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HAITI PRODUCTIVE LAND USE SYSTEMS PROJECT

SOUTH EAST CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

AND

AUBURN UNIVERSITY

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FIRST ASSESSMENT AND REFINEMENT OF THE PLUS M&E SYSTEM

by

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TABLE OF CONTENTS

EXECUTIVE SUMMARY i
REZIME iv

INTRODUCTION 1

I. ASSESSMENT OF THE M&E INFORMATION COLLECTION AND REPORTING SYSTEM 2
II. ASSESSMENT OF RELEVANCE AND APPROPRIATENESS OF MONITORING INFORMATION 4
PROJECT PLUS BASELINE REPORT 4
CASE-STUDY MONITORING 5
CHECKDAMS. 7
HILLSIDE ROCK WALLS. 8
HEDGEROWS. 9
THE TOTAL SAMPLE AND CONTROLS. 9
ADDITIONAL INTERVENTIONS, NEW INTERVENTIONS/ FARM TRIALS 12
III. ASSESSMENT OF CALCULATION ALGORITHMS FOR THE SPIS 14
IV. CRITIQUE FINANCIAL EVALUATIONS OF INTERVENTIONS 14
V. RECOMMENDATION OF AN ANALYTICAL METHODOLOGY FOR AN ECONOMIC EVALUATION OF INTERVENTIONS 15
VI. PROJECT WIDE FINANCIAL ASSESSMENT OF INTERVENTIONS. 17
APPENDIX A. IMPLEMENTOR QUESTIONNAIRE 21
APPENDIX B. PLUS SPIS FOR 1993 24
I. ENVIRONMENTAL (QUANTITATIVE) 25
II. ENVIRONMENTAL (QUALITATIVE) 30
III. FARMER INCOME (QUANTITATIVE) 30
IV. ENVIRONMENTAL AND INCOME SUSTAINABILITY (QUANTITATIVE) 32
V. ENVIRONMENTAL AND INCOME SUSTAINABILITY (QUALITATIVE) 34

LIST OF TABLES

TABLE A POTENTIAL PROJECT WIDE IMPACTS OF PLUS INTERVENTIONS IN 1993 (IN H$) 18
TABLE B CONTRIBUTIONS OF PLUS INTERVENTIONS TO THE FARMER 18

APPENDIX TABLES

TABLE I RELATIVE USEFULNESS OF THE SPIS 23
TABLE 2 PERCENTAGE OF FARM PLOTS HAVING INTERVENTION BUT NOT PARTICIPATING IN THE PROJECT 26
TABLE 3 PERCENT OF FARM PLOTS WORKED BY FARMERS WITH AND WITHOUT SECURE TENURE HAVING SELECTED SOIL AND WATER CONSERVATION STRUCTURES 29
TABLE 4 FARMERS' TARGETS OF INVESTMENT 35

LIST OF FIGURES

FIGURE 1 -PLUS M & E SYSTEM AND LEARNING PROCESS 6
FIGURE 2 -PLUS PROJECT INTERVENTION AREAS 27

First assessment and refinement of the PLUS M&E system

EXECUTIVE SUMMARY

The objectives of PLUS of "sustainable increases in on-farm productivity and farmer income through the integration into farming systems of appropriate land use and soil conservation measures which enhance soil productivity" are achieved with a series of interventions that result in improved yields and translate into higher and/or more stable farmer incomes as erosion rates from hillside cultivations are reduced over time.

The experimental design, implicit in the Monitoring and Evaluation (M&E) of PLUS, addresses adequately the needs of the M&E system with a learning process that continually refines interventions and their implementation, and identifies new interventions requiring a continuous formative evaluation.

PLUS has established an on-going system to determine the farm-level impact for the project's four primary interventions: hedgerows, checkdams, rockwalls and vegetable gardens. Protocols and questionnaires have been developed to monitor each intervention in selected watersheds in order to obtain the necessary information to address the Strategic Performance Indicators (SPI) of the PLUS M&E (Monitoring and Evaluation) system. The progress that has been made to date, in implementing the M&E system and associated "learning process" is remarkable.

In assessing the M&E information collection and reporting system the following recommendations are made regarding additional data that need to be collected for the calculation of the SPIs. Although most of this information is included in the protocols instructing the enumerators on data collection and recording, it is suggested that an entry is also allowed on the forms for the following data. Include data on cost of transportation, differentiated by expenditures for transportation and time spent by the farmer in transporting the produce to the market. Include data on prices received by the farmer for the produce. Record tenure control that the farmer has on the plot with the intervention. Determine cost of constructing a checkdam and a rock wall and installing a hedgerow. Soil type information and slope should also be recorded for the monitored plots. Finally, an estimate of total farm area cultivated by each monitored farmer should also be part of the information collected.

The design of control plots will be enhanced by matching their characteristics with those of the monitored plots. These characteristics should relate not only to slope but also to type of soil, tenure control of the plot, and total area farmed. Control sample contamination, as control farmers adopt PLUS interventions, will force a continuing replacement of farmers in the control

sample. The data collection forms and protocols for the control sample are simply parts of the monitoring forms and protocols.

Protocols and data collection forms need to be developed for the remaining PLUS interventions of fruit tree grafting, seed banks and trees, as well as for the farm trials. Implementor reports on numbers of participating farmers, training sessions, meters of hedgerow installed, number of trees, hectares with rock walls etc., should be reporting these numbers by watershed or zone of intervention. The present reporting of aggregate numbers does not address the information needs for calculating the SPIs.

The real discount rate and use of financial measures for each intervention is outlined in this report. It is recommended that remaining values be used to truncate long series of data for the interventions and that financial measures of project interventions be accompanied by a commentary on: the size of the required investment, availability of credit, particular farmer skills etc.

The PLUS SPIs are presented in this report, in Appendix B, and a preliminary assessment of project wide PLUS interventions was made. As the project evolves and PLUS learns from its M&E, SPIs should also be changing. To this effect, a questionnaire was developed for PLUS, in order to determine the usefulness of present SPIs in improving project implementation.

Although an economic analysis of PLUS project wide impacts of interventions is not part of the PLUS M&E system, it would add information to the evaluation of PLUS interventions. This is because off-farm impacts could be much larger than on-farm impacts. In addition to an economic analysis, PLUS should perform a farmer appraisal and needs assessment as soon as possible, since presently available information does not derive from a systematic approach that can address the SPIs.

A preliminary estimation attempt of PLUS SPIs was made in conjunction with a project wide assessment of PLUS interventions. The results obtained based on the 1993 PLUS implementation efforts, are as follows. During 1993, 60 ha of arable land was created behind checkdams and the expected physical soil building behind the hedgerows installed (if properly maintained), is estimated at 263,400 cubic feet.

Secondary adoption of PLUS interventions by zone of intervention, based on baseline information, could range from a low of 6 percent to a high of 85 percent of plots adjacent to project assisted farmers. More than two-thirds of the income generated to the farmer (H$630), comes from PLUS interventions that directly address environmentally improved land use practices.

The "farmer needs assessment exploratory survey" completed by PLUS, has provided some direction for the current implementation of the farm trials of bean and cowpea varieties and vegetative barriers with different principal components (plantain/sugar cane and leucaena/gliricidia).

From a preliminary project wide financial evaluation (for some of the PLUS interventions), it is estimated that PLUS interventions contribute to the average farmer income from crops of H$352, the following percentage increases: hedgerows 7.2 percent, checkdams 22.7 percent, vegetable gardens 51.1 percent and trees (fruit and hardwood) 98 percent. In comparing interventions, vegetable gardens have the highest Internal Rate of Return (IRR=infinity), followed by hedgerows (IRR=85%) and checkdams (IRR=73%).

Premye travay pou evalwe ak amelyore sistèm evalwasyon Pwojè PLUS-la

REZIME

Pwojè PLUS vize pou ogmante pandan lontan randman peyizan yo jwenn nan jaden yo ak kòb y-ap rantre nan travay tè-a. Pou sa, li entegre nan sistèm fè jaden nan mòn yo, teknik pou kenbe tè ak dlo lapli ki pèmèt tè-a bay plis randman. Ak tout you seri teknik ke pwojè-a mete sou pye, ewozyon fini pa diminye, rekòt yo vin ogmante, ki fè moun yo ka fè plis lajan, yo ka fè lakilti pi lontan nan mòn yo.

Jan yo planifye sistèm swivi ak evalwasyon pwojè-a pèmèt ke yo ka pran leson pandan y-ap sèvi ak sistèm-nan pou amelyore entèvansyon yo ak fason yo aplike yo. Li pèmèt tou identifye nouvo aktivite ki mande pou toujou ap aprann pandan evalwasyon-an ap kontinye fèt.

Pwojè PLUS etabli you sistèm pou kalkile impak kat (4) pi gwo entèvansyon pwojè-a: ranp vivan, mi sèk nan ravin, kòdon ròch, ak jaden legim. Pwotokòl ak kesyonè yo devlopé pou evalwe chak aktivite nan basen vèsan ke yo chwazi yo ki pèmèt ranmase tout enfòmasyon ki nesesè pou réponn SPI-yo (an angle: "Strategic Performance Indicators" - Indikatè pou mezire pèfomans estratejik) ki nan sistèm swivi ak evalwasyon Pwojè-a. Gen gwo pwogrè ki fèt e gen anpil bagay ki aprann depi sistèm nan ap aplike nan Pwojè-a.

Dapre sa nou wè nan fason yo ranmase ak rapòte enfòmasyon yo, men rekòmandasyon nou fè pou gen plis enfòmasyon ki rasanble pou pèmèt kalkile SPI-yo. Se vre ke enfòmasyon sa yo nan pwotokòl pou fòme moun k-ap travay pou ranmase ak rapòte done yo, men li ta bon pou ekri yo nan fòm y-ap itilize yo. Men enfòmasyon anplis li ta bon pou konnen: kou transpò pwodwi yo, ki gen ladan depans ak tan ki nesesè pou peyizan yo mennen pwodwi yo nan mache, ak pri yo vann pwodwi yo. Li ta bon pou konnen tou nan ki kondisyon peyizan yo travay tè-a (pwopriyetè, fèmye, demwatye...). Fòk yo ta konnen tou kòb ki depanse pou fè you mi sèk, you kòdon ròch, you ranp vivan. Pou jaden y-ap evalwe yo, li ta bon pou konnen ki kalite sòl ak ki pant yo genyen. Anfin, fòk yo ta chèche konnen sou ki kantite tè chak peyizan y-ap swiv yo fè lakilti.

Jaden kontwòl (ki travay jan peyizan nan zòn nan fè lakilti) ke yo chwazi yo te dwe plis sanble ak jaden ki gen estrikiti ke y-ap swiv yo. Non sèlman yo te dwe genyen apeprè menm pant, men menm kalite sòl, yo ta dwe travay nan menm kondisyon, yo ta dwe menm kantite tè. Kòm gen plis peyizan k-ap adopte teknik pwojè-a, yo pral oblije ranplase tanzantan peyizan-kontwòl yo pa lòt. Fòm pou ekri done yo ak pwotokòl pou chwazi jaden kontwòl yo, se you pati nan fòm ak pwotokòl pou fè swivi-a.

Yo dwe fè pwotokòl ak fòm pou rasanble done sou grefaj zab fwitye yo, sou bank semans, sou plantasyon pye bwa, ak esè nan jaden peyizan yo. CARE ak PADF dwe bay chif sou kantite patisipan, kantite reyinyon fòmasyon yo fè, kantite mèt ranp vivan ki fèt, pye bwa ki plante, kantite tè ki gen mi sèk etc. pa basen vèsan ou byen pa zòn. Jan yo bay li an gwo kounye-a pa pèmèt kalkile SPI yo.

Nan rapò sa-a nou bay fason pou kalkile sa yo rele nan ekonomi to aktyalizasyon-an ("taux d'actualisation") ak jan yo dwe itilize mezi finansye yo pou chak entèvansyon. Nou rekòmande tou ke yo prezante kèk chif an pliziè ti moso pou yo pa parèt trò long. Yo ta dwe tou lè y-ap pale de mezi finansye ki pran pou chak aktivite pwojè-a, bay kèk enfòmasyon tankou: kantite lajan ki envesti, si gen kredi nan zòn nan, sa peyizan yo konn fè byen etc.

SPI yo prezante nan Apendis B rapò sa-a, e te gen you premye evalwasyon aktivite pwojè-a ki te fèt. Plis pwojè-a ap evolwe, eksperyans ap fèt, SPI yo dwe chanje. Se pou sa, you kesyonè te devlope pou konnen si SPI yo te itil, si yo te pèmèt amelyore pèfòmans pwojè-a.

Menm si you analiz ekonomik sou impak aktivite pwojè-a pa fè pati sistèm swivi ak evalwasyon-an, men li ajoute sou enfomasyon ki pèmèt evalwe aktivite pwojè-a, paske impak pwojè-a kapab depase impak nan jaden peyizan-an. Anplis you analiz ekonomik, PLUS dwe fè you evalwasyon bezwen peyizan yo rapidman, paske enfòmasyon ki ranmase deja yo pat soti de you apwòch sistematik ki te fèt espesialman pou reponn SPI yo.

You premye esè estimasyon SPI yo te fèt ansanm avèk you evalwasyon an gwo ki te fèt sou entèvansyon pwojè-a. Men ki rezilta ki te jwenn e ki te baze sou sa ki te fèt pandan lane 1993-la: 60 ekta tè kiltivab te kreye deyè mi sèk yo, 263.400 mèt kib tè te dwe ateri dèyè ranp vivan ki te fèt yo (si yo ta fèt kòrèkteman).

Dapre enfòmasyon ki ranmase, kantite peyizan ki pa travay ak pwojè-a men ki kopye teknik pwojè-a sou vwazin yo ka evalwe ant 6 pou san jiska 85 pou san. Plis ke detyè kòb peyizan yo fè (H$630) te soti nan aktivite pwojè-a, aktivite ki pèmèt amelyore anvironman-an tou.

Ankèt pou chèche konnen bezwen peyizan yo ke pwojè-a te fè ("Farmer neds assessment exploratory survey") te you gid pou etabli sou tè peyizan yo esè varyete pwa òdinè, pwa inkoni, ak ranp vivan ki fèt ak tout kalite plant (bannann/kann ak lesena/glirisidya).

Dapre you premye evalwasyon finansye gwosomodo (pou kèk entèvansyon PLUS), kòb anplis ke pwojè-a pote pou peyizan-an nan fè lakilti vo apeprè H$352. Ranp vivan responsab 7,2 pou san ogmantasyon lajan anplis peyizan-an resevwa, mi sèk 22,7 pou san, jaden legim 51,1 pou san, pye bwa (fwitye, forestye) 98 pou san. Lè y-ap konpare entèvansyon yo, jaden legim yo bay pi gwo pwofi, sa

yo rele nan ekonomi to randman intèn, "taux de rendement interne" (pa ka konte), apre se ranp vivan (85 pou san) ak mi sèk (73 pou san).

INTRODUCTION

This report is part of the on-going effort by the South East Consortium for International Development (SECID/Auburn University) in collaboration with the PLUS (Haiti Productive Land Use System) Team, namely, CARE International,Inc. (CARE), the Pan American Development Foundation, Inc. (PADF) and USAID/Haiti, to implement a Monitoring and Evaluation (M&E) system which orients the project toward activities that promote sustainable increases in farmer income, while conserving natural resources.

The report addresses five main issues:

I. Assessment of the M&E information collection, reporting system, including individual responsibilities of CARE, PADF, and SECID. Make recommendations to achieve the M&E objectives.

II. Assessment of the relevance, utility, and appropriateness of information reported by PADF and CARE for use in the M&E system. Make recommendations to achieve the M&E objectives.

III. Assess calculation algorithms for all Strategic Performance Indicators with special emphasis on the net incremental returns for each intervention.

IV. Critique financial evaluations of project interventions.

V. Recommendation of an analytical methodology for economic evaluation of interventions.

Beyond the scope of work: Estimation of the 1993 PLUS SPIs, based on existing information, and

VI. Project wide financial assessment of PLUS interventions

The work was conducted at Port au Prince, in close collaboration with Dr. John Dale (Zach) Lea (SECID).

I. Assessment of the M&E information collection and reporting system

Within one year from the agreement on a PLUS M&E system (Angelos Pagoulatos, "Monitoring and Evaluation System for PLUS", SECID/Auburn PLUS Report No.3, April, 1993), PLUS has established an on-going system to determine the farm-level impacts for the project's four primary interventions. PLUS already completed a Project PLUS Baseline data collection effort and is well under way to having the information data collection forms in place, for all interventions, along with the determination of the monitoring and control samples.

Presently the monitoring data collection effort is under way, for four major PLUS interventions and the completed forms are coming to SECID. SECID is responsible for providing technical assistance, verifying, storing, analyzing, determining algorithms and calculating the strategic performance indicators (SPIs) of the PLUS M&E system.

Protocols and questionnaires, translated into Creole, have been developed by the PLUS team to address the monitoring of hedgerows, rock walls, vegetable gardens, checkdams, soil saved and land surface area created. Directions provided to the enumerators have been refined as problems were encountered in the field.

Verification by SECID, is directed toward the accuracy of the monitoring information collection. Thus, SECID in collaboration with CARE and PADF have to identify needs and problems arising in the monitoring data collection by field enumerators.

Several visits in the field, by SECID, revealed problems in collection of the monitoring data. Delays due to motivational problems coupled with under-staffing of enumerator teams and lack of transportation, scales for weighing etc. Drought in some instances did not allow for data collection from some farmers. Enumerators in some cases did not follow instructions and provided wrong measurements or simply did not fully complete the forms. In all cases the problems were jointly resolved by the PLUS team (Reports: Yves Jean, January 27, 1994; Roosevelt Saint-Dic, January 14, 1994, December 3, 1993, December 17, 1993, February 11, 1994; J. D. Zach Lea, December, 1993). The process of the monitoring effort verification is working well.

PADF is responsible for the collection of all the monitoring data in their regions of intervention and their transmittal to SECID. CARE is also responsible for the collection of the monitoring data in their zones of intervention regarding the four interventions (hedgerows, rock walls, checkdams and vegetable gardens), as well as the remaining data necessary for the calculation of the SPIs. SECID and CARE will develop the methodology for determining secondary adoption rates and SECID will

carry out the study as part of a special studies agreement. SECID will also develop the methodology for determining incremental net returns for each intervention.

Two baseline surveys have been completed by PLUS. The first, called "the farmer needs assessment exploratory survey" was completed in October, 1993, by Richard A. Swanson, William Gustave, Yves Jean and Roosevelt Saint-Dic, "Farmer Needs Assessment Exploratory Surveys", SECID/Auburn PLUS Reports Nos. 7-13. This survey contributed to understanding farming systems in Haiti as they relate to the PLUS implementation. The second survey, called "the PLUS baseline information survey" was completed in November, 1993, by John Dale (Zach) Lea and S. Riviere, aimed at obtaining statistically based baseline in each zone of project program concentration. This baseline data will serve as a point of departure from which to measure future project accomplishments.

A study evaluating leucaena hedgerows-utilized-for-soil-amendment and as-forage, was completed by John Dale (Zach) Lea, entitled "September 1993 Financial Evaluation of Hedgerows". A document by Henry Jude Belizaire describing the contacts made and achievements in linking agricultural producers with agricultural businesses was produced in February, 1994.

Farm trials (research/demonstration trials) on 21 plots are under way at Cap Haitien and Les Cayes, where Dr. Frank Brockman (SECID), in collaboration with PADF field staff and farmers are testing the following interventions: Cap Haitien - vegetative barriers with plantain/sugar cane as principal components; Les Cayes - vegetative barriers with leucaena/gliricidia and forage grasses as principal components and established with long term crop (manioc) to protect against uncontrolled grazing (PLUS meeting notes on December 7, 1993, January 4, 1994 and January 25, 1994; and SECID semi-annual Status Report, April-September, 1993).

Farm trials on bean and cowpea variety (9 plots) are also under way, in collaboration with CARE, in Barbe Pagnole, Bombardopolis, La Fond and Passe Catabois.

As PLUS includes the remaining interventions into its monitoring efforts along with control samples, the monitoring teams need additional strengthening. In particular SECID with the personnel that it presently has, will not be able to handle the additional work required by the increased monitoring effort in the PADF and CARE monitoring zones. SECID should consider adding at least two more individuals to its technical personnel and as soon as possible, in order to meet the additional monitoring requirements and avoid causing any delays or reduced technical support in the field. Finally, the implementors should make sure that implementor assistants are part of the M&E monitoring teams, rather than the monitoring teams being formed without them. This

will enhance monitoring activities by incorporating the implementation into the M&E system.

II. Assessment of relevance and appropriateness of monitoring information

The monitoring information that PLUS is collecting, coupled with the baseline information that has already been collected, constitutes the basis for evaluating over time the achievement of project objectives.

Figure 1., presents an overview of the PLUS M&E system with its learning process. The baseline information survey and the farmer needs assessment exploratory survey constitute the basic control for the calculation of the SPIs. The SPIs drive the M&E system in that it is the data requirements for the calculations and reporting of the SPIs that determine what protocols and data collection forms the monitoring case studies are supposed to have. It is the data requirements of the SPIs that demand the setting of control plots, in order to evaluate the PLUS interventions. The SPIs also motivate the special studies (agroforestry and tree improvement, germplasm, financial and economic evaluation of interventions, marketing studies etc.), and farmer appraisals and needs assessment.

The SPIs also, through the information that they contain, motivate farm trials, require an information clearinghouse (for sustainability), allow the evaluation of present interventions and suggest their refinement or new interventions. The SPIs themselves need to be refined or changed to keep abreast of project transformations.

The work done by PLUS up to date and the progress achieved in implementing the M&E system are remarkable. The comments and suggestions that follow constitute minor adjustments to the existing PLUS M&E system. They are suggestions made to further strengthen the ability of PLUS to measure the effects of its interventions. Some additional suggestions regarding information collected through the monitoring effort, implementor reports and refinement of the SPIs are also included in this report.

Project PLUS Baseline Report

The "Project PLUS Baseline Report" was recently completed (by Dr. J.D.Z. Lea and S. Riviere). From a sample of 30 farmers per watershed in the areas of PLUS intervention (in a few cases the sample included only 20 or less observations) the following information has been collected:

- Farmers' present use of environmentally improved land use practices
- Relation between land tenure and adoption of environmentally

improved land use practices
- Relation between land tenure and adoption rates
- Relation between land tenure and slope of farm plot
- Yields obtained on major crops
- Farmers' crop revenue and average area of cultivation
- Importance of crop revenue in family income
- Farmers' marketing practices
- Prices received by farmers
- Value of farm labor
- Existing vegetable gardens
- Farmers' ownership of livestock

This information will constitute the point of departure for assessing the changes brought about by project interventions and allow PLUS to evaluate its interventions through the M&E SPIs.

Case-Study Monitoring

The PLUS case-study monitoring is designed to collect information regarding the evaluation of its interventions at the farm level. This is the information necessary for the calculation of the PLUS M&E SPIs which allows PLUS to learn about intervention impacts, as if it were operating a large scale farm trial. CARE, PADF and SECID decided to focus their specialized, case-study monitoring efforts on four interventions: Leucaena hedgerows, rock walls on hillsides, checkdams in ravines, and vegetable gardens. Protocols and data collection forms were developed for the four interventions and for measuring soil saved and surface area created.

The following frequency and data collection was decided:

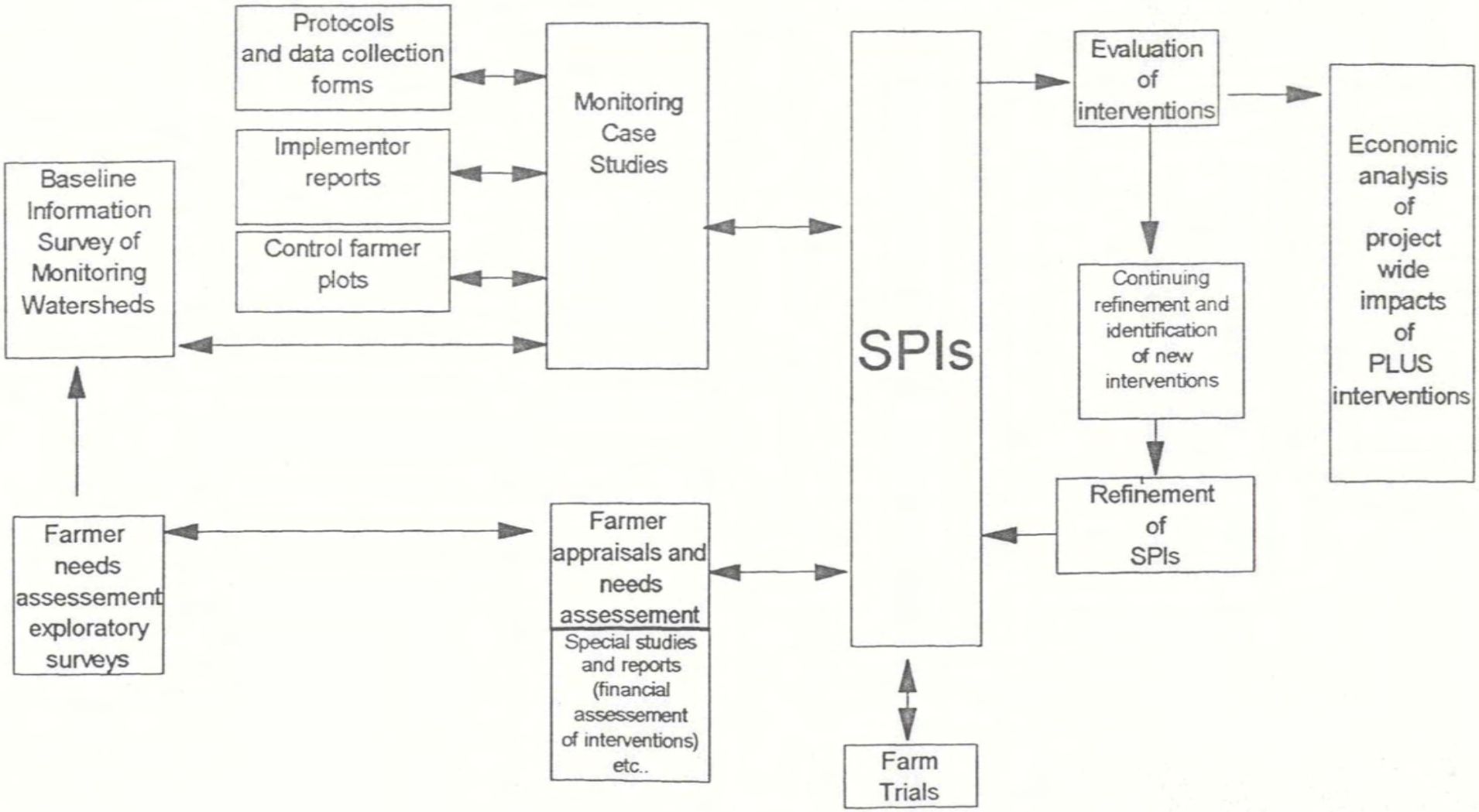
BIGs (Bio-intensive vegetable gardens).

Data will be collected every three days from 20 farmers in Marigold-Jacmel (PADF) and from 20 farmers in LaFond (CARE). The first form requires a descriptive drawing of the vegetable garden that determines its size in square meters as well as the space allocated to each type of vegetable in the garden.

The second form reports on each farming activity (from land preparation to harvesting) the number of people hired to do the work for each farming activity, the number of hours worked by each worker in that activity, how much money was each worker paid in cash and the value of food received. What inputs or materials (seed, poles etc.) were used, in what quantity and what was their cost. What was the monetary cost for transporting the vegetables to the market or, if transported on foot by the farmer, what was the time spent. For each type of vegetable produced, the quantity consumed at home, the quantity sold, the quantity stocked, the quantity given as gifts, are recorded along with the date that each operation takes place.

- Figure 1 -

PLUS M&E SYSTEM AND LEARNING PROCESS



Comments/Recommendations:

Although the frequency of collecting the data is every three days, it is not required throughout the year. As the collection of data proceeds we will know the total number of visits required and during which months of the year. Although the enumerator is directed by the data collection manual to record the following information, some additional entries need to be on the forms. Data on cost of transportation for the vegetables produced are not differentiated on the form by expenditures for transportation or time spent by the farmer in transporting their produce to the market. Furthermore, the form does not provide for a column to record a price received by the farmer from the sale of the vegetables.

Checkdams.

Twenty checkdams are part of the sample in Palmist à Vin (PADF) and 20 checkdams in Passe Catabois (CARE). Two forms are used for the data collection on checkdams. The first form identifies the ravine from which 5 consecutive checkdams are monitored (where the top and bottom checkdams cannot be included in the sample). Thus there are 4 ravines monitored (that have at least 7 checkdams on them) to come up with 20 observations. The first form then proceeds to identify the checkdam from which data is collected, the material used in the construction of the dam (stone or vegetative barrier), the horizontal distance, width and height of the dam, and the distance between the dams. This first form is used once a year to collect the physical parameters of the checkdams. It is from the parameters of this form that new land surface created with checkdams is measured.

The second form is used weekly to collect information on the cultivations that take place on the new surface of land. This form is identical to the second form used in the collection of data for the cultivation and products of the vegetable gardens.

Comments/Recommendations.

As the monitoring effort completes one year, we will identify the months during which this form is to be used in collecting the data. The following additions represent items that need to be included in the forms, although the enumerator is presently directed by the data collection manual to record some of this information. The weekly form (the second form addressing the management of the newly created land surface) does not differentiate the cost of transportation that the farmer pays and the hours spent by the farmer in transporting produce to the market. This form needs to provide for the monitoring of prices received by the farmer for the produce. We also need to record the cost of constructing the checkdam as well the cost of it's maintenance. On the forms used, information should also be recorded regarding the tenure control that the farmer has on the land (ravine) where the checkdam is built.

Several considerations, including time saved by the enumerators, have entered in the decision to monitor only ravines with at least seven checkdams. This way it will take only 4 ravines to collect information on 20 checkdams. Given the requirement that data collection be representative of the range of situations existing in the regions of intervention, this limitation of eligibility of a ravine for sampling, is too restrictive. PLUS should consider allowing ravines with a smaller number of checkdams to enter the sample. Increasing the number of ravines from 4 to 6, will greatly enhance variation within the sample without adding considerably to the time and travel required for the collection of data.

Hillside Rock Walls.

Data will be collected from 20 farmers in Mirebalais (PADF) and from 20 farmers in Barbe Pagnole (CARE). Three forms are used for the collection of data. The first form is used annually to collect information on all rows of rockwalls. The information is on what vegetative barrier is associated with the rock walls, what was planted behind the rock walls, the width, length, height and slope of the wall, the slope of the land behind the wall and the distance between walls.

The second form is used weekly to determine type of operation relating to the maintenance of the rock wall and the associated vegetative barrier, how many people involved, how many hours spent working, how much was paid in money and how much was given to them in the form of food. The benefits recorded refer to how much biomass, small branches, wood or other did the farmer utilize and how (feeding animals or selling wood etc.).

The third form, is to used bi-annually to determine yield of the product produced on the land between the rock walls.

Comments/Recommendations.

There is no recording of prices received by the farmer from products sold. The prices of products produced behind the rock walls should also reflect the improved quality of the products from better seed. We also need to record the cost associated with the construction of the rock walls and associated vegetative barrier. It seems unnecessary to monitor maintenance of rock walls and associated vegetative barriers on a weekly basis. Monthly monitoring should be sufficient to measure the costs of maintenance of these structures. The tenure control that the farmer has on the land where the rock walls are installed must also be established.

Hedgerows.

Data will be collected from 20 farmers in Les Cayes (PADF) and 20 farmers in Bombardopolis (CARE). Four forms are used for the collection of information. The first form is to be used annually and identifies what is planted between the hedgerows, the plant used for the hedgerows, the length of the hedgerows, the distance between hedgerows, the slope of the land behind the hedgerow, and the slope and width of the hedgerow itself. These parameters are used for measuring soil saved.

The second form is to be used weekly to record the maintenance and utilization of the biomass, small branches and wood from the hedgerows. It is the same form used for the rock walls.

The third form is used to determine the yield from harvesting the hedgerows and is to be used semi-annually.

The fourth form is to be used semi-annually to determine yield of the product produced on the land between the hedgerows.

Comments/Recommendations.

We need to determine the cost of planting the hedgerows as well as the prices received by the farmers for the products produced in association with this intervention.

The Total Sample and Controls.

CARE and PADF have identified 120 farm families each, to serve as the samples for the collection of the monitoring data (and control plots) and they were divided as follows: 20 farmers per intervention plus 40 farms on non-intervention hillside plots (20 for rockwalls and 20 for hedgerows) as witness (comparison or control) plots ((20*4+20*2= 120)* PADF+CARE= 240)).

The sample of 20 farmers (or plots) to serve as control for the measurement of yields of products produced without rock walls or hedgerows is to have the following characteristics common with the

farmers that have rock walls and, or hedgerows:

- they must be cultivating the same products
- they must be in the same watershed
- the land must have the same slope
- the plots must have similar physical characteristics

The forms to be used in the collection of yield measurements are the same forms used in the monitoring measurement of yields from rock walls and hedgerows.

Comments/Recommendations.

The experimental design implicit in the monitoring and evaluation (M&E) of PLUS is one that addresses adequately the needs of the M&E system with a learning process that continually refines interventions, their implementation, identifies new interventions and requires a continuous formative evaluation of interventions. It is important to reemphasize that the PLUS M&E system never intended to be a summative evaluation of the entire project.

The objectives of PLUS of "sustainable increases in on-farm productivity and farmer income through the integration into farming systems of appropriate land use and soil conservation measures which enhance soil productivity" are achieved with a series of interventions that result in improved yields and translate into higher and, or more stable farmer incomes as erosion rates from hillside cultivations are reduced over time. Yield improvement and stabilization reflect the achievement of the bulk of PLUS objectives.

The steps in the Implementing Design for yield data collection for hedgerows and rock walls is as follows:

1 Identify group of farmers that will be adopting these PLUS interventions (non-random assignment of interventions)
2 Draw sample for monitoring over time (time series information "with" the interventions)
3 Document installation of PLUS interventions (hedgerows etc. from data collection forms and reports)
4 Measure yields from plots "with" hedgerows and plots "with" rock walls over time
5 Identify (for comparison with the adopters) farmers (plots) in the areas of intervention that are similar to the farmers (plots) that adopted the interventions (non-random, non-equivalent, only for comparison with the adopters)
6 Provide information about the ways (physical social or economic characteristics) the two groups (adopters and control) of farmers (plots) are alike and different
7 Measure yields from control (comparison) plots at the same time as step 4

8 Determine the differences in yields under step 4 and step 7 to derive the effect of the PLUS interventions of hedgerows and rock walls.

It becomes immediately apparent that in order to represent "history" the yields, obtained from the control group, must be recorded every time that yields are measured for the adopters. "History" here refers to the prevailing general economic and climatic conditions during the time period covered by the project, for example, ease of availability of inputs, rainfall etc. Thus PLUS should not limit the collection of yield measurement to one time, but continue the data collection on yields every time that yields are measured for the farmers that have adopted hedgerows and rockwalls (the monitoring effort).

Because the control group of plots is chosen from within the same watershed in which interventions are being implemented, it is expected that some of the farmers from the control group may become adopters of hedgerows and/or rockwalls (sample contamination). Thus the plots that make up the sample of control plots will be changing over time as farmers who become adopters of the interventions are dropped and new ones are added. The total area farmed by each participating farmer as well as control farmer should also be added on the monitoring forms. The importance of this information is not only to make the participating and control farmer data more comparable, but is needed for the calculation of some of the PLUS SPIs.

In order to address correctly step 5 above, PLUS must include in the criteria for selection of the control group of plots, that the plots must have similar soil quality characteristics, similar erosion rates, similar depth of soil, similar tenure control of the plot, similar cropping histories and rotations and possibly similar overall hectares of land under cultivation.

Because of the diversity of field conditions within a small area in the zones of intervention, seeking controls for paired comparisons may require a massive and costly effort by PLUS. A more efficient and cost effective method for obtaining a comparison between the interventions and the traditional system should be considered by PLUS. For example, formal farmer-managed, PLUS supervised on-farm-trials on adjacent plots in the same field would provide pair-wise comparisons with a less costly level of involvement on the part of PLUS.

In order to address correctly step 6 above, PLUS must develop a simple form that can be used to record the characteristics referred to, under step 5 above (or include in an existing form). This means that the form must record the slope of the plot, soil characteristics, etc. This same form must also be added in the collection of information from those farmers in the monitoring sample with hedgerows and rockwalls. Although a slope of 20 degrees

in one plot and 26 degrees in another within the same watershed may be similar, when we are determining differences between yields from the control plots and from plots with a PLUS intervention, weight should be given only to differences between yields coming from plots with a smaller difference in slope, all else equal. Thus, the selection of the control plots will have to be done only after careful examination of the physical characteristics compiled from the plots of adopters of hedgerows and rock walls.

Prices received by farmers, prices paid for inputs and cost of farm labor, have been recorded in the baseline study as the "without" the PLUS interventions control. The same information will be collected from the monitoring effort of PLUS interventions to see how these variables change over time. Although this design is adequate for a formative evaluation of the implementation of the program, a few additional pieces of information will greatly enhance the ability of PLUS to judge the outcomes of its present interventions and contemplated future marketing interventions.

The second form developed for vegetable production should be improved by adding prices received by the farmers and the differentiation of cost of transport of their products (in terms of monetary cost to the farmers or time spent by the farmers in transporting their products to the market). This form should be compiled twice a year for the (hedgerow and rock wall) control farmers, when yield measurements are made on their plots. This will allow PLUS to see if improvements in the marketing process (or saturation of markets for certain products) has some effect on prices received and paid by farmers, or if improved quality seeds gives improved quality products that command a higher price. To the extent that PLUS directly works with the improvements in the marketing process, then it would be more appropriate to measure benefits to marketing programs at the site of the marketing effort.

Since "history" here cannot be taken into consideration through a control group, PLUS should be keeping track and reporting on prevailing economic, climatic and other relevant conditions, for eg. droughts, scarcity of certain inputs, over-production of certain products, etc.

Additional Interventions, New Interventions/Farm Trials

Monitoring forms for the collection of information from the on-going farm trials need to be developed and used as soon as possible, in order to measure input requirements, yields and prices paid and received by the farmer. The forms that have already been developed for the monitoring case studies can be used directly for the monitoring of farm trials. Not all data need to be collected from the farm trials and special attention should be paid to their interpretation. Under experimental conditions, labor requirements could be overstated and therefore be misleading.

For the remaining interventions, PLUS should also collect data. Especially on fruit production, charcoal and wood, grafted trees and marketing of these products. A documentation is also needed on the operation of seed banks as they constitute part of the SPI information reported by PLUS.

As interventions are modified over time, and/or new interventions are considered, PLUS should be monitoring these interventions also. If the monitoring effort overtime becomes considerably larger, additional resources would have to be allocated for this undertaking. Monitoring teams should be strengthened by adding personnel as well as equipment.

When the SPIs were selected in order to drive the PLUS learning process of the M&E system, they were based on the interventions that PLUS was then contemplating. As interventions are refined or changed so should the SPIs. Furthermore now that the bulk of the monitoring effort is in place, it is time to decide the relevance of the existing SPIs and decide which SPIs may not be possible to calculate given existing constraints that drive the overall allocation of effort. To this effect, a questionnaire was developed, to solicit opinions within PLUS on usefulness of SPIs in providing information for improving implementation (Appendix A).

An SPI for PLUS is a statistic of direct normative interest which facilitates concise, comprehensive and balanced judgement about the condition of major aspects of a society that are part of project goals (the term strategic performance indicator was coined in relation to the "Natural Resources Management Program, 492-0444" in the Program Assistance Approval Document, USAID/Philippines, September, 1990). An SPI is subject to the interpretation that if it changes in the "right direction", while other things remain equal, project goals are progressively and continually being achieved. Since PLUS does not have a fixed set of interventions with which to achieve its goals, rather it uses the M&E learning process to refine and identify new interventions, the M&E system is part of project implementation. The PLUS M&E system is not designed to solely estimate project performance and impact (which are not mandated quantitatively in the project documents). It is supposed to keep providing the necessary information to the implementors, which will allow them to continually and progressively identify "appropriate land use and soil conservation measures to provide sustainable increases in farm productivity and farmer income". It is therefore imperative that the implementors participate in the changes that need to be made before we can revise them based on the experience accumulated during this last year.

III. Assessment of calculation algorithms for the SPIs

The assessment of the algorithms for calculating the SPIs is based on the report by J. D. (Zach) Lea, "Monitoring and Evaluation Report, May - October 1993). In Appendix B., the SPIs are presented by utilizing implementor reports, the existing baseline information as well as several special studies. Any further suggestions regarding the implementor reporting, assessment of calculation algorithms and data needs, in order to complete the calculations of the SPIs are included in the Appendix B.

IV. Critique financial evaluations of interventions

The financial evaluation of the hedgerows is appropriate and should serve as an example for future financial evaluations of interventions. Since vegetable gardens and checkdams utilize land that was previously unused the net benefits associated with these plots are zero without the intervention.

In the case of hedgerows, checkdams, rockwalls and trees, a "remaining value" should be calculated, and added to the net incremental benefits of the last year for which calculations are made. Thus, long term project intervention calculations, can be truncated to a 10 year period as long as "remaining values" are used.

For each intervention a Net Present Value (NPV) as well as an Internal Rate of Return (IRR) are calculated. The reason for calculating both is so that "mutually exclusive" interventions will be compared trough the magnitude of the NPV, the rest by the magnitude of the IRR. Thus among "mutually exclusive" interventions, the intervention with the higher NPV is preferred over the intervention with the lower NPV, as long as they are both positive. Otherwise we rank preferred interventions based on the magnitude of the IRR, as long as the IRR is greater than the discount rate.

The comparison between vegetable gardens and the other interventions should be made based on the magnitudes of the IRR. The same applies for checkdams. It is less clear with hedgerows and rock walls, in that potentially either one could be placed on a given plot and thus become mutually exclusive. If on the other hand hedgerows need to be installed where there is no availability of large stones, then the two interventions may not be perceived as mutually exclusive.

These financial evaluations do not fully account for the difficulties that may be present in obtaining credit. Thus, a financial evaluation of interventions, should be also addressing descriptively issues like ease of obtaining the capital for the investment or any other special requirements (for eg. required technical knowledge etc.).

The real discount rate used in the evaluation of PLUS interventions has been 10 percent. Normally, for investments with long term benefits from resource conservation, a low real discount rate is used. This is done in order to allow net benefits that will materialize after several years to have some weight in the financial evaluations. At the same time we know that credit availability in the zones of intervention of PLUS is almost exclusively through informal channels and that interest rates can be as high as 120 percent per year. My conclusion is that without additional information on the cost of capital in Haiti, the real discount rate of 10 percent, is acceptable.

V. Recommendation of an analytical methodology for an economic evaluation of interventions

The PLUS M&E system with its associated SPIs, provide for a "PLUS learning process" designed to refine existing interventions, identify new ones and provide information that would allow PLUS to devise strategies in order to achieve project objectives. Thus the M&E system is geared toward evaluation of alternative interventions and provision of useful information for improving implantation rather than measuring performance toward quantitative goals. The M&E system refers to a large farm trial which PLUS implementors conduct in order to evaluate the effect of their interventions. Direct use (with no adjustments) of any of the data for an economic evaluation of the PLUS project was not intended and would be inappropriate. The PLUS M&E system does not contain the format of a "logical framework" based evaluation.

The temptation exists to use directly some of the numbers generated by the SPIs or the monitoring results, in order to derive project wide impacts. Obviously, the simplest calculation would be the multiplication of any net benefit by the number of participating farmers or lineal feet of hedgerows etc. Such direct calculation should take into account that the implementors concentrate their efforts mainly in the monitored watershed.

The possibility of driving project activities, may render the data "non representative" for the "PLUS learning system". Although PLUS should be able to extrapolate to the non monitored watersheds the results obtained from its monitoring (based on slope, soil quality etc.), these results should not be directly extrapolated project wide for the purpose of an economic evaluation. The monitoring information simply represents the results of a large scale farm trial.

For an economic evaluation of project wide impacts, relevant data need to be collected from the remaining watersheds, in the zones of intervention and used to adjust upward or downward the estimates obtained from monitoring. A sample of 20-40 observations from the non-monitored watersheds could concentrate on yields obtained and prices received, structures still effective and soil

saved behind vegetative barriers. Thus, the measurements should be taken only right before and right after the harvest of major crops and could be designed and carried out as a collaborative effort within the PLUS group.

Viewed this way, the economic evaluation of project wide impacts uses some of the information that is part of the monitoring system, after it has been adjusted to reflect results obtained in the remaining areas of intervention. If hedgerows, for example, are not found to remain effective over time, in non monitored zones, resulting benefits would be sharply decreased in calculating project wide benefits. It is thus necessary that the implementor reports, containing the number of participating farmers, training sessions, meters of structures, hectares of cultivation, etc., be always presented by zone or watershed of implementation and not as aggregate numbers.

The economic evaluation of project wide impacts should account for:

a. Aggregation of impacts
b. Use of cif and fob prices for imported and exported (or exportable) commodities, adjusted for the foreign exchange premium, tariffs and subsidies, in-country transportation, handling and marketing costs.
c. Opportunity cost of labor
d. Additional economic activity generated through the backward (input) and forward (products) linkages
e. Environmental impacts on subsequent downstream users

The environmental impacts to downstream users relate to sedimentation, reduced water retention capacity and arrival to the sea of sediment that affects fisheries. Given the steep slope farming in the areas of intervention of PLUS and the high rates of erosion, it is possible that income and on-farm productivity effects are less than the secondary effects of reducing damage to subsequent users of the resources.

It is necessary that a special study be made in order to monetize these secondary effects since the objectives of PLUS include reductions in environmental degradation. This study should first calculate the on-farm impacts of decreased rates of soil erosion and stabilization. Several SPIs provide information regarding on-farm soil conservation impacts. Then, by following a representative watershed off-site avoidance of damage can be estimated. The non permanent nature of checkdams, rock walls, hedgerows and trees should not suggest that off-farm impacts are of little importance. As long as they provide on farm soil conservation benefits, they must also provide off-site benefits.

Upland farming activities cause additional soil erosion, silt and chemical pollution of streams. Sediment is stored in the

delivery system awaiting storm events. Sedimentation and silt result in flood plain damage during severe storms resulting in losses of crops, animals, farm property, roads and in some instances human life. Sediment transport and silt, decrease the water holding capacity of natural reservoirs thus increasing the time and effort associated with water provision.

Sedimentation of coastal zones and turbidity reduce the productivity of sedentary species of shellfish and by damaging coral reefs, indirectly affect other fisheries. Coastal waters are the most productive of all marine areas and many species of fish and crustaceans are dependent on near-shore waters during at least part of their life cycle. Sea fisheries produce benefits in the form of income to fishermen (who need to apply a larger effort for the same catch), availability of fish for domestic consumption (or export), employment in related services, etc.

The economic analysis of off-site damages should not require contingent valuation/bidding game techniques, given the difficulties associated with simulating markets in rural Haiti. Cost-side approaches are very useful because they involve tangible actions which have directly observable market prices. Therefore, changes in productivity, loss of earnings, foregone income opportunity and replacement cost should be the approaches used in the analysis.

VI. Project wide financial assessment of interventions.

This is an attempt to determine the magnitudes of project wide impacts that PLUS interventions may have. For this attempt, only baseline data and special reports was used and no information from the PLUS monitoring results is utilized. From the reporting forms of CARE and PADF we simply aggregated and used approximate levels of adoption for the different interventions.

For hedgerows information on yields (animal forage and soil conservation) was obtained from the John Dale (Zach) Lea study "September 1993 Financial Evaluation of Hedgerows". Based on the estimate (from implementor reports) that hedgerows were installed on 762 ha of land during 1993, with an annual net benefit to the farmer of H$ 181 from SPI III.1 (if properly maintained after the investment in the hedgerow has been made), we estimate a potential project wide impact from hedgerows of H$137,900 annual income (TABLE A).

TABLE A
Potential Project Wide Impacts of PLUS Interventions in 1993 (in H$)

Intervention	Income per ha (ann.)	Capitalization per ha	Income Project Wide	Capitalization Project Wide
Vegetable Garden	180 (per Garden)	121,000	641,520	41,333,800
Gully plugs	4,000	21,565	240,000	1,293,900
Rock walls			89,400	678,750
Hedgerow	181	1,374	137,900	1,047,000
Improved Seed				
Trees	15 (per Tree)	75 (per tree)	4,590,000	22,950,000
Grafting				

Capitalizing the value of the Hedgerows over a ten year period with a real discount rate of 10 percent we obtain H$1,047,000 as the value of potential project-wide financial impacts. These calculations assume that the farmer is using the hedgerow for forage as well us for soil conservation (See SPI III 1). The net benefit from hedgerows represents about 7.2 percent of the farmer average gross income from crops. This is assuming that the average farmer installs hedgerows on a plot which is about 0.14 of a hectare (calculation from implementor reports, by dividing the total hectares by the number of participating farmers). The average income from crops was found in the PLUS Baseline Information Report and is H$ 352 (TABLE B).

TABLE B
Contributions of PLUS Interventions to the Farmer*

Average Farmer annual income from crops H$ 352			
Intervention	Ha	Return/ unit	% of H$352
Hedgerows	0.14	25.34	7.2
Checkdams	0.02	80	22.7
Rockwalls	0.05	--	--
Vegetables	--	180	51.1
Trees	23 (trees)	345	98

* Percent of income increase above and beyond the $352, that a farmer will obtain by adopting a particular intervention.

Checkdams provide about 0.02 ha of new land which is assumed to be planted with banana trees. The annual expected income is H$ 4,000 per hectare (after the investment in the checkdam has been made) and the cost of building the dam is calculated at H$ 9,500 with a remaining value of H$ 9,500 after 10 years (From "Intervention Success Stories" by J.D.(Zach) Lea, R. Saint-Dic and F. Brockman and consultant estimation of the cost of building the dam). The structure considered here is about 6m length by 1m height. The project wide annual income contribution of checkdams (60 ha from the implementor reports) is calculated at H$ 240,000 and their capitalized value, as calculated for SPI.III.1. (at 10 percent real rate of discount), is H$ 1,213,900 per ha (TABLE A). The net benefit from a checkdam is about 22.7 percent of the farmer average gross income from crops (TABLE B).

Vegetables are grown on land that is not presently utilized by the farmer and their annual net income contribution per ha is H$ 180 (J.D. (Zach) Lea, R. Saint-Dic, F.Brockman). The Project wide income contribution of vegetable gardens (3,564 gardens from implementor reports) is estimated at H$ 641,520. Although vegetable gardens do not add to land values, the capitalization value here refers to the knowledge gained by the farmer from PLUS. Thus we calculate project wide a capitalization value of H$ 4,333,800 (TABLE A). The annual contribution of vegetables as a percent of the farmer's average gross income is estimated at 51.1 percent (TABLE B).

Rock wall calculations were based on estimates of rockwalls in place (about 494 ha) and the net incremental benefits of hedgerows. No information could be found for improved seed or fruit tree grafting.

Trees were assumed to be fruit trees yielding an average annual income of H$ 7.5 from fruit and an average annual income from wood of H$ 7.5. The income from fruit assumes that after the fifth year a steam of H$ 10 will be generated from the production of fruit and the income from hardwood assumes that H$150 will be the farmgate value of the wood from a 25 year old tree. Thus, the capitalized value of the average tree is H$ 75, at a 10 percent real discount rate (TABLE A). Given that PLUS reported approximately 612,000 trees, and assuming a 50 percent survival rate, the annual project wide income from trees is H$ 5,355,000 and their capitalized value H$ 22,950,000 (TABLE A). From implementation reports, it was calculated that on the average a farmer has 23 trees from the project. The contribution of these trees as a percent of the farmer's average gross income from crops is 98 percent (TABLE B).

Given the difficulty of obtaining information for these calculations, caution should be used with these numbers. It is evident that trees, even if somewhat overestimated, have the largest contribution to farmer's income. However, for the trees to avoid occupying cultivable land, they need to be planted on the

perimeter of plots (or used as part a hedgerow). Planted on the perimeter of plots would lessen their effectiveness in reducing erosion rates. Checkdams, rock walls and hedgerows have smaller contributions to income but are expected to be more effective for soil conservation purposes.

This project wide financial assessment of interventions did not include all interventions by PLUS. They constitute the necessary financial evaluation needed in order to address some of the SPIs.

APPENDIX A.

IMPLEMENTOR QUESTIONNAIRE

SUBJECT: Your Present Evaluation of the SPIs

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Please help us appraise the SPIs by giving us your responses to the following questions. We welcome any other comments you may have concerning your experience with the SPIs.

1. Use the attached TABLE 1 to enter your opinion as to the usefulness in providing information that you can use in improving the implementation of the PLUS Project. The SPIs are listed on the attached pages.

2. From the information obtained from each SPI, briefly explain what types of implementation decisions will be made.

3. What additional information, not presently obtained through the SPIs, would be useful in your implementation of the PLUS Project?

4. List the interventions your organization is presently promoting and allocate the percentage of extension time and/or resources directed toward the implementation of each intervention.

5. Would you consider it useful (in evaluating the M&E effort as a whole) to estimate the amount of personnel time devoted to the M&E effort as a whole and where possible to allocate that to the various interventions.
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TABLE I

RELATIVE USEFULNESS OF THE SPIs

SPI	Usefulness Rating		
	Very Useful	Useful	Not Useful
I.1			
I.2			
I.3			
I.4			
I.5			
II.1			
III.1			
IV.1			
IV.2			
IV.3			
IV.4			
IV.5			
IV.6			
IV.7			
V.1			
V.2			
V.3			
V.4			
V.5			

APPENDIX B.

PLUS SPIs for 1993

PLUS SPIs for 1993

TABLE 2, and Figure 2, are presented to facilitate the identification of monitored watersheds. The PLUS SPIs for 1993, were calculated based on presently available data and information. What follows presents the basis on which the SPIs should be calculated in the future. Some SPIs do not require calculations, rather they are supposed to contain information derived from the farmer appraisals and needs assessments that are performed periodically. Suggestions follow most SPIs on additional data or information requirements and method of derivation. The relevance of not being able to report on some SPIs cannot presently be assessed. It will be assessed when implementors have had the opportunity to react to the questionnaire in Appendix A as PLUS tries to focus on the refinement of its SPIs.

I. ENVIRONMENTAL (QUANTITATIVE)

I.1 Percent of area of a micro-watershed in environmentally improved land use practices (rate of adoption of interventions).

Maps for PADF are completed and should be soon be available for presentation. The methodology used by CARE relies on aerial photography and should also be soon available. Either methodology is adequate for the purpose of determining this SPI.

I.2 Secondary adopters per area per project assisted farmer.

From the "Project PLUS Baseline Information" report Table 4 entitled, "Percent of Farm Plots Having Conservation Structures and Managed by Farmers Participating in Project," we calculate the percentages for secondary adopters given in TABLE 2.

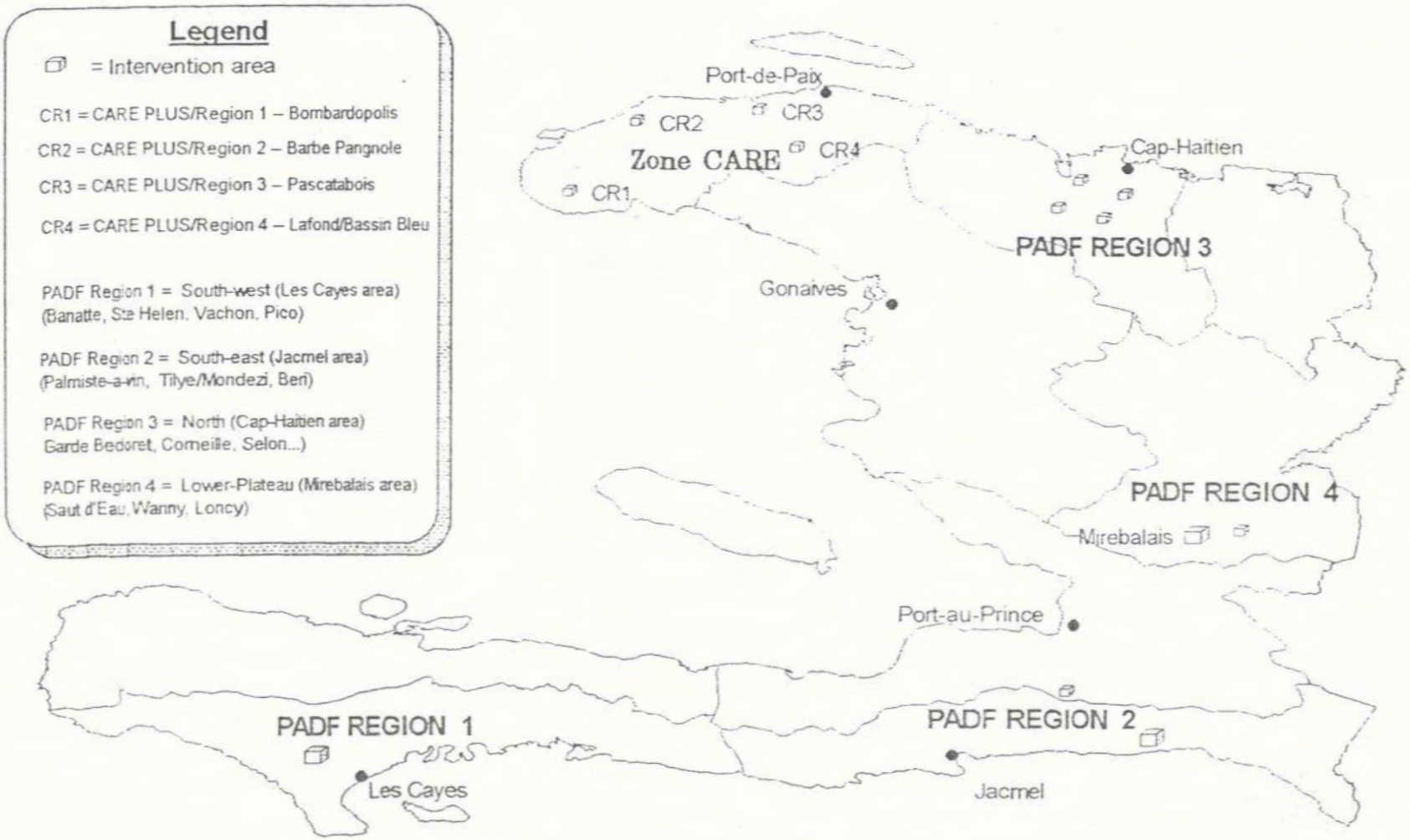
TABLE 2

%of Farm Plots having intervention but not participating in the Project					
Monitoring zone	Hedgerow	Rockwall	Stubble Barrier	Checkdams	Any Type #
Pico	29	0	0	0	7
Banatte	15	0	0	0	11
Mondezi	12	0	0	0	6
Palmist a vin	67	0	0	0	67
Corneille	0	0	76	0	76
Bedorette	0	0	85	0	85
Castanille	0	0	62	22	57
Saut-d'Eau	17	0	4	0	7
Wanny	10	13	0	0	6
Bombardopolis	18	19	20	35	22
Barbe Pagnole	0	50	14	25	20
Passe Catabois	0	0	54	0	43
LaFond	0	50	18	9	19

The resulting calculations are based on data that include adoption by farmers of interventions extended by projects other than PLUS. As monitoring data becomes available, the baseline information above will be used to adjust the new figures. Secondary adoption should be addressed by PLUS. Two small random samples (one in the zones of PLUS intervention and one outside the zones of intervention) of 20 farmers each should suffice for satisfying the requirement of this SPI. However this may be an expensive effort.

FIGURE 2

PLUS PROJECT INTERVENTION AREAS



I.3 Physical soil building behind structures (m^3/m).

The methodology and field measurement are contained in the monitoring case study data collection forms. The methodology is sound. From SECID's rough calculation, it is estimated that 25 cubic feet of soil per 139 linear meters of hedgerow have been build up behind hedgerows. From the implementor reports we know that 1,464,430 meters of hedgerow were installed during 1993 which if properly maintained should be capturing about 263,400 cubic feet of soil, over the next 5 to 7 years. Additional results are forthcoming from the monitoring information.

I.4 Percent of secure household farm in the intervention area in environmentally appropriate land use practices.

TABLE 3, presents the results obtained in the "Project PLUS Baseline Information Report".

From the "farmer needs assessment exploratory survey" the secure household tenure is estimated for the monitoring watersheds. In Jacmel, about 78 percent of plots have secure tenure, 14 percent are being rented and 8 percent have sharecropping.

In Mirebalais, about 70 percent of plots have secure tenure, 20 percent are being rented and 10 percent have sharecropping.

In Cap Haitien, about 80 percent of plots have secure tenure, 10 percent are rented and 10 percent have sharecropping.

In the Northwest, about 98 percent of plots have secure tenure, 1.5 percent are rented and 0.5 percent have sharecropping.

The information for this SPI should be collected through the monitoring case studies, and be reported later.

TABLE 3

PERCENT OF FARM PLOTS WORKED BY FARMERS
WITH AND WITHOUT SECURE TENURE
HAVING SELECTED SOIL AND WATER CONSERVATION STRUCTURES

	Land-Use Practices						
	Hedgerow		Rockwall		Stubble Barrier		Checkdam
	Tenure?*		Tenure?		Tenure?		
	Yes	No	Yes	No	Yes	No	
Vachon	31	0	0	0	3	0	100
Pico	32	0	14	0	0	0	100
Banatte	29	4	10	0	2	0	75
Mondezi	21	20	0	0	4	6	75
Palmist à vin	8	0	0	0	0	0	0
Beri	2	0	3	0	0	0	0
Corneille	5	0	0	0	75	54	14
Bedorette	0	0	0	0	80	0	5
Castanille	4	8	0	0	83	58	27
Saut d'Eau	7	0	0	0	26	0	100
Wanny	17		15		7		100
Cerecit	11		12		0		100
Bombardopolis	16	12	23	25	54	75	91
Barbe Pagnole	2	0	5	0	4	75	24
Passe Catabois	0	0	11	0	35	23	30
La Fond	6	0	4	0	38	23	33
All Zones Combined	12	5	8	4	20	17	31

* The figures in the columns headed by "Yes" are the percent of secure tenure farm plots (worked by farmers having a secure tenure relation to the plot) that have the indicated structure installed. The figures under the "No" columns are the percent of farm plots not having a secure tenure relation with the farmer working the plot that have the indicated soil and water conservation structure installed.

I.5 Area of arable land created by mechanical structures.

From the methodology explained in the case study questionnaire forms, it is calculated that 60 ha of arable land was created by checkdams (implementor reports).

II. ENVIRONMENTAL QUALITATIVE

II.1 Improvement of contiguous farm land adoption of conservation land use practices within the micro-watershed.

PADF has already developed the monitored watershed maps with the possibility of locating all interventions within a watershed. Thus, contiguity of adoption of conservation land use practices will be forthcoming. CARE through aerial photography will also be able to show contiguity of adoption of conservation land use practices within each monitored micro-watershed.

III. FARMER INCOME (QUANTITATIVE)

III.1 Incremental net returns for each intervention.

Since monitoring results are not yet available the incremental net returns for each intervention, the following information is based on estimates that were developed after discussion among the SECID group and already calculated estimates. From J.D.(Zach) Lea "Initial Financial Evaluation of Hedgerows" June, 1993) and "Intervention Success Stories by J.D. (Zach) Lea, Roosevelt Saint Dic, and Frank Brockman.

Checkdams

In H$ per ha.

year 1	year 2-year 9	year 10
-5,500	4,000	13,500

Net present value = 21,565 at 10% real discount rate.

Internal rate of return = 73%

Checkdams start with an investment of H$9,500 and have a remaining value of H$9,500 in year 10. The crop grown on the new surface is bananas. The average annual net income from the bananas is expected to be H$4,000, after the investment in the checkdam is made.

Hedgerows

In H$ per ha.

year 1:-185, year 2: 52, year 3: 207, year 4: 294, year 5: 309
year 6: 239, year 7: 199, year 8: 154, year 9: 131, year 10 : 1198

Net present value = 1,374 at 10% real discount rate.

Internal Rate of Return = 85%

The net present value of incomes beyond year ten is calculated as 965 and is added as the remaining value of hedgerows in year 10. The average annual net income expected from the hedgerow (it is also used to feed animals) is expected to be H$181, after the initial investment of the hedgerow is made.

Vegetable Gardens

In H$ per ha.

year 1 - 10
180

Internal Rate of Return = infinity

The net annual income from a hectare of vegetable garden is H$ 180. The net present value of the vegetable gardens is calculated to indicate the farmer capitalized gain from being exposed to the knowledge of operating efficiently their vegetable gardens. The net present value is H$1,216.

The incremental returns for the remaining interventions will be calculated when the monitoring data becomes available.

From the incremental net returns for checkdams, hedgerows and vegetable gardens since none of them are mutually exclusive, we conclude that the vegetable gardens, having the highest IRR, are more effective in producing income than hedgerows or checkdams, because they require no appreciable investment on the part of the farmer.

Hedgerows follow the vegetable gardens (with IRR=infinity) having an IRR = 85% and checkdams which require the largest investment have an IRR of 73 percent.

It is only with additional information, on time and labor cost (food etc.) requirements and consideration of farmer working groups, where work is shared, that the true cost of building the checkdams will be determined and therefore adjust the value of the associated IRR.

This SPI asks PLUS to determine costs and benefits associated with each intervention of their implementation effort as well as the costs and benefits associated with the practice that is being replaced (without the project). Thus, these projected incremental net benefits are supposed to be estimated initially, before the intervention becomes part of the PLUS implementation. The monitoring case studies are supposed to provide the actual costs and benefits that the farmer has experienced. Then the actual figures obtained from monitoring, substitute the projected ones and calculations of NPV and IRR are repeated.

This SPI becomes an important part of the information required for SPI.V.3. which addresses the correspondence between project calculated evaluation and farmer evaluation of income potential for each intervention. This is the importance to PLUS of SPI.III.1.

IV. ENVIRONMENTAL AND INCOME SUSTAINABILITY (QUANTITATIVE)

IV.1 Number of farmers adopting improved seed (commercial or seed bank) and number of participating farmers and amount of seed handled for: cereals, vegetables, fruit, hardwood and fast-growing tree seedlings, etc.

Seed banks are being established as improved seed is provided by the project and is paid back by the farmers (with interest) in kind. No information on commercial versus farmer operated seed banks and amount of seed handled by category exists, as required for this SPI.

Presently we have:

Cereals

Number of participating farmers 5,030 planting 720ha.

Vegetables

Number of participating farmers 1,364 setting 89ha.

Fruit trees

Number of participating farmers 1,977 setting 154,401 trees.

Hardwood trees

Number of participating farmers 1,933 setting 164,878 trees.

Transplants, direct seeding

Number of participating farmer 4,215 setting 372,000 trees.

CARE and PADF reporting does not address this SPI making impossible its calculation. The reporting of CARE and PADF should contain the information needed for this SPI.

IV.2 Area of household farm under improved seed (or better quality seed).

PLUS established 950 ha in improved crop seed and 4,450 vegetable gardens. Again the reporting by CARE and PADF does not address this SPI. There is no figure for hectares of vegetable gardens. Furthermore the case study monitoring forms should provide information on total farm plot area operated by each farmer in the sample.

IV.3 Hedgerows installed (area) and percent still effective.

PLUS has installed hedgerows to protect 452 ha. No information yet on the percent still effective.

IV.4 Percent of farmer income gains from interventions with environmentally improved land use practices.

To calculate this SPI, we need to know the adoption of one or more PLUS interventions by the same farmer. This should be determined when the monitoring case studies are completed. For the moment we know that from the hedgerows, checkdams, vegetable gardens and trees (see project wide financial assessment of interventions, TABLE B) that their total annual income contribution to the average farmer who adopts them all is H$630.34. Given that all interventions, except vegetable gardens, are directly associated with an environmentally improved land use practice, the total income to the farmer becomes H$630.34. The percent of farmer income gains from the accounted for interventions with environmentally improved land use practices is 71.4 percent.

IV.5 Percent increase in No. of household farm livestock.

From the baseline information report, we conclude that given the difficulties in measurement of this SPI, we will not be reporting it. The main difficulty is with the vague responses given by interviewed farmers.

IV.6 Incremental net returns to land/ha

a. Land area under each intervention times incremental net returns for each intervention will be reported when the PLUS monitoring data collection is completed.

We need to know the number of PLUS interventions adopted by the same farmer, from the monitoring case studies. Meanwhile the calculation can be the projected incremental net returns for the first year accompanied by the capitalized value of each

intervention:

For a hectare with hedgerows, year 1 =H$ -185, capitalization: H$ 1,374.
For a hectare with checkdams, year 1 =H$-5,500, capitalization: H$ 21,565.
For a vegetable garden, year 1 =H$ 180.
IV.7 Average gain in labor/hour productivity.

a. Incremental net returns from each intervention divided by the additional labor required by each intervention.

Since information on time requirements has not been collected with the baseline information study, it will require a lot more additional effort to provide the controls necessary for this SPI. No attempt will be made to quantify SPI V.7.

V. ENVIRONMENTAL AND INCOME SUSTAINABILITY (QUALITATIVE)

V.1 Interventions addressing farmer's most preferred farm-based income-earning enterprise.

From the baseline information report we have the following farmer reactions (TABLE 4). Unfortunately the resulting farmer answers are unqualified regarding the specific type of enterprise they are referring to, and how they perceive the project providing technical support. The questions should be limited to income earning activities only. Do farmers have an interest in soil conservation and how does that interest rank with other more immediate income earning activities?.

Using the farmer needs assessment exploratory survey, PLUS Report No 8, pages 6-12, and with additional questions to address the points raised above, we will be able to provide the information required by SPI.V.1.

TABLE 4			
FARMERS' TARGETS OF INVESTMENT			
	Percent of Farmers Interested in Investing in the Indicated Income-Earning Activities		
Monitoring Zone	Crop Production	Livestock Production	Commerce
Vachon	47	47	60
Pico	30	90	40
Banatte	39	50	39
Mondezi	90	63	50
Palmist à vin	18	9	86
Beri	100	41	62
Corneille	89	29	18
Bedorette	89	18	7
Castanille	70	7	26
Saut d'Eau	57	45	48
Wanny	20	67	80
Cerecit	45	83	90
Bombardopolis	57	27	57
Barbe Pagnole	14	52	31
Passe Catabois	86	76	31
La Fond	38	38	45
All Zones Combined	53	45	48

V.2 Risk reductions associated with each intervention as perceived by farmer.

The source of information for this SPI is the "Farmer Needs Assessment Exploratory Surveys".

Farmers perceived risk is due to:

1. their weak financial position
2. lack of technical support
3. can not afford credit (rates can be 120% annually)
4. price variability

Price variability information

>200%	Cowpeas
100% - 200%	Corn, cabbage, sweet potatoes, coffee, manioc, sorghum, avocado, banana.
50% - 100%	Plantain, cassava, citrus, pineapple, tomato, millet, beans, pigeon peas, yam.
20% - 50%	products of latanier, sugar cane, cocoa, rice.

From the "Farmer Needs Assessment Exploratory Survey we also know that marketing margins going to intermediaries (madame sara) can be very high for certain products:

Beans: 75% (range 100%)
Pigeon beans: 25% (range 25%)
Cowpeas: 100% (range 25%)
Corn: 200% (range 60%)
Sorghum: 30% (range 70%)
Green peas: (range 90%)
Bananas: (range 70%)
Plantain: (range 50%)
yams: (range 60%)
Cassava: (range 50%).

No systematic effort has yet addressed this SPI. Using the "Farmer Needs Assessment Exploratory Survey" PLUS report No.8, pages 6-12, with additional questions regarding what decisions and actions is the farmer presently making to decrease risk, whether present PLUS interventions address his concerns of risk and what changes in present interventions or new ones would address his concerns of risk, should provide the necessary information for this SPI.

V.3 Correspondence between project calculated evaluation and farmer evaluation of income potential for each intervention.

This SPI will be calculated after the PLUS monitoring results become available and there are additional farmer needs assessment

exploratory surveys based on the instructions contained in the "Farmer Needs Assessment Exploratory Survey" PLUS Report No.8, pages 6-12. From the monitoring case studies (corrections of the net incremental benefits) and the NPV and IRR revised results obtained from SPI.III.1., the correspondence between project calculated and farmer evaluation of interventions, will be determined.

The motivation behind this SPI is to compare our value ratings of the interventions, with that of the farmer. What are the reasons for the differences? Do farmers use different criteria and how can we incorporate their criteria to our criteria? Over time, changes in farmer evaluation of interventions may also be changing as farmers' knowledge increases and as the project refines the technology associated with the interventions.

V.4 Refinement of intervention based on problems and constraints identified by farmers.

The "Farmer Needs Assessment Exploratory Survey", identified the following constraints faced by farmers in the PLUS zones of intervention.

1. Lack of water (need for cisterns and more effective utilization).
2. Lack of pest management.
3. Need of grain and seed storage facilities.
4. Availability of improved seeds that are drought resistant, early varieties.
5. Need of forage for animals
6. Need of crops with major economic and consumption roles.

PLUS has already established farmer seed banks and the following Farm Trials (research/demonstration trials).

CARE - SECID have nine plots on bean and cowpea varieties, in Barbe Pagnole, Bombardopolis, LaFond and Passe Catabois.

PADF - SECID have twenty-one plots in the following:
Cap Haitian - vegetative barriers with plantain/sugar cane as principal components.
Les Cayes - vegetative barriers with leucaena/gliricidia and forage grasses as principal components and long term crops (manioc) to protect against uncontrolled grazing.

Again, the need arises for the completion of the farmer appraisal and needs assessment. SPI.V.1 and SPI.V.2. provide the basis for the refinement of PLUS interventions, in addition to the general problems and constraints identified through the collection of information with PLUS Report No.8, pages 6-12. The titles contained in these pages of questionnaires are: Opportunities;

Unrealized Possibilities; Program Interventions; and The Farming System.

The motivation of this SPI is that clearly a responsive project should be able to show that it has responded to problems and constraints that relate to project objectives, expressed by farmers.

V.5 Human resource development.

No information yet.