix are of satisfactory quality.

In brief, production systems using Winstrips are the cheapest, while sacks are the most expensive. It is also evident that personnel, seedling container, and potting soil count for approximately 80 percent of the cost of production in the case of a nursery system using Roottrainers.

A comparison of the costs when expressed as percentages of total production costs between a CARE Roottrainer nursery and a PADF Roottrainer nursery shows the following:

TABLE 9

PERCENTAGE COST COMPARISON BETWEEN CARE AND PADF NURSERIES

	CARE Percentage	PADF Percentage
Personnel (incl. water)	56.06	46.21
Roottrainers	22.61	19.35
Potting soil	10.43	14.12
Racks	4.35	3.33
Shading	2.24	6.99
Transportation	3.10	5.88
Various	1.21	4.12

The CARE nursery produces five times more than the PADF nursery and has a much higher level of supervisory staff, one manager with two assistants and two permanent employees. Water haulage costs are high at the CARE nursery. The PADF nursery is still using the 100 percent imported GRO-mix, while CARE is using a mixture that is made up of 50 percent GRO-mix and 50 percent CARE-mix. Shading costs are much higher at the PADF nurseries due to the shadehouses. The transportation costs of inputs for the nurseries are the best available estimates.

Production costs vary from nursery to nursery. The majority of the costs are for personnel, Roottrainers, and potting soil — 80 percent in the case of PADF, and 88 percent in the case of CARE.

The payment of \$0.08 per seedling by PADF to the cooperating NGOs does not cover any risks nor does it sufficiently reimburse management time of senior NGO staff.

The substantially lower production costs of the CARE nursery are probably due to economies of scale, and very low investment costs.

Financial Benefits to Participating Farmers

Little is known about tree yields in the various regions of the country. The Auburn research team is in the process of collecting these data, and more results should be available by the end of 1989.

From data collected during fieldwork, the following calculations were made. Under the AOP, farmers generally receive 125 seedlings each for planting. Assuming that 40 percent of these will grow into mature trees, farmers are left with 50 trees occupying 0.02 hectares. It is also assumed that the farmer will harvest his trees at five-year intervals and that half the trees will be used to make charcoal and the other half will be sold off as posts or saw timber. Their estimated value is summarized in Table 10.

TABLE 10

ESTIMATED PRODUCTION DATA FOR *LEUCAENA LEUCOCEPHALA* PLANTED ON-FARM

The value of production per five years would be:

25 trees and branches and tops of trees sold as posts yield:

5 bags of charcoal @ \$ 2.50	\$ 12.50
25 trees sold as posts @ \$ 3.00	<u>\$ 75.00</u>
Total	<u>\$ 87.50</u>

When expressed on a per hectare basis, the value of production would be \$4,375 over five years, or \$875 per year per hectare. The value of production of one hectare of fertile land, growing maize intercropped with beans, would be around \$400. Trees lots are established primarily on marginal lands, where it would not be feasible to cultivate other crops. However, a lot of trees are planted as border plantings or planted in gardens where growth rates may be higher.

From the above calculations it is clear that producing trees is an attractive enterprise from the farmer's perspective. Labor requirements are minimal, and it can even be argued that time is saved because the farmers can use the wood from pruning for firewood, which otherwise might have to be collected from a much greater distance. Trees allow farmers to make marginal lands productive again. The success of the AOP confirms this.

The Economic Internal Rate of Return (IRR)

The calculated economic IRR using Lotus 1-2-3 is 33 percent. The sensitivity analysis shows that a 10 percent reduction in project benefits will lower the IRR to 30 percent. An increase of 10 percent in project costs still yields an IRR of 30 percent. The Net Present Value at the cut-off rate of 12 percent is over \$44 million. All these calculations are based on the sole benefit of the estimated number of trees produced under the NPA. The real IRR of the proposed project is therefore substantially higher. From an economic viewpoint, the decision to go ahead with this project is justified.

AGROFORESTRY

A Question of Definition

Agroforestry can be defined as the association of trees and agricultural crops, on the same parcel of land, either at the same point in time, or sequentially. There are numerous land management or tree-crop associations that are possible within the scope of agroforestry. While agroforestry is considered by

many to be a new, modern form of appropriate land use recently introduced into many regions in the tropics, it is, in fact, a land use system that has been in existence in peasant agricultural systems long before present-day technicians became aware of it or its potential benefits. Agroforestry is a new term for an ancient but common form of land management.

For the peasant farmer, agroforestry offers several potential benefits in the form of more favorable product mixes and yields, as well as environmental considerations. However, the actual impact will depend on site-specific conditions and the types of interventions that are undertaken.

Haitian Agroforestry Systems

The following Haitian agroforestry systems have been identified, according to their geometrical configurations and land use, and instituted under the AOP, to varying degrees:

- **Intercropping.** Planting multiple crop species in rows, on a common piece of land; trees are included among the crop species;
- **Alley Cropping.** Planting multiple rows of the same woody species across a garden, with agricultural cropping between the rows;
- **Contour Planting.** Planting woody, herbaceous, or other plant materials on the slope along the contour to reduce or prevent erosion;
- **Border Plantings.** Planting usually single rows of trees to delimit land, either by ownership boundaries or by separate fields, paths, and the like;
- **Interspersed Plantings.** Planting multiple crop species, including trees, in the field in a nonsystematic fashion; rows are not evident; and
- **Tree Plantations.** Planting trees close together, usually for the production of wood as the primary crop.

All of the agroforestry activities promoted under the AOP require at least some level of continuing management on the part of project participants. For some interventions, the management requirements may be limited in terms of duration, frequency, and the required effort, with a certain amount of risk if proper management is not practiced. However, the management and risk factors can be considerable for other interventions and species combinations. It is important that the NPA extension and outreach personnel make a concerted effort to explain this to participants, in suitable detail, for each species and intervention that is being promoted. There is reason to believe that this has not necessarily been the case under the AOP.

Priorities for the NPA

Seedling production has been a major activity under the AOP and should continue as a significant component of the NPA. An estimated 200,000 peasant farmers will have received seedlings from the AOP project by the end of 1989. Seedling production techniques have been more or less successfully mastered under the AOP.

Based upon the field visits undertaken for the preparation of the PID and the PP, it would appear that the only proven large-scale seedling production technology available and tested under Haitian conditions is that of the large containerized nurseries funded under the AOP.

The main seedling production should continue to come from the centralized nurseries, for the simple reason that these nurseries function well and are relatively cost-effective, given their levels of production. A sudden attempt to change to other types of nurseries or production systems would risk seriously disrupting the tree distribution program of the NPA. However, this is not to say that the exploration and development of alternative production techniques and materials should not be investigated, and, if possible, developed to provide an additional source of low-cost, low-volume nursery production.

Efforts to support the development of local or community-level nurseries, which focus on producing small numbers of trees for local needs, should continue on a small scale. The priority sites for these efforts should be those locations that cannot be serviced through the centralized nursery system. It should be remembered, however, that it takes much more time and effort to train the staff and provide the necessary technical and administrative support required to set up and run 15 small nurseries, which produce 10,000 seedlings each, than it does to set up one nursery to produce 150,000 seedlings.

Farmers for the most part are managing their hedgerows in a manner that satisfies their individual needs. As long as the grantees continue to advise these planters of the various management options that can be undertaken, based upon the end results desired by the planter — soil improvement, erosion control, or fodder production — they will have the means to continue making management decisions in an informed manner.

There is concern on the part of the design team that the laissez-faire dissemination of hedgerows may be a potential pitfall for the NPA. Farmers are planting hedgerows at excessively wide spacing on the steepest sites, where the soils have all but disappeared. There is the risk that they may become over-extended and be unable to manage the hedgerows successfully, with seed straying into otherwise productive sites. The grantees and the research unit of the NPA should attempt to examine and evaluate carefully when and where hedgerows should and should not be promoted, before beginning any major initiatives in hedgerow technology dissemination.

A key characteristic of the AOP that should be retained under the NPA is the maintenance of grantee flexibility in the activities and direction of their programs. The grantees should continue to have the latitude to explore new directions and initiatives, as long as new activities are undertaken at reduced levels suitable for new and unproven ideas.

Experience has shown that AOP participants have decided, on their own, what they thought were the most effective options or activities for their individual needs. They have used that as the basis to decide how they would use the trees and what technical assistance they might need. Adequate information is not available to support an attempt to identify priority interventions that should be disseminated under the NPA.

It is important that there be a dialogue between project extension personnel and their clientele. This should include the presentation of complete information packages, detailing the potential hazards and the management requirements, as well as the potential benefits, that apply to various activities. Project staff would be doing a great disservice to the farmers if only the positive aspects of proposed interventions are presented, leaving either hard experience or word-of-mouth as the only sources of additional information.

FORESTRY

The Need for Better Management

Concern about forest product utilization is not a prominent part of the AOP extension activity. As trees mature beyond the nominal three to five years considered to be most suitable for conversion to fuelwood, more attention should be given to management of individual trees and stands that remain. It is estimated that 10 to 20 million trees planted under the AOP still remain to be harvested. The evidence suggests that upwards of 60 percent of PADF trees survive after six months. The survival rate for CARE has always been reportedly higher, due perhaps to the greater attention paid by CARE field staff to extension activities.

While a 1985 PADF survey suggests that poles or planks were items most sought after by 95 percent of project planters, most of the products actually harvested went for charcoal. Under such circumstances, there would seem to be little need to concentrate on improving tree characteristics, such as good form. However, of the estimated 10 million AOP trees remaining to be harvested, better management would likely improve their quality and sale value. The NPA should assist peasants in making intelligent choices of species for planting, based not only on site and soil matching, but also on income production potential and preferred utilization.

A closer attention to management techniques could have the effect of improving the growth rate of individual trees and stands, of producing healthier stock, and of increasing the sale value of the harvest.

Pruning

More thought should be given to proper pruning techniques. At present, the most common mistake in the AOP is pruning too early, thus decreasing photosynthetic activity and often wounding the tree in the process. Since a dull machete is usually employed to prune off side branches, the branches are sometimes split or stripped from the stem when the cut is not cleanly made. Early pruning thus affects growth rate and plant vigor. Extension messages should emphasize that sharp tools must be used to ensure that pruning is done properly.

Delayed pruning is more difficult to accomplish with a machete, and the added branchiness will affect light penetration into the understory. Nevertheless, there is a potential tradeoff in added branchwood for fuel, if side branches are allowed to remain for a few more seasons.

Coppicing

One aspect of management of individual trees that could be improved is coppicing. Farmers who harvest trees primarily for charcoal tend to sever the tree at ground level. Among those trees that coppice well, such as *Azadirachta*, *Leucaena* spp., *Gliricidia*, *Casuarina*, and *Calliandra*, cutting too low reduces the overall vigor and inhibits rapid regrowth. Although a limited amount of advice on coppicing potential of tropical hardwoods in Haiti was provided by the University of Maine research team, guidelines for proper stump height have not been verified. In general, however, satisfactory results have been observed

when the stump height is between 25 and 50 cm. More applied research is needed, and the information must be systematically recorded and disseminated, if it is to be followed.

A second important aspect of coppice management is maintaining an ideal number of stems that emerge from the base of the severed parent tree. In general, peasants who maintain stands for the purpose of harvesting charcoal keep too many stems. The net effect is to reduce the diameter growth of each of them, while suppressing the overall vigor of the plant. The sum total of stem biomass of seven stems, for instance, probably does not exceed the biomass of two properly selected and managed stems of the same age, in another tree of the same species nearby. No data have been reported to support this claim. However, *Leucaena* is known to produce stagnant stands when too many stems are left unmanaged.

Pollarding

When crown growth of large trees produces excessive competition for light and nutrients in a farm garden, the tops of some species can be removed entirely without killing the tree itself. This permits a continuation of diameter growth, thus maintaining much of the value of the stem and the investment in planting it there. *Leucaena* spp., *Azadirachta*, *Casuarina*, and *Gliricidia* are known to respond well to pollarding in Haiti. Other native species that are not in general use in the AOP are also pollarded, and are usually employed as living fences, or as property boundary markers. Pollarding is difficult and dangerous to do, especially on tall trees. However, it is one way to get the benefits of wood production in a garden, while simultaneously practicing the cultivation of annual crops.

Stands

Most of what has been said about management techniques pertains to individual trees and to stands. The major focus in an extension effort, however, belongs in promoting stand management. Most emphasis should be put on encouraging *rak bois* or small plantations on marginal land. Some of the advantages of *rak bois* over individual planting in fields are decrease in competition with annual crops, better utilization of vacant lands and steep slopes with typically poor soils, and a natural affinity for subsequent development of pioneer grasses and weeds that may be useful forage in areas removed from crop production. As trees mature, the colonization and maturation of rangeland species in the understory could become an important factor in the subsequent utilization of the land for pasture, and an improvement of animal nutrition.

There is also the possibility of overseeding the ground with grasses and leguminous forage species, in an improved seedbed provided by organic matter in the litter layer, to enhance the productive capacity of the site. Once outplanted, stands of saplings that are mature enough to withstand grazing pressure could be host to small groups of animals which could be allowed to utilize the stands on a regular, but rotational basis. It is recommended that land over 50-percent slope be given special emphasis on the part of extension personnel, with a view toward maximizing the productive potential of the land itself, optimizing environmental stability, and promoting cost-effective soil conservation through biological means.

Fruit Trees

Most intensive farming takes place on valley floors and on bench terraces above river beds where deeper, more productive soils occur. Fruit trees are often planted there as well, despite their intense shading of annual crops. It is believed that peasants plant a wide variety of fruit tree species on the better lands, as a measure of insurance in providing food from perennial crops, when unfavorable weather limits harvests of annual crops.

Since cropping intensity has increased on all lands over the years, the tendency has been to bring added pressure on the most marginal of sites. Due to the higher risk on steep slopes, fruit trees should not be planted there. There is no justification, therefore, for the NPA to go beyond what the AOP has maintained as the production quota of fruit trees. The yearly average of PADF has been about 250,000 fruit trees per year, and has included 14 popular fruit species, about five percent of total yearly nursery production. CARE has maintained an active interest in assisting community groups to grow substantial quantities of fruit species. Furthermore, there have been, and still are, a number of other USAID and donor-financed fruit tree-production projects in Haiti. Most important, perhaps, is the long history of on-farm propagation of fruit species by Haitians themselves, without external subsidies.

SEED AND GERMPLASM

Seedling Seed Orchards

The establishment of seed orchards in Haiti is a major goal of the NPA since they offer greater control of both quantity and quality of forest tree seed delivered to AOP agroforestry activities, as well as to future reforestation projects in Haiti. Additionally, the issue of conserving genetic diversity is being met, while biodiversity is addressed through the ever-increasing list of native species identified and selected for possible seed production in life zones receiving the highest degree of demographic pressure.

The AOP decided to establish the seedling seed orchard rather than the clonal seed orchard for the following reasons:

- The vegetative propagation of native hardwoods is still in the experimental stages and, therefore, the risk is too high to depend on adequately propagating the desired families in a clonal system; and
- The need to establish breeding populations with the widest possible genetic makeup for future tree improvement is great.

The seed orchard serves two purposes — it conserves the gene pool of a given species and provides seed of selected parentage.

Seed Collection

The coordination of seed collection by various umbrella groups and implementing organizations, ranging greatly in size, is a logistical nightmare. Seed quality is necessarily compromised by the demands of individual nurseries to meet seasonal planting targets. The synchronization of seed demand with seed

supply is a tortuous task. Some species fruit within a narrow time period, but do not store adequately. Weather anomalies, such as Hurricane Gilbert, can result in unpredictable seed yields. The pressure to meet production goals often leads to the misconception that any seed is better than no seed. Thus, unselected seed is often sown in the nurseries to appease the demands of the nursery rather than to solve the forestry problems of Haiti.

The transfer of seed collection responsibility to an independent agency might solve some of the problems of seed quality, but not the problems associated with the efficient management of a containerized nursery network. It appears that a single, independent seed collection and storage facility might not be the answer. Centralization runs a high risk of failure in Haiti. It would be better to improve current seed processing and storage systems that have evolved over the past decade, than to dismantle them and start over again in the hopes of achieving a miracle.

Conservation of Biological Diversity

Although endangered or threatened species are not ordinarily important in the economic life of a peasant farmer in Haiti, the challenge is how to preserve species that the Haitian peasant might not normally plant. The approach comes from the perspective of economic botany, in other words, based on utility, not on conservation themes. One species that has been identified as being in need of conservation while at the same time having enormous economic implications for peasant households, is *Attalea crassispata*, an endangered Haitian palm.

The direct effects of preservation of the existing populations of *Attalea* would be in situ conservation of the remaining individuals — two specimens at Fond des Nègres and 15 at Dumay, both in the southern peninsula. The consequences are important for the palm because a viable population is the best way of saving its germplasm.

The indirect effects must be borne out over the next few years. Methods of propagation must be identified. The oil-bearing properties and other values, such as for thatch, will be studied. If favorable propagation techniques and economic values can be identified, one objective would be to work this species into the agroforestry outplanting schedule, for example, by year four or five of the NPA.

FORAGE AND LIVESTOCK MANAGEMENT

The Role of Forages

With the exception of two limited areas, the Daulphine Plantation in the Northeast, and the other in the Central Plateau, Haiti does not have the extensive pasture/forage producing sites found in other Caribbean countries. Much of Haiti's land area is used for human food production.

Forages are not fully appreciated within the Haitian context and are composed almost entirely of indigenous grass species with low nutritive value during most of the year. The lack of forage management, production, and comprehensive study contribute to the improper use of the forages that do exist.

After an initial flush of new growth during the rainy season, there is an abundance of natural forage production that is not fully or efficiently utilized. As these grasses mature and the dry season approaches, they become lignified (woody), thus quickly lowering their nutritive value and digestibility. The result is a short production period of four to five months, followed by severe reduction in forage availability during the dry season. Livestock continue to be poorly nourished.

In addition to this inefficiency in forage use, people do not like to have dense grass patches or stands close to houses or around field crops. Farmers believe that these grass stands serve as nesting grounds for pests, such as rats, insects, and parasites, that are harmful to humans, livestock, and crops. Therefore a quick solution to the problem is to burn the grasses.

Forages that are not burned face three other possibilities throughout the year:

- Use as animal feed with a tethered animal grazing. The practice of cut-and-carry is the exception rather than the rule;
- Used as straw for thatch roofing; or
- Unused forage stands left to decay.

The Role of Livestock

Haiti's agricultural community is not oriented towards livestock production. Animals, such as horses, mules, and donkeys, are used mostly for transportation and, to a very limited extent, for animal traction. Oxen are more commonly used for animal traction, mostly around sugar plantations and, to a lesser degree, for land cultivation, transportation, loading, or riding the animal itself. The limited use of oxen for land cultivation is due to the fact that arable lands not in sugar production are either too small or too sloping for the ox and equipment to maneuver. In addition, there is the problem of not having enough forage to feed the ox. The oxen that are used on the plantations are fed the sugar cane leaves left in the field after harvest. Neighboring farmers also feed these leaves to their livestock.

With the exception of the equine species that is the farmer's main means of transporting his products, livestock are generally viewed as a "walking savings account" that increases in value as the animal grows and becomes older. In other societies, value is determined by the productivity — more milk or meat — of the individual animal based on specific husbandry practices and management. The farmer, therefore, tends to sell his livestock when he needs some money, rather than when the animal is ready for market. This method has the following serious disadvantages:

- The animal may be too young and not fully fattened and developed;
- The animal may be too old and, if fattened, the meat too tough; and
- The farmer may be forced to sell at a lower price because of pressing personal needs.

With the limited exception of the swine repopulation project, completed by September 1989, the goat development project, which was not continued after its first phase, and the vertically integrated poultry industry around the Port-au-Prince area, the livestock and forage production issues at the farmer's level have not been fully addressed. The primary constraint within the livestock sector has always been

an inadequate and improperly utilized source of livestock feed, mostly forages, and a scarcity of feed grains, such as corn and/or feed grain sorghum.

Forages Within the Agroforestry System

Within the context of the AOP, forages are viewed as a means of soil conservation and as a source of improved soil fertility through their use as a green manure crop. This provides an opportunity to use existing high-yielding grass varieties, such as Guinea Grass, and introduce other well-known high biomass, forage-producing varieties to accomplish the targeted objectives, while at the same time benefitting the livestock sector.

Grass/forage species are described as bunch grasses — those that grow vertically, and creeping/running grasses — those that grow horizontally close to the ground. Both types have their specific advantages and disadvantages. The bunch grasses lend themselves more to a cut-and-carry system of management, with some specific varieties producing great volumes of forage. In contrast, the creeping grasses produce less biomass and are more for direct grazing or hay making.

Since the objectives of the agroforestry project are mainly soil erosion control and forage production to be used as green manure, the bunch grasses are preferred and recommended. The species known to be adapted to Haiti, for which there is a limited amount of seed available, are listed in Table 11.

TABLE 11
FORAGE SPECIES ADAPTED TO HAITI

Common Name	Scientific Name
Guinea Grass	<i>Panicum maximum</i>
Napier or Elephant Grass	<i>Pennisetum purpurem</i>
King or Cane Grass	<i>Pennisetum var.</i>
Guatemala Grass	<i>Tripsacum laxum</i>
Sugar Cane	<i>Saccharum officinarum</i>
Vetiver	<i>Vetiveria zizanoides</i>

The physical characteristics of these grasses are appropriate for the soil conservation objectives of the NPA. They are deep-rooted, thus providing soil stabilization; they are characterized by a massive and broad ground base, thus assisting in trapping water, debris and soil; and finally, they are tall, with

a high leaf to stem ratio, capable of producing large quantities of forage, thus providing a solid wall barrier. While there are other promising grasses, both bunch and creeping, their adaptability and seed availability are still under investigation.

Forage Technological Packages

If the research recommendations are followed, a complete forage technological package can be organized, promoted, and implemented. The shrub/grass/forage package would include, but not be limited to, the following information:

- Recommended tree shrubs and grasses to be planted by region: the above mentioned species could be used as starters;
- Proper planting methods and planting times;
- Proper shrub-grass planting combinations;
- Optimum forage harvest time for green manure, animal feed, and for making hay;
- Proper feeding practices for livestock maintenance and for optimum performance — more meat and milk. This could be practiced by individual farmers or a larger, concentrated operation; and
- Recommendations for the market potential of the end product, whether meat or milk, such as proper handling, improved transportation methods, and market demand for quality.

AGRONOMY

Crop Species

Increasing population pressure has resulted in cultivation of slopes with such steep gradients that land degradation and erosion have assumed threatening proportions. New cropping systems need to be defined for these steep slopes, involving hedgerows; grain crops, such as maize, sorghum, and millet; root crops, such as sweet potato, cassava, yams, and taro; leguminous crops, such as beans, pigeon pea, groundnuts, and cowpeas; and forage species. Cassava, yams, groundnuts, and sweet potatoes are high-risk erosion crops, since the soil is ripped up during harvest.

Maize is grown everywhere, at all elevations, and dominates the grain crops planted in the first wet season, in association with grain legumes. Sorghum is the principal cereal in the somewhat drier, second rainy season, followed by maize. Beans are the main source of protein in all regions. All intercropping systems should include beans. Bananas are present in all cropping systems.

This range of crop species available to the farmer should suffice for the rehabilitation of hillside agriculture. Many other crop species are known and sporadically found in the countryside. Soybeans could play an important role in providing edible oil for domestic consumption, since extraction facilities already exist. Soybeans could profitably take a place as a leguminous grain crop in the intercropping

pattern of relatively humid regions. They could also be grown in the plains to replace the decreasing acreage of sugar cane.

Intercropping

Intercropping of three or more crop species such as maize, sorghum, or millet as a grain crop, with beans or peas as a legume, and relay cropping with sweet potatoes and pigeon peas, keep the field covered during most of the year. This is the best possible use of resources with minimal risk of crop failure. The techniques need to be optimized for each ecological zone, slope category, and soil type and thickness, to reduce soil erosion to a minimum and increase yields to a maximum. Seedbed preparation and planting patterns on the contour, plant spacing and timing, and harvesting in alley systems all need attention.

Peasant farmers have been forced to cultivate slopes that are actually too steep for cropping, and have little or no soil cover remaining. On such slopes, profitable crops can no longer be cultivated. Here, trees and grass cover should be established for forage and utilization for feeding livestock. The hillside farmer expects that the crop yields in alley ways will increase significantly as a result of planting hedgerows and, once again, provide him with a livelihood for his family. So dire is his predicament at this time that he cannot accept better spaced or double hedgerows, unless the benefits will be amply supplemented by increased yield from adjoining crops to compensate for the loss of land taken out of production.

For the same reason, the farmer tends to reject planting forage grass in place of crops on even the steepest slopes. He may be disappointed against all expectation, however, where only a few inches of soil remain or none at all. Furthermore, green manure from the hedgerow is often not applied to the soil for improvement of the center of the alley, but is carried off for feeding livestock.

Hedgerows and Alleycropping

Hedgerows and alley cropping are the most recent innovation in the struggle for control of erosion, rehabilitation of the remaining soil on the hillsides, and increased productivity of the land. It appears to be the best possible approach under the circumstances. It is also one of the most complicated agricultural systems in the world. Little is known about its adaptation to Haitian conditions. Details and quantitative data on production choices are still to be worked out.

Two mistakes are already visible in farmers' fields. One is inadequate spacing on steep slopes. This will overburden the hedgerow and lead to breaches and erosion gullies. The farmer is interested in the beneficial effects of hedgerows and is willing to accept the loss of space to grow crops in return for livestock fodder and firewood from trimmings, and the expectation of future benefits in crop yields. This is similar to the way he accepts cash income from the sale of wood for construction, from trees planted under the AOP, as partial payment for the loss of cropping space.

He is not prepared, however, to plant hedgerows closer together as the slopes increase to the top of the hill. The income from wood cannot replace the value of a good crop. He overlooks the fact that his crops are no longer very productive. The role of extension is to convince the farmer to adjust hedgerow spacing according to slope gradient and erodibility of the soil type. Suitable hedgerow spacing, as a function of slope gradient, is described in Table 12.

TABLE 12
RECOMMENDED HEDGEROW SPACING ACCORDING TO SLOPE

Slope (percent)	Spacing (meters)
5-10	17-20
10-15	13-17
15-25	8-13
25-35	6- 8
35-50	4- 6
over 50	2- 4

Hedgerows need to be spaced so closely together on slopes exceeding 50 percent that crops will be shaded out and the terrace essentially becomes a forest area, which is precisely its proper use. In marginal situations, special measures can be taken to manage crop production. Hedgerows may be pruned sufficiently short so as not to shade the crop, but the benefits from the hedgerow will be reduced accordingly. Regrowth may suffer and little fodder and mulch produced. Alternatively, shade tolerant crops can be grown.

The second mistake is to remove all, or nearly all, the forage derived from hedgerow pruning for feeding of livestock. At the same time, the farmer expects the hedgerow to improve the soil and raise crop yields in the alleys. Utilization of hedgerow prunings for building up soil fertility is one of the principles of alley cropping. Most of the prunings, as well as crop residues, are needed for green manure on the severely degraded soils found in Haiti. Extension staff need to convince the farmer to incorporate all green manure into the soil, well before the beginning of each growing season.

Management of *Leucaena* hedgerows includes a schedule of sufficiently frequent pruning to prevent pod set. Shedding of seed causes weediness. Once established, the plants are difficult to eradicate.

EXTENSION TRAINING

The Content of PADF Training

Discussions regarding the planning, content, and methods used in training were held with the key staff involved in training in each organization: the CARE training coordinator and her assistant, and the PADF Regional Managers and their staff. Due to limited field time, only four training sessions were observed — two presented by CARE, one for farmers and one for animators; and two by PADF, both for animators. While providing a sampling of trainers' capabilities and methods, there was insufficient time to be able to give a balanced, overall picture.

Unlike CARE, which has a training unit consisting of a training coordinator, an assistant training coordinator, and trainers, the PADF Team Leaders and assistants plan and conduct their own training sessions. Though there are certain constants — the use of Chapters One and Two in the *Gid Animate* and the work on the use of administrative forms — content, method, and quality vary depending on the region.

Virtually all PADF training is centered on the animators, who are responsible for monitoring and training farmers. The Team Leaders, with their coordinators and assistants, design and conduct two seminars for their animators every year. These seminars last one and a half to three days, reaching groups of 20 animators in each seminar. Some animator training has also been undertaken for PADF by the FAO Training Institute at Limbé.

Training areas in the PADF program that need to be strengthened are noted below:

- Training can contain too many new practices and messages. Training sessions on the animators' guide may take many hours, and cover too many different messages. The trainees better absorb the key messages when they are focused. This does not happen when they read the chapters in their entirety;
- Animators need more training and practice in effective communication with farmers;
- There needs to be more hands-on practical training of basic farming techniques;
- Training methods and activities need to be more varied to make animators more attentive;
- Training design needs to be based upon careful field observation of the people to be trained — the animators and the farmers. But the key training design persons, the Team Leaders, spend an extremely limited amount of time in the field. Thus training needs for farmers and animators may not be accurately or adequately defined; and
- There is little or no follow-up monitoring of animators' and farmers' capacities in the field, to measure training effectiveness.

The Content of CARE Training

In 1987, CARE hired a training coordinator who has set up a comprehensive training program to reach all project personnel: administrative staff, senior staff, all levels of extension staff, nurserymen, and trainers of trainers. Four training centers were recently established. Training is in communications, language, computers, technical topics, nursery techniques, pesticide safety, planning, agroforestry, and grafting. An assistant training coordinator is being trained to take over from the expatriate training coordinator in 18 months. Nine trainers are being trained to plan and conduct training in the training centers, and at other sites. The training coordinator plans to develop the capacities of trainees and grassroots extension staff to make their own simple teaching aides.

Training areas in the CARE program that need to be strengthened include:

- The cultural appropriateness of training techniques needs to be examined;
- Training supports extension and there is a need for better integration and coordination with Regional Managers and their extension staffs for the defining of training needs, selection of participants, and monitoring;
- There is a need to monitor the effectiveness of the training given. Regional Managers and their extension staff should play a lead role in defining training needs and monitoring its impact; and
- Training design should be based on careful, accurate field observations of trainees' needs. Apart from structured training sessions, the training coordinator does not have the opportunity to visit the field. Joint visits with Regional Managers are to be encouraged.

Coordination of CARE and PADF Training Programs

The training programs, including the production of training materials, should be closely coordinated at all levels. The PADF and CARE training coordinators should meet once a month to share approaches and methods on training and on the development of training materials. As much as possible, booklets and other printed materials should be jointly designed.

Some of the proposed monthly meetings should take place at regional sites during CARE or PADF training seminars, permitting the training coordinators to share ideas and observations on training techniques. One of the monthly meetings should be a two-day meeting to jointly plan the training materials for each year. Visits by the training coordinators and their involved project staff should be made to other tree planting programs offering extension training such as the Mennonite Central Committee and the Save the Children Foundation.

Other activities should include joint visits to other training projects, or invitations to trainers from other projects to present techniques, and exercises in planning training and measuring its effectiveness. There was positive feedback regarding the 1988 Bombardopolis retreat. CARE/PADF should have one joint training workshop or retreat, two to three days long, each year, to share training techniques. The participants would be the training coordinators, Regional Managers, and Team Leaders, midlevel staff involved in the planning and conducting of training, and selected animators.

Training Focus for the NPA

The overall training emphasis in the NPA is the fostering of improved knowledge and capacities in the extension agents, who in turn train the farmers. Whatever materials are produced should be aids and resources for the training process and not an end in themselves. Training is a support for agriculture extension. Its content should be guided by the practices and knowledge that the extension agents wish to teach. The grantees need to carefully identify training needs through observing peasant farming practices. The grantees should support baseline and anthropological studies dealing with the attitudes behind farmers' practices and how people learn. They also need to monitor the effectiveness of past training on farmers, extension agents, and school children and teachers.

EXTENSION

PADF Extension Activities

The objective of PADF extension services is to "improve technical and motivational efforts by project personnel and intermediary groups providing services to peasant farmers." The agency does this by providing training by technical staff to animators who are attached to the local NGOs that work with PADF. The extension service is designed to be flexible and adaptable to a wide variety of NGOs, ecological zones, and "changing circumstances over time." It also is designed to be able to provide appropriate services based on farmer preference.

A key point of PADF's approach is that it encourages the development and independence of NGOs. PADF also encourages regional Team Leaders to develop their own extension objectives. Based on the local social, economic, and ecological reality, the objectives from region to region may differ.

PADF works in five regions of Haiti: the Southwest, the Southeast, the North, the Upper Central Plateau, and the Lower Plateau. There is a PADF staff of technical experts in each region, headed by a Team Leader assisted by a team of assistants. Regional differences determine the specific job responsibilities of the assistants, but they range from having overall subregion responsibilities, to training, research, and agroforestry development.

The basic structure of extension services is the same in each region. The agency transmits information through local NGOs to farmers. There are essentially three different relationships with NGOs. The first, and the ideal, is the relationship with strong, already established NGOs, where the animators are in place. They have received training from the NGO itself in a wide variety of subjects and the PADF tree and/or soil conservation activity becomes another aspect of their work. They receive additional training from PADF and pass on the technical information during the course of their normal day's activities. In these cases, control of the animators' activities is the responsibility of the NGO. Usually the stronger NGOs are given contracts to establish and run nurseries. Some of these types of NGOs may have several tree animators. In such cases, animators may be supervised directly by a coordinator who is sometimes paid by PADF and sometimes by the NGO.

In the second case, a group of people in a given area may join together to form a NGO because they believe tree planting is important. Animators are selected by these NGOs and trained. They pass on their information to the farmers in the area, often under the direction of PADF. Their work is only with the project. The third case is a mixture of the first two: the NGO may have already been established, but it may be weak in terms of management, finance, or vision. Again, the animators are trained and technical information transfer takes place with the local farmers. No matter what the supervisory arrangement is, animators generally work with up to 30 farmers a season.

PADF uses a different set of animators to transfer soil conservation information. These hedgerow animators are paid \$12 for every 150 meters of hedgerows they plant on farmers' lands. They work with any number of farmers.

One area that may detract from the efficacy of the message information transfer is the absence of any training of animators in communication techniques. Such techniques may include training in how to listen, how to use visual and audio aides, and how to facilitate meetings.

One of the most confusing issues about the PADF extension service is the relationship with the animators. The strong NGOs, such as the Christian Reformed World Council (CRWC) in Pignon and The Institute for Rural Development (IRD) in Les Cayes, already have their own agendas and have trained their own animators. They know that they are working for the NGO and ultimately for the community. The issue arises when weaker NGOs are considered.

If animators need to be paid directly by PADF, where does their allegiance lie — with the NGO and the community or with PADF? If allegiance is with PADF, the information transfer may be compromised because the animator may be more interested in pleasing PADF than in serving the needs of the community. PADF also has limited financial and human resources. It becomes difficult to determine the efficacy and sincerity of information transfer if PADF has to do it directly.

The final issue that ultimately may affect information transfer is that of having different animators for separate substantive tasks within the project. The case in point concerns soil conservation animators. A possible problem may arise here if PADF becomes accustomed to providing a new set of animators each time a positive, practical, and validated technology is extended. As a result, it may find itself saddled with many different sets of animators.

CARE Extension Activities

CARE's basic extension objective is to get relevant technical messages out to the farmers. CARE does not work through NGOs so the concentration is directly on the interaction between the monitor and the farmer. There is no intermediary group.

It operates in four regions in the Northwest Province — Bombardopolis, Jean Rabel, Passe Catabois, and Bassin Bleu. Each region is administered by a Regional Manager and his team of technical assistants, each with different areas of responsibility.

CARE's extension service and its training activities are currently directed by a centralized training unit consisting of one expatriate and one Haitian staff member. A CARE Agroforestry Training Center (CAFTCEN) is located in each region, where activities are coordinated by a trainer who is responsible to the training team. A CAFTCEN consists of land for experiments and demonstrations, classrooms for training sessions, and sleeping quarters for students.

The most important interface in the CARE information exchange is that between the monitor and the farmer. Monitors are from the communities in which they work. They are supervised by animators, who supervise from seven to 12 monitors. All CARE monitors are salaried and are required to perform certain tasks within an overall job description. Their job is more general than that performed by PADF animators, although their basic function is transfer of messages and materials. CARE monitors work with 35 farmers a season.

The monitors arrange material resource transfer by enrolling farmers to receive trees, which are distributed at the centralized container nurseries at the beginning of each season. With the expansion of CARE nursery coverage, a limited amount of seedlings are transported to central distribution sites.

Like PADF, CARE has a modest extension service involving local schools. Environmental and tree information is provided to teachers, as well as plastic sacks to help schools start their own learning nurseries. It is hoped young people will be inculcated with a lifelong understanding and appreciation of the role of trees in the environment and in their gardens.

The close community contact developed by senior regional staff has allowed them to make administrative decisions based on an understanding of the farmers and their problems. As the central training unit becomes more powerful and assumes more control over the direction of training and extension efforts in the various regions, this intimacy is weakened. It becomes difficult for regional Team Leaders to make informed and sensitive decisions regarding project emphases. This could become a problem in the future, inasmuch as activities undertaken in the project may not relate directly to actual problems faced by the farmer.

Another related problem that may surface is that training for extension might not reflect the realities of the respective regions. Thus messages being transmitted might not represent positive options for farmers and they perhaps could not be validated under local conditions.

Another issue, similar to one raised for PADF, is that of the information load capacity of the monitor. In CARE's case, these agents already receive exposure to many different concepts. Perhaps CARE should consider limiting the extent to which individuals are expected to be technically competent in many different fields.

Although communications training is important, CARE should exercise caution in terms of overload. An assumption has to be made that monitors can already communicate effectively with their neighbors. While form is important in message transfer, relevancy and completeness of content is the key.

CARE should exercise caution under the NPA, particularly if it stays with the extension system it describes in its FARM proposal. Training methods to be implemented for extension staff are innovative — participatory, learning by doing, and using demonstrations and farmer exchanges to help transmit important messages. It cannot be emphasized enough, however, that if CARE begins to change the content of these messages in order to "confront problems associated with the lack of collaboration between farmers," the project will suffer greatly. It is strongly recommended that CARE sticks to the area it knows best — the innovative and highly successful provision of validated information regarding trees, soil conservation, and farming practices.

The basic premise of the CARE training and extension component under the FARM proposal is that its activities will be tailored to "confront the problems associated with the farmers' present attitude and knowledge." It is clear that the purpose of extension is to confront problems that arise from lack of knowledge. However, experience and the accompanying social soundness analysis make it quite clear that attitude is not something that hinders Haitian farmers from adopting farming practices that will improve their quality of life, as defined in their terms.

Finally, a possible problem may arise if CARE implements its strategy of hiring 125 people as extension agents, training them, and letting them go. First, the extension system works well as it is now. Second, a salary is an extremely coveted item in the Northwest. Will having 250 ex-employees — possibly disgruntled — pose its own problems for CARE and for the NPA in the future? Third, intensively training people and having them work with groups for a specified period of time implies that there is and will be a finite supply of validated knowledge. It will take two years to transmit this knowledge. Is that really the case?

Ironically, the CARE project is impressive because of its intensive geographical coverage. Changing the entire premise and system of information transmittal seems unnecessary and may pose hazardous problems.

INSTITUTIONS

USAID

The NPA will benefit a range of institutions from the donor to the farmer. USAID's credibility in the area of support to agroforestry throughout the Caribbean has been enhanced through the success of the AOP. This credibility will be strengthened by the NPA, which will incrementally add sustainable agroforestry interventions to an already successful effort. These increments will offer USAID the chance to continue at the forefront of agroforestry experience and thought, while contributing directly to income generation for the Haitian hillside farmer. The equitable development found in the AOP, to be continued in the NPA, will stimulate economic development — a situation not often found in such large projects and one which will set the NPA apart from most development efforts in Haiti.

Using known American organizations, such as CARE and PADF, with long histories of working with USAID, guarantees that USAID oversight and accountability will require no more than normal resources. The cooperative agreement (CA) approach used under the AOP has worked well: it provides a considerable amount of freedom to the grantees, fostering a professional working relationship with USAID — on both technical and implementation issues. The CA approach should be continued in the NPA.

The NPA experience is expected to further refine the process of USAID using international NGOs to implement broad-based projects in which effective structures for implementation fall outside of government institutions. The successful experience of the AOP and the increased monetary commitment in the NPA to Haitian hillside agroforestry, will give USAID an experienced voice in pursuing agroforestry issues with the GOH.

PADF

The NPA allows PADF to continue and expand on its experience from the AOP. This project will give PADF 13 years of institutional experience in agroforestry work in Haiti. This should be exploited by PADF and applied to other parts of the region. If this does not happen, it will be a missed opportunity.

PADF has established management systems that are effective and appropriate to agroforestry efforts under the AOP. USAID, the recipients of project trees, local NGOs, and PADF now stand to benefit further from these already established systems — PADF should be fully up and running on day one of the NPA.

PADF employs 800 people, including eight expatriates, either directly, or indirectly through NGOs with which PADF has production or extension contracts. This makes PADF an important employer, especially in the rural areas of Haiti. This fact provides credibility and respect for PADF from local NGOs and other institutions with which PADF interacts.

The approach followed by PADF in the NPA will further develop the institutional relationship between the NGOs and PADF. The breadth of this experience, striking a balance between broad geographic coverage and more diversification under the NPA, will illustrate how to avoid killing the goose that lays the golden egg.

CARE

The AOP gave CARE the opportunity to continue a strong presence in the Northwest Province. Under the NPA, this presence should continue and remain concentrated in the Northwest. Local response to CARE assistance has been positive. The NPA will allow CARE to continue to work directly with the local population on income generation through agroforestry efforts.

The NPA will maintain CARE's position as the largest single employer in the northwest area. With 300 people paid directly by CARE in the Northwest and Gonaives, where its subregional headquarters are located, CARE salary payments provide an important injection of cash into these areas.

CARE's worldwide credibility in the agroforestry domain has been strengthened by the AOP experience. Moving slowly into more agronomic aspects and soil conservation efforts under the NPA offers CARE the possibility to become a recognized leader in hillside agroforestry endeavors. Working successfully in what is often considered the most difficult area of Haiti will give CARE and other NGOs ideas for agroforestry interventions elsewhere.

Local NGOs

The PADF approach of working through local NGOs provides many benefits. The NPA will offer employment opportunities at the local level where seedling production, distribution, and extension take place. More than 750 people will be initially employed by local NGOs utilizing PADF funds coming from the NPA. While this an important cash transfer to rural areas, it also pays for work that should have an economic payoff.

By offering employment opportunities, the NGO gains both respect and power. It gives the NGO control of cash payments to those whom it favors or chooses as extension agents, as long as the required work is adequately performed. People so employed are often leaders or members of the NGO, more often than not a church group. While this may benefit the NGO through the building of dependence of people on the NGO, the immediate benefit of rural employment and progress toward NPA goals makes such dependence an acceptable part of the PADF/NGO system.

The central nurseries run by NGOs require good management. Though assisted by PADF, the nurseries are ultimately the responsibility of the NGO. This responsibility often means that the NGO must improve its internal management to handle the running of a nursery. This entails scheduling, handling of expenses and payments, inventory control, personnel management, and technical knowledge. These activities demand skills that have been either created or strengthened by this approach of using local NGOs for seedling production. The extension contracts signed between local NGOs and PADF also enable the NGOs to acquire a better-trained staff within a defined geographic area.

Under the PADF component of the NPA, nursery production and extension will follow closely the system established under the AOP. In many cases, the nursery or extension activity has been a new endeavor on the part of the NGO. Very few of the participating NGOs were doing any work in agroforestry before the AOP started. Thus the added activities have introduced new areas of action and knowledge to the NGOs. This benefit is expected to become more important under the NPA since additional technical interventions are to be tried and incorporated into the planting and extension activities. More emphasis is to be placed on assisting NGOs to link up with and make use of resources outside of PADF.

ENVIRONMENTAL ASSESSMENT

Purpose of the EA

The purpose of this EA is to provide USAID with a full discussion of the positive and negative impacts of the NPA project activities on the natural and human environment. The EA is prepared in accordance with 22 CFR, Part 216, Environmental Procedures, or A.I.D. Regulation 16. Environmental assessment deals with the identification, measurement, interpretation and communication of impacts. It is conducted to ensure that environmental factors and values are factored into the USAID decision-making process. Due consideration has also been given to A.I.D.'s recent *Policy Paper on Environment and Natural Resources* (April 1988) in the review of the NPA.

Several approaches were taken to arrive at the analysis that follows. A "scoping of issues" was conducted by review of project documents such as the PID, by interviewing key staff who are implementing the AOP and who are likely to be involved with the proposed project, by discussion with members of the PP Design Team, and by direct observation.

Scoping of Issues

The key issues identified during the scoping exercise include the following:

- Use of pesticides in high-production, containerized seedling nurseries;
- Allocation of agroforestry research inputs so that meaningful, practical results are obtained; and, how to monitor, track, and disseminate useful results throughout the Life of Project (LOP);
- Appropriate use of positive environmental interventions, such as soil conservation methods in the farming systems of Haiti;

- Need for and allocation of resources for environmental education in the context of the project; and
- Conservation of biological diversity through the seed and germplasm improvement component.

Summary and Recommendations

This EA examined the five key components of the NPA: nursery production, seed and germplasm improvement, applied research and technology generation, extension, and training. Positive environmental benefits are predicted to accrue from the various technical interventions proposed to improve soil fertility and to reduce soil erosion. Few, if any, negative or adverse effects are predicted.

The role of research will be to focus on farm practices that employ appropriately effective types of vegetative barriers and productive new systems of alley cropping on steep hillsides, which comprise over 70 percent of Haiti's farmlands. A pilot program in environmental education in three rural regions of the country will teach primary school students between the ages of 10 and 18 the values of trees in farming systems, the general ecology of Haiti and the problems of soil erosion and its causes and cures, as well as practical skills, such as fruit tree propagation in school-run nurseries and ways to manage trees on the student's family's farm.

The seed and germplasm improvement component will address several basic problems, such as matching appropriate species/varieties with peculiar ecological site conditions; replenishing the supply of seed for indigenous tree species of potential economic value, many of which have been eliminated from native habitats throughout Haiti because of widespread deforestation; and preserving at least one (and maybe more, if additional species can be identified) species of the economically important but biologically endangered species of neotropical oil palm, *Attalea crassispatha*.

Also, a comprehensive analysis of pesticides proposed for use in the centralized, high-volume production, seedling nurseries was prepared in accordance with A.I.D. Regulation 16 and the Agency's *Policy on Pesticide Use*. A number of general use pesticides are recommended for procurement and use under the NPA.

Based on the extensive review of project activities conducted during this EA, the following recommendations are made:

- **Pesticides.** Only pesticides included in the list in the EA will be permitted for use or procurement with project funds. These pesticides are recommended as relatively safe, if used according to label instructions and under proper supervision, and in conjunction with the proposed training and Integrated Pest Management (IPM) practices already begun under the AOP;
- **Applied Research.** Applied research on tree species-site relationships and appropriate soil conservation practices will be a critical link toward successful protection of soil resources on steeplands. CARE and PADF project staff should make every effort possible to develop practical applied research tasks with the research unit of the NPA and quickly translate these results into their extension/outreach program. Monitoring of the implementation of soil conservation measures on private farmlands should be programmed to determine the

effectiveness of extension/outreach based on the results of this research. The midproject evaluation, planned for the NPA, could further review the effectiveness of these practices;

- **Environmental Education.** This pilot program should be implemented during years 1, 2, and 3, and then evaluated for effectiveness, including content of messages and impact on target groups. Any redesign should be made during year 4 of this program; and
- **Seed and Germplasm.** Elements of the seed and germplasm improvement component will have significant impact on the quality and quantity of germplasm outplanted in the NPA. It is critical to facilitate the continuation of the effort now in progress by IRG under the AOP, without undue interruption. The timing of the nursery production activities planned by CARE and PADF are dependent on the success of the establishment of the seedling seed orchards now underway in five regions, as well as the production of viable seed for known species provenances throughout Haiti. The germplasm component should be fully funded and priority given to rapid procurement to ensure the smooth transition from the AOP to the NPA, without work stoppage.

SECTION NINE

PROCUREMENT PLAN FOR TECHNICAL ASSISTANCE

JUSTIFICATION FOR SOLE-SOURCING

Based on the experiences and lessons learned from the successful AOP, the NPA will build upon the institutional structure created by the present AOP grantees, PADF and CARE. Much time and effort have been directed towards developing the essential contacts and community presence in those regions where the grantees are working. In addition, the grantees have an established, functioning, network of 1,100 trained and experienced professional staff, extension agents, and animators.

The rapidity and success of NPA efforts to build upon past AOP activities will be maximized if the AOP grantees also undertake the implementation of the NPA. If the grant to implement the NPA is awarded to another institution(s), whether through a direct grant or open bidding, many of the past advances made by PADF and CARE in developing a local presence and establishing community-level credibility, will be temporarily — if not permanently — lost. A new grantee (or contractor) will require an extended transition period — up to one year or more — for orientation of new personnel, development of a network of competent and trained extension agents, and for reestablishing community-level credibility and presence, before any significant on-the-ground activities would be possible.

The continued involvement of the present AOP grantees will also minimize the risk that the GOH may object to the method of project implementation, in other words, the practice of the United States and other donors to bypass official GOH channels and agencies to work directly with local NGOs. Both grantees, as well as many of the NGOs that participate in project activities, have complied with the requirements that they register with the GOH. In brief, sole-sourcing the NPA to the present grantees is fully justified on two grounds: first, both have demonstrated particular competence in implementing development activities under the difficult conditions that presently prevail in Haiti; and, second, contracting with a new institution would cause serious disruption, which, at best, could put a brake on development activities for at least a year and, at worst, stop the NPA dead in its tracks — stillborn — and thereby abort one of USAID's more exciting, innovative, and challenging projects in the Latin American and Caribbean region.

This recommendation is supported by A.I.D. guidelines and competition requirements for grants and cooperative agreements. According to the revised version of *A.I.D. Handbook 13*, competition is not required for: "Mission funded grants and cooperative agreements to registered Private Voluntary Organizations and cooperatives for umbrella programs, field programs, institutional development/strengthening, and collaboration among PVOs and cooperatives." In addition, competition is not required when one or more of the following conditions — relevant to the present situation — prevail:

- Assistance awards for which one recipient is considered to have exclusive or predominant capability, based on experience, specialized facilities, or technical competence, or based on an existing relationship with the cooperating country or beneficiaries; or
- Follow-on assistance awards intended to continue or further develop an existing assistance relationship.

At this time, however, the PP design team cannot recommend a noncompetitive waiver for CARE, for the reasons discussed earlier under Key Issues. The following draft depicts the A.I.D. authority and justification for a competition waiver for PADF. The same authority and justification will be applicable to CARE, if the conditions outlined below are met.

It is not recommended that a noncompetitive waiver be granted to the other two participating institutions — SECID/Auburn and IRG.

DRAFT WAIVER OF COMPETITION FOR PADF

The Problem

A waiver of competition is requested for the procurement of technical assistance under the National Program for Agroforestry (521-0127). The required services are to be provided through a Cooperative Agreement with the Pan American Development Foundation at a total five-year cost of \$15 million.

Discussion

The NPA builds upon the experience and lessons learned from the successful predecessor, AOP. Critical to the success of the NPA will be the continuation and strengthening of the existing institutional structure created by PADF over the past eight-year period under the AOP. This structure encompasses a network of 83 intermediary organizations and 31 tree seedling nurseries, which have provided outreach services to 125,000 farmers. It is the opinion of the USAID/Haiti Agriculture and Rural Development Office that PADF is the only organization that can continue effective and efficient implementation of this component of the NPA over the next five years.

Several factors justify the noncompetitive award of a Cooperative Agreement to PADF:

- PADF currently has an established, functioning network of 800 trained and experienced staff, extension agents, and animators. This network has proved to be highly dedicated and successful in implementing the PADF component of the AOP under the difficult conditions of Haiti. A new grantee (or contractor) would require an extensive transition period of a year or more for orientation of new personnel and the development of a network of competent and trained extension agents;
- PADF has developed a local presence and has established community-level credibility that is of immeasurable value and importance to the success of the NPA agricultural and extension outreach activities. Such credibility is not gained overnight, but earned over many years of diligent work. Any new implementing organization would be obliged to endure a lengthy trial period, thus causing unacceptable delays in project implementation; and
- The continued involvement of PADF builds upon a firmly established relationship with the Government of Haiti and will thus minimize the risk that the GOH might object to the method of project implementation. This is an important issue; the GOH has demonstrated its concern with the donor agency practice of circumventing official government channels and

agencies, working directly through NGOs, by establishing a rigorous and lengthy registration process. PADF has already complied with this requirement and is recognized by the GOH as an officially sanctioned NGO, eligible to work in Haiti. Any new organization entering Haiti may, or may not, receive this sanction and, in either case, would encounter a lengthy delay in project start-up, which would be unacceptable.

Under A.I.D. HB13, Chapter 2.3(b), competition for the procurement of services is not required for "Assistance awards for which one recipient is considered to have exclusive or predominate capability, based on experience, specialized facilities, or technical competence, or based on an existing relationship with the cooperating countries or beneficiaries." Furthermore, HB13, Chapter 2.3(d) states that competition is not required for "Follow-on Assistance awards intended to continue or further develop an existing relationship."

Recommendation

For the above reasons, competition should be waived in the procurement of technical assistance for the described NPA project and a single source authorized to negotiate a Cooperative Agreement with the Pan American Development Association.

THE CASE OF CARE

For reasons discussed earlier, the PP team found CARE's FARM proposal seriously flawed. If CARE wishes to be a key player in the NPA, then it will have to undertake the following:

- With guidelines provided by USAID, rewrite its FARM proposal — taking into account the comments and recommendations contained in this document, the accompanying technical reports, and particularly the social soundness analysis;
- Present the rewritten proposal to USAID for discussion and negotiation; and
- Agree to the active participation of the PP design team in these discussions and negotiations — preferably the Team Leader and one other team member. (There is a possibility that these services could be paid for by A.I.D./Washington).

If CARE refuses to change its position, then USAID should negotiate with CARE to take over its nursery production and agroforestry activities in the Northwest and find another grantee or contractor to implement these activities as soon as possible.

OPEN BIDDING FOR THE RESEARCH CONTRACT

The research components of the NPA — seed collection/germplasm improvement and the applied research — should be combined under one institutional contract awarded on the basis of open bidding. Both incumbents would, of course, be free to bid on this contract. The contract would call for a minimum of four long-term professionals: a seed and germplasm specialist, a database manager, an

agroforester, and an agronomist with experience in forages and grasses. A fifth position, not presently budgeted for, is highly recommended, that of team leader, whose major responsibility would be to manage this effort and not to undertake research.

Continuity in the research effort is essential. Thus, it is incumbent upon USAID, in consultation with the grantees, to issue an RFP for this effort.