PRODUCTIVE LAND USE SYSTEMS

Haiti

SOUTH-EAST CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

AND

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MONITORING AND EVALUATION SYSTEM FOR PLUS

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Haiti PLUS PROJECT
Monitoring and Evaluation System

CONTENTS

FORWARD

This report is the product of a two month consultancy by Dr. Angelos Pagoulatos to develop a Monitoring and Evaluation System specifically for the Productive Land Use Systems Project (PLUS). The work was initiated in response to the PLUS Project Amendment of August 1992 transforming the Agroforestry II Project (AFII) into PLUS. This Amendment and SECID's Scope of Work specifically mandated "the development and implementation of an effective monitoring and evaluation system." To SECID was assigned the following responsibilities:

- to "actively support CARE, PADF and the USAID Mission in the proper monitoring and evaluation of the socio-economic impacts of project activities,"
- to "guide CARE and PADF in setting up regular monitoring of project activities, including the development of indicators for assessing purpose-level and output-level achievement"
- to "assist CARE and PADF in interpreting and analyzing data emerging from their monitoring systems and identifying programmatic lessons that apply to the entire project;"
- to "assist CARE and PADF in modifying their training programs in light of feedback received."

The system described herein is the product of extensive discussions held with CARE, PADF and USAID over the two month period. It seeks to respond concerns of USAID that the project chart its progress in adapting to the increased emphases on sustainability, income generation and farmer-client orientation. It also respects the Grantees' need to be efficient with respect to labor requirements for data collection. The focus of the evaluations are on the technical innovations rather than on performance of the institutions involved.

Due to the extensive time required to obtain consensus of all parties on the Strategic Performance Indicators and the uncertainty of the Grantees on the choice of technologies, it was not possible to finalize all the details of data collection that might be desired by the implementors. Nevertheless, the framework of a system which is both flexible with respect to future technologies and practical in application has been put into place. Refinements of the system are anticipated with future visits by Dr. Pagoulatos.

Dennis A. Shannon
Campus Coordinator
Haiti PLUS Project

EXECUTIVE SUMMARY

A Monitoring and Evaluation (M&E) System for PLUS was set up during a consultancy to Haiti between January 8 and February 26, 1993. The system was designed in collaboration with USAID, CARE and PADF, with the assistance of the SECID long-term staff. The system is general in nature, but will be refined as implementation plans are finalized and as more information becomes available. Key aspects of the M&E System are:

- a conservation farming systems approach;
- sustainability of environmental improvements;
- a learning process with information flow leading to refinement of existing interventions and identification of new interventions;
- Strategic Performance Indicators (SPIs) to measure progress of the project to meet its goals;
- the use of baseline information;
- monitoring of intervention packages;
- evaluation of intervention packages by farmer appraisal as well as by technical and economic assessment;
- refinements of the interventions; and
- refinements of the M&E System.

Examples of data requirements for monitoring of particular types of activities and some recommendations on methodology were included.

REZIMÈ

Yon sistem swivi ak evaluasyon pou pwojè PLUS te mète sou pie pandan pasaj yon konsiltan nan SECID ant 8 janvye e 16 fevrye 1993. Sistem sa'a te elabore ansanm avek USAID, CARE, PADF ak asistans pèsonel lontèn SECID yo. Nan nati li, se yon sistem ki general, men kap vin' pi fen lè tout plan travay fini ak plis enfòmasyon disponib. Men kèk aspè ki konsidere nan sistèm sa-a:

- Pou teknik ke pwojè-a ankourajé ta pèmèt kenbe tè-a;
- Veye pou amelyorasyon ki fèt yo dire lontan;
- Yon pwosesus aprantisaj ak sikilasyon enfònasyon ki ka pèmèt amelyore teknik ki la deja epi idantifye lot teknik;
- Defini kèk pwen byen klè ki va pèmèt mezire pwogrè pwojè-a fè;
- Al chèche enfòmasyon nan men peyizan-an pou ka pi byen konprann sa kap pasé;
- Swiv kòman moun yo aplike teknik yo;
- Chèche konnen si moun yo byen aplike teknik yo, si sa yo montre yo-a pèmèt yo fè plis lajan. Fòk nou chèche konnen tou si peyizan yo konsidere sa yo montre yo-a valab;
- Chèche konnen kòman teknik yo ka amelyore;
- Chèche konnen kòman sistèm pou swiv ak evalue aktivite pwojè-a ka amelyore.

Yo bay ekzanp sou ki kalite enfòmasyon ou ka bezwen pou kontwole kèk aktivite. Yo bay tou kèk konsèy sou fason pou ranmase enfòmasyon yo.

INTRODUCTION

The work for this consultancy started on January 8, 1993 and was completed on February 26, 1993 at Port-au-Prince, Haiti. The SECID multi-disciplinary team consisted of an Agricultural Economist, Dr. J. D. Zach Lea; Agronomist, Dr. Frank E. Brockman; and Agricultural Economist, Dr. Angelos Pagoulatos, the Monitoring and Evaluation Specialist. An M&E System for the interventions of PLUS was to be set up in collaboration with CARE and PADF.

The PLUS grantees were to finalize their implementation plans by the middle of March 1993 and, as a result, no specific agroclimatic zones or interventions were set at this point in time. The resulting M&E System is thus of a more general nature. As this consultancy continues in the future, opportunity exists to refine the M&E system and associated methods and procedures, as more information becomes available. In the interest of starting this process of M&E, data requirements were kept to a minimum. The goals of the PLUS M&E System are to evaluate and rank the performance of interventions and effectiveness of the project in meeting its goals of sustainable land use practices and farmer income.

I. THE PLUS TEAM AND ORGANIZATION

Workshop times and dates were set up for the collaborative effort and materials were prepared to facilitate the groups' efforts and discussions regarding the M&E System. The PLUS team received help from Dr. Wahab and Dr. Fontaine (USAID). SECID was represented by Dr. Lea and Dr. Brockman. CARE was represented by Mr. Gregory Brady, Mr. Artus Pierre and Mr. Wilner Alix. PADF was represented by Mr. Arlin Hunsberger, Mr. Michael Bannister and Mr. Gardy Florentin.

II. THE M&E SYSTEM FOR PLUS

II. a. FARMING SYSTEMS APPROACH

Adopting a conservation farming systems approach involves studying the system as an entity made up of all its components and their interrelationships, together with the relationships between the system and its environment (Douglas).

The aim of the PLUS team is to arrive at a consensus by understanding of farmers' natural and socio-economic circumstances, and to jointly develop appropriate productive and sustainable land use recommendations. The intention is to develop conservation farming systems that are both productive in the short term and sustainable (conservation and income effective) in the long term, addressing the needs of the small farmer.

II. b. SUSTAINABILITY (LAND USE/INCOME)

Sustainability of environmental improvements is addressed in the M and E System in terms of the improvements in land use practices through:

1. A learning process within the M and E system that allows for improving the development and refinement of the interventions.

2. Adoption of packages of interventions because of their continuing income potential to the farmer which increase labor and land productivity.

3. A monitoring system that documents the continuous management and adoption of interventions by farmers over time.

4. An evaluation of interventions by setting controls (Baseline control) and inclusion of farmer perceptions of problems, constraints, income and risk associated with the interventions (Farmer participatory appraisal).

II. c. LEARNING PROCESS AND THE M&E SYSTEM

Table 1 depicts the flow of information within PLUS and the resulting learning process. The consultancy of Dr. Marianito R. Villanueva, assisted by Dr. Richard A. Swanson, produced a review of technologies tested or developed in PDAI and ADS II Project with potential application to the PLUS project. From their recommendations on crops, cropping practices, soil and water conservation practices and future testing needs, PLUS will identify packages of interventions and agroecological zones where they will be operating. The information and knowledge generated under PLUS through the collection of baseline data, and all data from monitoring and evaluation will be part of the necessary documentation. This information will enable the identification of new interventions and refinement of present interventions. Thus, data collection procedures and analysis will be opened to scientific scrutiny. PLUS will gain credibility and allow the accumulation of knowledge on which to base future planning of interventions or projects.

Table 2 illustrates the flow of the M&E system. This flow is based on the learning process and links together all subsystems. The SPIs break the evaluation of interventions into parts which constitute benchmarks to be achieved. Timing and sequence of the main M&E activities are also given for collection of baseline information and monitoring and evaluation. The M&E System was not intended to lead to an evaluation of project impact, but rather to provide information necessary in increasing the effectiveness of the grantees in selecting interventions and making them available to farmers.

Table 1 . M&E PLUS SYSTEM
Learning process and refinement of interventions

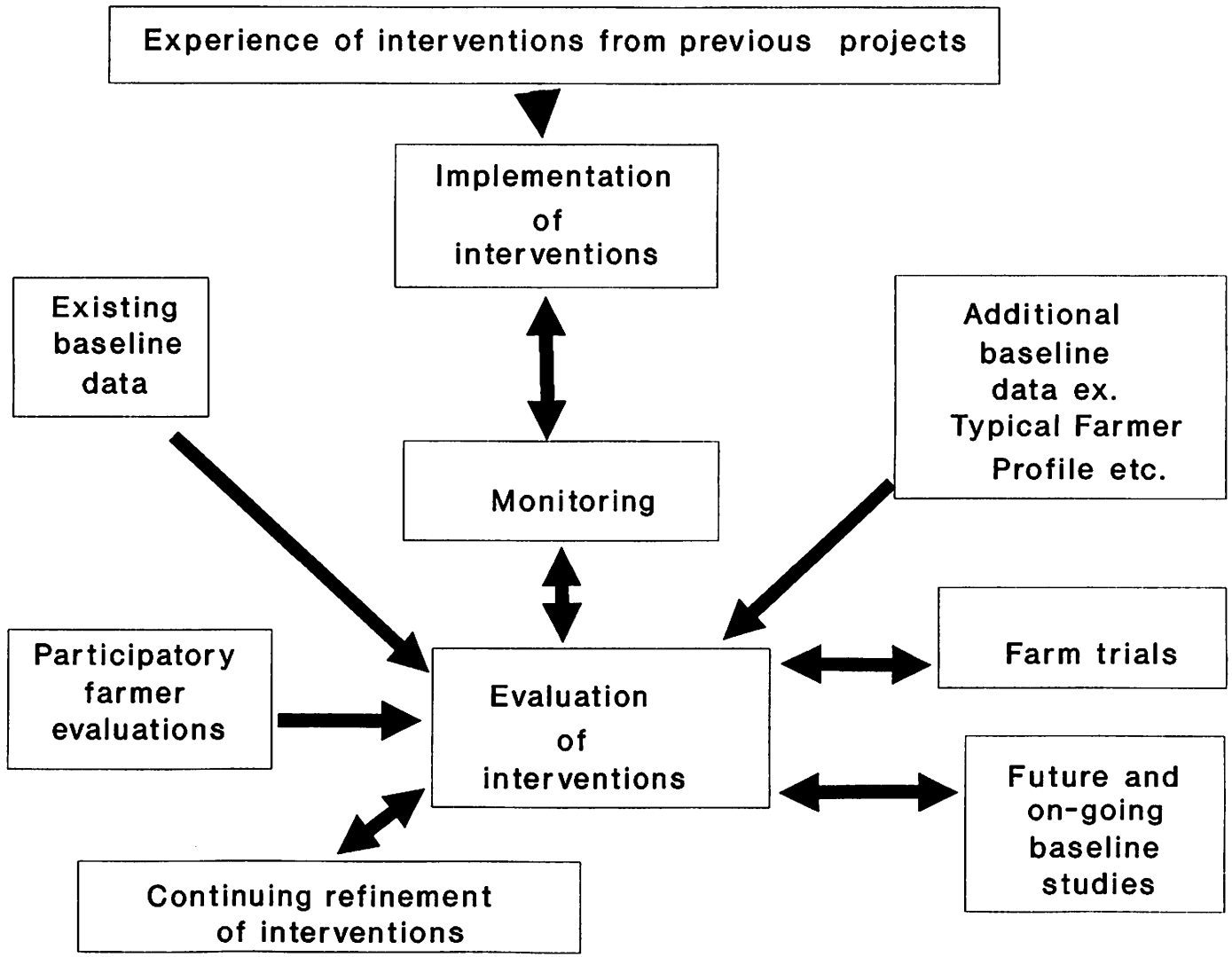
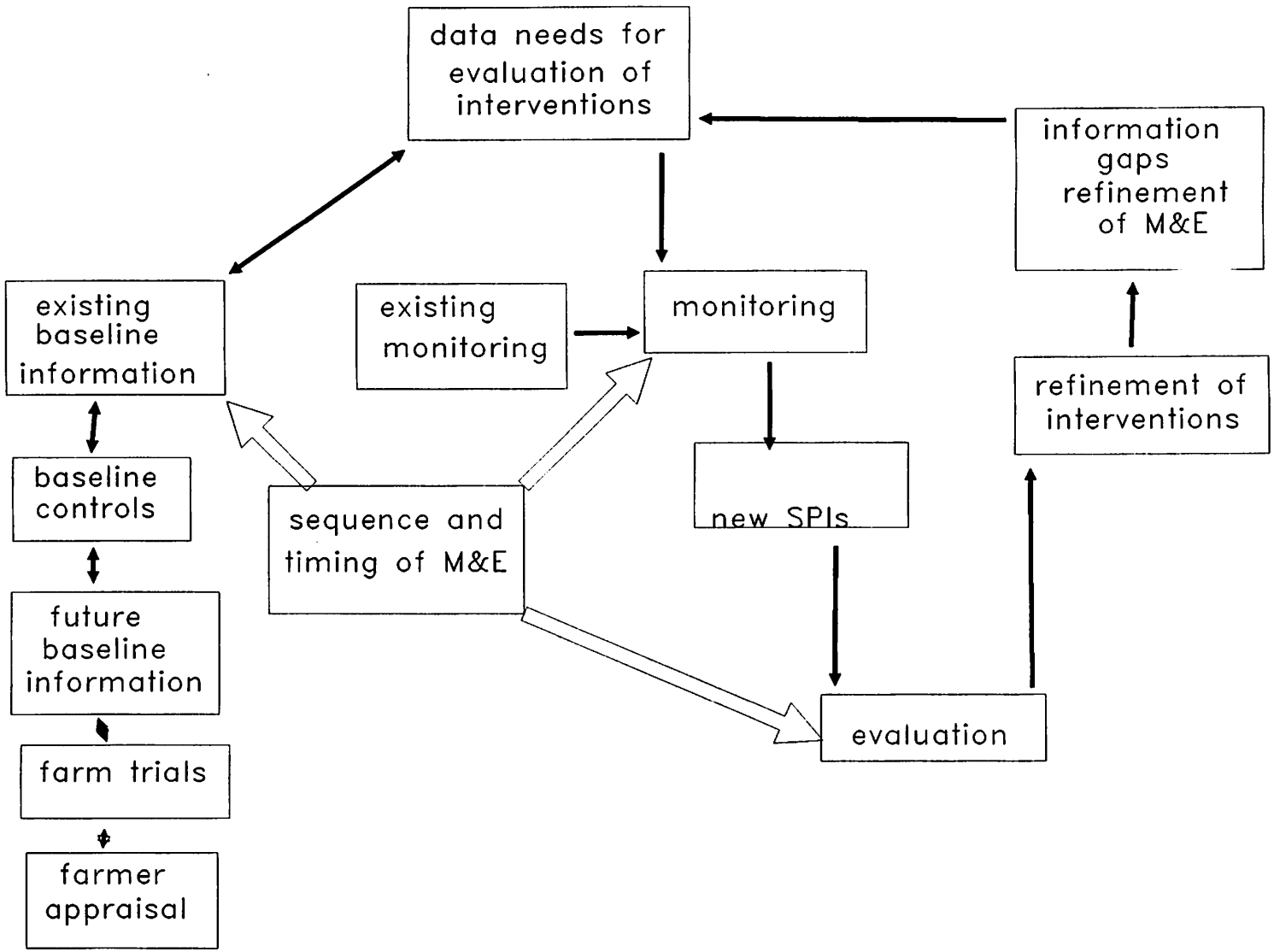


Table 2 . PLUS M&E SYSTEM



II. d. STRATEGIC PERFORMANCE INDICATORS (SPIs).

Until now, SPIs were used by the project to monitor and report project activities, with associated targets to be met at prespecified periods of time. The numerical values of the SPIs represented meters of hedgerows installed, number of gully plugs installed, number of farmers installing hedgerows, etc. When the M&E system was instituted to evaluate interventions and quantify income and environmental effects associated with these interventions, it became clear that the old SPIs would not suffice. Although these old numerical SPIs will still continue to be reported, new SPIs should be added to the reporting of PLUS to evaluate and rank and refine its interventions.

The new SPIs address sustainability of income and environmental effects stemming from project interventions. These new SPIs were identified in collaboration with CARE and PADF. The purpose of the evaluation process is to identify information gaps, allow for refinement of present interventions and identify new interventions for PLUS.

As a first approximation to the PLUS M&E system, the attainment of these new SPIs represents generation of information and key measures for evaluating interventions. It will allow PLUS to quantify some of the main variables and measure progress of the project in meeting its goals.

Nineteen new SPIs were formulated that address information associated with project objectives (Table 3). Reporting units and formats associated with each SPI document both data collection and analytical procedures used in the calculation of the SPIs.

The SPIs address environmental direct impacts through changes in land use practices (SPI: I.1-I.5 and II.1). Income is addressed through the incremental net returns associated with each intervention (SPI: III.1 and V.1). Indirect income impacts become part of the incremental net returns associated with each intervention since benefits to livestock, firewood, etc. are now part of the farming system. Long-run income effects are represented by the increase in livestock which serve as a savings account and risk aversion mechanism for the farmer in SPI: IV.5 (Ellis).

Secondary impacts of environmental improvements (sediment, water capacity and quality etc) are addressed, at this point in time, by measuring soil retained by structures (SPI: I.3 and I.5).

Sustainability is explicitly accounted for by the continuous refinement of interventions based on farmer reaction and participation (SPI: IV.1 - IV.7 and V.1 - V.5). Farmer increased environmental awareness is reported with SPI: V.5. Since farmers

TABLE 3. NEW PLUS SPIs

Strategic Performance Indicators	Reporting Units & Formats	Reporting Frequency
I. ENVIRONMENTAL (QUANTITATIVE)		
1. Percent of area of a micro-watershed in environmentally improved land use practices (rate of adoption of interventions).	a. Copies of maps of representative micro-watersheds. b. Calculations (improved area/total area) (adopting farmers/No. farmers)	
2. Secondary adopters per area per project-assisted farmer.	a. Describe method of observation b. Count	
3. Physical soil buildup behind structures on farm plots (m^3/m).	a. Methods of field measurements for mechanical structures and hedgerows b. Report calculations	
4. Percent of secure household farm in the intervention area in environmentally appropriate land use practices.	a. Report method of data collection & calculations. b. adopting farmers by tenure (security over farm plots) of: 1) tillage, planting, weeding, & crop residue practices 2) crop rotation, intensity & fallow mgmt 3) mech. structures, hedgerows & their mgmt.	
5. Area of arable land created by mechanical structures (Ha).	a. Method of field measurement b. Report calculations c. Value of crops produced on that land	

TABLE 3 (Continued)

Strategic Performance Indicators	Reporting Units & Formats	Reporting Frequency
II. ENVIRONMENTAL (QUALITATIVE)		
1. Improvement of contiguous farm land adoption of conservation land use practices within the micro-watershed	a. Copies of maps b. Method of calculation for descriptive results	
III. FARMER INCOME (QUANTITATIVE)		
1. Incremental net returns for each intervention.	a. Method of data collection for: yields, prices, labor requirements, & other monetized cost used in the analysis b. Methods of analysis & calculations for each intervention	
IV. ENVIRONMENTAL AND INCOME SUSTAINABILITY SPIs (QUANTITATIVE)		
1. Number of farmers adopting improved seed (commercial or seed bank) & No. of participating farmers & amount of seed handled for: cereals, vegetables, fruit, hardwood, & fast-growing tree seedlings, etc.	a. Method of data collection b. Analysis c. Comment on existence and performance of private nurseries	
2. Area of household farm under improved seed (or better quality seed)	a. Area planted to traditional seed b. Area planted to improved seed	
3. Hedgerows installed (area) and percent still effective.	a. Meters of hedgerow installed chronologically b. Meters of hedgerow still in place and properly managed by chronological installation by tenure.	

TABLE 3 (Continued)

Strategic Performance Indicators	Reporting Units & Formats	Reporting Frequency
IV. ENVIRONMENTAL AND INCOME SUSTAINABILITY SPIs (QUANTITATIVE)		
4. Percent of farmer income gains from interventions with environmentally improved land use practices.	a. Identification of interventions having a direct environmental impact. b. Method of calculation of income gains for interventions (from III.1). c. Present & sum farmer income gains from each intervention (including the gains from trees & wood products) in the zones of operation	
5. Percent increase in No. of household farm livestock	a. Present control data for each zone of operation. b. Method & result of enumeration	
6. Incremental net returns to land/ha	a. land area under each intervention times incremental net returns for each intervention (SPI: III.1)	
7. Average gain in labor/hour productivity.	a. incremental net returns for each intervention divided by hour labor requirements per intervention	

TABLE 3 (Continued)

Strategic Performance Indicators	Reporting Units & Formats	Reporting Frequency
V. ENVIRONMENTAL AND INCOME SUSTAINABILITY SPIs (QUALITATIVE)		
1. Interventions addressing farmers' most preferred farm-based income-earning enterprise	a. Method of data collection b. Results of farmer preference ranking of farm-based, income-earning enterprises c. Describe how interventions address farmers' preference ranking. d. From farmer expressed preferences identify new products that may require further marketing studies. e. Suggest marketing studies for identifying new interventions for increasing farmer income.	
2. Risk reduction associated with each intervention as perceived by farmer.	a. Method of data collection. b. Qualitative results of farmer perceived risks associated with each intervention. c. Describe how refinements of interventions address farmers' risk perceptions.	

TABLE 3 (Continued)

Strategic Performance Indicators	Reporting Units & Formats	Reporting Frequency
V. ENVIRONMENTAL AND INCOME SUSTAINABILITY SPIs (QUALITATIVE)		
3. Correspondence between project calculated evaluation and farmer evaluations of income potential for each intervention.	a. Method of data collection b. Comparison between farmer evaluations of income potential & calculated evaluation & ranking based on III.1	
4. Refinement of interventions based on problems and constraints identified by farmers.	a. Method of data collection b. Problems & constraints expressed by farmers associated with each intervention. c. Describe how refinements of interventions address these problems & constraints	
5. Human resource development	a. Address benefits & regional impact from development of skills b. Increased farmer environmental awareness	

minimize risk, special importance is placed on SPI: V.2. Finally, income from interventions that strictly address environmental improvements is reported separately from those interventions which are income oriented and depend on farmer participation in improved land use practices (SPI: IV.4). Interventions aiming at production intensification to alleviate the need for additional land requirements and income from tree products should receive special attention. Intensification of production may not be a strategy to be pursued in the areas of intervention given extremely low incomes, increasing population pressure, and large gaps in self-sufficiency (Larson and Pagoulatos). New interventions for PLUS could be developed, motivated in part, by the information identified with SPI IV.4.

The SPIs defined in Table 3 follow the learning process described in Section II.c. above. They provide for a continuous identification of information gaps to improve the M&E system (SPI: V.3). CARE and PADF may add SPIs as they see fit to address more specific internal needs. The SPIs in Table 3 were agreed to by everybody on February 12, 1993.

On February 23, 1993, SECID and CARE agreed to the following modifications to SPIs: I.1, II.1, IV.1, IV.2, IV.3, and V.3.

For SPI: V.3, it was agreed that SECID will have the primary responsibility to report and be able to suggest improvements in data collection.

For SPI: IV.1, only fast-growing tree seedlings are relevant for CARE, since CARE is not extending any of the other interventions.

For SPI: IV.3, CARE will not be reporting information if hedgerows are not one of its interventions.

SECID and CARE also agreed that CARE, citing the lack of qualified personnel, will request SECID research efforts to address the data collection and analysis for SPIs I.1, I.3, I.5, II.1, III.1, IV.2, IV.4, IV.6, IV.7 ,V.2 and V.5.

For SPI: IV.5, CARE could use an indicator, potentially other than livestock, that will result from a sociological study of farmer expenditures.

For SPIs V.1 and V.4, CARE will follow the "Reporting Units and Formats" of the SPI and report the information in its quarterly and semi-annual reports, which will become available to SECID.

III. BASELINE DATA

Table 4 provides the sequence and timing for the generation of the baseline information. Some information already exists and some is

in the process of completion. Future baseline type studies such as farm trials are in the planning stages. Completion times are attached to each activity, and Table 4 suggests a sequence of activities and benchmarks.

III. a. EXISTING BASELINE DATA

Existing baseline studies provide detailed information on a regional basis regarding: labor profiles (labor use by operation, family labor availability) and contribution to total revenue (ADS II Project, 1986 and ADS II, 1987, Taylor).

Costs of production for major crops are reported for the Les Cayes Region (Grafton and Quentin, ADS II, 1987). Biomass production, land tenure, cropping calendars, variability of prices and adoption of farming system innovations are addressed by several reports (Cunard, Jaffe, Walters #52, Grafton et al #43, Swanson et al, Walters #44, Bertelson, Grafton et al #40, Blemur etc).

The reports quoted here are only a subset of the existing baseline data available and represents a few reports I found and had a chance to read. SECID is in the process of instituting an Information Clearinghouse and documentation center and will be able to identify other existing information.

Based upon the baseline data examined, prices of inputs and outputs are needed in order to make a strictly financial initial evaluation of the interventions. However, existing data may not serve PLUS well, given the specific agroecological zones of intervention by CARE and PADF. In the agro-ecological zones of intervention, income characteristics may be very different from the more aggregate data available in the available baseline information.

III. b. BASELINE CONTROL

A set of maps describing the farm holdings, geophysical characteristics and land use practices within a microwatershed should be drawn to serve as control for SPIs: I.1 and II.1. These maps may be drawn with the help of existing GIS information and need only be rough sketches of the microwatershed. They are not needed for every microwatershed in the regions of operation. Rather, a sample of a few watersheds can be chosen to represent the strategic performance indicator within region of operation.

Existing baseline information was collected in 1985-1986. It is necessary to update prices paid and received in order to operationalize existing information.

The data needed are crop prices, wage rate information, livestock numbers and prices, land use profile and information on tree

TABLE 4 PLUS SEQUENCE AND TIMING FOR BASELINE INFORMATION

IMPLEMENTATION BASELINE INFORMATION	JUNE 1993	DECEMBER 1993	JUNE 1994	DECEMBER 1994
Existing baseline information	(1) SECID experts identify and evaluate information from existing reports/files (March)			
	(2) Dr Villanueva's report (February)			
	(3) Information Clearing house and Documentation Center at SECID (March)	(3) Updates and linkages (Sept)	(3) Updates and linkages (March)	(3) Updates and linkages (Sept)
Presently undertaken Baseline studies	(4) Baseline control data (March) (4') Typical farmer profile by agroclimatic zone-land use practices and enterprises Pre-Testing (March) Completed data collection and reports to SECID (April). SECID analysis of information. (June)			
Baseline Studies underway	(5) Dr Jolly's consultancy marketing in the Northwest report (?)		(6) Dr Shapiro's Preliminary results	(7) Final Results
Future Baseline Studies	(6) Identification of Additional Baseline Studies needed	(6) Same	(6) Same	
	(7) Completion of Studies under (6) and (7)	(9) Same	(9) Same	

TABLE 4 (Continued)

IMPLEMENTATION BASELINE INFORMATION	JUNE 1993	DECEMBER 1993	JUNE 1994	DECEMBER 1994
Farm Trials	(10) Design Farm trials based on baseline information (1) - (6) (April)		(11) Refinements in Farm Trials from Evaluation Input (April)	

production and wood products. Table A1 in Appendix A presents the data entries that CARE and PADF need to collect. The baseline control data correspond to a subset for the "baseline control" information Typical Farmer Profile developed by the PLUS group led by Dr. Lea.

In Table A1, it can be seen that only some of the information needs to be at the agroclimatic zone level and most at the regional level. The data needed at the agroclimatic zone level may be collected from a small sample of agroclimatic zones. SECID, CARE and PADF will decide the exact level of information needed at the agroecological zones. Furthermore the method of collection could be from a meeting of key informants.

III. c. TYPICAL FARMER PROFILE AND FUTURE BASELINE STUDIES

In the previous section, we decided to collect some information from the Typical Farmer Profile as part of the Baseline Control information. This information is needed quickly for the initial evaluation of the interventions and it will be collected from key informants. A more extensive effort, as the one described in the Typical Farmer Profile, should be done in a more systematic way in order to improve over time the data base for the evaluation of interventions.

The Typical Farmer Profile (TYP), should be field tested and refined before it is implemented. It should also be modified depending on informational objectives to be identified in the future. The TYP will be useful for collecting and organizing baseline data on a sample of farmers within representative agroecological zones of operation of CARE and PADF. In these cases, the TYP could be expanded to capture additional socio-economic information and should be applied to samples of farmers within representative recommendation domains of the agroecological zones. Additional future baseline studies considered by the team are addressed in Appendix A.

IV. MONITORING OF INTERVENTION PACKAGES

Table 5 provides a suggested time table for the flow of monitoring activities. Dates for the completion of activities are suggested to PLUS grantees as they make progress in writing their implementation plans for the next two years. As mentioned above, the already existing monitoring and reporting of number of farmers adopting interventions and numerical accounting of interventions remains in place. Additional monitoring forms will be developed by the PLUS team.

IV. a. DATA NEEDS

Suggested data needs for monitoring of interventions are given in Appendix B.

IV. b. METHODOLOGY, DATA COLLECTION AND ENTRY

SAMPLING

To conduct the monitoring activities, given constraints of time and cost, PADF and CARE will draw samples from the farmers showing intention to adopt one or more of the interventions proposed within a package. For each general type of intervention:

1. Hedgerows
2. Crops
3. Fruit and hardwood trees
4. Cover crops
5. Mechanical structures

a sample of 10 farmers per intervention will be drawn at random. Thus for approximately 4 geographic regions of intervention for PADF, and 5 interventions, a total sample of 200 farmers will be drawn. The sample should be distributed between agroecological zones of intervention using as weights the population of farmers indicating intent to adopt at least one of the interventions within an agroecological zone. CARE should have a similar sample. No reference is made here on basing sample size on range, error and variance since we know nothing regarding the interventions. Eventually a more precise sample size will be determined.

For the second year of PLUS implementation, the sample will increase from 10 farmers per intervention by an additional 5 farmers per intervention following the same procedures as above. Thus the size of the sample for CARE and PADF will become approximately 300 farmers. This way, refinements of interventions can be incorporated into the sample.

DATA ENTRY SYSTEM

All tables needed for the collection of data as part of the Monitoring and Evaluation for the PLUS project will be developed collaboratively by the PLUS team. Similar tables will be used by either PADF and CARE in reporting results. It was agreed that all three groups (CARE, PADF and SECID) had access or could convert to LOTUS 123, which will facilitate the analysis of the information gathered. The data is to be kept and delivered in electronic file format.

The group started to develop some common monitoring forms for alley cropping and they will continue the effort over the next few weeks.

TABLE 5 PLUS SEQUENCE AND TIMING FOR MONITORING

Implementation of intervention monitoring	June 93	Dec 93	June 94	Dec 94
Monitoring of intervention packages	(1) Identify monitoring data needs, data entry system and reporting (FEB)			
	(2) Develop forms for monitoring of interventions			
	(3) Determine data collection methodologies (FEB)			
	(4) Draw farmer sample for monitoring (MAR)		(5) Draw additional farmer sample	
	(6) Monitoring for: hedgerows, mechanical structures, crops, hardwood tree, fruit tree (APR)	(6) Monitoring (SEP)	(6) Monitoring (APR)	(6) Monitoring (SEP)
	(7) Reporting monitoring results to SECID (MAY)	(7) Reporting (OCT 10)	(7) Reporting (MAY 10)	(7) Reporting (OCT 10)

TABLE 5 (Continued)

Implementa-tion of interventi on monitoring	June 93	Dec 93	June 94	Dec 94
	(8) Analysis and report of monitoring results by SECID (JUN 1)	(8) Analysis and report of monitoring results by SECID (DEC 1)	(8) Analysis and report of monitoring results by SECID (JUN 1)	(8) Analysis and report of monitoring results by SECID (DEC 1)
Monitoring of farm trials		(9) monitoring report on farm trials (DEC 1)	(11) monitoring report on farm trials (AUG 1)	(11) monitoring report on farm trials (DEC 1)
		(10) monitoring report on farm trials (DEC 1)		
Meetings and newsletter	(12) PLUS review meeting and newsletter (APR)	(12) PLUS review meeting and newsletter (JUL)	(12) PLUS review meeting and newsletter (MAR)	(12) PLUS review meeting and newsletter (JUL)
		(12) PLUS review meeting and newsletter (SEP)		(12) PLUS review meeting and newsletter (SEP)
		(12) PLUS review meeting and newsletter (DEC)		(12) PLUS review meeting and newsletter (DEC)

IV. c. FARM TRIALS

Based on the consultancies of Drs Villanueva and Swanson and the expertise of the PLUS team, farm trials are to be initiated within PLUS. Establishment of participatory monitoring and evaluation programs will follow. Revision and refinement of the trials and extension recommendations will be based on feedback provided by the monitoring and evaluation activities. The monitoring, evaluation and revision activities are to be on-going throughout the farm trials.

Monitoring of:

1. The execution and management of the farm trials;
2. The progress with dissemination of the recommendations.

Evaluation of:

1. the results of the farm trials to determine the effectiveness and potential impact of the test practices;

2. farmers' reasons for adoption, modification or rejection of the extension recommendations.

V. EVALUATION OF INTERVENTION PACKAGES

Evaluation of interventions or intervention packages is the guiding force of the M&E System for the refinement of interventions. Table 6 provides a suggested time table of the proposed activities.

V. a. DATA NEEDS

A suggested list of data needs for starting the evaluation of interventions is presented in Appendix C.

V. b. PARTICIPATORY FARMER APPRAISAL EVALUATION

Appendix C, describes a farmer group informal participatory process. A farming systems consultant with knowledge of expert systems and analytical hierarchy process should lead the design of the participatory farmer appraisal and evaluation of interventions. The identification of problems, constraints and perceptions of risk should not be obtained in a vacuum. That is, there should be an explicit recognition and documentation of the kinds of knowledge the farmer has as a reference (i.e. type of farm trials, type of intervention, information on additional possibilities provided by the project, etc) when providing her evaluations.

TABLE 6 PLUS SEQUENCE AND TIMING FOR EVALUATION

IMPLEMENTATION OF EVALUATION OF INTERVENTIONS	JUNE 1993	DEC 1993	JUNE 1994	DEC 1994
IDENTIFICATION OF DATA NEEDS FOR EVALUATING INTERVENTIONS	(1)Data existing from baseline studies (table AD1) (February) (2)Baseline Control (February) (3)Complete collection of additional data for evaluating interventions in 2) by CARE and PADF and reported to SECID (April 15)			
PARTICIPATORY FARMER GROUP APPRAISAL	(4)Participatory farmer appraisals. Farmers perception of problems (April) Information and Reports given to SECID (May 1). SECID processes information and synthesizes reports with causal diagrams (May 15)	(4) same (October, November 1, November 15)	(4) same (April, May 1, and May 15)	(4) same (October, November 1, and November 15)
FARM TRIALS		(5) Farm trials evaluation report (August) Farm trials evaluation report (November 1)	(5) same (May 1)	(5) same (November 1)
EVALUATIONS OF INTERVENTIONS AND LEARNING PROCESS	(6) SECID will analyze the data from (1), (3) and (4) and provide report with evaluations of interventions with suggestions for refinements of interventions (February 1)	SECID will analyze the data from (4), (5), and monitoring results to evaluate PLUS interventions and provide suggestions for the refinements of interventions. (December 1).	(6) same (June 1)	(6) same (December 1)

VI. REFINEMENTS OF INTERVENTIONS AND M&E SYSTEM

The M&E System for PLUS, represents a systematic method for collecting, analyzing and incorporating additional information in the evaluation of interventions. Strategic performance indicators serve the role of early warning signals to the progress of PLUS implementation of the M&E system.

Analyses and procedures that make up the M&E System are general in nature given that the grantees are now in the process of determining their final implementation plans. As the next two years evolve, refinements of the M&E System will be necessary and, in particular, the analyses and methodology of the evaluations will need to improve as more information becomes available.

At this point the baseline data collection and monitoring information do not entail appreciably more effort. According to PADF, although monitoring will require the collection of more information, the area covered by interventions will be much more concentrated than before. Table C3, in Appendix C, was an attempt to estimate the effort needed for the M&E. Ultimately, the level of effort depends mainly on whether CARE and PADF only consider information collected at the agroecological level to be useful to their operations. Obviously, the more detailed and disaggregated the data, the more the effort and cost required for their collection.

In this report, several data lists and methods of analysis of data were presented upon request of the grantees. They were compiled in order to facilitate the grantees' understanding of the size of the M&E system.

We all understand and recognize that the impacts of the interventions could turn out to be very small, that the agroecological zones differ and are too many, that the farmer household is complex, that in general that the world is too complex and therefore very difficult to infer and generalize from relatively few observations. If one concludes that therefore we need a complete description of the complex world before we can determine orders of magnitude, it is an incorrect conclusion. These grantees have been thinking about concentrating to a few interventions (about four). If they perceive an evaluation of gully plugs as having to address most shapes and forms of gully plugs, it must follow that the grantees are not working with four or so interventions, but hundreds of them. If this is the case then evaluation could be based on the different recommendations associated with each of the hundreds of project interventions. The evaluation of interventions should be done within a comparative framework and therefore determination of orders of magnitude should suffice.

In light of limited resources and time, I would suggest that the use of proxies, secondary information (previous project reports, World Bank etc.), and experience be used as much as possible. Limit research studies to information that is the most crucial to the extension effort. This means that PLUS needs to prioritize research needs. The impacts from interventions could turn out to have small magnitudes but this cannot mean that therefore we should not be attempting to measure them. As long as they refer to the project goals of income and environmental sustainability they need to be calculated. PLUS could reduce, rather, some of its efforts in identifying and measuring secondary impacts (or whether livestock or tin roof is a better proxy) when it is having difficulty addressing the orders of magnitude associated with the selection and refinement of its interventions. As this M&E is refined overtime, some of the impacts as they relate to project goals will be addressed more directly.

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APPENDIX A

Analysis of Baseline Control and Use of Data

Table A1 - Baseline Control

Future Baseline Studies

ANALYSIS OF BASELINE CONTROL AND USE OF DATA

The Baseline Control farmer profile will provide the following information:

1. Yields and output prices received for important crops and intercrops for each zone.

2. Land use practices in crop/intercrop, tree and livestock activities which will be characterized as to their relationship to good conservation (Tables C1 and C2 in Appendix C)

3. From monetized costs of inputs and labor, a net farm income estimate will be obtained for each household farm activity (crop/intercrop, trees and livestock).

4. Returns to land for evaluation of intervention packages.

5. Average labor productivity for evaluation of intervention packages.

6. Number of on farm livestock for the calculation of wealth accumulation indicator.

7. Number of trees by species in order to calculate additional tree species contributed by PLUS.

8. Improvement of farm household income generated from intervention packages.

Table A1 presents the entries for the Baseline Control data. Explanations for each entry follow:

1.1 Crop/Intercrop Profile. The Crop/Intercrop form is used for either sole crops or intercrops. In the case of a sole crop, a mark should be drawn through the word "INTERCROP" and the name of the sole crop entered on line 1.1. Line 1.2 should be left blank in the case of a sole crop. In the case of an intercrop, a mark should be drawn through the word "CROP" and the name of the intercrop, "maize-black bean," for example, is entered in the first line. The name of one of the intercropped crops should be entered on the second line, "maize," for example. Additional pages of the form should be used for the other crops of the intercrop combination. Thus, with a maize-black bean intercrop, you would have two forms with "maize-black bean" on the first line. One of these forms would be used to enter information about the beans and thus would have "maize-black bean" on the first line and "black bean" on the second line.

1.2 Intercrop/Crop name

1.3 Crop Cycle Dates. Enter the start and end month for each crop cycle. A crop cycle begins with land preparation and planting and ends with harvest. For example, if the first crop cycle begins in January and ends in May, the entry would be: Jan-May.

The "Crop Cycles" columns are to used to enter information about crop activities that relate to a particular crop cycle. In many cases, only one cycle of the crop is grown per year. In these cases, only one column would be used. In some cases, the crop is planted and harvested more than once each year. In these cases, more than one column would be used. The first column would be used to enter information about the first cropping cycle. Additional columns would be used to enter information about the second and third crop cycles.

1.4 Area Planted. This is the area in local unit of measure of the farm plot planted to this crop. (Total farm area will be recorded on the General Questions Relating to the Farm form). Since land-use is a major concern of the project, it would be most helpful to know how farmers use their various plots of land. Thus, if a farmer produced one crop or intercrop on different fields with significantly different degrees of slope, a separate set of crop/intercrop forms should be completed for each field or plot. For example, if the farmer typically has a hillside plot and a valley-bottom plot planted to the same crop or intercrop, then crop/intercrop forms should be completed for both fields as if there were different crops planted on the two fields. This will allow us to understand differences in yields and crop expenses between the two sites.

1.5 Slope of area planted. Farmers may have the same crop planted on hillside or on valley bottom land. This question asked what is a <u>typical</u> slope for this crop. Select one of the three responses shown on the form and enter its number into the "Crop Cycles" column.

1.6 Use of crop residue. Enter the number from the choice list of the response that best describes the typical situation.

1.7 Method of land preparation. Enter the number from the choice list of the response that best describes the typical situation.

1.8 Planting practices for crop. Enter the number from the choice list of the response that best describes the typical situation.

1.9 Planting distance between rows.

1.10 Planting distance within rows. This refers to the distance between groups of plants (hills) within a row or to the distance between individual plants within a row when they are not planted in

hills.

1.11 Planting: surviving plants per hill. Enter the number of plants per hill that survive. "Survive" can be considered survival to flowering stage.

1.12 Crop variety. Enter the number from the choice list of the response that best describes the typical situation.

1.13 Number of weedings per cycle.

1.14 How weeding is done. Enter the number from the choice list of the response that best describes the typical situation.

1.15 Intercrop name:. This is simply a repeat of the same information entered on the first page of the 2-page Crop/Intercrop form.

1.16 Prices paid by farmer for fertilizer and agricultural chemicals (Gde/cycle).

1.17 Amount of harvest per crop cycle. Enter the amount of the harvest less any spoiled grain or fruit that cannot be used in the same manner as most of the material harvested. This figure includes all of the harvest that can be used by the farm family or sold. Enter this amount in the local market measurement unit used by the farmer. We want the harvest to be expressed in the unit of measurement used in the local market. For example, beans are harvested and sold in marmites. Hopefully, the harvest unit and the market unit are the same. But if they are not, please express the harvest in the local market unit.

1.18 Give the number of kilograms in the local market unit. For example, a marmite of maize contains 2.77 kg.

1.19 Selling price per market unit. This is the price the farmer receives when selling the product to the typical buyer. If the farmer does not normally sell the product, record the price the farmer would receive if the product were sold.

1.20 No. hours in standard hired person day. Enter the number of hours implied when key informants speak of a man-day in discussing hired labor. This figure is to be used with the information collected on labor inputs.

1.21 Price of seed or plants. Enter the price a farmer would pay for seed or plant seedlings/cuttings. Enter the price whether or not the farmer actually purchases the material (per standard land unit).

1.22 Land prep. labor cost/p-day. Enter the amount of money plus the value of food and drink normally given each day to a worker who

is preparing land for planting.

1.23 Planting labor cost/p-day. Enter the amount of money plus the value of food and drink normally given each day to a worker who is planting land.

1.24 Frt/chem labor cost/p-day. Enter the amount of money plus the value of food and drink normally given each day to a worker who is applying fertilizer and chemicals. Remember to indicate whether men, women, or children normally do this work.

1.25 Harvest labor cost/person-day. Enter the amount of money plus the value of food and drink normally given each day to a worker who is doing weeding.

1.26 Harvest labor cost/person-day. Enter the amount of money plus the value of food and drink normally given each day to a worker who is doing harvesting.

1.27 P-harvest labor cost/p-day. Enter the amount of money plus the value of food and drink normally given each day to a worker who is doing post-harvest processing.

LIVESTOCK PROFILE FORM

The livestock profile form is used to develop a profile of the most important livestock enterprises of the representative farm. We would expect these enterprises to include such animal enterprises as chickens, goats, and pigs. We would not want the family horse or donkey included here unless producing horses or donkeys for sale was a common enterprise of most farmers in the area.

There are two columns under the heading, "animals." Each of these columns can be used to enter information about a separate animal enterprise. For example, one column could be used for the goat enterprise and the second column could be used for the pig enterprise. The complete profile of the representative farm will contain livestock profiles for up to four animal types. Thus, one or two livestock profile forms will be completed for each representative farm.

Animal production unit. In several of the questions below, we will refer to an "animal production unit" (APU). An APU is a breeding age female and her off-spring.

2.1 Name of animal. Enter the name of the animal enterprise. For example, goat or pig.

2.2 Number of breeding age males. Enter number.

2.3 Number of breeding age females. Enter number.

2.4 Production cycles/year. A production cycle begins when the female is bred and ends when the off-spring are weaned or sold. An animal may have a fraction of cycles per year. For example, a goat may have 1.4 cycles per year.

2.5 No. off-spring per cycle. Enter number of off-spring. For example, a goat normally has two off-spring per cycle.

2.7 Selling price for babies. Enter the selling price the farmer receives for the babies sold.

2.8 Selling price for weaned animals. Enter the selling price the farmer receives for weaned animals.

TREE CROP PROFILE

The tree crop profile form is used to describe a single tree crop such as mango or orange. The complete profile of the representative farm will contain 1 to 4 tree crop profiles representing 1 to 4 separate tree crops. The tree crops selected for description should be those that make important contributions to the farm family income in terms of products consumed on the farm or sold.

3.1 TREE CROP PROFILE FOR: (species). Enter the common name, variety and scientific name of the tree crop.

3.2 Number of trees owned.

3.3 Products (in order of importance). Enter the products produced from the tree in their order of importance, beginning with the most important entered into the first column from the left. For example, a mango tree would produce mangos, fuel wood, charcoal, or planks. If mango fruit were the most important product, it would be listed first. If fuel wood were the second most important product, it would be listed second.

3.4 Production cycles/year. For a fruit tree, a production cycle begins with flowering and ends with harvest. For a fuel or fodder producing tree, a production cycle begins with harvest, continues through regrowth and ends just before reharvest. Thus, a production cycle includes one harvest.

3.5 Quantity harvested/cycle. Enter the amount of harvest units per production cycle. For mango fruit, this might be expressed in number of individual fruit or number of standard containers. For a fuel or fodder crop, this might be expressed in armfuls.

3.6 Selling price per harvest unit. Enter the price the farmer could receive for the harvest unit. We recognize that prices are often low at harvest time. However, if that is when the farmer

would typically sell, that is the price we want.

3.7 Tree care labor per cycle (p-days). Enter an estimate of the number of person-days spent in caring for the tree each cycle. This should not include harvest labor. Again, use the same method of entering the person-days of labor (including the male, female, or child designations) that we discussed above.

3.8 Tree care labor cost per day. Enter the amount of money plus the value of food and drink the farmer would have to give each day to a hired worker who is caring for the tree.

3.9 Harvest labor (person-days). Enter an estimate of the number of person-days required for harvesting the production from each tree.

3.10 Harvest labor cost per day. Enter the amount of money plus the value of food and drink the farmer would have to give each day to a hired worker who does the harvesting.

3.11 Post-harvest labor (person-days). Enter an estimate of the number of person-days required after the harvest to prepare the product for marketing.

3.12 P-harvest labor cost per day. Enter the amount of money plus the value of food and drink the farmer would have to give each day to a hired worker who does the post-harvest work.

3.13 Cost of package per market. unit (Gdes). Enter the cost of the package being used to market the product. For example, grain is often marketed in sacks; so, the sack is the package. Tomatoes are often marketed in boxes; so, the box is the package. If the package is not sold with the product, do not enter a cost for the package. For example, grain is often carried to market in baskets that the farmer keeps.

3.14 Packaging labor (mkt. units/person-day). Enter the number of market units a hired person is expected to fill in one day. For example, if the packaging job is to fill sacks with grain, tell us how many sacks a worker is expected to fill each day. Remember to indicate whether men, women, or children normally do this work. If this labor has already been included in the post-harvest labor discussed above in paragraph 3.11, please indicate this by writing: "included in post-harvest labor."

3.15 Packaging labor cost per person-day. Enter the amount of money plus the value of food and drink normally given each day to a worker who is doing post-harvest packaging.

3.16 Transport per market unit. Enter the amount of money a farmer would have to pay someone else to transport a market unit of the product to the market at which it is normally sold. For

example, the farmer may have to carry mangos to market in a basket. How much would the farmer have to pay someone else to carry the mangos to market?

LANDUSE (Agroclimatic)

4.1 - 4.10 Land use practices to be changed by project.

4.11 Of all trees outside house garden, what percent planted among crops?

4.12 Of all trees outside house garden, what percent are planted on field borders?

TABLE A1 - BASELINE CONTROL
LANDUSE (Agroclimatic)

1.1 CROP/INTERCROP PROFILE: _____

1.2 Intercrop name: _____

	Crop Cycles		
1.3 Crop Cycle Dates (start-end months)			
1.4 Area Planted (carreaux or other)			
1.5 Slope of area planted 1 = low slope (<__ degrees) 2 = sloping 3 = highly sloping			
1.6 Use of crop residue 1 = burned on field 2 = incorporated into soil 3 = cut & carry livestock feed 4 = left in field for animals 5 = (specify)			
1.7 Method of land preparation for crop 1 = soil turned with hoe 2 = soil turned with plow 3 = (specify)			
1.8 Planting practices for crop 1 = plant on ridges 2 = plant in hills 3 = plant in furrows 4 = random planting			
1.9 Planting: distance between rows			
1.10 Planting: distance within rows			
1.11 Planting: surviving plants per hill			
1.12 Crop Variety: 1 = introduced variety 2 = traditional variety			
1.13 Number of weedings per cycle			
1.14 How weeding done: 1 = hoe 2 = pulling 3 = sepet or machette 4 = animal drawn tools 5 = (specify)			

TABLE A1. BASELINE CONTROL (cont.)

OUTPUT PRICES (REGIONAL)

CROP/INTERCROP PROFILE FOR: _____ 1.15 Intercrop name:			
	Seasons		
1.16 Prices of fertilizer and chemicals			
1.17 Amount of harvest per crop cycle (yield)			
1.18 Describe market unit			
1.19 Selling price per mkt. unit			

REPEAT FOR MOST RELEVANT PRODUCTS

CROP/INTERCROP PROFILE FOR: _____ Intercrop name:			
	Seasons		
Amount of harvest per crop cycle (yield)			
Describe market unit			
Selling price per mkt. unit			

REPEAT FOR MOST RELEVANT PRODUCTS

CROP/INTERCROP PROFILE FOR: _____ Intercrop name:			
	Seasons		
Amount of harvest per crop cycle (yield)			
Describe market unit			
Selling price per mkt. unit			

INPUT PRICES AND WAGE RATE (REGIONAL)

1.20 No hours in standard hired person-day			
1.21 Price of seed or plants per unit			
1.22 Land prep. labor cost/p-day			
1.23 Planting labor cost/p-day			
1.24 Frt/chem labor cost/p-day			
1.25 Weeding labor cost/p-day			
1.26 Harvest labor cost/p-day			
1.27 P-harvest labor cost/p-day			

LIVESTOCK (Agroclimatic)

LIVESTOCK PROFILE	ANIMALS	
2.1 Name of animal		
Number of animals		
2.2 No. of breeding age males		
2.3 No. of breeding age females		
2.4 Production cycles/year		
2.5 No. of off-spring per cycle		
2.7 Selling price for babies		
2.8 Selling price for weaned animals		
INPUTS:		
Price of rented pasture (Gdes/carr.)		
Buying price of fodder (Gd/unit)		

TREES (Agroclimatic)

3.1 TREE CROP PROFILE FOR: (Species)				
3.2 Number of trees owned				
3.3 Products (in order of importance)				
3.4 Production cycles/year				
3.5 Quantity harvested/cycle				
3.6 Selling price per harvest unit				
INPUTS				
3.7 Tree care labor per cycle (p-days)				
3.8 Tree care labor cost per day				
3.9 Harvest labor (person-days)				
3.10 Harvest labor cost per day				
3.11 Post-harvest labor (person-days)				
3.12 P-harvest labor cost per day				
3.13 Cost of package per mkt. unit (Gde)				
3.14 Packaging labor per mkt. unit (p-days)				
3.15 Packaging labor cost per day				
3.16 Transport cost per mkt. unit (Gde)				

LANDUSE (Agroclimatic)

General Questions Relating to the Farm
4.1 Total area of farm?
4.2 Number of plots or fields?
4.3 What percent of total farm area does farm household control on long-term basis?
4.4 Typical Rotation/fallow systems for hillside plots or fields (give names of crops and dates of fallow) 1._____ 2._____ 3._____
4.5 Fallow management: 1 = 1 and left idle 2 = land tilled only 3 = land planted to cover crop 4 = other (specify)
4.6 Percent of plots/fields planted on A-frame contour?_____
4.7 Percent of plots/fields planted on traditional contour?_____
4.8 What soil conservation structures exist? 1 = rock walls 2 = hedgerows 3 = gully plugs 4 = other (specify)
4.9 Species used for hedgerow?
4.10 Management of hedgerow: 1 = clipped & fed 2 = clipped & incorporated 3 = grazed 4 = other (specify)
4.11 Of all trees outside house garden, what percent planted among crops?
4.12 Of all trees outside house garden, what percent are planted on field borders?

FUTURE BASELINE STUDIES

From the M&E System it becomes apparent that two special studies will be needed. These are the Typical Farmer Profile (TFP) and in the TFP, Participatory Farmer Appraisal. Since most of the information has become part of a smaller and quicker study (our baseline control), the TFP could be combined with more marketing information and made into a more intensive study that improves our baseline information.

The Participatory Farmer Appraisal, in order to be successful, will also require a more precise design by a farming system specialist.

A lot more work and analysis will have to be allocated to the evaluation procedures for the interventions over time. At this point most of the evaluation of interventions is based on financial (to determine farmer income potential) and land use considerations. An economic analysis of the interventions (and/or package of interventions) will be necessary in order to assess the benefits of interventions from a regional and national point of view. Furthermore, presently the interventions are not evaluated in a quantitative manner regarding their benefits to the environment.

In order to be able to evaluate interventions from an environmental standpoint, a measure of magnitude of secondary impacts is necessary. That is, damages downstream like siltation of reservoirs/water quality and fish/industry impacts constitute probably the bulk of benefits associated with some interventions. Although at this moment such studies may not be part of PLUS's goals, measurements of these magnitudes would make the evaluation of interventions more relevant. It may also provide information for a further evaluation of the project as a whole.

A study addressing soil erosion reductions in the areas of intervention through the use of USLE equations would also add to the understanding and measurement of reductions in rates of soil erosion.

As the M&E System evolves, identification of additional information gaps should guide the need for more special studies. This need will arise especially when looking at evidence that may suggest alternative and conflicting solutions.

APPENDIX B

Data Needs for Monitoring of Interventions

DATA NEEDS FOR MONITORING OF INTERVENTIONS

This list of data was compiled to guide the data needs for monitoring interventions:

1. **HEDGEROWS.**

   a. Spacing of hedgerows

   b. Crop planted between hedgerows

   c. Condition of hedgerows

   d. Area of farm household covered by hedgerows

   e. Physical soil build-up behind structures (m^3/m)

   f. Management of hedgerows

   g. Land tenure arrangement of the farm operator

   h. Number of farmers adopting the intervention per agro-climatic zone

   i. Meters of hedgerows installed

   j. Yield and prices received for crop planted between hedgerows

   k. Use of hedgerow biomass

   l. Labor and other input cost associated with crop production

   m. etc

2. **MECHANICAL STRUCTURES**

   a. Type of mechanical structure installed

   b. Area of new cultivation created

   c. Volume of soil retained

   d. Type of crop / tree planted

   e. Prices and yields associated with crops / trees planted

   f. Percent destruction of mechanical structure

g. Labor and other input cost associated with crops / trees planted

h. Size of mechanical structure

i. etc

3. COVER CROPS

a. Area (m) in cover crops

b. Types of cover crop (velvet bean, jack bean etc)

c. Type of crops planted

d. Yields and prices associated with the crops planted

e. No of farmers working under cover crops

f. Other uses by the farmer of cover crops

g. Labor and other input cost associated with crops planted

h. etc

4. GRAFTING FRUIT TREES

a. No of fruit trees (by species) grafted

b. No of participating farmers

c. Yields for each type of fruit tree grafted

d. Prices per unit of fruit produced

e. Source of grafting material over time

f. etc.

5. IMPROVED SEED

a. Types of crops with improved seed

b. Land characteristic of area where crops are grown

c. No of participating farmers (initially)

d. Yields and prices associated with the output of improved seed crops

e. No of farmers participating in the seed bank

f. Amount of seed handed by the seed bank

g. Labor and other input cost associated with the output of improved seed crops

h. etc

6. VEGETABLE GARDENS

a. Types of vegetables grown

b. Land characteristics of areas where vegetables are grown

c. No of participating farmers

d. Yields and prices associated with the output of vegetables

e. No of farmers participating in the seed bank

f. Amount of seed handled by the seed bank

g. etc

7. FRUIT AND HARDWOOD TREES

a. No of fruit and hardwood trees planted (by species)

b. Description of trees in place over time (in terms of management and existence)

c. Existence and number of individual and group nurseries

d. No of trees handled through nurseries

e. Labor and other input costs associated with the production of the fruit, charcoal, poles and planks

f. Yields of fruit, charcoal, poles and planks etc and prices associated with each, obtained by the farmer

e. etc

To collect the data for monitoring of interventions, forms will be developed by PLUS to conduct the surveys. For hedgerows an attempt was led by Mike Bannister to develop a monitoring form which follows closely the data requirements listed here.

APPENDIX C

CALCULATION OF SPIs

The SPIs in Table 3 are differentiated by being quantitative and qualitative. In the interest of clarity the PLUS group requested additional guidance in the calculation of some of the quantitative SPIs.

SPI: I.1. From the information on the maps we know the total number of household farms in the microwatershed and type of tenure per plot (security over farm plots). We also know the number of farmers adopting interventions. Thus for each intervention we can determine the percentage of farmers adopting (rate of adoption of interventions) by land tenure regime.

SPI: I.2. Secondary adopters are those farmers that are not paid in any form by the project and were encouraged to adopt by a non-paid farmer.

SPI: III.1. Costs and benefits associated with the project intervention minus the costs and benefits associated with the use of the same land without the intervention. Appendix C presents suggestions on the methods of analysis for the evaluation of interventions.

FARMER GROUP INFORMAL PARTICIPATORY INTERVIEWS

The informal survey is considered to be the heart of the farming systems approach for conservation and sustainable resource use. Farmers take an active and preeminent role in the appraisal of interventions. Interviews with groups of farmers should be conducted by team members themselves. Interviews should be semi-structured with the emphasis on promoting dialogue. Although questionnaires are not necessary, use should be made of topic guidelines to ensure the team covers the relevant topics on given subject.

The primary advantages of the informal survey are its low cost and rapid turn round, its sequential and interactive data collection procedures, and its conduciveness to obtain information on farmer values, opinions, objectives and knowledge.

Group interviews have the advantage of allowing the determination of <u>consensus</u> and <u>ranking importance</u>. During the survey, PLUS will need to develop and revise their set of guideline questions on a regular basis for further interviews. The interviews could and should be completed rapidly. After each day's work, the team members themselves should gather and discuss and record:

- -what have they learned?
- -Have they observed similar phenomena?
- -Do they agree on their interpretations of the answers given and what they have seen?

-What are the gaps in their knowledge and do they need to explore further?

Methodology:

Groups of farmers will be formed by selecting 4 farmers per intervention adopted in each agroecological zone of operation. Thus, for 5 general types of interventions per zone we will have groups of approximately 20 farmers.

Only 2 groups of farmers will be interviewed from each region of operation (to be determined at random). Thus with 4 regions of operations, 8 group interviews will be conducted annually. Interviews should concentrate on the evaluation of the packages of intervention (why do farmers adopt?).

Input constraints
Fixed type constraints (weather)
Crop/intercrop interventions
Fodder production/utilization
Tenure
Trees (fruit - hardwood - hedgerows)
Marketing

The report generated for transmitting the information collected should identify the agroecological zone, number of farmers participating and:

1. Problem Ranking: Produce a ranked list of problems and priorities. These could be crop and livestock production problems, health and social welfare problems, or problems of land degradation, etc.

2. Preference ranking: For each component of interventions make a ranked list from most preferable to least, with favorable and unfavorable criteria indicated for each item eg. comparing different trees species for fuel, grasses for fodder etc.

The reports should be analyzed and causal diagrams constructed as an input to the evaluation process for the interventions.

Use of Causal Diagrams

Causal diagramming is a valuable technique for determining and explaining the complex relationships between for different causes and how their effects, individually or combined lead to a particular problem. By clearly demonstrating these interrelationships the technique can help avoid or resolve differences between team members as to which of their list of causes and constraints identified are linked. It can also show to the team that, should they seek to remove one cause or the overcome a particular constraint without dealing with the others that

contribute to the problem, their proposed interventions may have little overall impact.

In causal diagramming, we identify a potential cause or constraint that contributes to a particular problem. Not all causal factors are equal or have a direct effect on the problem. Some will be more distantly related to it than others yet still be a contributory factor to it. This can be demonstrated through the use of causal chains linking the various causal factors in a logical sequence to the problem. The causal chain below shows that the causal factor of low soil fertility has the effect of producing low crop yields, which in turn is the ultimate cause of the farm households key problem, namely food shortage.

Shortage of food	←	low crop yields	←	low soil fertility

Causal diagrams can be used to identify points within a farm household system where there may be scope for the PLUS team to formulate recommendations for farm, community and/or policy level intervention. The objective of the intervention being to tackle a particular problem by combating the causes or removing the constraints to increasing production on a sustainable basis. The diagram is likely to reveal a number of points for such interventions and the team should jointly discuss these and mark them on the diagram. They will need to determine which of these points have the most potential to make an impact on the problem and which constraints have to be overcome before other potential interventions can have any effect. Discussions over potential intervention points can be used to decide which constraints should be ameliorated by an appropriate intervention. Low rainfall in an area with no irrigation potential is a fixed constraint, lack of cash is a constraint that can be overcome by the provision of credit.

DATA NEEDS FOR EVALUATION OF INTERVENTIONS

From the monitoring effort and baseline data only certain information will be obtained. For an initial evaluating interventions, the following additional data are needed. This information should be updated only as interventions are refined over the life of the project.

1. HEDGEROWS

a. Labor requirements to establish hedgerows
b. Labor requirements to maintain and manage hedgerows
c. Identify crops before the intervention
d. Predicted economic results due to use of intervention.

2. MECHANICAL STRUCTURES

a. Labor requirements to build mechanical structures
b. Labor requirements to maintain mechanical structures
c. Other monetary costs associated with mechanical structure
d. Economic or physical life of mechanical structures (no of years)
e. Predicted economic results due to use of intervention.

3. COVER CROPS

a. Labor requirements and other input costs to establish and manage properly over crops
b. Identify crops grown before the intervention
c. Predicted economic results due to use of intervention.

4. GRAFTING FRUIT TREES

a. Labor requirements and other input costs for grafting
b. Predicted economic results due to use of intervention.

5. IMPROVED SEED

a. Identify crops grown on the plot before the intervention
b. Predicted economic results due to use of intervention.

6. VEGETABLES GARDENS

a. Identify crops grown on the plot before the intervention
b. Predicted economic results due to use of intervention.

7. FRUIT AND HARDWOOD TREES

a. Labor and other input costs associated with planting and management of the trees
b. Predicted economic results due to use of intervention.

FINANCIAL EVALUATION OF INTERVENTIONS

Evaluation of interventions is based not only on incremental net benefits associated with each intervention, but also on the farmer evaluations. Furthermore, labor requirements as compared to family labor availability constitutes an additional consideration in the evaluation process. A multi-objective framework for evaluation of interventions should be used to account for capital and labor constraints.

The calculation of incremental net returns (with and without the intervention) has been addressed by Fleming and Karch and additional detail can be found in Gittinger and Pagoulatos. The use of opportunity costs and shadow pricing for labor may be required for some of the financial analysis estimates (for example, value of biomass production etc.).

Limitations of the analysis and identification of additional data needs should also be part of the intervention evaluation reports. The SPI: V.3 should serve as a guide in improving evaluation outcomes over time.

Grafting of trees, mechanical structures, hedgerows, fruit and hardwood trees require a multi-period determination of costs and benefits based on the number of periods needed to capture the bulk of the direct benefits from the intervention. Since many interventions will not be able to capture the bulk of their benefits during the next two years, remaining values should be constructed to capture the full effect of interventions. Consistent accounting of similar type of benefits and costs associated with interventions will make a comparison possible.

Net present values, B/C ratio and/or IRR will be determined for each multi-period analysis of interventions. Only B/C will be calculated for the annual interventions such as cover crops, improved seed, and vegetable gardens. Comparisons and ranking between mutually exclusive interventions will be done based on the IRR. Not all interventions will always be part of the decision framework of each farm household. There are just so many ravines to be reclaimed with mechanical structures within a farm. Furthermore, trade offs among different criteria such as income, risk, wealth accumulation and labor requirements should be calculated. It should be pointed out that the analysis described here addresses the financial aspects of the evaluation of interventions.

Evaluation of interventions as if they were recommended independently is different than evaluation of interventions as a set from which to choose. If a farm household has the potential of adopting more than one environmentally improved intervention, what sequence of adoption will the extension agent propose to the farmer for these interventions? Based on the opportunity costs associated with the delay of adopting an intervention, some guidelines and suggestions to the farmer can be formulated. Constraints that could affect a sequential adoption pattern are labor availability, capital constraints and length of time before the bulk of benefits can be realized from each intervention.

The evaluation component in this M&E System introduced several elements and criteria in order to rank interventions. However, environmental benefits from secondary impacts were left out because of the unavailability of secondary impact information.

LAND USE PRACTICE EVALUATION

Each proposed intervention may not entail a land use practice with a conservation improvement.

Each proposed improvement should be classified according to whether it is:

a. conservation effective-the proposed improvement will be expected to contribute directly to the maintenance and enhancement of soil productivity and reduce land degradation.

b. conservation neutral - the proposed improvement will be expected to have no significant direct or indirect impact (beneficial or negative) on soil productivity or land degradation.

c. conservation negative - the proposed improvement will be expected to directly or indirectly contribute a decline in soil productivity and land degradation.

From the characterization of present land use practices (TABLE C1) based on whether they lead or do not lead to:

1. Improved soil structure
2. Fertility improvement
3. Improved moisture (water infiltration)
4. Reduced soil loss/siltation

We will determine whether the land use practices with PLUS interventions constitute improvements in conservation based on the aid from TABLE C2.

Table C1 Land Use Practices in Relation to Conservation (Without)

Without PLUS (From Typical Farmer Profile)		Land use within household farm		Land use of common property resources
Practices related to:	Practices consistent with conservation	Practices consistent with conservation	Practices consistent with conservation	Practices consistent with conservation
A) Crop Production				
B) Livestock Production				
C) Other natural resource utilization				
D) Mechanical structures				

Table C2 Land Use Practices in Relation to Conservation (With)

Without PLUS (From Typical Farmer Profile		Land use within household farm		Land use of common property resources
Practices related to:	Practices consistent with conservation	Practices consistent with conservation	Practices consistent with conservation	Practices consistent with conservation
A) Crop Production				
B) Livestock Production				
C) Other natural resource utilization				
D) Mechanical structures				

TABLE C3

DATA COLLECTION EFFORT

CARE/PADF/SECID	COLLECTION LEVEL	CARE/PADF EFFORT	FREQUENCY
Baseline Control	mostly regional 6 agroclimatic zones key informants	9 person-days	1
Baseline Maps	6 micro-watersheds		1
Evaluation Information	technical personnel	5 person-days	1 & as needed
Monitoring	sample 200 farms 1st year 300 thereafter		?
Typical Farmer Profile & Marketing	sample of agroclimatic zones		1
Farmer Participartory Evaluation	sample of agroclimatic zones		3