

PD-AAP-220

MID-TERM EVALUATION

FOR THE

AGROFORESTRY OUTREACH PROJECT

USAID/HAITI PROJECT NO. 521-0122

All reported opinions, conclusions and recommendations are those of the authors (contractors) and not those of the funding agency or the United States Government.

Prepared by:

Richard P. Miller -- Team Leader and Social Scientist

Marko Ehrlich -- Forester

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## FOREWORD

This is a study of the Agroforestry Outreach Project conducted at the request of USAID/Haiti. It is intended to serve as the project mid-term evaluation and includes the team's conclusions and recommendations and supporting background statements. The recommendations focused on refinements of the current project which can serve as a model in anticipation of the proposed Agroforestry Outreach II possibly beginning within the next two years.

The Agroforestry Outreach Project is a very successful project when measured by standard indicators. This makes the project both easy and difficult to evaluate. It is easy to evaluate in a traditional inputs/outputs analysis concentrating on the activities and outcomes to date. Most of the short-term to medium-term indicators demonstrate that the project implementation model has not only maintained its intended pace, but in certain instances has far exceeded the design team's expectations. That type of success, however, also makes the project more difficult to evaluate.

Precisely because of this early success, the project demands and can withstand more fine tuning than would otherwise be possible. More complex issues need to be addressed to suggest appropriate mid-course corrections. Accordingly, the evaluation team looked at certain project details closely and made demands that might otherwise be considered unfeasible. The purpose of the evaluation, therefore, is not to suggest means to reach the immediate goal indicators; those are already well understood. Instead, the purpose of the evaluation is to suggest a procedure through which this project can form a solid basis and serve as a successful model for a sustained agroforestry effort in Haiti, making a lasting positive impact on the local environment.

Another difficulty with this evaluation report is clearly distinguishing between one USAID project, and three independent sub-projects (also referred to, at times, as projects); all four exist in their own right. In that regard, this report shifts levels of analysis, at times treating the projects of each sub-grantee individually and at times referring to the overall USAID project. For the latter, a bias has emerged, and the report sometimes refers to the overall project when the discussion actually pertains only to the small farmer components of Pan American Development Foundation (PADF) and CARE, and not the large-scale tree plantations of Double Harvest. When the discussion focuses on unique observations of only one of these agencies and not the others, that agency is referred to directly in the text. This format has been used to address the needs of USAID and each of the three grantees, all four of which should find this evaluation useful. Note that this report refers to one of these grantees as "Double Harvest" (what they call themselves) instead of "Operation Double Harvest" (what they have been called by USAID). There is no other difference between those two names.

The team approached the task of evaluating the project by reviewing related project documents, holding discussions with associated personnel (administrators, planners, technicians, advisors, farmers, and critics), and visiting a representative sample of the project sites throughout Haiti. In

addition for comparative purposes, contacts were made with other donor induced reforestation efforts in Haiti. A summary of the team's activities follows:

SCHEDULE OF ACTIVITIES WHILE IN HAITI

- November 7 Arrive in Haiti
- November 8 Meet project personnel, AID Mission personnel, and grantee personnel located in Port-au-Prince.
- November 9-11 Travel with project coordinator and CARE project director to the Northwest, including nursery and planting site visits in Jean Rabel, Cafe Paul, Passe Catabois; and interviews with CARE foresters, nurserymen, monitors, agronomists, animators, and peasants.
- November 12-15 Review relevant documents, interviews and discussions with project staff and AID Mission personnel, and grantee and sub-grantee personnel.
- November 16 Site visit to Double Harvest nursery, interviews with Double Harvest staff, and site visits to several Double Harvest plantations including Gardere et Roy, Heraux, and Ashton.
- November 17-19 Travel with AID project manager to visit the PADF zone in the Northeast, including discussions with the PADF forester, several sub-grantee personnel, and peasants with nursery and plantation site visits at Mapou, Limbe, Riviere Salee, Pilboro, Planton (near Limonade), Savane Carre, St. Michel, and Hinche.
- November 20 Port-au-Prince
- November 21-22 Travel to the southwest with PADF staff to meet project personnel and to visit planting sites, nurseries, and specie trials. Site visits included CODEPLA at Fond des Blancs (Gousse, Perrine, Dugais and Collet), Aquin, DCCH at La Borde (Anader, Bry) and

World Team at Bergeau.

- November 23-27            Port-au-Prince--interviews with CARE and  
PADF foresters, USAID mission staff,  
World Bank project staff and others.
- November 28-30            Site visit to Region I of the CARE  
project in the northwest with a nursery  
visit at Riviere de Henne, at plantation site  
visits at Josmin, Bombardopolis, Cite  
Nimey, Savanne Mole, Joblin, Mare Rouge, Dos  
d'Ane, and Anse Rouge. The trip included  
interviews with CARE foresters, monitors,  
agronomists, and peasants.
- December 1-4            Port-au-Prince--write-up.

Throughout most of the evaluation, the two team members conducted interviews and made site visits together. Due to the individual team member's schedules, however, CARE site visits were made independently, with the forester visiting Region I and the Social Scientist visiting Region II.

The evaluation was also complicated by the numerous U.S. and Haitian holidays which occurred throughout the month of November. Although most project personnel made themselves available during these holiday periods, there were more logistical difficulties than there would have been otherwise.

The team appreciated the assistance received by the project coordinator's office and supporting staff. We particularly appreciate the support of Dr. Fred Conway, Project Coordinator, and Mr. Tom Greathouse, Forestry Advisor, who were particularly helpful in providing background information, arranging schedules and accompanying the team on field trips. Special thanks also go to the staff of the three implementing agencies who set aside valuable time to assist the evaluation team in any way possible. We particularly appreciated the assistance and contributions of PADF staff Mr. Steve Goodwin, Acting Project Director, Mr. Mark Webb, forester, and Mr. Bill Buffum, forester; CARE personnel Mr. Larry Holzman, Country Director, Mr. Dan Stephens, Project Director, and foresters Miss Marcia McKenna and Mr. Paul Campbell; and Double Harvest personnel Mr. Aart van Wingerden, President, and Ron Smith, forester/Nurseryman. Their contributions, critical to the evaluation, were greatly appreciated.

In addition, the team appreciates the thoughtful and cordial assistance from many USAID Mission personnel. Special thanks go to Mr. Robert Wilson, Project Manager, who accompanied us during parts of our field tour. We also appreciate the stimulating discussions and backstopping provided by Dr. John Lewis, Acting Agricultural Development Officer, and Mr. Harlan Haggood, Mission Director.

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## Chapter 1

### MAJOR CONCLUSIONS AND RECOMMENDATIONS

Each of the three components of the USAID Agroforestry Outreach Project was initiated as a distinct experimental model for Agroforestry Outreach in Haiti. Two of the three grantees--PADF and CARE--have proven quite successful and are complementary in their approach. Both revolve around the concept of social forestry--small-scale village level multi-purpose reforestation activities. The third grantee, Double Harvest, has a radically different approach to planting trees and has experienced more difficulties. Somewhat successful with its nursery activities, it has had much less success with its large-scale tree plantations. Its research component also has serious deficiencies. Double Harvest has accomplished little scientific research on its own, and only recently has it allowed other project technical staff to carry out research on its land. Double Harvest's accounting has only lately been brought up to date. It is also expected that following the 1984 growing seasons, neither PADF or CARE will purchase any more seedlings from the Double Harvest nursery. It is not likely, therefore, that Double Harvest will continue to play an integral role in the development of an overall Agroforestry Outreach Project implementation model. The Double Harvest research component now administered by the Coordinator's Office is expected to produce the most beneficial results.

- Recommendation I: The second phase of the Agroforestry Outreach Project should continue as an integrated project focusing on the interventions of PADF and CARE; in fact it is that concept that is normally understood when speaking of the Agroforestry Outreach Project in Haiti. The concept of large-scale tree plantations as promoted by Double Harvest should receive a careful review following the completion of the current phase. New plantations should be introduced only if that concept is found worthy of continued experimentation. If Double Harvest is to receive new funding, it should only be as a distinct experimental component of the overall USAID Project. If such an ongoing experimental effort is found to be of little benefit for Phase II, Double Harvest should only receive sufficient additional funding to maintain the existing research sites.

## 1.1 Project Implementation Model

The USAID Agroforestry Outreach Project has been quite successful in meeting initial project objectives by identifying an efficient implementation model for moving trees in rural Haiti. Numerous peasants throughout Haiti have been motivated to plant a substantial number of trees. Some tree planting goals have been achieved in half the expected time and the pace is quickening.

- Recommendation II: The primary focus of the project -- moving trees -- should continue as is for the next two years. Haiti's environmental situation combined with the grass-roots demand for trees requires that this action orientation be maintained in the immediate future. The project should also maintain its flexible, simplified implementation model which is one of its basic strengths. Because of the overwhelming success with the first step, planting trees, indicators of project success should be redefined toward a medium to long term perspective to get a better measure of long term project impact (i.e. the number of trees surviving instead of the number of trees planted, the number of trees cut for subsistence purposes versus the number of trees cash-cropped.)

Despite the success in meeting immediate project objectives, the project itself may not contribute as much toward broader sector goals as initially anticipated. Project personnel accurately perceive that this project alone cannot reforest Haiti.

- Expectations of significant increases in rural incomes may be realized at the end of the first cycle and thereafter. The trees haven't matured sufficiently to provide results at this time.
- Expectations of a significant contribution towards erosion control appear justified only in the long run. Cash-cropping of trees -- a major project innovation -- diminishes the erosion control impact of tree plantations as a function of the length of the cycle. Because of these newly planted trees, however, increased natural regeneration with resulting erosion control should take place.
- Expectations of significantly increasing the charcoal supply for Haiti cannot be evaluated at this time. Alternative uses of this wood may include construction timber and lumber. Secondary factors such as access, droughts, and market pressures might determine more accurately uses for the planted trees. In addition, some project sites are located in areas with no traditional charcoal production and it is not likely (and may not be preferable) that charcoal production will be initiated in these locations as a result of this project.

- Recommendation III: Realistic expectations for the impact of the project should be brought in line with the experiences of the past two years. However, certain incremental shifts in the implementation model should take place to focus on areas which have so far received insufficient attention:
  - (A) Technically, more work should be done in certain problem areas -- on steep slopes, in high altitudes, and in arid zones. Some of this work should focus on erosion control as well as agroforestry. In the area of agroforestry, there a greater effort integrating tree production directly into existing crop production and herding practices. In this regard, grantees should continue to build on their strengths. This means that CARE should continue to focus more on the soil conservation efforts, while PADF continues to focus on moving trees.
  - (B) Institutionally, the project should interact more regularly with indigenous Haitian institutions and Haitian personnel. USAID should increase communication (interaction) with the Government of Haiti and work more closely with other reforestation efforts. The implementing agencies should work more closely with competent Haitian institutions. This is being done by PADF in some areas, but not in others. A concentrated effort should continue to develop capable village institutions where they do not now exist, and continue to work with those that already exist. More qualified Haitian personnel need to be integrated into the project implementation staff, particularly in the Northeast.

The project currently plants trees at the rate of approximately 2.5 million trees per year with average survival rates not exceeding 50% - 60%. The project doesn't come close to replacing the estimated 17 million trees that are cut each year in Haiti. Yet, the project cannot significantly increase its tree planting capacity in the short to medium term and remain successful.

- Recommendation IV: Any project expansion undertaken over the next 2 - 3 years should focus on qualitative instead of quantitative growth. The number of trees to be planted and the number of farmers to be reached should remain close to existing levels. As additional funds are available, staffing increases within the above constraints should be the first priority.
- Recommendation V: USAID should consider a one-year extension of Agroforestry Outreach I, prior to implementing Agroforestry Outreach II. Agroforestry Outreach I will require additional time to test its underlying hypotheses and sufficiently refine its technical, social, and economic packages. Research findings in each of these areas need to be incorporated into the design effort for Agroforestry Outreach II.

## 1.2 Research

The research component has received less attention than moving trees and this has been recognized. Current efforts are underway to remedy the situation. Nonetheless, significant changes in staffing patterns and time allocation must occur if the project is to obtain sufficient reliable information on the technical, economic, and social variables related to agroforestry in Haiti.

- Recommendation VI: More and better research must be undertaken as a secondary project focus. Technical research has begun and is an integral part of the existing implementation model. Useful project related social and economic research has not yet begun. The project's Coordinator's Office should be redefined as a Planning Unit and take responsibility for the required research over the next two to three years.

## 1.3 Training

Effective training of project personnel has been a key element of the project's initial success, but much work remains to be done. Members of the implementation teams, especially the monitors and the animators, will continue to require extensive training sessions to absorb the newly acquired knowledge on agroforestry in Haiti. As attention and energy is reallocated away from the development of the implementation model, non-formal training of Haitian personnel needs to become a project priority. Ultimately, long term project success depends upon successful training of Haitian personnel.

- Recommendation VII: The project's technical assistants (both AID and grantee staff) should be more directly involved in the training component. The Agroforestry Resource Center under the jurisdiction of PADF should be strengthened and should take a much more active role in providing training and technical assistance for forestry activities in Haiti. Although initially the Resource Center would work primarily with PADF personnel, eventually such a center should be available to any agency active in reforestation efforts in Haiti.

## Chapter 2

### INTRODUCTION

#### 2.1 Project Background and Objectives

The Agroforestry Outreach Project (521-0112), according to the Project Paper, was designed to protect the productive capacity of agricultural lands in Haiti by addressing the negative effects of the historical and continuing deforestation of the Haitian countryside. The major contributing factors associated with this environmental degradation are clearing land for agricultural production and exploitation of wood products to help meet the demand for fuelwood and charcoal production. Effects of this deforestation include declining agricultural productivity, declining energy supplies, and declining standards of living in rural Haiti. Recognizing the gravity of the situation in each of these areas, the project seeks to redress each of these simultaneously through the promotion and implementation of peasant agroforestry activities. This initiative attempts to address the major problem areas associated with deforestation--soil erosion, energy scarcity, and rural poverty--without debating priorities between them.

The project makes two major assumptions which are distinct from earlier reforestation and soil conservation efforts in Haiti. The first is that wood, if planted as a cash crop, can provide the peasants a short term economic return. Thus, the project emphasizes the feasibility and profitability of planting and maintaining fast-growing coppicing hard-wood trees. The second major assumption is that the most effective vehicle for implementing these activities is to provide direct assistance through non-governmental organizations (NGO's) instead of public sector channels. It is argued that the advanced state of Haiti's environmental degradation, the ineffectiveness of Haitian government institutions, USAID's and other donor's alternative efforts at institution building within the public sector, and the well established private sector throughout the Haitian countryside merit this consideration. The thrust of the project, therefore, is to plant trees in Haiti, as many and as soon as possible.

The Agroforestry Outreach project is a four-year project totalling \$8 million U.S.. It provides grants to three independent NGO's--Pan American

Development Foundation (PADF), CARE, and Operation Double Harvest--in addition to coordination and technical assistance by two AID contractors:

- PADF, through a grant of \$3,900,000 is to promote tree growing and other economically productive and ecologically sound land use practices by small farmers through the provision of plant materials and agroforestry extension. They are to establish an Agroforestry Resource Center and three regional Agroforestry Outreach Teams, plant three million trees through about eighty sub-projects, and train appropriate personnel. They are not an implementing agency themselves, but instead, provide financial and technical assistance to other NGO's to plant trees and establish nurseries.
- CARE, through a grant of \$2,350,000 is also to promote tree growing and other economically productive and ecologically sound land use practices by small farmers. In contrast to CARE, however, they are (in most instances) the implementing agency as they themselves provide seedlings, technical assistance, and agroforestry extension. Major outputs are to include the construction and expansion of regional nurseries and demonstration plots, and the planting of four million trees with the assistance of thirty-five hundred farmers through appropriate training of extension agents.
- Double Harvest, through a grant of \$850,000, is to expand their program of tree nursery experimentation, seed production and storage, and large-scale demonstration tree plantations. In addition, they are to develop a seedling plug system, and conduct tree farm research.

## 2.2 Scope of the Evaluation and Statement of Work

This report consists of the findings of a four-week mid-term project evaluation for this project. The terms of reference for the Forester and the Social Scientist follow. In addition, due to the significance of the hypothesis concerning the economic rationality for cash cropping of trees for the small farmer in Haiti, the evaluation team requested an economic analysis from the mission to be a part of the evaluation report. Unfortunately, this was not available at the completion of the evaluation.

The evaluation team is composed of the following individuals:

SOCIAL SCIENTIST/TEAM LEADER: Richard P. Miller, private consultant, 4420 Egypt Rd., Smithville, Ohio 44677; Tel: (216) 669-3217.

FORESTER: Marko Ehrlich, private consultant, Port-au-Prince, Haiti.

The Statement of Work for the evaluation team follows:

### 2.2.1 Objective

The Contractors shall work as members of a team to conduct a mid-term evaluation of the Agroforestry Outreach Project.

### 2.2.2 Scope of Work

The evaluation comes at the mid-point of the life of the Agroforestry Outreach Project. Its main purpose is to review the activities of the Project to date and to make recommendations for mid-course corrections for the remainder of the Project. The evaluation will cover the four components of the Project: the grants to Operation Double Harvest (ODH), Pan American Development Foundation (PADF) and CARE; and USAID Project Coordination/Technical Support. The Project will be evaluated as a whole, though each component will be considered on its own terms.

Each of the grants in the Project takes a different approach to the organization of its agroforestry activities. The ODH grant is intended in part to establish relatively large-scale demonstration tree-farms. The PADF and CARE grants, on the other hand, are designed to implement agroforestry sub-projects on small-farmer plots. PADF works largely through intermediate organizations, while CARE has mainly implemented its sub-projects directly.

There is also considerable diversity within each of these project components as well. ODH works on both private land and on land it has leased from the Haitian government. PADF has made several different kinds of sub-project agreements with a variety of intermediary organizations. CARE has worked with community councils and other groups with differing levels of experience. Seedlings have been planted in areas differing widely in elevation, rainfall, soil type and land use patterns.

The evaluation team, consisting of a forester and a social scientist will prepare a joint report to be submitted to the USAID Mission to Haiti. The team will spend one month in Haiti beginning in late September, 1983 and will submit its final written report before the departure of the team leader from Haiti.

The Social Scientist will serve as team leader and will be responsible for submission of the final written evaluation report. In consultation with the other team member, the Social Scientist will make decisions about the activities of the evaluation team.

The Social Scientist will mainly assess and make recommendations about:

- organizational models for enabling intermediate agencies to implement tree-planting projects;
- institution-strengthening aspects of the Project;
- motivational methods for interesting farmers in tree-planting;
- data collection and analysis;
- research program for assessing socio-economic impact of the Project;
- training of extension agents.

The Forester will mainly assess and make recommendations about:

- species selection for factors such as soil type, rainfall pattern, elevation, time of planting, as well as for utilization, including as fuelwood and charcoal;
- nursery management at central (ODH), regional and local (CARE, PADF) nurseries;
- seedling distribution and planting methods;
- survival and establishment of seedlings;
- collection of data on survival and other technical factors;
- research program, including species trials, case studies (PADF, CARE), and wood production study (ODH);
- training of extension agents.

The evaluation of the ODH component will include an assessment of :

- the farm arrangements employed by ODH;
- the development and use of the Winstrip seedling plug system;
- the management of the demonstration tree farms;
- the management of the central nursery facility and seed production/storage system;

- research at the nursery level;
- research on the demonstration tree farms.

A sample of ODH sites to be visited will be made by the team based on ecological variation and on the use of private versus public land. The ODH component will be evaluated not only in terms of its grant agreement, but in the context of the Project as a whole, in its additional role as a supplier of seedlings to PADF and CARE.

The evaluation of the PADF component will include assessment of:

- the various organizational arrangements employed in subprojects;
- the establishment of the Agroforestry Outreach Center and three regional teams;
- the degree to which the objective of planting 3 million trees through 80 subprojects has been attained;
- mid-course changes, such as altering the use of incentives and the support of regional nursery development;
- post-planting follow-up activities;
- training for extension agents;
- research, data collection and analysis.

A sample of PADF sites to be visited will be made by the team based on organizational criteria. The sample will include smaller and larger sub-projects with more and less experienced intermediary organizations. Planting sites in different ecological zones will be visited.

The evaluation of the CARE component will include assessment of:

- the various organizational arrangements employed in subprojects;
- the degree to which the goal of the adoption of tree-growing by 3500 farmers has been attained;
- mid-course changes, such as altering the use of food-for-work and incentives, the establishment of a mechanical soil conservation component, and collaboration with ODNO;
- post-planting follow-up activities;

- research, data collection and analysis;
- training of extension agents.

A sample of CARE sites to be visited will be made by the team based on organizational criteria. The sample will include smaller and larger subprojects and subprojects with and without a tree-maintenance incentive system. Planting sites in different ecological zones will be visited.

The evaluation of the Technical Support component will include assessment of:

- the activities of the Project Coordinator in coordination and leadership, documentation and distribution of information, training and AID liaison;
- the activities of the Forestry Advisor in providing technical advice, documentation and distribution of information, maintaining standards of technical performance, and training;
- the activities of short-term contractors.

### 2.2.3 Required Reports

The Social Scientist shall prepare the following reports in collaboration with the other member of the evaluation team:

1. Oral report of activities, findings and recommendations to Project Manager, Project Coordinator, and Forestry Advisor.
2. Final written report of activities, findings and recommendations to be submitted before the departure of the Social Scientist from Haiti.

### 2.3 Evaluation Modalities

As the terms of reference demonstrate, this evaluation is unusual in that there are three independent components to evaluate in addition to an overall project which integrates all three. Moreover, due to the nature of these components, instead of a few project sites or zones, there are over one hundred. Therefore, the evaluation team made a number of separate field trips attempting to visit a representative sample of project sites for each component. Interviews were held with staff members at all levels in AID, the

three grantees — PADF, CARE, and Double Harvest -- a number of sub-grantees of PADF, and the peasant farmer. In addition, reports concerning Haitian agroforestry were reviewed, and numerous project files were consulted.

The following chapter initially offers a point by point assessment of the findings of the evaluation team for each of the three grantees. This is followed by a more general assessment of the social, institutional, and technical issues of the project as a whole with the three components combined. More specific conclusions and recommendations are contained in these analytic sections. This report is intended as suggested policy and procedure for the USAID mission, for the grantees and sub-grantees. The report is ultimately destined for indigenous Haitian institutions, whether they be in the public or private sector. Its purpose is to improve the medium and long-term, as well as the short term impact of the project.

## Chapter 3

### COMPONENT ANALYSIS

#### 3.1 Double Harvest

##### 3.1.1 Description and Objectives

The purpose of this grant is to assist Double Harvest in expanding and implementing its forestation program in Haiti. The project grant agreement details a number of specific objectives toward this end:

- (1) to strengthen the managerial, technical, and administrative capabilities of Double Harvest;
- (2) to establish a Central nursery facility for the efficient production and distribution of seedlings;
- (3) to establish a program of seed selection, production, storage, and distribution;
- (4) to carry out an extensive research program;
- (5) to establish a series of demonstration tree farms in a variety of ecological zones to demonstrate the technical and economic feasibility of commercial forestry to meet Haiti's wood and energy needs. At least three organizational models were suggested for a combined minimum of four or five demonstration plantations:

- Private Landowner/Sharecropping Option - In the first model, a contractual arrangement is drawn up between Double Harvest and the landowner. Essentially, the land owner agrees to release his land to Double Harvest for a period of nine years during which time Double

Harvest will prepare the land, plant trees, and manage the plantation for the life of contract. Double Harvest provides all the financial inputs, and keeps all the revenues until its initial investment has been fully recovered. At that time, the two parties enter into a fifty/fifty profit sharing arrangement until the contract expires, at which time the land, in its current form, reverts back to the original owner.

- State Land Lease/Peasant Farmer Option - Under the second model, Double Harvest is to enter into a long-term lease arrangement on land owned by the Government of Haiti. As described above, Double Harvest would provide the production and managerial inputs and will contract tree maintenance to local peasants for the first few years. Once again after recovering its initial investment, Double Harvest would renegotiate its maintenance contracts to provide the peasants with a substantial portion of the subsequent revenue.
- Private Landowner/Buy-out Option - The third model is similar to the first model, except that an interest accumulation buy-out option replaces the fixed-term sharecropping arrangement. Here, Double Harvest maintains complete land-use rights until it has recovered its initial investment plus interest accrued at fifteen percent per annum. At that time, all use and control rights revert back to the original owner. The land owner may buy-out Double Harvest at any time during that period by paying the total initial investment plus accrued interest to date.

Large areas of unproductive private and public land are scattered throughout the Cul-de-Sac. Private land owners often believe that these large tracts are too poor to be used for food or cash crops, and much of this land currently supports only scrub brush. Double Harvest believes, to the contrary that tree plantations of fast-growing hardwoods are an economically viable alternative for production on these marginal lands. A similar rationale is applicable to the state lands on the hillsides and the lowlands of the Cul-de-Sac which are not usually considered to be productively utilized. If the Double Harvest hypothesis is valid, their experiments would not only reduce soil erosion on marginal land, but could make a substantial contribution toward supplying the charcoal market of Port-au-Prince. In addition, short-term benefits would accrue to the wage laborers who maintained the tree plantations and were provided free garden plots around the young seedlings for the first few years.

The development philosophy underlying these tree plantation models is very similar to that used with its successful dairy and tomato operations. Essentially, Double Harvest believes that this country is in such desperate need of agriculture that only the elite, educated Haitians have any hope of resolving the agricultural crisis; they can most effectively take advantage of the unused potential. The economic success of the wealthy businessmen, it is believed, will demonstrate a similar economic viability for the small farmer. The philosophy might be articulated in the form of a class struggle--you pull them up or they will pull you down.

### 3.1.2 Progress to Date

The various organizational models have been attempted with varying degrees of success. Of the seven tree plantations started, the first model--Private Landowner/Sharecropping--is the most popular. It has been used on most of the existing plantations and seems to provide the best opportunity in the long run. It is the only model of the original three that is still of interest to both Double Harvest and the land owners.

The second model with state leased land was attempted at Fonds Parisien with generally poor results. After obtaining a lease from the state, Double Harvest found third and fourth generation squatters farming the land, many of whom considered it their own. After Double Harvest employees work out an arrangement with the farmers to work the ground and plant the trees, they discovered that animals were turned loose the first year and killed most of the trees. Because of the Haitian regulation which prohibits large or small ruminants from grazing in unauthorized areas, Double Harvest told the farmers to keep the animals off the land. An accord was finally reached whereby Double Harvest agreed to pay the farmers \$15 per carreau (3.2 acres) for the final land preparation prior to planting, and a \$7.50 maintenance fee per carreau per month during the growing season. This example indicates the kind of problem one might expect trying to plant trees on state land. Although the initial difficulties at this site have been at least temporarily subdued, Double Harvest does not see this as a viable working model for the future; there is even some consideration of Double Harvest withdrawing from this location.

The third model has yet to be implemented.

To implement its tree planting program, Double Harvest staff contacted wealthy land owners and introduced them to the Double Harvest implementation model for cash cropping of trees. A few landowners kept track of progress on earlier plantations, liked what they saw, and signed a contract themselves. After the first two and one-half years of the project, however, there has not yet been sufficient interest generated in this component so that wealthy land owners regularly approach Double Harvest to express interest in large-scale tree production as a business opportunity. Double Harvest staff is still actively involved in recruiting participants in their charcoal production experiment. Since empirical data on the economics of large scale tree production is just now becoming available, no one is quite sure how it is all going to work out.

Double Harvest has succeeded in establishing a large-scale tree nursery in Cazeau, outside Port-au-Prince. In the process, Double Harvest developed seedling container system (Winstrip) which, when perfected, will prove to be among the best tree seedling production methods presently available. This development process was also needed to eliminate a number of alternative tree seedling production methods (i.e., speedling). Presently, only the "winstrip" and the "root-trainer" constitute valid seedling-production alternatives. The advantages of one technique over the other have to be further studied. Double

Harvest seedling production--critical for enabling the early success of the tree planting operation--has lacked, however, quality and reliability. Seedling quality has been below standard during the first few planting sessions and seedling production has often not matched delivery schedule nor type of seedling requested. It is recommended that Double Harvest tree seedling production emphasize quality over quantity, focusing on the quality of the potting mix and the reliability of seedling delivery.

Double Harvest tree farm establishment has succeeded in showing how not to rather than how to be successful in establishing commercially viable tree farms in Haiti.

a. Documentation relative to each tree demonstration farm is inadequate.

b. Establishment of tree farms does not follow an experimental plan, but rather shows repeated errors which could be avoided if a more rigorous approach was followed.

c. Double Harvest technical staff is inadequate to conduct technical research on the established tree farms.

d. Expectations that Double Harvest develop a tree farm establishment and management package that would receive widespread application in the private sector of Haiti are severely compromised by the lack of a clearly defined experimental plan.

It is recommended that Double Harvest implement such a plan as soon as possible, focusing on a simple technical package consisting of efficient establishment and management techniques.

### 3.1.3 Likelihood of Achieving Objectives

Experimentation with various organizational models for large-scale tree plantations has been accomplished through demand rather than a systematic process. Nonetheless, the optimum organizational model-- private landholder / sharecropping --has probably been found. While certain modifications of this model may be in order, it is unlikely that they will produce substantially better results. This model provides a direct test of the economic feasibility of such an effort. To the degree that the land put into experimental tree farm production has no alternative production capacity, most of the risk is carried by Double Harvest and USAID; the wealthy landowner has very little to lose.

The economic feasibility of such an effort, however, has not yet been determined. Although some data are now available, conclusions should not be drawn until after the surviving trees have gone through at least one complete cycle (i.e. about 4-6 years). Whether or not such plantations will ever set a good enough example for other businessmen to enter such ventures on their own

accord is not yet clear. By Double Harvest employees's own admission, they themselves can never reforest the Cul-de-Sac. They could provide seedlings and technical assistance, but would rely on others duplicating their efforts to become the charcoal producers of Haiti. A good example must be set before any of this takes place. It is not yet clear whether or not the existing demonstration tree farms can set such an example.

In order to maintain the successful implementation model already established, the project should continue to place its primary focus on those organizational models which most efficiently move trees. Double Harvest should continue working with its existing "private landholder / sharecropping" model for the implementation of large-scale tree plantations. Since Double Harvest seems to be extended to its working capacity on the most favorable available plantations, its efforts should be concentrated on those. Only after these plantations are seen as a success should Double Harvest continue experimenting with the more difficult, although ultimately important, problem areas, such as government land.

It is extremely important that Double Harvest takes advantage of the experience accumulated over the past years. It is recommended that it address the following questions as completely as possible:

- Which institutional arrangement has been most effective in establishing tree farms in the Cul de Sac?
- Which potting mix has produced the best quality seedlings?
- Which species (as a function of soil types) produce the best results for commercial tree farms?
- Which soils are best suited for commercial tree plantations in the Cul de Sac?
- Which soil preparation technique works best and is most cost-effective?

In order to answer satisfactorily the above questions, Double Harvest needs to collect, analyze, and document the information necessary. Past history, however, has shown a chronic deficiency in Double Harvest's performance of such activities. It is recommended that Double Harvest improves (by hiring additional staff) its data collection, analysis and documentation capacity. Failing to take full advantage of the valuable experience accumulated by Double Harvest would reflect negatively on the project's overall teaching potential as a pilot project.

### 3.2 Pan American Development Foundation

#### 3.2.1 Description and Objectives

The purpose of this grant is to provide support to PADF to establish a program of agroforestry extension and outreach to the Haitian peasants. According to the Grant Agreement:

"the program, over a four year period, will seek to protect the productive potential of Haiti's land and generate income in rural areas by promoting and replicating tree-growing and other economically productive and ecologically sound land uses by small farmers."

The project is to accomplish these goals by carrying out the following project objectives:

1. Establish an Agroforestry Outreach Center;
2. Establish at least three Agroforestry Outreach Teams;
3. Assist in planning and implementing at least eighty sub-projects by planting three million trees;
4. Establish agroforestry demonstration areas;
5. Train personnel and provide effective training materials; and
6. Collect and analyze data on forestation efforts in rural Haiti.

The Agroforestry Resource Center headquartered in Port-au-Prince was to provide technical and material assistance to a wide-variety of private and voluntary groups or individuals who wish to undertake forestry or conservation efforts in rural Haiti. The Center was to supervise the regional Agroforestry Outreach Teams who would actively work with existing intermediary organizations (NGO's) who were to motivate peasants to plant and maintain trees. Historically, many NGO's have significant experience in rural development activities throughout much of the Haitian countryside. The PADF grant recognized the value of these institutions--some of whom were already involved in reforestation activities prior to this project. PADF was to

provide additional financial and technical assistance so that the organizations could make substantial improvements in their existing reforestation activities.

Resources allocated for these purposes were divided between Resource Center/Administration/Overhead (55%) and Sub-project Outreach (45%). Major items in the first category include PADF project personnel, material support (vehicles, office equipment, etc), overhead, and training materials. Major items for the second category include equipment and consumables, tree maintenance programs, and NGO personnel costs (matched).

### 3.2.2 Progress to Date

PADF field staff has shown extraordinary capacity to adjust quickly to changing circumstances. Surprised by its own ability to "move trees" effectively and efficiently, the staff successfully established a network of regional nurseries that has enabled PADF to further expand its tree planting capacity.

Unquestionably, this flexibility is the result of excellent leadership and top quality personnel in the field (Forestry Teams). It also shows that by keeping the efforts focused on a few objectives, success is more likely. Moreover, PADF field staff has demonstrated their ability to take advantage of the learning process inherent in this pilot project. Research activities have been undertaken in various parts of the country which will yield important results and improve PADF's ability (and the Project's as a whole) to establish small-scale tree plantations in rural Haiti.

PADF has organized its work with sub-grantees around a detailed development philosophy which is an integral part of its project implementation model and an essential ingredient for project success. The major assumptions of this philosophy are as follows:

- Trees should become a crop. Trees should be planted with the idea of harvesting and replanting, just as peasants harvest and replant other crops.
- Peasants should find trees which grow fast, so that they can begin to profit from them after three or four years.
- Trees can grow together with food so that they don't interfere directly with food crop production.
- Trees should be planted on the peasants' own land so that the peasants know that they themselves will benefit from trees, just as they benefit from crops that they plant on their own land.

- Trees should be planted in a large quantity to demonstrate that the peasant has a serious interest in receiving help to solve his problems. Even five hundred trees can be planted on 1/6 of a carreau, still leaving a few years during which food can be intercropped among the trees.
- Peasants who plant trees have the right to cut them down.

Combined, these operating assumptions offer strong support for the project hypothesis to cash crop trees, a general agroforestry model, and the notion that the peasants are ultimately responsible for their own destiny and possibly the reforestation potential in rural Haiti. Some people believe, however, that cash cropping of trees is not a viable option for all peasant farmers. It is an excellent idea in principle, especially for farmers with sufficient land and food resources. Empirically, there has not yet been a successful demonstration of its success (see Smucker 1981: 66). Current observations tend to support the hypothesis for many project beneficiaries, but it can't be adequately tested until after the first crop of trees has been harvested.

The major thrust of PADF activities the first two years was to plant trees. Through its sub-project outreach component, PADF enters into a contractual agreement with a sub-grantee providing cash or in kind materials, trees, technical assistance, and record-keeping forms for the animators. The amounts vary greatly by sub-grant, but in no case do they exceed \$25,000 per sub-grant. A single grant may finance the purchase and planting of anywhere from less than 1,000 trees to over 200,000 trees. Some grants do not support direct tree planting activities, but instead finance seedling production in nurseries.

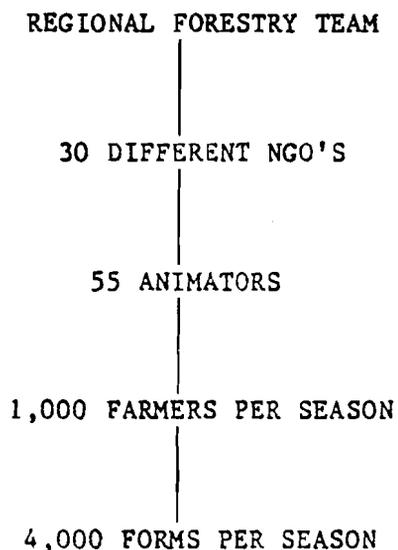
The sub-grantee is responsible to organize its sub-project to be consistent with the overall project philosophy, and to supervise the work of the village animators, who, in turn, directly supervise the activities of the tree planters in their own zone. Grants are usually made for a single planting. Ongoing work with a particular organization, therefore, requires a series of contractual agreements, one for each growing season (two per year).

Regional Outreach Teams are responsible for the sub-grants in a particular zone. The composition of each team varies greatly, in part due to the operating style of the local organizations with which it works. Essentially, an American forester works with his own supporting staff composed of Haitian and foreign personnel. The team assists the NGO's who received sub-grants in the project. Where the sub-grantees are sufficiently organized, they provide assistance to the village animators. Otherwise, the regional forester and his team provide this assistance directly. The village animator is responsible for drawing up a list of eligible and interested cultivators. The animator also serves as the local extension agent for the farmer and is responsible for completing the questionnaire forms.

Regional Forestry Teams are responsible to the central office in Port-au-Prince. Their expenses are paid by PADF. Sub-grantee staff members may be supported either by the PADF grant or their own organizations. They are generally responsible to their organizations and provide their services for a

particular project. The animator may be responsible to the local NGO or the Regional Forestry Outreach Team. He is remunerated by piece rate, receiving two dollars for each planter identified, plus two dollars for each of three questionnaires properly filled out as a part of the post-planting activities. Figure 1 is indicative of the work undertaken by a regional team:

Figure 1: Forestry Team's Activities



The PADF office in Port-au-Prince also provides technical assistance to each Agroforestry Outreach Team. Two nursery specialists, one expatriate and one Haitian, assist all the regional teams in nursery construction and extension. In addition, the central office assumes primary responsibility for collating and analyzing the questionnaire forms.

### 3.2.2.1 Organizational Arrangements

The concept of regional Agroforestry Outreach Teams is sound and has been implemented quite successfully. A group of dedicated, hardworking staff members are in place and have provided optimum support for the project's implementation model in sometimes trying conditions. The decentralized structure permits the teams to respond more appropriately to the wide social, institutional, and ecological diversity found throughout the country.

First, these various regional teams work with a variety of sub-grantees. Characteristics of these sub-grantees vary widely. Most sub-grantees are private organizations. Some have worked in Haiti for generations, others are quite new. In a few instances, indigenous community councils receive grants

directly. Some maintain a paternalistic (neo-colonial) operating style, while others are quite low key by encouraging the development of the Haitian peasant, and not themselves. Accordingly, some have a significant degree of Haitian personnel involvement in their rural development programs; others rely heavily on expatriate involvement. Some groups perceive such rural development activities as ends in themselves. Others want to give farmers trees to plant on the condition that they meet certain religious obligations. Given this wide diversity of intermediate agencies, one might wonder how PADF is able to get anything done at all. Somehow, it has managed to maintain the appropriate balance between its agroforestry development philosophy and that of the intermediate agencies which is crucial to the successful implementation of their program.

Three regional agroforestry outreach teams have been established. One team is based in Cap Haitien and is responsible for the Northeast sandwiched roughly between the CARE project to the west and another PADF region to the south. A second team is based in Port-au-Prince and is responsible for the Cul-de-Sac and the southeast (including Jacmel). A third team is based in Les Cayes and is responsible for PADF activities in the southwest. In addition, PADF has established two quasi-autonomous teams working in the Central Plateau (between Cap Haitien and Port-au-Prince) and on the south coast (west of Les Cayes). The latter two teams, headed by part-time PADF staff, have not yet acquired the status of a regional agroforestry outreach team. They continue to work under the supervision of one of the three regional foresters.

The Agroforestry Outreach Center in Port-au-Prince exists and officially continues to assume the overall coordination of the regional agroforestry teams. In practice, however, the Project Director assumes major coordinating activities, and the Outreach Center, itself, has not received much attention. The evaluation team is unaware of any individual whose full-time responsibilities are to coordinate the work of the Outreach Center. Instead, most individuals are either assigned to a regional team, or have more specific responsibilities (e.g. nurseries or questionnaires) in supporting those teams.

The lack of a functioning Outreach Center has not yet hindered effective project implementation. The work proposed for this center is being accomplished through other project staff. Technical and material assistance to sub-grantees is being handled by the Regional Forestry Teams plus the nursery construction and extension staff based in the central office. An active extension program is in place, if only for the benefit of the project and sub-grantee personnel, animators and tree farmers. A small library is located in the PADF office at Port-au-Prince. Most materials are in English, although a few are in French. Little has been translated into Creole. In addition, PADF occasionally sells nursery materials to NGO's who are unable to procure the materials elsewhere in Haiti. One reason the Outreach Center has not received more attention is the high priority placed by project staff on planting trees. Apparently most materials for this center are acquired only as they fulfill a missing need in the implementation program. The Resource Center should check with the Groupement Pilot Project in Bayonnais to determine whether or not any of their training material might be useful for the PADF Resource Center or any of the Regional Forestry Teams.

### 3.2.2.2 Quantifiable Objectives: Trees and Sub-projects

As of September 1983, PADF had implemented 160 sub-projects since the project began. PADF defines their sub-projects as contractual relationships between PADF and a sub-grantee. Therefore each time a contract is signed, a new sub-project is added. Since many contracts are renewals or extensions of previously existing projects with the same groups, PADF is not working in 160 locations with 160 different groups. If a "sub-project" is redefined to combine all the contractual relationships between a given organization and PADF as one, there were forty-two PADF sub-projects following the spring (1983) planting season.

These figures indicate that indeed PADF has large number of separate activities which it coordinates. Substantial efforts are required just to keep track of the various sub-projects, in addition to providing the necessary extension services required for successful project implementation. These figures also indicate that there are many NGO's working in rural development activities that have not yet entered into a formal agreement with PADF. Preliminary estimates from a NGO survey undertaken by USAID/Haiti indicate that there are approximately two hundred NGO's currently involved in rural development activities in Haiti. It is unlikely that PADF will saturate this market in the near future.

By September, 1983, PADF had planted 4,022,000 trees, well above the projected total for the entire four years. Clearly, this is a highlight of the project. Earlier forestry projects in Haiti attest to the failure of not just growing seedlings in nurseries, but of planting trees in the countryside. Numerous reports cite examples of seedlings left in nurseries or by the roadside and ignored, never reaching a farmer's field. Through its innovative philosophy of development, this project has overcome those deficiencies. There is nothing to indicate that this project may not be capable of maintaining that tree planting figure for another two years, thereby doubling the total number of trees planted over the life of the project.

### 3.2.2.3 Mid-Course Corrections: Incentive Payments and Nurseries

Incentive payments were initially introduced with about 20% - 30% of the trees planted the first season. Under this program, each planter was paid five cents for each surviving tree after six months, and another five cents for each surviving tree after twelve months. It was argued that such an incentive was essential to establish sufficient interest in the program. After the first one or two growing seasons it became apparent that there was

sufficient interest in tree planting without these incentive payments and they were dropped. According to current plans, PADF has dropped all incentive payments for new sub-projects, and by next year, all existing incentive payments will have been phased out. There are a number of good arguments for eliminating incentive payments in this program. First, if there is sufficient interest without the payments, why pay them? Given the economic hypotheses argued for this project, no payment at all is one step closer to economic feasibility than to add an incentive payment to an already substantial subsidy. Second, there is no point in incurring additional project expenses if they serve no useful purpose. By eliminating the incentive payments in the contracts with the sub-grantees, PADF could supply approximately twice the number of trees for the same amount of money.

The purpose of this project was to plant trees, and not to grow seedlings, so that initially there was a concern on the part of some project staff that they not grow seedlings without a pre-established market. For the first growing season, all seedlings were purchased from Double Harvest for distribution to the PADF sub-grantees. There were some concerns, however, with this procedure: (1) There were logistical difficulties in distributing seedlings throughout Haiti within a specified time frame. In the best of circumstances, it's difficult to reach some of the outlying areas which have poor road conditions. In addition, rainfall patterns necessitated precise scheduling to optimize growth potential; (2) The seedlings weren't always of sufficient quality. High quality seedlings are considered essential to project success; and (3) A number of small NGO's were already engaged in reforestation activities, including nursery production. As a result, it was decided that PADF would actively support the concept of decentralized nurseries through these sub-grantees. This had the further advantage of decentralizing nursery management and extension services which makes the sub-grantees that much closer to self-sufficiency.

Currently, PADF supports nineteen nurseries scattered throughout the country. Consistent with its implementation model, none of these are actually PADF nurseries, but are sub-grantee nurseries which receive PADF technical and financial assistance. Some sub-projects grow only their own seedlings in their nursery facility. Other sub-project nursery facilities either don't have a planting program or produce more seedlings than they themselves can use. These excess seedlings are then purchased by PADF for distribution to other sub-grantees. It is estimated that in May, 1984, PADF will only purchase about one-quarter million seedlings from Double Harvest. By fall 1984, PADF is likely to be completely self-sufficient in seedlings.

As an unexpected benefit, PADF has discovered that the economic feasibility of hardwood nurseries was much greater than anticipated. Given the current level of material and technical inputs with a guaranteed market of 7.5 cents per seedling, a nursery facility barely holds its own the first year, breaks even the second year, and by the third year can show a profit. With a guaranteed market, decentralized nurseries can be completely self-supporting. One reason for this is that the estimated cost of producing a seedling by the subgrantees may only be about three to four cents per seedling -- substantially under the 7.5 cents now paid (Note: This figure is only an informed estimate, as no accurate calculation has been made.)

#### 3.2.2.4 Post-Planting Activities

Extensive record-keeping activities have been instituted to follow the progress of tree planting activities for the first twelve months following planting. A questionnaire has been drawn up, pretested, revised, and administered for every planting site. The primary responsibility for completing the questionnaire rests with the peasant animator. This is the same individual who is responsible for providing most of the technical advice and extension to the farmer. In most cases he makes an initial site visit, does a general site analysis, and recommends species and planting arrangements to the farmer. In addition, he has four separate questionnaires from which he fills out during his pre-planting visit, a one week post-planting visit, followed by six and twelve month survival counts.

There are a number of problems with this arrangement which the project staff is well aware of. First are the general issues of data reliability with the questionnaire. Recall that the animator is being paid to identify farmers and fill out forms with few incentives for accuracy. Second is his allocation of time in terms of the training he receives and the time he spends with the farmer. Since the project continues to stress the importance of these questionnaires, much of the training of these animators necessarily focuses on accurate completion of these questionnaires. Perhaps too little time is actually devoted to training these individuals in technical matters. And since the animator is being paid to fill out questionnaires, it is expected that his priorities would be placed with those questionnaires. Third, for the time not spent completing questionnaires, the animator may be more involved in animation (convincing people to plant trees) than extension (offering technical advice); once again that is where his immediate rewards lie. So far, the project has not suffered significantly from these problems, but the future is less certain.

#### 3.2.3 Likelihood of Achieving Objectives

PADF staff members have been quite successful developing an effective implementation model for planting trees the first two years of the project. After only two years, they have already planted one million more trees than was initially expected for the entire four year project. According to the PADF definition of sub-projects, staff members already have twice the number of sub-projects than was anticipated for the entire four years. Based on the more conservative USAID definition for sub-project, they already have more than one-half the total number anticipated for the four-year project, and will likely exceed the total of eighty for four years. In both cases, the number of established sub-projects are another short-term indicator of project success.

The evaluation team, however, suggests that the more conservative USAID definition of a PADF sub-project is a more accurate indicator of project success. First, for the project to have any sustained impact on the environmental situation, energy supply or rural incomes, each of the sub-components must be more than just a seasonal, annual, or biennial slice of time. Sequencing successive projects one after the other over time is convenient administratively for record-keeping purposes, but should eventually lead to a single, ongoing reforestation effort. The more conservative definition of a sub-project, therefore, is probably conceptually more consistent with medium to long term project viability. Since the project has been so successful in meeting the short-term objectives and therefore has established credibility with a variety of constituents, it can begin to shift its focus to a longer time frame and still maintain its current momentum.

PADF should continue to work with a variety of intermediate organizations as it has successfully done in the past. Assistance to church groups, mission and community organizations and other non-governmental organizations are appropriate modes of intervention according to the needs and capabilities of a particular population or region. On a carefully selected basis, however, priority should be given to increased collaboration with indigenous Haitian institutions, whoever they might be. These include community councils and groupement, in addition to other private organizations with active participation and decision making by the Haitian population.

In executing its ongoing experimental program, PADF and CARE should initially select one or two zones and technical teams, with only a few peasants who offer the best chance to succeed with the alternative models previously rejected for much of the project. To the degree that they are successful, similar activities should be undertaken elsewhere.

Training of project personnel has been adequate for implementing a successful tree planting operation. It is not clear, however, whether this same level of training will be adequate for long-term sustainability of these tree planting efforts. It is too early to tell if the quality of the extension effort will ultimately result in long survivability or permit large-scale replicability of these earlier efforts. Reliable survivability rates are only now being calculated for the first time. The first two years of the project focused on moving trees and initiating specie trials -- both of which require a lot of attention by the agroforestry outreach teams. Training at most levels was limited to that which was necessary for that focus, and was undertaken, for the most part, by the Agroforestry Outreach teams.

A functional Agroforestry Resource Center distinct from the Outreach teams received only minimal attention and is not being developed to its maximum potential according to current project priorities. Because of this, there have been fewer materials and personnel available for training workshops than would otherwise have been the case. In the short term, most of this deficit has been made up by Outreach Teams, but this in turn has limited the Outreach Team's time for technical support, research and other tree planting activities. Although much of the project's success is due to the decentralized implementation model, a centralized functioning Resource Center could provide an important training support network for the Regional Outreach

Teams. In Chapter 4, the evaluation team will outline a procedure whereby the Resource Center can more systematically provide these kinds of support services.

Training of local personnel should be seen as a key responsibility of the Regional Forestry Teams with the assistance of PADF's Resource Center and to a certain extent of the Technical Sub-unit. The objective of such training should be the transfer of technical and managerial knowledge and the delegation of responsibility and work load to local personnel.

Data gathering and data analysis for these reforestation efforts have proceeded on two broad fronts. Record keeping activities for project implementation purposes by the village animator have been one major focus. These questionnaires provide good data for general project monitoring, but provide insufficient information for a research orientation on specific technical matters, social impact analyses, or economic analyses. With this in mind, specie trials have been undertaken as one aspect of the agroforestry demonstration areas discussed in the Project Grant Agreement. These will ultimately provide sound technical information to improve the technical package and training materials, and to provide inputs for future agroforestry efforts in Haiti. The need for systematic social and economic analyses have been discussed and generally agreed upon, but to date little has been done. A much greater effort must be undertaken in these latter two areas.

It is recommended that data collected in the field from case studies and species trials become part of a larger data base (computerized) centered within the Technical Sub-unit where it can be statistically analyzed and adequately documented. Individual research efforts by PADF field staff should be encouraged and supported with additional staff if necessary, as long as the scope of activities remains within the overall framework of a Project-Level Research Program.

The data base presently at the disposal of the PADF field staff could be one of the Project's greater assets and its analysis and documentation within the framework of a coherent research program could yield critically important information for the successful design and implementation of the Agro-Forestry's Project Phase II.

### 3.3 CARE

#### 3.3.1 Description and Objectives

The CARE grant is designed to develop agroforestry models which preserve the productive capacity of agricultural land and provide local farmers with a reliable source of income. CARE, in collaboration with the GOH regional development authority, HACHO, is to work in Northwest Haiti on agricultural land either owned or farmed by small farmers. This is to be accomplished by the following specific project objectives:

1. Develop replicable and economically feasible agroforestry project models, including experiments with planting on:
  - individually owned property,
  - state leased land with profits distributed through sub-leasing or share-cropping arrangements,
  - rented or share-cropped land of a community council with profits shared by participants in a communal arrangement.
2. The adoption of tree-growing as an appropriate land use practice and income-generating activity by 3,500 farmers by 1985.

CARE is to sign an official agreement with HACHO designating it as the official counterpart agency. CARE is to assume responsibility for overall management and administrative responsibility, technical assistance and training, while HACHO is to provide personnel to carry out project activities. CARE and HACHO are to work primarily through community councils, but are to seek opportunities to work through other organizations and groups already established in the Northwest.

To implement the project, CARE will hire three international staff members consisting of one administrator and two foresters. The administrator is to coordinate activities in the field, while each of the foresters will be

responsible for organizing the extension of the project and supervising nursery operations. Each forester will work with a team of Haitian agronomists/extension specialists, nursery managers, and village animators.

The project grant agreement detailed a series of reporting activities and monitoring indicators to be assessed during project execution. Intermediate goal indicators include the number of trees planted, survivability rate, volume of wood produced, value of that wood, cumulative project costs, cost per surviving tree, and the number of other organizations involved in project activities. Indicators for the second intermediate goal--the adoption of tree planting activities--include the number of farmers planting trees on their own land, the number of farmers planting trees on a self-motivated basis, and the number of trees planted and maintained by self-motivated farmers. The Grant Agreement also recognizes the fact that the final goal of preserving productive capacity as a long-term intended impact will not be measurable for a long time. Only an evaluation eight to ten years after initial project implementation can measure this impact.

Resources allocated for these purposes include materials and equipment (25%), personnel operations (57%), and in descending order of magnitude, contingency, overhead, and training.

### 3.3.2 Progress to Date

The CARE Northwest Agroforestry Extension Project has established a project base in Gonaives supported by a full-time American Project Director with some part-time backstopping by additional CARE staff. The same CARE office in Gonaives also supports a CARE feeding program and other project activities. For the first nine months of the project, the CARE Agroforestry Project Director was employed part-time with the food distribution program and part-time with the Agroforestry Project. This created a number of problems, one of which was the confusion between CARE as a relief agency distributing food, and CARE as a rural development agency encouraging farmers to plant their own trees. Initially, this problem was exacerbated by the fact that the same CARE staff person was administering both projects. In addition, the work load of the Agroforestry Project Director can easily keep an individual busy full-time. When the CARE Project Director shifted full-time to the Agroforestry Project, it facilitated CARE's transition from a relief to a rural development agency. The worst of the transition now seems to be over.

Two Agroforestry extension teams are presently responsible for implementing the project in the northwest. The forestry team in Region I is based in Bombardopolis and consists of an American forester and a supporting Haitian staff--two agronomists, five animators, four nurserymen, and twenty-five monitors. This team is generally responsible for the western-most portion of the northwest peninsula. The forestry team for Region II is based in Jean Rabel and also consists of an American forester and a supporting Haitian staff -- one agronomist / coordinator, one agronomist, two animators, three nurserymen, and thirty monitors. Region II borders Region I on the west

and extends eastward toward PADF's Northeast regional team based in Cap Haitien.

The agronomists normally have a four-year diploma from the Department of Agriculture in Port-au-Prince. Specific agroforestry technical skills are taught by project staff. In Region II, special recognition was given to one exceptionally capable agronomist who received the title of "coordinator" plus additional remuneration. In this role, he has assumed many of the responsibilities of the American forester for certain parts of that region, which has permitted the American forester to concentrate her efforts elsewhere. The overall responsibilities assumed by this team, therefore, are greater than would have been possible without this level of Haitian expertise.

Each agroforestry team utilizes its personnel differently according to its own staff capabilities and pre-existing village expertise. In general, the agronomists supervise the nurserymen, help with the specie trials, and assist with the animation. They are primarily responsible for the dissemination of technical information. The agronomists visit some of the planting sites of each of the monitors, but there are too many sites for them to visit each one. Ideally, the agronomist attends all community council meetings in the villages and is accompanied by the American forester, when possible. The Region II forester is able to rely much more heavily on the animators for convening meetings. In contrast, animators from Region I supervise monitors in their record-keeping efforts or set up a meeting, but are much less involved in the animation or training session, itself.

The project staff is currently working toward an organizational model whereby the agronomist will work primarily at the level of the community council and up, and the animator will work at the intermediate level of groupement within a village. When the community council works with more than one groupement, there are too many meetings for the agronomist to keep track of. It is hoped that the animator can assume more of that responsibility. The monitor will continue to work primarily at the individual level with the cultivators. For the CARE project, each monitor is responsible for up to sixty cultivators per year (thirty per planting season).

The monitors serve as the personal contacts for all project beneficiaries. Once a group of interested cultivators in a particular village is identified, the monitor draws up the list and administers the preliminary questionnaire concerning the cultivators' interest, past reforestation experiences, etc. The monitor then visits the piece of land and is responsible to guide the cultivator on how to best plant trees. The monitor suggests specie and planting arrangements, and if appropriate, might suggest that the cultivator choose a different piece of land. In contrast to the PADF animator piece rate remuneration, the CARE monitor is salaried and receives between \$40 and \$60 a month for his efforts.

CARE's technical package has also been quite successful. Executing directly the extension, planting and monitoring aspects of the Agroforestry Project, the Regional Forestry Teams in the Northwest have experimented with different implementation arrangements (i.e., incentive payments) and

developed, as a result, very successful implementation packages (i.e., no incentive payments/fixed salary for extensionists). The Forestry Teams in the Northwest have also been successful in moving towards self-reliance in terms of tree seedling production. Thus, they have been able to adjust more quickly to changes in demand and climate as well as reach remote areas of the Northwest. By the end of the second planting season of 1984, the CARE component is expected to be self-sufficient in terms of tree seedlings.

The most outstanding achievement of CARE's Regional Forestry Teams has been the effective training of Haitian personnel to take over and assist in the day-to-day activities associated with the tree planting project. This success has demonstrated that, despite difficulties in finding adequate personnel, it is an effort well worthwhile and one that cannot be avoided.

### 3.3.3 Operational Models

Among the three operational models suggested in the Grant Agreement for experimentation, only one--planting on individually-owned property where the land owner is an active participant--has proven successful under this project. The monitors have received explicit instructions that a farmer has to be a private land-owner to participate in this project. There has been little systematic experimentation on state-leased land, primarily because since so much private land is available, there hasn't been a need to work on other types. Likewise, there have been few trees planted on land selected by the community council with profit sharing by participants on a communal arrangement. Church groups have requested trees for shade, but have been turned down because that didn't fit with the cash-cropping scheme. People have also wanted to plant trees beside the road, but the project again was declined. Although the trees along the road could help control erosion, the project staff feels there are too many unresolved problems with tree ownership, land rights, and cutting rights to get involved in that situation. Individual motivation, in contrast to group motivation, is apparently the easiest to administer and is the most efficient in relation to the cash-cropping hypothesis which underlies the project.

Since the project inception, there has also been a major shift in the Government of Haiti's regional development organization responsible for the Northwest. HACHO no longer exists and has been replaced (in part) by ODNO (Organization for the Development of the Northwest). The Project Paper recognized the decline in the effectiveness of HACHO with the withdrawal of USAID funding in 1979. This Agroforestry Outreach Project was to have been the first time that USAID had come back to HACHO since 1979 to assist in implementing its agroforestry activities. Since HACHO was the recognized regional development organization for the region, it was hoped that they could obtain state land for the project.

ODNO, supported mainly through Title I funds, is still trying to get

organized. It received only one-half of what HACHO had requested for its operating budget and none of what HACHO had requested for the Agroforestry Outreach Project. Nonetheless, ODNO has officially assumed responsibility for coordinating all of the rural development projects in the Northwest, of which there are now three—beekeeping, CARE, and Agroforestry. ODNO operates out of the Ministry of Plan. ODNO is interested in what is taking place with the Agroforestry Project and it seems pleased with the progress the project is making on its own without substantial ODNO intervention.

The Agroforestry project's current collaboration with ODNO is limited to a few mechanical soil conservation efforts. Here, the government was interested in having ODNO try some line hedges and contour canals to help halt soil erosion on denuded hillsides. There is a similar interest expressed by the forester in Region I to deal more directly with some of the soil conservation aspects of the project. This type of intervention is worthwhile on a small-scale on an experimental basis, but hasn't yet proved successful on a larger scale. The line hedges, for example, work fine technically but have not yet demonstrated their social or economic feasibility. Since the benefits from them contrast so vividly with the expected short-term cash return from the fast-growing hardwood trees, they are less likely to be adopted on a large scale any time soon.

#### 3.3.4 Quantifiable Objectives: Number of Farmers and Trees

The CARE project was somewhat slow getting started, but since has made up for lost time. As of September 1983, 3,128 farmers had planted 1,173,000 trees in the two regions in the Northwest. They have established six regional nurseries, which is a sufficient number to provide all of their own seedlings, although the number of seedlings per nursery is expected to continue to grow. Fifty-seven monitors provide farmer supervision in eight project zones within the two regions. At the current rate of planting 700,000 seedlings per season over the last two years of the project, the project should reach the goal by planting at least four million trees during the life of the project.

#### 3.3.5 Incentive Payments

Initially, incentive payments took one of three forms: (1) food for work, (2) cash payments for surviving trees, or (3) no incentive payment. The first was a form of instant gratification and was consistent with a number of earlier reforestation or soil conservation efforts in rural Haiti. With this method, farmers were paid in kind with food as a form of remuneration for the tasks successfully completed. It was also the method most consistent with CARE's role as a relief agency. CARE project personnel since dropped food for work as a form of incentive payment, as they quickly learned that most people participating in this program were more interested in the food than the trees. Some community councils working with the project were quite good and

were seriously interested in rural development. Other community councils were no more than a conduit for receiving assistance or relief supplies; they had little interest in the cash-cropping of fast growing hardwood trees.

Preliminary results also indicate that some trees planted under an incentive program have higher mortality rates than do trees planted with no additional incentives. Farmers who planted trees without incentive payments see the surviving trees as their only return, and maintain them accordingly.

The second form of incentive payments involved cash payments for surviving trees. Here, the farmer would receive five cents for each tree surviving six months plus another five cents for each tree surviving twelve months. Most of these incentive payments are also being phased out. Participants are now being told that their last payments will be next July. Project staff would rather use this same money to pay more monitors. Phasing out such incentive payments is also consistent with the underlying project philosophy. Ongoing incentive payments are at least two steps removed from demonstrating the economic viability of cash-cropping trees. No incentive payments are one step closer. Ultimately, farmers paying for seedlings would be the final step. In the near future, however, it is not likely that farmers will pay for seedlings, except perhaps for fruit trees and mahogany.

For both PADF and CARE, effective motivational methods have evolved which have stimulated an enormous demand for trees. This demand is a function of at least three independent factors:

- (1) The intensive animation campaign by the Government of Haiti over the last five to ten years to generate a grass-roots interest in tree planting activities;
- (2) The effective animation program of the project to stimulate interest in tree planting activities for whatever reason;
- (3) The recognition by the peasants that trees do have some economic value, although in many instances peasants may not understand why they are planting trees or for what purposes they will be used.

In the long-term, if the current conceptualization of the project continues to hold, the complete cycle for cash-cropping trees will be an economically viable opportunity for the farmer without direct cash subsidies. Ongoing extension services, however, are likely to be required.

Remaining incentive payments to motivate farmers to plant trees under the PADF and CARE grants should continue to be phased out. By fall 1984, no new agreements which include incentive payments should be undertaken. In the few areas where incentive payments remain, they should be completely phased out without the option for renewal. Current animation practices alone seem sufficient to create the necessary demand for seedlings. Eventually, if the project's underlying economic hypotheses are true, not only will farmers be willing to plant and care for trees without these payments, but eventually they will be interested in and able to purchase seedlings at a nominal cost.

### 3.3.6 Post-Planting Activities.

Most of the post-planting activities are restricted to tree survival counts carried out by the village monitor. These are a part of the general record-keeping system on all tree planters which begins with pre-planting interviews and concludes six month and twelve month follow-up site visits. The series of questionnaires used by CARE are a slightly modified version which had been drawn up by PADF. The PADF and CARE questionnaires are not identical, but are comparable and are generally compatible for analytic purposes. With such significant demands being placed on the monitors for these record keeping purposes, much of their field time in addition to their bi-monthly training sessions are oriented around these questionnaires.

Project staff, however, are concerned about the quality of the data being collected. Even setting aside momentarily the question of quality, the sheer quantity of this data makes it highly unlikely that much of it will ever be used. This summer, therefore, a new system is to be implemented which should substantially improve the reliability of at least some of the data. CARE foresters and agronomists are to do repeat survival counts on a three percent sample of the sites already surveyed and use the information collected from those samples.

There are also plans to implement case studies on a one percent sample of the plantation sites. These will follow the progress of related activities from planting through the harvest of the trees. The case studies will monitor soils, inter-cropping patterns, and general history of agricultural production for a particular plot. In addition, specie trials with designed replications have been undertaken to provide additional sound technical data on these agroforestry activities in the Northwest. Little research has been undertaken on the social or economic aspects of these agroforestry activities. Specific recommendations to correct these deficiencies will follow.

### 3.3.7 Training

On-the-job training has proceeded adequately for the current stage of project implementation but much work remains to be done. As stated by a responsible project staff member, "One can never do too much training. There is always a lot which remains to be done." In addition to appropriate training there is a problem in identifying competent middle-level staff to receive that training. CARE, for example, has money to hire competent agronomists, but the right kind of person isn't available -- the person with the right mix of training, experience, and personality. It is difficult to find a competent person willing to work in the Northwest on holidays (as necessary).

One key ingredient to the successful implementation model now being

implemented by both the CARE and PADF staff is the high degree of dedication, enthusiasm, and efficiency found at all levels of the implementation team. Without this intense personal commitment the Agroforestry project would not be what it is today. Accordingly, a similar level of personal commitment is required from new staff additions to maintain the implementation plan.

Technical extension work has not been an overall project strength. A number of foresters working for both CARE and PADF felt uneasy with the technical package (e.g. matching species to site) during the initial stages of project implementation. One forester raised a similar concern with the widespread utilization of *Leucaena*. Had the forester and the farmers known then what is known now, that particular technical package wouldn't have been pushed as it was. These examples seem to demonstrate that there is much to be learned before effective technical extension can be undertaken. Despite this lack of knowledge, the overall package seems to have worked out. In addition (as previously mentioned), the demands placed on the monitors as enumerators make it difficult for them to transfer to the farmer what technical knowledge is known.

Two general conclusions emerge from the discussions held during site visits: (1) The villagers don't seem to require an intensive animation program; they are already motivated to plant trees, and (2) Of the contacts that are made with the villagers, many are not for technical assistance or extension, but focus on animation activities. While these seem to be accurate conclusions to date, they may not hold in the future.

#### 3.4 Likelihood of Achieving Objectives

CARE has developed an effective implementation model for planting trees. The project is likely to maintain its current pace planting trees and will likely reach its goal of four million trees over the first four years. It is also likely that many more than 3,500 farmers will ultimately be reached as CARE has already reached 3,128 farmers and continues to encourage monitors to initiate tree planting activities with new beneficiaries and not just those who have planted trees in the past. In addition, CARE has a clear indication of which operational model is most effective for moving trees--owner participation on private holdings. It is too early to tell if that same model will necessarily be the most effective in resolving the larger issues of environmental degradation in rural Haiti.

In order to maintain the successful implementation model already established, the project should continue to place its primary focus on those organizational models which most efficiently move trees:

- CARE should continue to operate primarily on private, individually-owned property where the landowner actively participates in the planting and caring for trees. CARE should not, however, completely dismiss the other organizational arrangements discussed in the Grant Agreement--planting on state leased land or corporate community holdings. For example, ongoing negotiations with ODNO (which replaced HACHO in the Northwest) should continue in an attempt to find a workable model to plant trees on government land. Ultimately, the successful implementation of tree planting activities in these more difficult areas responds more completely to the larger questions of environmental degradation and deforestation in Haiti.
- In executing its ongoing experimental program, PADF and CARE should initially select one or two zones and technical teams, with only a few peasants who offer the best chance to succeed with these alternative models that previously had been rejected for much of the project. To the degree that they are successful, similar activities should be undertaken elsewhere.

Available data is being systematically gathered on a number of indicators which will eventually permit an evaluation of the intermediate project goals. However, only a few preliminary results are available at this time. More specific technical, social, and economic research orientations, which will permit the project to learn lessons from the current experience, will be outlined below.

It is recommended that CARE continue its training efforts (possibly analyzing and documenting the reasons for its success) and share such experience with PADF Forestry Teams and PADF sub-grantees who carry the major responsibility in the training of local personnel.

## Chapter 4

### GENERAL ANALYSIS

#### 4.1 Research

##### 4.1.1 Introduction

Part of the goal of any pilot project such as the Agroforestry Outreach Project is to provide a learning experience. Specific lessons have to be learned, specific problems resolved and specific questions answered. While this project has succeeded at "moving trees" in rural Haiti, a number of additional questions need to be resolved during the next two years of the project. These include questions about specific technical, social, and economic aspects of the project which have not previously been properly addressed. Each aspect will require appropriate answers to enable Phase I of the Agroforestry Outreach Project to serve as a model for subsequent phases. The strength of any program lies in its ability to define goals, set priorities and thus focus research efforts towards the development of a coherent body of knowledge. That is precisely what this project now requires.

To obtain these results a number of coordinated activities need to be undertaken. Preliminary indications are that most (if not all) of this research should be primary and not secondary research. Much of the past research on Agroforestry in Haiti is generally too vague to respond to the specific questions which need addressing concerning specific project zones. Research designs should be drawn up with that in mind. Should relevant secondary data be available, this should save both time and money. Quality data, however, should not be sacrificed to economize on the latter two.

##### 4.1.2 Technical Aspects

On the technical side, specific questions need to be addressed. These include: Which tree species are most appropriate for any particular site? What growth rate and thus, what wood volume can be expected in any particular site (using the most appropriate species)? What impact, if any, will the massive introduction of exotic tree species have on the natural environment of Haiti? Which technological package is most appropriate to produce tree seedlings in Haiti? Which mix of tree species and which silvicultural treatment maximize wood volume on any particular site? These questions and others need to be addressed by a specifically designed research program.

The Evaluation Team recommends that the Agroforestry Outreach Project design and implement a Technical Research Program that has the following technical goals:

1. Design, test, and develop seedling production technology suited to the ecological diversity of Haiti.

2. Design, test, and develop tree growing technology suited to the ecological diversity of Haiti.

3. Design, test, and develop tree distribution technology suited to the socio-cultural diversity of Haiti.

The discussion that follows will specifically consider only the first two goals. The latter will be addressed in the section on social and economic research.

In order to achieve the first goal, the research program needs to achieve the following objectives:

(A) Design and test alternative seedling container systems.

(B) Produce and test different soil mixes.

(C) Develop and test container/soil mix packages for each tree species used in the Project.

(D) Design and test alternative nursery lay-out and construction techniques.

The first objective above can be achieved by accomplishing the following tasks:

(a) Determine the best materials to be used for the container system. Qualifying parameters: durability, handling, transportability, cost, maintenance.

(b) Determine the appropriate site and shape of root container system for each tree species planted. Qualifying parameters: root/leaf ratio, root development, soil adherence to root system, root damage at transplant.

(c) Determine the most appropriate potting mix for each tree species planted. Qualifying parameters: root/leaf ratio, root development, cost, handling.

(d) Determine the most appropriate lay-out and construction technique as a function of production capacity of the nursery and its location. Qualifying parameters: construction material cost, local availability, expansion capacity, manageability of seedling production operation.

In order to accomplish the second goal the objective below needs to be achieved: Design and test alternative tree species / silviculture packages as a function of:

- Ecological conditions of planting site;
- Tree harvest desired;
- Length of tree crop production cycle; and
- Length of food crop production cycle.

In turn the above objective is achieved by accomplishing the following tasks:

(a) Determine the best suited tree species for each major ecological zone. Qualifying parameters: survivability, growth rate, resilience, adaptability.

(b) Determine the most appropriate spacing patterns and thinning/pruning procedures for each tree species planted and for each tree harvest desired. Qualifying parameters: growth rate, soil/nutrient requirements, wood quality, branching pattern, etc.

(c) Determine the most appropriate tree species combination for each major intercropping pattern and food crop desired. Qualifying parameters: growth rate, crown size and shape, interspecies competition and compatibility, etc.

#### 4.1.3 Socioeconomic Aspects

The project has until recently profited more from past research than from project-specific research results. The implementation model that has proven successful is in fact the result of previous extensive and sound social research as well as a socially sensitive implementation team.

As the project progresses, it is important to test the basic hypotheses upon which the project is based. It is also important to have a much clearer

indication of the beneficiary's needs and motivations as well as the project's outcomes and impacts. The need for this type of research has been discussed at length and generally agreed upon but very little has been accomplished. Existing questionnaires are important for project monitoring, but are not being used and should not be used for sound socioeconomic research. For the sake of clarification, therefore, the research activities discussed here are distinct from the existing record-keeping activities now administered by PADF and CARE.

In contrast to the technical research component which is integrated into the project implementation model, the socioeconomic research component should be kept distinct from project monitoring. These two purposes should be clearly delineated and appropriate questionnaire forms, sampling frames, and staff be drawn upon for each.

There were also earlier attempts at systematic socioeconomic research, but they failed for a number of reasons: (a) the project staff was new and had not yet established any credibility; (b) the sample size was too large; and (c) the staff responsible for administering the survey was trained for technical matters and were not trained to execute social surveys. The timing is now right to implement a socioeconomic research component. Credibility has now been established at the project sites, the sample size has been substantially reduced, and the need for independent research has been identified.

Conceptually, it is recommended that "socioeconomic" research be broken down into its component parts: "social" research and "economic" research. Each component is necessary, has a distinct perspective, and offers valuable information to the project design and implementation efforts. When the research is combined into one, the results are usually inadequate to respond to the needs of each component, individually.

#### 4.1.3.1 Social Research

For the social research component, specific questions need to be addressed. Who receives trees and who doesn't? What is the socioeconomic status of recipients and non-recipients? Of those who aren't project beneficiaries in a project zone, what is their level of interest or disinterest in the project? What is the cost and availability of construction material (building poles) and fuelwood supplies for recipients? for others in the same village? What types of wood do they use (prefer to use) for each and what types would they sell? What is their current land tenure status and for what purpose is their land now being used? Are there tree tenure regulations? Can one enforce property rights in land and property rights in trees? What sanctions are enforced for misbehavior? Why do they plant seedlings on some land and not on other? What are the herding practices of tree planters? their neighbors? What is the feasibility of protecting trees from foraging livestock or unauthorized cutting? What is the collective action capability at the local level given the existing authority patterns or

lack of them?

Other items were found on an earlier PADF questionnaire but were subsequently eliminated. Some of the suggestions made by Uli Locher (July 1982) might also be useful. Appendix A contains copies of two questionnaires which, after substantial revision, might also form the basis for such a survey.

The social research component should be administered through two separate methodologies. First is a two stage stratified random-sample survey. A sample of project sites should be selected within which a few individuals would be surveyed to provide general baseline data on the major variables. Some village-level data would be collected simultaneously.

Second, in-depth case studies should be undertaken in a few carefully selected households based primarily on participant observation research methodology. This would provide detailed information on a few planters and non-planters at a substantially higher degree of reliability than the earlier survey. While these data have the inherent disadvantage of weak generalizability, they would provide some cross-checks with the earlier survey work and could go into more detail in a few isolated cases.

#### 4.1.3.2 Economic Research

The economic research component would focus on an economic model for agroforestry for the village farmer in Haiti. With this component, one must develop and implement a systematic research design and methodology to test the fundamental economic hypothesis upon which this project is based -- the cash cropping of trees. Hard empirical data are required to determine to what degree tree planting can be maintained on a self-sustaining basis.

One aspect would focus on the wood market in Haiti, including fuelwood, and wood for charcoal and construction purposes. It would include a sampling of ecological zones, the distance from roads, and the market status of various wood products, including their current uses, sources, costs, and destination. A second aspect would include a cost/benefit analysis for the village farmer. Does it really pay farmers to grow trees in the short to medium run? What is the economic return of the land for tree production in comparison to alternative cropping arrangements? What subsidies are included in these calculations? Other questions include: To what degree is there an existing market orientation for wood products? What is the existing market value for wood as a commodity in its current form? Do farmers now sell trees? If so, whose trees are they selling, for what purposes are they sold, and for what price? Have these farmers expressed an ongoing interest in planting seedlings? Have they ever offered to purchase seedlings? What market conditions are necessary to make it economically feasible for farmers to purchase seedlings even at a subsidized price? See Uli Locher (1982: 17-18) for other questions which may need addressing.

#### 4.1.3.3 Record-Keeping Activities

For project implementation purposes (i.e. for planting trees), the evaluation team recommends that existing record-keeping activities be continued but on a scaled down version: (1) the questionnaire should be simplified (as has been done by CARE), and (2) the sample size should be substantially smaller. A simplified questionnaire form should be drawn up as has already been recommended by PADF and CARE project personnel. The forms used by CARE and PADF should be identical, if at all possible, to permit comparability in data analysis. This data would continue to be gathered by the peasant moniteur (CARE) and animateur (PADF) on samples under their jurisdiction. The primary purpose of this questionnaire would be to continue with an adequate level of project monitoring, to help structure the monitor's (animateurs) activities, and to encourage ongoing communication and dialogue between the project staff and those planting trees. In addition, this questionnaire would provide useful information to lower level and middle level extension agents and regional project staff.

Sampling should take place accordingly and should be determined by the Outreach Teams in consultation with the Project Director and the Project Coordinator. Sample sizes should vary independently over time and space so that monitors and animators may not know exactly when and where their work will be controlled. The samples selected should respond to project monitoring requirements and the level of supervision required for each of the monitors and animators. It is expected that these procedures will permit project staff at all levels to spend more time with extension, training, and other project activities. These questionnaires would continue to be under the jurisdiction of the forester responsible for each of the regional forestry outreach teams.

It is the general observation of the evaluation team that the previous degree of project monitoring is not required for the life of the project, if the project will ultimately be self-sustaining and successful. Systematically developed sampling methodologies can also provide equally reliable data. If this is not found to be the case (i.e. if significantly less stringent monitoring produces undesirable results), the project should maintain its flexibility and revert back to the earlier intensive monitoring procedure for the time being. The shift away from intensive monitoring should only be undertaken to the degree it can be properly absorbed by the project staff and beneficiaries.

For the data already collected on the existing questionnaire forms, both PADF and CARE (through the Project Coordinator's Office) should maintain their basic file construction and analysis strategy with certain modifications: (1) Sample size and sampling procedures for the questionnaires already completed should be clearly defined according to the desired generalizability of the results. Data reliability cannot be the only criteria upon which the sampling of completed questionnaires is based. (2) Further experimentation should be made with the Osborne and DBASEII to determine whether or not they provide appropriate file construction and analytic potential for project

implementation purposes. Mike Bannister's experience in the southwest may ultimately determine the utility of this hardware and software in particular, or microcomputer technology in general, for administrative as well as research purposes.

In summary, the other research components do not negate the utility of these data and they should not be ignored. Only a sample of the data already collected, however, needs to be analyzed. If record-keeping requirements demand otherwise, more of the data might be aggregated. In the future, care should be taken to only collect that amount of data which can be profitably used.

## 4.2 Project Organization

### 4.2.1 Organizational Structure

In order to effectively and efficiently execute such a research program, an organizational structure must exist which focuses more directly on these research efforts. Although some of the technical research has been undertaken by project personnel, it is insufficient for project and program requirements and very little of the data have been analyzed and written up. Systematic social and economic research has not yet been undertaken and must begin as soon as possible. It is important that baseline data be collected for all three research components before tree harvesting takes place. A minimum of two to three years will probably be required to successfully complete these efforts and it is important that preliminary results be available before the design of Phase II.

For the purpose of implementing this research, the evaluation team recommends that the existing Project Coordinator's Office be redefined as a Planning Unit. This change should take place as soon as possible so that the necessary research activities can begin. Existing staff would be maintained, although some job descriptions would change. The coordinator's primary responsibility would shift from administration to research coordination and planning. The current Project Coordinator has been quite effective in his position. For a variety of reasons, he has assumed many of the administrative responsibilities often handled by the Project Director. Because of these responsibilities, however, the Coordinator has been unable to undertake the research activities which are now so important to the ongoing project evolution. The time is now right to shift the administrative responsibilities to the Project Manager. The role of the technical advisor would be similar in substance to what it is now, but expanded in scope.

Overall, the Planning Unit would be primarily responsible for research and planning, including establishing the appropriate research designs, collecting data, doing the analysis, and coordinating the design effort for Phase II. As a secondary focus, the Planning Unit would continue to provide technical assistance and training coordination to the three sub-grantees. Within the Planning Unit, the existing hierarchy would remain. A social scientist would be the coordinator of the Planning Unit, and would be primarily responsible for the social and economic research components. A forester would be responsible to the social scientist and would coordinate the tasks of the Technical Sub-unit.

Each Sub-unit has a clear mandate to execute and coordinate research activities in its respective field. Social and Economic research will be conducted by two different modes:

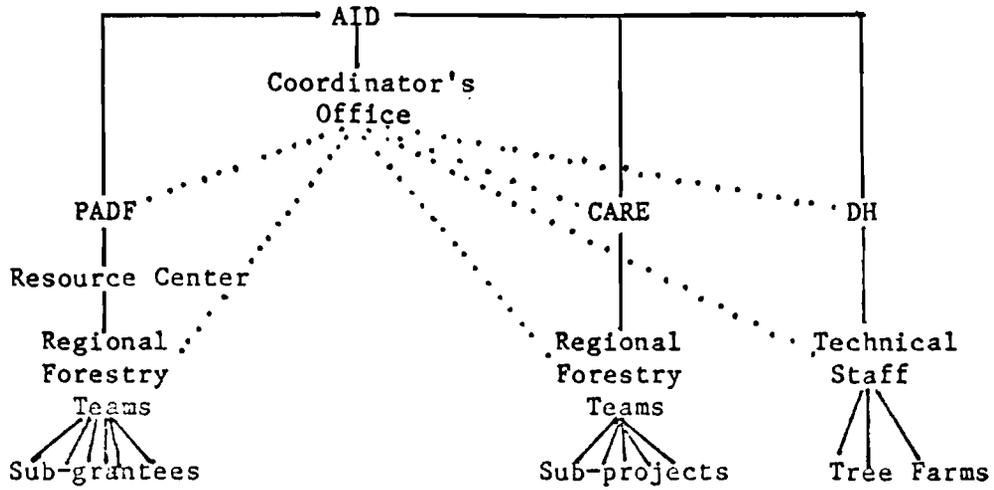
- Research conducted within the Planning Unit by the staff of the respective Sub-units, including graduate student interns; and
- Research conducted by outside consultants.

The Technical Sub-unit will implement its research program using three different modes:

- Research conducted by the Regional Forestry Teams;
- Research conducted by the Planning Unit with graduate student interns under direct supervision of the Technical Advisor;
- Research conducted by outside consultants.

Figure 2 shows the present organizational structure, while Figure 3 shows how it might be changed to strengthen the research capability of the project:

FIGURE 2: PRESENT ORGANIZATIONAL STRUCTURE

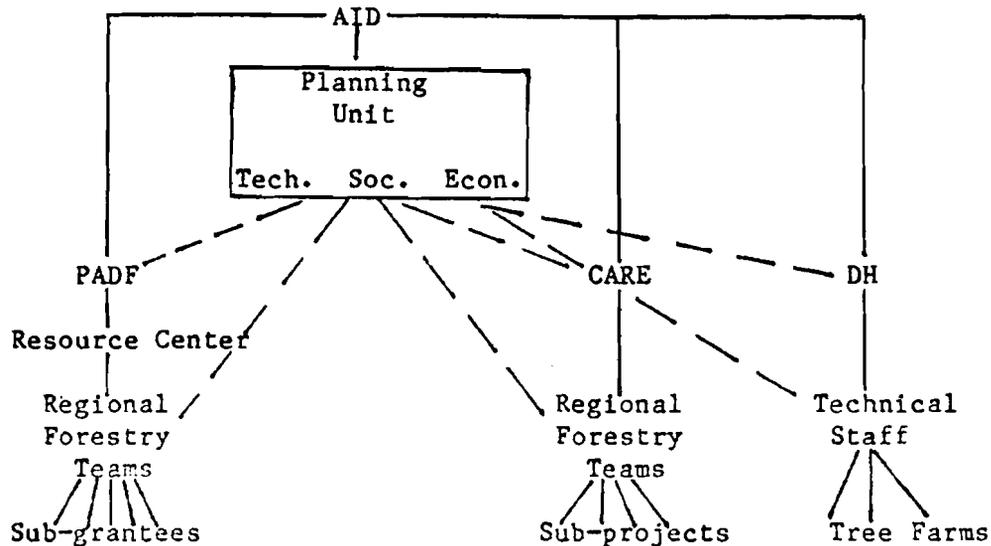


Note: ——— supervisory role

. . . advisory role in project implementation and  
in research

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FIGURE 3: PROPOSED ORGANIZATIONAL STRUCTURE



Note: ——— supervisory role

- - - advisory role in project implementation, supervisory  
role in research

The Technical Sub-unit must assure execution of the Research Program by:

- (a) coordinating technical research activities;
  - (b) supervising research activities by interns and outside consultants;
- and
- (c) collecting data, analyzing it and documenting it.

#### 4.2.1.1 Technical Sub-Unit

The Technical Sub-unit must be able to answer all relevant questions regarding the Project's technical achievements and must be able to support, with research results, the corresponding claims. Functioning as a clearing

house for technical information relative to the Agro-Forestry Outreach Project, the Technical Sub-Unit should be able to specify, by the end of the project, the following:

- Most appropriate tree species for planting in Haiti;
- Most appropriate sites;
- Best growth rates by species and site; and
- Best survival rates by species and site.

The Technical Advisor in charge of the Technical Sub-Unit must assure that the Research Program is executed and that results are adequately documented; emphasis should be placed on data analysis and documentation of research results. For this purpose, the Technical Sub-units's staff must consist of:

- (1) Technical Advisor, acting as head of the Sub-Unit;
- (2) Technical Assistant, in charge of documentation; and
- (3) Technical Assistant, in charge of data analysis.

The role of the Technical Advisor also includes that of providing technical assistance to the Regional Forestry Teams, coordinating their research activities and supervising the research conducted by student interns.

#### 4.2.1.2 Social and Economic Sub-units

The social and economic sub-units are charged with coordinating these research components for the Agroforestry Outreach Projects. The staff responsible for these aspects includes:

(1) The Planning Unit Coordinator who will serve as the head of the Planning Unit. This individual will also be responsible for the Social Sub-unit and Economic Sub-unit and will serve in a coordinating capacity for the Technical Sub-unit. The scope of work for the Planning Unit Coordinator will parallel that of the Project Coordinator for this project, but have less emphasis on the training and administrative aspects. [Actually, in the original scope of work (see the Project Paper, Annex D), there was more emphasis on research than administration, but the position evolved otherwise.] The individual should have a Ph.D. in a related social science discipline, and previous experience in related research and planning activities for rural development projects in the Third World. The basic tasks would include:

- Research: Documentation and Distribution of Project Information as described earlier in this evaluation and found in Annex D, Section B of the Project Paper;
- Project Coordination and Leadership, but to a lesser degree than with the Project Coordinator. The scope of work in Annex D, Section A should retain item numbers (1) and (2). Item number (3) would be transferred to the PADF Resource Center (discussion to follow) and item (4) would be transferred to the Project Manager; and
- AID Liaison Role, but with less emphasis than specified in Annex D, Section C.

(2) A Social Research Associate who would be responsible for the Social Sub-unit with assistance from the Planning Unit Coordinator. This individual should be an upper-level graduate student (A.B.D.) with appropriate substantive and methodological training and experience to deal with the topics previously cited. This individual should be trained in the discipline of social anthropology, (rural) sociology, or political science. Supporting staff would be hired locally as needed.

(3) An Economic Research Associate who would be responsible for the Economic Sub-unit with assistance from the Planning Unit Coordinator. This individual should also be an upper-level graduate student (A.B.D.) with appropriate training and experience to deal with the issues previously cited. This individual needs to be an economist, since most of economic issues so important to this project have received such little attention by a trained economist. Assistants for this sub-unit would also be hired as needed.

The short term social science consultants have generally performed well, but few scopes of work answered important research questions. The preliminary work now underway by a short-term economic consultant is beginning to deal directly with such issues. Follow-up activities should be actively pursued.

#### 4.2.1.3 Implementation Scenarios

The research required of the Planning Unit cannot be adequately performed by the existing staffing levels. The expanded scope of the research component and the quality of research desired require significant changes in both the staffing levels and the time-frame required for this research. Three alternatives might be considered:

- Alternative A: Extend Phase I of the Project by twelve months in order to provide sufficient time for data collection, analysis and documentation by existing staff. This would permit some of the necessary research to be undertaken, but with a substantially reduced scope;

- Alternative B: Increase funding to support additional staff of the Planning Unit within the existing time frame to enable data collection, analysis and documentation to take place. This would allow a wider variety of research to take place, but in a more superficial manner;
- Alternative C: Combine Alternatives A and B. Extend Phase I of Project by twelve months and increase funding to support the additional staff required for the Planning Unit. This would ultimately permit sound implementation of the research component to accompany the sound implementation model already established by the project.

The evaluation team recommends that the project implement Alternative C. The possibility of not implementing any of the three alternatives, (not extending the length of the Project nor increasing funds for research staff) would severely compromise the research potential of the Project, and the lack of research results could negatively reflect upon the Project's overall achievements. While Alternatives A or B alone are an improvement over the existing situation, they are not likely to produce satisfactory results. The design and implementation of Phase II of the Project depends to a great extent upon the successful implementation of the proposed organizational structure and the execution of an adequate research program.

#### 4.2.1.4 Resource Center

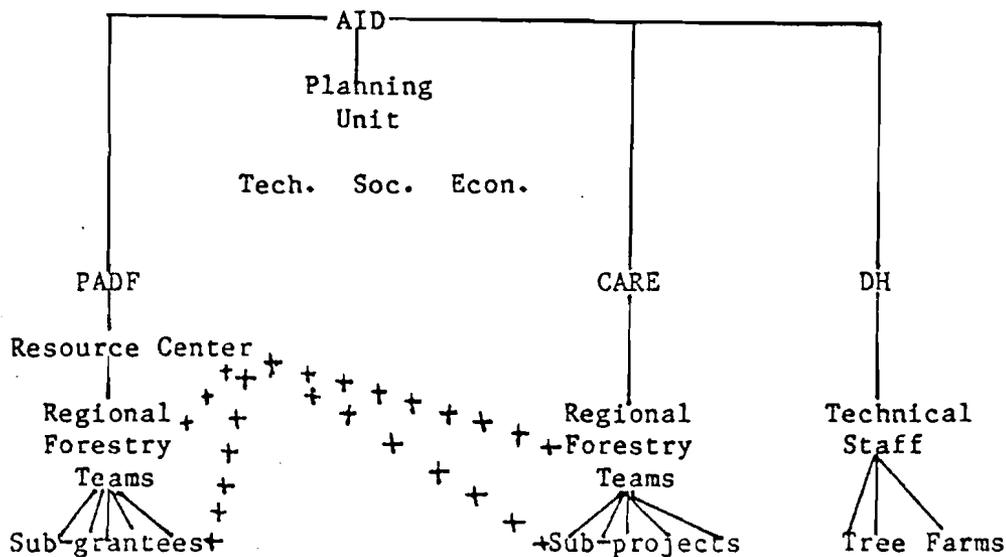
Effective training of project personnel has been a key element of the project's initial success. However, as attention and energy is re-allocated away from the development of the implementation model, training of Haitian personnel needs to become an important project priority. Long-term impact of the project depends upon increasing the involvement of Haitian personnel, but the full potential for Haitian involvement has not yet been realized.

To help respond to these training needs, the Agroforestry Resource Center (under PADF) should hire a full-time specialist in agroforestry animation to be assisted by a capable Haitian staff. This individual would be responsible for organizing and leading training sessions, both in Port-au-Prince and regional centers, in collaboration with the regional forestry teams. He/she would continue to develop materials related to agroforestry in Haiti with the assistance of other project staff for distribution to Regional Outreach Teams and tree farmers. Although officially under the auspices of PADF, it is hoped that CARE might also make use of the personnel and material assistance available. Eventually, perhaps in Phase II of the project, this Resource Center would no longer be responsible only to PADF, but also to other agencies with similar agroforestry training requirements.

The Resource Center could also include a retail outlet to sell agroforestry supplies and equipment not otherwise available in Haiti. This is similar to what PADF is now doing with a few of their sub-grantees.

The linkages that could develop by strengthening the Resource Center are shown in Figure 4:

FIGURE 4: PROPOSED ORGANIZATIONAL STRUCTURE WITH PROPOSED TRAINING LINKAGES



Note: ----- supervisory role

--- advisory role in project implementation, supervisory role in research (See FIGURE 3)

+++ training linkages

In summary, all recommended staffing increases are listed below in descending order of priority:

1. Appoint the research staff to the Planning Unit as described above;
2. Appoint a full time animator/coordinator with supporting staff for the Agroforestry Resource Center based in Port-au-Prince;
3. Augment existing regional forestry teams to deal more directly with

problem areas; and

4. Add additional regional forestry teams to cover the geographic areas not now served by this project.

It is recommended that the latter not be instituted before the second phase of the project. While most of these recommended changes will not substantially increase the quantitative success indicators now visible in the project, they will provide a sound integrated package for long-term project development.

#### 4.3 Institutional Analysis

The institutional aspects of the Agroforestry Project have been ongoing topics of discussion in the USAID mission, among the NGO staff and with those less directly involved in project implementation. One over-riding concern is how long USAID (through the NGO's) must continue to subsidize the Agroforestry program before indigenous responsible institutions begin to emerge which can assume the responsibilities now handled by USAID. Embedded in this question are two different issues which should be separated analytically: (1) financial assistance and (2) technical assistance.

Within the context of this project, it is also useful to distinguish between the public/private dichotomy and the indigenous/foreign dichotomy. In many USAID projects elsewhere, the choice of working with either the public or the private sector may not exist; it is assumed that there will be active participation by the host government. When the host government participates, that necessarily involves the indigenous, as well as the public sector. With the Agroforestry Outreach Project, however, an explicit decision was made to work primarily through the private sector for reasons articulated in the Project Paper and elsewhere. This private sector involvement does not necessarily require active participation by the indigenous population at the middle levels of the project implementation staff, even though that level of indigenous participation may be preferred. This discussion, therefore, will focus on the indigenous/foreign dichotomy. It is assumed that indigenous participation and control is ultimately required for self-sustaining rural development, whether that be found in the public or private sector.

From the beginning, the project was designed to be implemented with as few bureaucratic impediments as possible. The project not only works independently from the Haitian bureaucracy, but, with the existence of the Coordinator's Office, the project is one step farther removed from the USAID bureaucracy. These relationships (or lack of them) have been important factors in efficient project implementation. The three project components,

instead, rely heavily on externally based NGO's. Setting aside momentarily the legal status of PADF, CARE, and Double Harvest in Haiti, each of these has substantial expatriate involvement throughout its organization and receives substantial external financial assistance. The latter, however, does vary by agency according to the proportion of external financial assistance, and the particular origin of that assistance. There are arguments which support a diversification of donor assistance to increase the flexibility and security of the recipient agency, but those arguments avoid the bottom line--the economic independence, and therefore the political autonomy, of Haitians planting trees. As long as external donor agencies continue to finance the project, they will continue to make most important decisions related to that project. Therefore, at the top level--the level of the NGO's--the Agroforestry Outreach Project is not building indigenous Haitian institutions, and is not likely to do so in the near future.

At the middle level, the PADF component, in particular, is strengthening some indigenous Haitian institutions, although it can be difficult at times to distinguish between indigenous and external NGO's working in rural Haiti. Hopefully, the completion of the USAID study on NGO's will help clarify this issue. Here, time and space do not permit a systematic discussion of the concept "indigenous," but a working definition for Haiti would include those institutions which (1) have a substantial involvement of Haitian personnel in decision-making positions and (2) have some degree of Haitian financial support. According to this definition, there can be indigenous staff working for foreign institutions, in which case there is a personalized transfer of knowledge without institution building. It is much more difficult to have a significant number of foreign staff working for indigenous institutions, because the mere presence of that staff precludes true economic independence and political autonomy.

There are two key factors, therefore, which identify the progress made toward institution building. The first is the amount of indigenous transfer of knowledge--to what degree are Haitians learning how to implement an agroforestry project. The second is the amount of indigenous institution building--to what degree are the key implementing organizations (at all levels) Haitian versus foreign. Any given example can be ranked either high or low on each of these factors. According to the typology developed, therefore, there are four different cells representing institution building and knowledge transfer within this project (see Figure 5):

Figure 5: Institutionalization

		INDIGENOUS INSTITUTION BUILDING	
		high	low
INDIGENOUS KNOWLEDGE TRANSFER	high		
	low		

The Agroforestry Outreach Project has developed a number of distinct organizational procedures which vary on each of these factors and serve as instructive examples. Their differences seem to depend on both the local organizational structures in place prior to project implementation and the particular operating style of each Agroforestry Outreach Team. Three examples follow:

[1] the optimal development of local indigenous institutional capability with indigenous transfer of knowledge. CODEPLA at Fonds des Blancs in the southwest is an example of a Haitian institution with a pre-existing organizational network in place. It employs capable Haitian personnel at all levels. In at least one case, PADF hired a former CODEPLA employee to oversee a number of projects in that zone. In that instance, there is indigenous transfer of knowledge without indigenous institution building.

[2] the development of local foreign institutional capability with little knowledge transfer to the Haitian population above the village farmer. For example: the evaluation team visited small-scale sites in the northeast where American or other foreign personnel filled all the middle-level staffing positions between PADF and the village farmer. In these instances, funding sources were often external, although some groups were moving toward increased Haitian financial autonomy.

[3] the high degree of local Haitian involvement (i.e. knowledge transfer to the Haitian population) in middle-level staffing positions, but long-range impact more personalized than institutionalized within the Haitian environment. Many of the CARE projects in the Northwest are good examples of this case. There is active, capable Haitian involvement at most levels of the

project implementation team to a greater degree than in most project zones elsewhere in Haiti. But these Haitians are employees of CARE and not an indigenous agency. This is due largely to the design of the CARE component, with CARE being the implementing agency. Ultimately, an alternative institutional mechanism will need to be considered.

Figure 6: Institutions and Agroforestry Outreach

		INDIGENOUS INSTITUTION BUILDING	
		high	low
INDIGENOUS KNOWLEDGE TRANSFER	high	Example [1]	Example [3]
	low		Example [2]

As can be noted from Table 6, there are no good examples of "high" indigenous institution building, and "low" indigenous knowledge transfer. Active participation by the Haitian population, therefore, seems to be a necessary but not sufficient condition for Haitian institution building. After an implementation model has moved into the top row in Table 5 or 6, (high indigenous knowledge transfer), it can then work from right to left (toward indigenous institution building). Only after a project implementation model is securely in the upper left-hand cell can responsible indigenous institutions begin to emerge and assume many of the responsibilities now handled by USAID. Even then, external financial contributions are likely to be required for the foreseeable future.

To date, therefore, with the wide diversity present in any subproject, one cannot clearly classify any sub-component in one cell or another. The tables, however, do indicate the two directions in which the components must proceed. This model suggests Haitian "personalization" as a pre-requisite to Haitian institutionalization. If it is found Haitian "institutionalization" can precede Haitian "personalization," the implementation models can proceed accordingly. The goal is the same. As many project components as possible should ultimately be characterized by the upper left-hand cell in Table 2.

Non-governmental organizations have emerged as effective implementing vehicles and their use in this project has strengthened the role of the

private sector in rural development in Haiti. PADF and CARE are evolving into legitimate rural development institutions in Haiti in contrast to their previous work with small business loans and relief efforts, respectively. The local capacity for small and medium sized NGO's to engage in tree planting activities has also increased substantially. Some of the sub-grantees would now be capable of maintaining their own programs if the project's technical and financial assistance was withdrawn.

A variety of intermediate agencies have proven effective including church groups, mission organizations, and various village organizations. The key to effective implementation, therefore, seems to be less a function of the type of intermediate agency than a function of the type of beneficiary and his/her land tenure status. The successful model plants trees on private, individually-owned property where the landowner takes personal responsibility for planting and caring for the trees. When Haitian personnel and/or Haitian institutions can assume substantial responsibilities in these areas, the project will have taken a significant step forward.

In the future, the project may require closer ties to the Government of Haiti. Increased communication, therefore, should be followed by increased collaboration. The Government of Haiti has already taken some actions which may decrease the independence and flexibility of NGO's working in Haiti. There was a decree by the Government of Haiti on December 13, 1982 which requested that all NGO's present a dossier to the Ministry of Plan with their purposes, by-laws, and objectives. Within one year, all NGO's were to have received approval or been asked to leave. As of late 1983 few people were aware of agencies already having received approval. On one hand, this may be an example of the GOH making a pronouncement which is not enforced. At the same time, it is an indication that the GOH is interested in the activities of the NGO's in Haiti and that changes may occur. It is in the best interest of this project's agencies to begin considering possible implications of such actions:

#### 4.4 Technical Aspects

##### 4.4.1 Agroforestry

The Research Program proposed for implementation during the remaining two years of the Project must specifically explore alternative agro-forestry packages such as:

- Mulching of Leucaena

-Leucaena hedges on contour — with tree/vegetable inter-cropping; tree/grasses for forage production; and tree/fruit plantations (coffee, cocoa).

Exploration of these agroforestry packages in the Haitian environment is already taking place on a very limited scale. It is recommended that the Project establish within its Research Program definitive priorities for the study of alternative agroforestry packages.

- Note: CATIE, a research institution based in Costa Rica, has expressed interest in participating in this research effort. Adequate consideration should be given to its proposal, especially in view of its proven record in agroforestry research. CATIE's experience also includes extensive research and implementation of fire-wood projects which could prove valuable for the fire-wood production aspect of this Project. Experience in this field is necessary for the implementation of Phase II of this Project.

#### 4.4.2 Trees Growing vs. Seedlings Planted

Reporting of Project accomplishments must distinguish between seedlings planted and trees actually growing after the initial six months or twelve months. Claims of number of seedlings planted are incorrectly interpreted as number of trees growing, ignoring the high mortality rate of seedlings after transplantation. The differentiation between seedlings planted and trees established is critical for avoiding unrealistic expectations about the Project's potential impact upon the environmental problems of Haiti.

#### 4.4.3 Technical Assistance to the Project

By keeping the implementation model very simple and the objectives clearly focused, the Project has avoided becoming overburdened by extremely complicated technical matters. Overall technical expertise in the field (Forestry Teams) and technical advice from the Forestry Advisor have been very adequate to achieve Project objectives. However, because of the increased need to conduct experimentation and adequately document it, more technical assistance is required. This need is especially obvious at the level of the Forestry Advisor (Technical Sub-unit) where assistance is required in:

- Data collection and analysis;
- Documentation of research results;

- Supervision of research activities;
- Execution of research activities; and
- Training.

Because the principal role of the Forestry Advisor is that of assuring implementation of the Research Program by coordinating research activities, and continually providing technical assistance to the Regional Forestry Teams and technical training, it is obvious that additional personnel is required to fulfill the roles listed above.

#### 4.4.4 Specific Technical Assistance

Short-term consultants to the Project (technical fields) have in general successfully completed their assignments. Less satisfactory has been the performance of the soil testing specialist. Added assistance is required to develop an appropriate soil testing package that meets Project requirements. Soil sampling and testing are critical components of the research effort to be undertaken by the Project in the future. A soil testing package to be developed and implemented using as much as possible local facilities and expertise should provide quick results and accurate and reliable results.

#### 4.4.5 Nurseries

The following are general conclusions relating to the project's nursery activities:

1. Nurseries are being established using modern technology and simple, flexible lay-out. The result is efficient and cost-effective production of the seedlings.
2. Regionalization of the nurseries has enabled a more efficient distribution of seedlings to remote planting sites in the Northwest and the Southwest. Moreover, diversification of the seedling source has resulted in better quality seedlings, better synchronization between rainfall, and delivery of seedlings to the planting sites.
3. The "root-trainer" has proven beyond doubt to produce efficiently and cost-effectively good quality seedlings. The "Win-strip," on the other side, still needs to prove its advantages relative to the "root-trainer."

4. The great majority of materials used in nursery construction and production of seedlings is of foreign origin and needs to be imported. Efforts need to be made to obtain similar results using indigenous materials.
5. It has been proven that regional nurseries can be managed effectively by NGO's through locally trained expatriate and Haitian personnel.
6. Managerial capacity among Haitian personnel, although scarce, is available and needs to be strengthened.

#### 4.4.6 Seedlings

The implementation model, both in terms of producing seedlings and transplanting them, appears to work very effectively and efficiently.

1. The use of NGO's to carry out extension and transplanting activities has proven effective.
2. Technical aspects of seedling production, and to a great extent, of transplanting methods, have been resolved successfully in a very short time.
3. Production of tree seedlings using the "root-trainer" has proven to be efficient and cost-effective. Root development is adequate to survive transplanting if the potting soil is appropriate.
4. Although "Promix" has given good results as a potting component, a locally produced substitute needs to be found (i.e. "bagasse").
5. Portability of the seedlings (grown in root-trainers) has been a key element for the project's rapid growth. Similarly important is their handling ease and the minimum skills required in executing successfully the tree planting.
6. Many difficulties in producing quality tree seedlings have been successfully overcome on most sites. A good technological package has thus been developed for producing and distributing ("moving") tree seedlings. The success of this package can be appreciated both in terms of tree survival and present reaction to the project.
7. Widespread implementation of this technological package for seedling production should be feasible and relatively problem-free. "User-friendliness" of this production package makes it transferrable to situations beyond the Haitian borders (i.e. Dominican Republic).

#### 4.4.7 Species Selection

Following are the conclusions concerning the selection of species for this project.

1. A diversity of tree species have been used in the project. This has been one of its major strengths. Recognition of ecological diversity has resulted in the planting of a diverse mix of trees in very different locations across Haiti.
2. In a very short time, a better understanding of each tree species' suitability to various ecological conditions has been achieved. Future plantings, by taking advantage of this learning process, should result in even better survival rates.
3. The project has gradually adjusted to the peasants' demand for certain favorite tree species. Flexibility in this regard coupled with continuous promotion of fast growing trees constitutes a critical element for the project success.
4. Continuous experimentation with native tree species (i.e. Procopis, Simorube, and Catalpe) might prove critical in finding tree species uniquely adapted to ecological conditions of Haiti, and thus enable the continuous growth of the project and the realization of its long-term expectations (i.e. erosion control, reforestation of marginal lands).
5. The establishment of species trial plots and use studies will produce, within a relatively short time, a valuable amount of information about species selection, which will further improve survival rates and reinforce the peasant's attitude towards trees.
6. Species selection needs to maintain a balance between the marketability of trees (especially in relation to time before harvest), the opportunity cost (loss of food crops), and the composition of the tree plantation.
7. Species selection varies as a function of the use for the tree, the ecological characteristics of the site, and the prevalent land use practices.
8. Where agriculture is sedentary, as opposed to migratory, trees should be grown in hedges, along borders and in dense wood lots on marginal lands.
9. In areas where migratory agriculture prevails, tree plantings might be adopted as an efficient use of the land during fallow, as long as the maturation cycle of the trees coincides approximately with the fallow duration of the period.

LIST OF PEOPLE INTERVIEWED BY THE EVALUATION TEAM

GOVERNMENT PERSONNEL

Robert Cassagnol	World Bank Forestry Project
Malcoem Berry	World Bank Forestry Project

USAID PROJECT PERSONNEL

Fred Conway	Project Coordinator
Tom Greathouse	Forestry Advisor

PADF PROJECT PERSONNEL

Steve Goodwin	Acting Project Director
Mark Webb	Forester, Cap Haitien
Bill Buffum	Forester, Cul-de-Sac/Southeast
Mike Bannister	Forester, Les Cayes
Stuart North	Nursery Construction
Edmond Poteau	Assistant, southwest
Michel Guillemette	Assistant, south coast
Herman Lauwerysen	Coordinator, Central Plateau
Frank Wache	Nursery Management
Ivanaubourg	Assistant, southwest
Polynice	Assistant, Cul-de-Sac
Jeanty	Research Assistant, Cul-de-Sac

CARE PROJECT PERSONNEL

Larry Holzman	Country Director
Dan Stephens	Project Director
Marcia McKenna	Forester, Region II
Harry Jean	Agronomist, Region II
Jean Carrel	Animator, Region II - Jean Rabel
Hubert Richardson	Nurseryman, Region II - Jean Rabel
Sauveur Fertile	Animator, Region II - Passe Catabois
Anoferne	Animator, Region II - Passe Catabois
Terry Adams	Logistics Manager
Andrea Joseph Adams	Ex-Forester, Region II
Paul Campbell	Forester, Region I

DOUBLE HARVEST PERSONNEL

Aart van Wingerden	President
Andre Vandenberg	Administrator
Ron Smith	Forester/Nurseryman

PADF SUB-GRANTEE PERSONNEL

Eldon Stoltzfus	Director, Mennonite Central Committee
Andy Barnes	O.M.S. International - Plaisance
Robert Liboirion	Project Director, CECI - St Michel
Joanne Hebert	Agronomist, CECI - St Michel
Dominique Ouattara	Agronomist, CECI - St Michel

Sauveur	DCCH Coordinator - La Borde
Faustin Fabre	DCCH Animator Coordinator - La Borde
Numalageau	Animator
Pere Lebellier	DCCH - La Borde
Gilbert	
Henri Ette	World Team coordinator - Bergeau
	World Team Nursery specialist - Bergeau

USAID HAITI PERSONNEL

Harlan H. Hapgood	Mission Director
John Lewis	Acting Head, Agr. Dev. Office
Robert Wilson	Agroforestry Project Manager
Lisa McGowan	OEA
Jim Walker	OEA
Mike Baldwin	PVD
Richard Byess	DRE

OTHERS

Ben and Gloria Loyer	Baptist Mission (UEBH) - Passe Catabois
Margaret Barkley	Private Consultant
Michael H. Jay	Canadian Embassy
Yves Bolisin	Cultivator - Bry
Rely Louziere	Cultivator - Anadere

PROJECT SUMMARY:  
INTERMEDIATE GOAL INDICATORS

as of September, 1983

	PADF	CARE	DOUBLE HARVEST
Trees Planted	4,022,000	1,173,000	685,000
Farmers Reached	8,150	3,128	na
Tree Farms Established	na	na	7
Nurseries	19	6	1
Demonstration Plots	10	7	?
Resource Center	yes	na	na
Forestry Outreach Teams	3	2	na
Projects (USAID Definition)	42 *	8	7
Sub-projects (PADF Definition)	160	na	na

\* As of May, 1983

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In addition, the Evaluation team had access to the Project files held by the Agroforestry Project Office. A wealth of materials were reviewed — too numerous to cite — and included quarterly reports, memoranda, letters, PIO/T's, and other miscellaneous project documents.

REPUBLIQUE DU NIGER  
MINISTRE DE L'HYDRAULIQUE ET DE  
L'ENVIRONNEMENT  
DIRECTION DES EAUX ET FORETS  
PROJET PLANIFICATION ET UTILISATION  
DES SOLS ET FORETS

B.P. 12.520 NIAMEY

Arrondissement de \_\_\_\_\_

Canton de \_\_\_\_\_

Nom de village \_\_\_\_\_

Nombre d'habitants \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_/\_\_\_\_/\_\_\_\_ Date de la visite

Renseignements fournis par (cochez les  
noms des participants) :

- Chef de village  
 Président du GVM  
 Président de la Samaria  
 Un (des) marabout(s) du village  
 Autres notables (mentionnez le nombre)  
 Autres participants (mentionnez le  
nombre)

THEMES

1. L'EAU.

Profondeur de puits dans le village \_\_\_ M \_\_\_ M \_\_\_ M \_\_\_ M

Autre source de ravitaillement en eau? \_\_\_ pompe \_\_\_ cours d'eau \_\_\_ mare

Est-ce que les puits tarissent à une époque de l'année? \_\_\_ non \_\_\_ oui

La nappe phréatique a-t-elle baissé depuis vingt (20) ans? \_\_\_ non \_\_\_ oui

2. LES PATURAGES.

Depuis dix (10) ans, les aires de pâturage sur le territoire du village ont-ils  
\_\_\_ augmenté? \_\_\_ diminué? \_\_\_ Sont-ils restés les mêmes?

3. LE CONTROLE DES MOUVEMENTS DU CHEPTEL VILLAGEOIS

A. Pendant la saison sèche que fait-on en générale, de point de vue du contrôle,

des animaux suivants : chèvres \_\_\_ errent librement \_\_\_ confiées au(x)  
berger(s)  
Remarques : moutons \_\_\_ errent librement \_\_\_ confiés au(x)  
berger(s)  
vaches \_\_\_ errent librement \_\_\_ confiées au(x)  
berger(s)

B. Pendant l'hivernage, que fait-on en générale, de point de vue du contrôle,

des espèces suivantes : chèvres \_\_\_ errent librement \_\_\_ confiés au(x)  
berger(s)

Remarques :

\_\_\_ attachées dans les concessions

\_\_\_ attachées dans les pâturages

moutons \_\_\_ errent librement \_\_\_ confiés au(x)  
berger(s)

\_\_\_ attachées dans les concessions

\_\_\_ attachées dans les pâturages

Remarques : vaches \_\_\_ errent librement \_\_\_ confiées au(x) berger(s)

\_\_\_ attachées dans les concessions

\_\_\_ attachées dans les pâturages

C. Les bergers qui contrôlent le bétail, sont-ils :

\_\_\_ membres de la famille du propriétaire du bétail?

\_\_\_ des bergers locaux payés par les propriétaires du bétail?

Combien par hivernage an

\_\_\_ CFA chèvre \_\_\_ CFA chèvre

\_\_\_ CFA mouton \_\_\_ CFA mouton

\_\_\_ CFA vache \_\_\_ CFA vache

\_\_\_ les éleveurs transhumants

Remarques :

\_\_\_ autres personnes (Décrivez les.)

### 3. RAVITAILLEMENT DU VILLAGE EN BOIS

A. \_\_\_ entièrement par ramassage

\_\_\_ une partie par ramassage, une autre partie par achat

\_\_\_ entièrement par achat (Passez à la question No. 4.)

B. Qui est qui ramasse le bois? \_\_\_ hommes \_\_\_ femmes \_\_\_ enfants

C. Où est-ce que l'on ramasse le bois?

\_\_\_ dans la brousse \_\_\_ distance en km du village

\_\_\_ dans les jachères \_\_\_ n'importe où \_\_\_ chacun dans les siennes

\_\_\_ dans les champs \_\_\_ n'importe où \_\_\_ chacun dans les siens

### 4. MARCHE DU BOIS DE CHAUFFE

\_\_\_ CFA prix d'un chargement d'âne \_\_\_ CFA autre mesure (Décrivez le.)

\_\_\_ CFA prix d'un chargement d'homme \_\_\_\_\_

### 5. AUTRES COMBUSTIBLES

Depuis combien d'années brûle-t-on \_\_\_ les bouses de bétail \_\_\_ tiges de mil

6. LA PLANTATION DES ARBRES

	<u>Combien</u>	<u>Quand</u>	<u>Site</u>	<u>Etat</u>
A-t-on planté, dans ce village, des arbres dans les bois :	_____ collectifs _____	_____	_____	_____
	_____ individuels _____	_____	_____	_____
	ou de famille			

7. LES PEPINIERES DANS LE VILLAGE

	<u>Nombre</u>	<u>Entretenues par</u>	<u>Depuis</u>	<u>Vendent</u>	<u>Donnent</u>
Collectives	_____	_____	_____	_____	_____
Individuelles ou de famille	_____	_____	_____	_____	_____

Remarques :

8. LES RESTES DES RECOLTES : LES DROITS D'EXPLOITATION

Les restes des récoltes (tiges de mil, etc.) appartiennent  
 \_\_\_ au propriétaire du champ, pour \_\_\_ mois après la récolte  
 \_\_\_ à tout le monde

9. LES LITIGES CONCERNANT L'EXPLOITATION DES RESTES DES RECOLTES

\_\_\_ N'existent pas    Arrivent \_\_\_ rarement \_\_\_ parfois \_\_\_ souvent

Ces genres de litiges sont tranchés par \_\_\_ le chef de village

Remarques :

- \_\_\_ un marabout du village
- \_\_\_ le chef de canton
- \_\_\_ une autre personne (Décrivez la.)

10. LES LITIGES CONCERNANT LES DEGATS COMMIS PAR LE BETAIL DANS LES CHAMPS OU JARDINS

\_\_\_ N'existent pas    Arrivent \_\_\_ rarement \_\_\_ parfois \_\_\_ souvent

Ces genres de litiges sont tranchés par \_\_\_ le chef de village

Remarques :

- \_\_\_ le chef de canton
- \_\_\_ une autre personne (Décrivez la.)

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11. LES LITIGES CONCERNANT LE BOIS

N'existent pas    Arrivent  rarement  parfois  souvent

Ces genres de litiges concernent avant tout :

le ramassage non-autorisé du bois mort sur les champs et des jachères des particuliers

l'ébranchage non-autorisé des arbres sur les champs et des jachères des particuliers

l'abattage des arbres vivants, sans la permission du propriétaire du terrain, sur les champs et des jachères des particuliers

autre(s) genre(s) de litige concernant les droits d'exploitation des bois

Ces genres de litiges sont tranchés par  le chef de village

Remarques :

le chef de canton

le forestier

une autre personne (Décrivez la.)

12. LES ACTIVITES DES FORESTIERS SUR LE TERRITOIRE DU VILLAGE

A. Les forestiers viennent sur le territoire du village combien de fois dans l'année? \_\_\_\_\_

B. Qu'est ce qu'ils y font?  distribution des plantes en pot

Remarques :

organisation des bois collectifs

organisation des bois individuels

imposition des amendes pour abattage non-  
autorisé des arbres sur le territoire du  
village

autres actions (Décrivez les.)

13. LA FERTILITE DES SOLS CULTIVES PAR LES VILLAGEOIS

A. La fertilité des sols en générale est : \_\_\_ en augmentation

Remarques : \_\_\_ pas de changement

\_\_\_ en baisse

B. L'érosion éolienne, depuis dix (10) ans, devient \_\_\_ dans les champs.

Remarques : \_\_\_ très marquée

\_\_\_ marquée

\_\_\_ pas de changement

\_\_\_ s'améliore

\_\_\_ n'existe pas

C. L'érosion hydrique depuis dix (10) ans, devient \_\_\_ dans les champs.

Remarques : \_\_\_ très marquée

\_\_\_ marquée

\_\_\_ pas de changement

\_\_\_ s'améliore

\_\_\_ n'existe pas

14. LES JACHERES

A. Dans ce village, environ combien de familles sur dix (10) ont actuellement des terres en jachères? \_\_\_ / dix (10) familles

B. La durée générale des jachères dans ce village, il y a trente (30) ans était : \_\_\_ 30 ans \_\_\_ 20 ans \_\_\_ 15 ans \_\_\_ 10 ans \_\_\_ 5 ans

C. La durée générale des jachères dans ce village, à présent, est de :

\_\_\_ 30 ans \_\_\_ 20 ans \_\_\_ 15 ans \_\_\_ 10 ans \_\_\_ 5 ans \_\_\_ moins

\_\_\_ les jachères n'existent pratiquement plus

Remarques :

15. LE FONCIER

A. Les litiges fonciers qui surviennent actuellement dans ce village

concernent \_\_\_ les limites des champs \_\_\_ les partages de l'héritage foncier  
 \_\_\_ n'ex- \_\_\_ les prêts de terrain \_\_\_ les ventes de terre (champs, jachères, jardins, etc.)  
 istent \_\_\_  
 pas \_\_\_ autres problèmes concernant le foncier (Décrivez les.)

B. Ces litiges-là sont tranchés le plus souvent par :

\_\_\_ le chef de village \_\_\_ un marabout du village  
 \_\_\_ le chef de canton \_\_\_ une autre personne (Décrivez la.)

Remarques :16. SITUATION DU VILLAGE RELATIF AUX ARBRES

\_\_\_ grands aires de brousse dans les environs du village  
 \_\_\_ quelques aires de brousse, des arbres sur les jachères et sur les champs  
 \_\_\_ assez déboisé comme paysage  
 \_\_\_ très généralement déboisé comme paysage

17. REMARQUES DIVERSES

REPUBLIC OF NIGER  
 MINISTRY OF HYDRAULICS  
 AND ENVIRONMENT  
 CONSERVATION SERVICE  
 FORESTRY AND LAND USE  
 PLANNING PROJECT  
 B.F. 12,520 TEL.:  
 NIAMEY, NIGER 72-20-87

NIGERIAN RENEWABLE RESOURCES

SURVEY

SOCIAL ASPECTS

Questionnaire number	Respondent's ethnic group	Number of adults respondent supports	Number of children respondent supports		
<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>		
Village name	Population	Headman in power for how many years	Well depth in meters		
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
Kilometers to district seat	Name of district	Kilometers to county seat	Name of county		
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
Mission number	Date of interview	Time of interview	Interviewer's initials	Date of team leader's control	Team leader's initials
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Date of arrival at headquarters	Receiver's initials	Date of control by Human Resources Section head	Human Resources Section head's initials		
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
Date of control by Human Resources Section consultant	Consultant's initials	Date of data entry into computer	Operator's initials	Comments?	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	

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1.

Sample of interviewer's handwriting. [In the ten (10) boxes below, write the numerals zero (0) to nine (9).]

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01. To maintain soil fertility in your fields, do you regularly do any of the following?

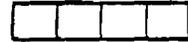
[Read the list of actions below. For each action, put the appropriate number or letter (1, 2, N) in the box reserved for this purpose. Then write these same numbers or letters in the corresponding boxes (01A. - H.) at the bottom of the page.]

[Actions]	[Performed or not]	No (1)	Yes (2)	Not applicable (you don't have any fields) (N)
A. Do you spread compound sweepings on your fields?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Do you contract with herders to have them graze their animals on your fields?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Do you burn bushes, branches and crop residues collected when you clean your fields?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Do you use green manure?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Do you use chemical fertilizers?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Do you build terraces to reduce surface run-off and hydraulic erosion?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Do you raise trees on your fields to regenerate soil fertility?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H. Any other actions? [Describe them.]		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>				
<hr/>				

01A. 01B. 01C. 01D. 01E. 01F. 01G. 01H.

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15



In certain areas of Niger people find they're using up various kinds of natural resources, whereas in other places, they don't notice any change or even consider resources are easier to find than before. Concerning the condition of the following resources, what have you observed during the last five years in your village?

[Read the list below, and ask the respondent about the condition of each resource. Next, place the letter (A, B, C, P, N) corresponding to the interviewed's reply in the box reserved for that purpose. Then write this same letter in the appropriate box (02. - 05.) at the bottom of the page.]

[Resources]	[Conditions]	De- creas- ing (A)	No change (B)	In- creas- ing (C)	Does not exist (R)	You don't know (P)	Not appli- cable (N)
02. Wind erosion of soils on your fields?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03. Water erosion of soils on your fields?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04. Fertility of soils on your fields?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05. Availability of forage for animals on village lands?		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

06. In some places people find it's getting easier or harder to find building poles to construct huts, silos and fences. In other areas there's no noticeable change. As for the availability of building poles, what have you observed during the last five years in your village?

[Read the list of conditions. Place the letter (F, C, D, B, P or N) corresponding to the interviewed's reply first in the box directly below and then in the box reserved for this purpose (.06) at the bottom of the page.]

Easier (F)	No change (C)	Harder (D)	Much harder (B)	You don't know (P)	Not applicable (N)
<input type="checkbox"/>					

02.     03.     04.     05.     06.

16

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3.

07. In certain places people find it's getting easier or harder to find fuel wood, while in other parts of the country there's no noticeable change. As for gathering fuel wood, what have you observed during the last five (5) years in your village?

[Read the list of conditions. Place the letter (F, C, D, B, P or N) which corresponds to the respondent's reply first in the box directly below, and then in the box reserved for this purpose at the bottom of the page.]

[Conditions]	Easier (F)	No change (C)	Harder (D)	Much harder (B)	You don't know (P)	Not applicable (N)
	<input type="checkbox"/>					

08. Where do you get the fuel wood which you burn in your family?

[Read the sources, and ask what proportion of fuel wood is collected in each. First place the appropriate letter in the box in the column. Next place this same letter in the corresponding box (08A. - 08P.) at the bottom of the page.]

[Proportion]	[Sources]	Family fields (A)	Family fallow (B)	Others' lands (C)	Bush (D)	You don't know (P)	Not appli- cable (do not collect (N)
All (T)		<input type="checkbox"/>	<input type="checkbox"/>				
Large part (G)		<input type="checkbox"/>	<input type="checkbox"/>				
Half (M)		<input type="checkbox"/>	<input type="checkbox"/>				
A little (U)		<input type="checkbox"/>	<input type="checkbox"/>				
None (R)		<input type="checkbox"/>	<input type="checkbox"/>				

09. At what distance (in kilometers) from the village are the places where you collect fuel wood?

[Place the number or letter (P; you don't know; N; not applicable because villagers no longer collect firewood) in the box (09.) reserved for this purpose at the bottom of the page.]

07.	08A.	08B.	08C.	08D.	08P.	08N.	09.
<input type="checkbox"/>							

17



4.

10. Some people have more experience than others with planting trees, producing seedlings in pots, and other tree-raising activities. Please tell me if you have ever done any of the following activities, and if so how many times.

[Place the letters corresponding to the respondent's replies in the appropriate boxes in the rows, and then in the boxes (10A. - 10K.) at the bottom of the page.]

[Activities]	[Frequency]				You don't know (P)	Not applicable (N)				
	Often (S)	Sometimes (F)	Rarely (R)	Never (J)						
A. Have you cut down little trees while working your fields?	<input type="checkbox"/>									
B. Have you avoided cutting little trees while working your fields?	<input type="checkbox"/>									
C. Have you promoted natural regeneration by pruning it?	<input type="checkbox"/>									
D. Have you transplanted seedlings which sprout at the base of large trees?	<input type="checkbox"/>									
E. Have you planted tree seeds?	<input type="checkbox"/>									
F. Have you planted trees in pots?	<input type="checkbox"/>									
G. Have you raised little trees in pots?	<input type="checkbox"/>									
H. Have you planted trees, for example, neems, in order to sell them?	<input type="checkbox"/>									
I. Have you planted trees by cuttings?	<input type="checkbox"/>									
J. Have you planted a live fence?	<input type="checkbox"/>									
K. Have you planted a wind break?	<input type="checkbox"/>									
10A.	10B.	10C.	10D.	10E.	10F.	10G.	10G.	10H.	10I.	10J.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10

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5.

I'm going to read you a list of different ways of raising trees on your fields. For each of these techniques, I would like you to tell me whether or not it's expensive in terms of money, materiel and labor, if it is effective or ineffective, and whether or not you would be interested in learning how to better use the technique.

[Techniques]	[Evaluation criteria]			In terms of money, materiel and labor			Is it:			Want to learn to use it better?		You don't know
	is it: costly	not costly	You don't know	(C)	(PC)	(P)	tec-tive	fec-tive	don't know	(Yes)	(No)	(P)
11. Is the technique of not cutting small trees when you're working your fields:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Is the technique of promoting natural regeneration by pruning it:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Is the technique of transplanting seedlings which sprout at the base of large trees:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Is the technique of planting tree seeds:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Is the technique of planting seedlings already sprouted in pots:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Is the technique of raising trees by planting cuttings:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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6.

17. People like trees for various reasons. Can you tell me if, for some of the following reasons, you would like to have trees of your field?

[Read the list of reasons below, and circle each reason selected by the respondent. If he chooses even one of the reasons A. - H., do not read the options J., P. and N.; instead, follow the instructions below the options. If the respondent chooses no answer among the options A. - H., read one after the other J., P. and N. until he chooses one. Place the letter which corresponds to his answer in the appropriate box at the bottom of the page, and go to question No. 18.]

- A. It's useful to have fuel wood and building poles readily available?
- B. Trees reduce wind and water erosion, and thus protect soils in the fields?
- C. Certain tree species enrich the soil?
- D. Certain tree species provide food, for example, nuts, edible leaves and fruits?
- E. Certain species produce leaves and seed pods which livestock like?
- F. For shade?
- G. It's possible to sell the wood of certain species?
- H. Other reasons? [Describe them.] \_\_\_\_\_
- J. You don't want trees on your fields?
- P. You've not thought about whether or not you want trees on your fields?
- N. Not applicable [Respondent has no field.]

[If the respondent has only selected one answer, place the letter corresponding to this answer in the box 17a., at the bottom of the page, and go on to question No. 18. Whenever there is more than one answer, follow the instructions below.]

I'm going to reread the reasons you've selected. Tell me which among them is the most important.

[Reread all circled replies. Place the letter indicating the most important in the box 17a., below.]

Now the following reasons remain. Among them, which is the most important?

[Read again all replies not selected on the first rereading. Place the letter indicating the most important in the box 17b., below.]

That still leaves us the following reasons. Among those which remain, which is the most important?

[Read all circled answers not previously chosen. Place the letter indicating the most important in the box 17c., below.]

17a.	17b.	17c.	17J.	17P.	17N.
<input type="checkbox"/>					

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7.

18. Sometimes farmers don't want trees on their fields. Do any of the following reasons cause you to not want to have trees on your fields?

[Read the list of reasons below, and circle each reason selected by the respondent. If he chooses even one of the reasons A. - K., do not read the options L., P. and N.; instead, follow the instructions below the options. If the respondent chooses no answer among the options A. - K., read one after the other L., P. and N. until he chooses one. Place the letter which corresponds to his answer in the appropriate box at the bottom of the page, and go to question No. 19.]

- A. Trees reduce the area available for crops?
- B. You can find enough wood elsewhere?
- C. Trees grow too slowly?
- D. Certain fields which you farm don't belong to you?
- E. Trees attract birds and wild animals?
- F. It's difficult to take care of trees?
- G. Other people will cut them without asking your permission?
- H. The forester prohibits you from cutting trees?
- I. Drought?
- J. You've already got enough problems supporting your family without worrying about trees?
- K. Other reasons? [Describe them.] \_\_\_\_\_
- L. You see no reason not to have trees on your fields?
- P. You haven't thought about whether or not you want trees on your fields
- N. Not applicable [Respondent has no field.]

[If the respondent has only selected one answer, place the letter corresponding to this answer in the box 17a., at the bottom of the page, and go on to question No. 19. Whenever there is more than one answer, follow the instructions below.]

I'm going to reread the reasons you've selected. Tell me which among them is the most important,

[Reread all circled replies. Place the letter indicating the most important in the box 18a., below.]

Now the following reasons remain. Among them which is the most important?

[Read again all replies not selected on the first rereading. Place the letter indicating the most important in the box 18b., below.]

That still leaves us the following reasons. Among those which remain, which is the most important?

[Read all circled answers not previously chosen. Place the letter indicating the most important in the box 18c., below.]

18a.	18b.	18c.	18L.	18P.	18N.
<input type="checkbox"/>					

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8.

19. Certain farmers want to reduce the number of trees on their fields, others want to increase them, or leave things as is. Are you raising or planting more trees on your fields?

[Place an "X" in the box indicating the respondent's answer.]

Yes [If the respondent answers "yes", place a cross in the "Yes" box at the bottom of the page and go on to question No. 20.]

No [If the respondent answers "no", place a cross in the "No" box at the bottom of the page and go on to question No. 21.]

20. How do you go about getting more trees on your lands?

[Read the respondent the list of actions below; each time, ask how often and place the letter in the appropriate box in the same row. After having dealt with all the options, write these same letters in the boxes reserved for this purpose at the bottom of the page.]

[Actions]	[Frequency]						Not applicable (has no field) (N)
	Often (S)	Several times (F)	Rarely (R)	Never (J)	You don't know (P)		
A. Do you avoid cutting small trees when working your fields?	<input type="checkbox"/>						
B. Do you promote natural regeneration by pruning it?	<input type="checkbox"/>						
C. Do you transplant seedlings which sprout at the base of large trees?	<input type="checkbox"/>						
D. Do you plant tree seeds?	<input type="checkbox"/>						
E. Do you plant seedlings raised in pots?	<input type="checkbox"/>						
F. Do you plant trees by means of cuttings?	<input type="checkbox"/>						
G. Do you plant trees and then water them?	<input type="checkbox"/>						
H. Another technique? [Describe it.] _____	<input type="checkbox"/>						

Yes	No	20A.	20B.	20C.	20D.	20E.	20F.	20G.	20H.
<input type="checkbox"/>									

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9.

21. Here are several reasons which sometimes lead farmers to not raise trees on their fields. Do any explain why you don't raise trees on your lands?

[Read the list of reasons below, circling each one chosen by the respondent. If he selects even one of the reasons A. - L., do not read the options P. and N.; instead, follow the instructions below the options. If the respondent chooses no answer among the options A. - L., read one after the other P. and N., until he chooses one. Place the letter which corresponds to his answer in the appropriate box at the bottom of the page, and go on to question No. 22.]

- A. You already have enough trees on your fields?
- B. Drought makes it too difficult to raise trees in fields?
- C. Even if you raise certain valuable trees, other persons will take them without asking your permission?
- D. Even if you raise certain valuable trees, the forester will prohibit you from cutting them when you need to?
- E. Even if you raise trees on your fields, roving stock will destroy the
- F. More trees on your fields would reduce the area available for crops?
- G. More trees on your fields would attract birds and wild animals dangerous for the crops?
- H. You find enough wood already, without having to raise trees?
- I. Certain fields which you farm don't belong to you?
- J. Trees grow too slowly?
- K. You've already got enough problems supporting your family without worrying about trees?
- L. Other reasons? [Describe them.] \_\_\_\_\_

P. You don't know?

N. Not applicable [The respondent has no field.]

[If the respondent has only selected one answer, place the letter corresponding to this answer in the box 21a., at the bottom of the page, and go on to question No. 22. Whenever there is more than one answer, follow the instructions below.]

I'm going to reread the reasons you've selected. Tell me which among them is most important.

[Reread all circled replies. Place the letter indicating the most important in the box 21a., below.]

The following reasons remain. Among them which is the most important?

[Read again all replies not selected on the first rereading. Place the letter indicating the most important in the box 21b., below.]

That still leaves us the following reasons. Among those which remain, which is the most important?

[Read all circled answers not previously chosen. Place the letter indicating the most important in the box 21c., below.]

21a.	21b.	21c.	21P.	21N.
<input type="checkbox"/>				

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we would like to know first, if the following trees were plentiful on your lands (fields and fallows) five (5) years ago, and whether they still are today; and second, if you could cut them and use them at will, which among them would you prefer to have for fuel wood, building poles, animal forage and other uses.

[Read the respondent the list of grass and tree species below, asking for each whether it was present or not five (5) years ago on his lands and whether or not it still remains there; and, for the tree species only, whether he prefers it for the uses noted. Place crosses in the appropriate boxes. (E = Vous ne savez pas; N = not applicable because the respondent has not had a single field over the past five (5) years). To identify grasses, show the respondent the samples and photos in the notebook.]

[Criteria of evaluation] [Species]	FIVE YEARS AGO					NOW					Fuel wood	Build- ing poles	For- age	O- ther uses	You don't know (E)	Not appli- cable (N)
	Too many	A lot	A Some	A few	None	Too many	A lot	A Some	A few	None						
32. Acacia nilotica																
33. Balanites aegyptiaca																
34. Prosopis africana																
35. Tamarindus indica																
36. Hyphaene thebaica																
37. Commiphora africana																
38. Acacia senegal (laeta)																
39. Acacia albida																
30. Piliostigma reticulatum																
31. Guiera senegalensis																
32. Eorassus aethiopicum																
33. Khaya senegalensis																
34. Parkia biglobosa																
35. Aristida longiflora																
36. Aristida pallida																
37. Andropogon gayanus																
38. Cymbopogon schoenanthus																

10.

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13.

45. If someone were to cut wood on your land, you knew who it was, and in your opinion, according to the law or rules, he shouldn't have done it, where would you have the best chance of getting compensation, if you wanted it? Given the time, the effort and the money necessary to get compensation, would it be worthwhile?

[Read the list of options A. - D. to the respondent. If he selects one of the options A. - D., place the numeral one (1) in the appropriate box and a cross in the box which indicates his estimate of the value of this recourse. If he has selected one of the options A. - D., ask the following questions.]

Where would you have the next best chance of getting compensation. Given the time, the effort and the money necessary to get compensation, would it be worthwhile?

[Place the numeral two (2) in the appropriate box, and a cross in the box indicating his estimate of the value of this recourse.

If he selects one of the options E. - H., place a cross in the corresponding box and go on to question No. 46. If the respondent does not choose any of the options A. - H., read one after the other the options P. and N., until he chooses one. Place a cross in the appropriate box. Then go on to question No. 46.]

[Choice of recourses or of inaction]	[Evaluation of recourses]	Is this recourse worth the trouble?	
		Yes	No
A. The village headman?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. The canton chief?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. The forester?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Somebody else? [Describe him:]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
E. In general, it's not worth the trouble, or it isn't good to ask for compensation.	<input type="checkbox"/>		
F. You would tell the individual in question that he would pay the fine if the forester charges you with the infraction?	<input type="checkbox"/>		
G. You would scold the individual in question, but not bring a case against him?	<input type="checkbox"/>		
H. It's impossible to get compensation?	<input type="checkbox"/>		
P. You don't know?		<input type="checkbox"/>	
N. Not applicable [The respondent has no land.]			<input type="checkbox"/>

46. If, every time you planted or maintained a tree on your fields you could get compensation in a satisfactory manner for any cutting or animal damage which occurs without your authorization, would you be more likely to plant or maintain trees on your fields?

[Place a cross in the appropriate box at the left. If the respondent answers "No", ask whether he already has enough trees on his fields, and place a cross in the appropriate box.]

Yes		No		You don't know (P)	Not applicable [The respondent has no fields] (N)
Yes	No	Yes	No		
<input type="checkbox"/>					

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14.

47. If the trees on your lands belonged to you, you could do with them as you wished, and get compensation for any damages caused by people or by their animals, would you be more likely to plant or maintain trees on your fields?

[Place a cross in the appropriate box at the left. If the respondent answers "No", ask whether he already has enough trees on his fields, and place a cross in the appropriate box.]

		You already have enough trees on your fields?		You don't know (P)	Not applicable [The respondent has no fields] (N)
Yes	No	Yes	No		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

48. If the majority of family heads in the village wanted to, could they themselves make and uphold a rule that:

[Place crosses in the appropriate boxes.]

A. All animals which graze on village lands must be herded at all times.	Yes	No	You don't know
i. A majority would want to make this rule?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. A majority would be able, themselves, to make it and uphold it?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Wood gatherers must ask authorization of the farmer before cutting live trees on his lands.	Yes	No	You don't know
i. A majority would want to make this rule?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. A majority would be able, themselves, to make it and uphold it?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Wood gatherers must ask authorization of the farmer before collecting wood in his fields.	Yes	No	You don't know
i. A majority would want to make this rule?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. A majority would be able, themselves, to make it and uphold it?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Farmers must plant and maintain windbreaks on their fields, each in his own.	Yes	No	You don't know
i. A majority would want to make this rule?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii. A majority would be able, themselves, to make it and uphold it?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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49. Concerning the management of animals belonging to the family, we would like to know, for goats, sheep and cows, whether you have them herded throughout the year, or only during the rainy season. At the same time, we'd like to find out whether you have none, five head or less, or more than five head of each type of animal.

[For each type of animal, note in the appropriate boxes below, first the number of head (by a numeral or a cross), and then the letter indicating the extent of herding. If the respondent possesses no animals of a species, place a zero (0) in the first box of the corresponding pair of boxes, and leave the second empty.]

[Species]	[Herding level] Number of head			Herded at all times	Herded only in rainy season	Not applicable
	0	≤5	>5	(A)	(B)	(N)
i. Goats	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
ii. Sheep	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
iii. Cattle	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	49i.		49ii.		49iii.	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

50. Cooking can be done with different fuels, such as millet stalks, cattle droppings and wood. Please tell me how much of your cooking you do with each of these fuels.

[Place the letters in the boxes corresponding to respondent's answers. Write these same letters in the boxes reserved for this purpose below the question.]

[Type of fire]	[Estimate of amount]	Stalks,	Cattle	Other	You	Not applicable
		Wood (A)	vines, etc. (B)	fuel (D)	don't know (P)	(doesn't cook) (N)
All	(T)	<input type="text"/>				
Large part	(G)	<input type="text"/>				
Half	(M)	<input type="text"/>				
A little	(U)	<input type="text"/>				
None	(R)	<input type="text"/>				
		50A.	50B.	50C.	50D.	50P.
		<input type="text"/>				

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16.

51. How do you go about getting the wood you burn to cook for the family?  
 [Place the appropriate letters in the boxes corresponding to respondent's answers. Write these same letters in the boxes reserved for this purpose below the question.]

[Sources of fuels]		Gathering	Purchase	Other source	You don't know	Not applicable
[Proportion of total]		(A)	(B)	(C)	(P)	(N)
All	(T)	<input type="checkbox"/>				
Large part	(G)	<input type="checkbox"/>				
Half	(M)	<input type="checkbox"/>				
A little	(U)	<input type="checkbox"/>				
None	(R)	<input type="checkbox"/>				
		51A.	51B.	51C.	51P.	51N.
		<input type="checkbox"/>				

52. How many hours does it take you to collect, by yourself, enough fuel wood to do the cooking for your family for one day?  
 [Place, in the spaces reserved for this purpose below, the number of persons the respondent supports, the number of hours spent gathering wood, and the number of days of cooking possible with the amount collected.]

Number of children supported  Number of adults supported

Number of hours spent collecting wood

Number of days cooking possible with amount collected

INTERVIEWER'S COMMENTS