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**IMPACT EVALUATION OF THE
HAITI SMALL FARMER IMPROVEMENT PROJECT**

Prepared by

Samuel R. Daines
Senior Economist

Practical Concepts Inc.
Washington, D.C.

for

Agency for International Development
Mission to Haiti

(Prepared under contract No. AID/otr-C-1377, Work Order No. 22)

Appendix A, *Survey Methodology* by
Theodore Ahlers, AID Contractor

Computer Programming by
Karl Hancock, PCI
Randle Buttars, PCI

January 1979

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EXECUTIVE SUMMARY

A. Project Background

The Haiti Small Farmer Improvement Project which is evaluated in this study was approved in 1974. It focuses on providing credit and technical assistance to small Haitian coffee farmers through regional credit and technical assistance centers. The objectives of the project are to increase income, standard of living, and production of coffee on target group farms. The project has been the subject of two previous evaluation efforts which focused principally on institutional issues. The current evaluation attempts to estimate final income, production, and standard of living impacts of the project on its participant farms and families.

B. Evaluation Plan

This evaluation is based on a comparison of 174 randomly selected participant farms and a matched group of 288 non-participant coffee farms of similar size from adjacent areas. To test the accuracy of this control group match, 143 new participant farms who have not yet entered into participation were selected at random. The comparison of this newly selected group of participants with the matched control group indicates that with a few important exceptions the control group closely represents participant farms before participation. These selected farms were interviewed using a Creole questionnaire which contained a wide variety of accounting and welfare indicators.

C. Income Impact of the Project

The project has achieved substantial increases in the incomes of approximately 70% of participants. For the 30% of farms over 5 Ha. the impact has been negative. Income increased by 74% for farms from 0-3 Ha., by 11% for 3-5 Ha. farms, and decreased by 22% for farms over 5 Ha.. Overall income impact on all participants is estimated at 21-37%. The project has been a success on its most important objective, income, but perhaps more significant is the fact that **the poorest farms are the ones achieving the largest improvement**. In the future the project should focus more exclusively on smaller farms where more success can be achieved and where the need is greater.

About half of the increased income is in the form of increased profits and half in the form of increased employment opportunity for absorbing under-utilized family labor. The smallest farms are the most efficient in land use and in rate of return, their poverty is more a function of the size of their businesses than their efficiency.

D. Non-Income Indicators of Standard of Living Impacts

Housing indicators of quality are used to identify the impact of the project on non-income dimensions of family welfare. Significant improvement is observed in the incidence of tin roofing which was used as the principal indicator.

E. Production Impacts

Total farm production impact estimates range from an increase of 87% on 0-3 Ha. farms, to a decrease of 9% on farms over 5 Ha. in size. Farms from 3-5 Ha. experienced a modest increase of 20%. This increased output came partly at the expense of internal rate of return on cash costs, which decreased by 3-41%. Since substantial increased income resulted, the decrease in rate of return on cash is not seen as a negative finding. **Two thirds of the production impact is attributable to increases in coffee.** The study findings indicate that project participation has had a fundamental impact on increasing the productivity of land in participant farms and also increased the productivity of smaller farms in comparison to larger ones.

F. Coffee Production and Technology Impacts

Coffee production appears to have increased by approximately 40% on participant farms as a result of the project. The smallest farms (0-3 Ha.) more than doubled their production while the largest farms over 5 Ha. slightly decreased. Fertilizer use increased dramatically, participants used fertilizer in 35% to 91% of the cases studied while only 3-9% applied fertilizer among the control group. The impact was insignificant in the introduction of new varieties in coffee and little impact was also observed in reducing the age of coffee stands. Coffee prices were higher for participants due to increased competitive position from expanded production quantities and from decreased dependence on middlemen for credit and marketing services.

Technical assistance from extension agents reached 99% of participants and 86% felt that the service had increased their coffee income. Farmers indicated that additional fertilizer is the most important way to increase coffee income, followed by pruning trees and reducing shade. Improved varieties, cooperative marketing and increased plantings to reduce the age of stand were all seen by farmers as of lesser importance.

G. Credit Analysis

The project reduced the dependence of participant farmers on coffee brokers and family lending sources. Credit need is still strong in both BCA and non-participant farms as indicated by the farmers in the survey. **91% of participants and 93% of non-participants indicated a need for additional funds in the coming agricultural year.** The average loan size requested was \$265 for participants and \$154 for non-participants. The three most important uses to which additional funds would be put are all non-coffee uses. Coffee uses are seen as secondary. Given the importance of coffee in all responding farms this finding is difficult to explain. Delinquency appears to be a growing problem of serious dimension, the study estimates that within the next 18 months delinquency rates will approach 60%

H. Agriculture Credit and Technical Assistance in Non-Coffee Areas

Two non-coffee areas receiving agriculture credit from BCA were included in the study to provide a basis for comparing the impact of lending where coffee is not the predominant small farm crop. **The conclusion of this analysis is that non-coffee lending has had no income, and only very slight production impacts.** Fertilizer use has increased substantially but without any corresponding increase in net income. Technical assistance reaches a much smaller proportion of credit and non-credit farms in non-coffee areas and is perceived as much less useful than in coffee areas. Credit demand is even higher in non-coffee areas, over 90% of BCA and non-BCA farms indicate a desire to borrow additional funds in the coming agriculture year. Important changes in technology, crop mix, or farm management will be necessary before non-coffee credit will be a success in non-coffee areas like La Vallee or St. Marc.

I. Analysis of Possible Rural Development Alternatives

Farmers in the survey were asked to rank the priority of alternative rural projects. **Roads, schools, and health facilities were the priorities, in that order, for the coffee areas.** Health facilities were ranked first in non-coffee areas followed by agricultural extension and schools.

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CHAPTER ONE PROJECT BACKGROUND, EARLIER EVALUATIONS AND METHODOLOGY

A. Project Background

The Haiti Small Farmer Improvement Loan was presented in AID Washington on May 21, 1974, subsequently approved and has now been in implementation for more than three years, some small farms have borrowed in three successive crop years. The project has been much evaluated, two and one half years after approval the first evaluation was completed.¹ Since then evaluation has been an annual event with the second evaluation completed in 1977² and the third (this one) undertaken in 1978. In many respects these earlier evaluations covered ground which the current study can avoid. Both for the purpose of orienting readers who may not be familiar with the project itself, and to clarify project purposes and objectives so that effective evaluation against those objectives is possible, this chapter covers a brief review of project documents, results of earlier evaluations, and outlines the methodology for the balance of the study.

1. Project Purposes and Goals

A review of the CAP reveals a particularly concise, understandable and evaluate-able set of purpose and goal statements. These purposes are stated in the Summary and Recommendations section of the CAP as follows:

D. Purpose of the Loan The proposed loan is intended to assist in the execution of a five-year small farmer coffee production program. The program seeks to increase the income and standard of living of the Haitian small farmer through increased production of improved coffee. This increased production is also expected to result in significant improvements in the Balance of Payments and revenue accounts of the GOH.

*The program seeks to establish a delivery system whereby a package of improved technology, fertilizer, credit and training may be channeled to the small farmer. Complementary goals are the capitalization of a small farmer credit fund and the establishment of small farmer cooperatives.*³

1.1/ *Assessment Report of the Haiti Small Coffee Farmer Project and the Bureau de Credit*, Credit Union National Association, Inc., Wash. D.C. Nov. 1976, cited below as CUNA 76

1.2/Evaluation of the Haiti Small Farmer Coffee Project, Development Alternatives Inc. Wash. D.C. June 1977, cited below as DAI 77.

1.3/ See Haiti Small Farmer Improvement, Capital Assistance Paper, Agency for International Development, Wash. D.C. May 1974 page i (hereafter cited as CAP 74)

The content and even sequential ranking of these purposes is consistently reinforced throughout the paper. In the Description of the Project (Part Three) section in the CAP these purposes are restated as follows:

Overall Goals of Program

1. Increase small farmer income and standard of living through increased production.
2. *Increase the quality and quantity of coffee produced in Haiti.*
3. *Improve the GOH Balance of Payments through increased exports.*
4. *Increase GOH revenues generally.*
5. *Capitalize and support an agricultural credit system.*
6. *Seek to establish a network of coffee producer organizations*
7. *Seek to increase GOH investment into agricultural development activities.*⁴

The implementing agencies are the National Coffee Institute, IHPCADE, and Agriculture Credit Office, BCA.⁵ IHPCADE has provided technical assistance to participant coffee farms through their regional coffee centers and BCA has provided supporting credit.

B. Project Evaluation Plan

The CAP appropriately contains an evaluation plan, which though brief, provides the necessary structure for effective evaluation. The evaluation plan states:

*The evaluation will endeavor to measure in overall terms progress toward the primary objectives of the loan as outlined in the loan document. . .*⁶

The predominant position of the goal to increase the income of small farmers is clear in the CAP evaluation plan, as are the secondary but still important objectives of increased production, productivity, foreign exchange earnings, and a delivery system for credit and technical assistance. The language is as follows:

*Increase income to small farms and cause corresponding increases in GOH foreign exchange earnings. Increase productivity by target group small farmers resulting in corresponding increase in GOH foreign exchange earnings. Develop a rural delivery system for the provision of credit, supplies and complementary services to the small coffee farmer.*⁷

The CAP evaluation plan saw the necessity of a "Farmer survey"⁸ to obtain the necessary data for the evaluation, and went so far as to attach "a suggested copy of a questionnaire . . . as Annex V"⁸ to the CAP itself. It is a credit to the foresight and technical skill of the project designers that the suggested questionnaire

1.4/ See CAP 74 page 4

1.7/ See CAP 74 page 133

1.5/ Institut Haitien de Promotion du Cafe et des Denrees d'Exportation (IHPCADE) and Bureau de Credit Agricole (BCA)

1.8/ Such a level of specificity, including even the suggested questionnaire is rare in AID Capital Assistance Papers. See CAP 74 page 133

1.6/ See CAP 74 page 133

in the CAP, titled "Basic Data Needed in Determining Impact of Program"⁹ covers all the basic data finally comprising the 1978 survey designed by contract data gathering specialists, AID and GOH officials. The CAP envisioned survey was described.

*2. Farmer Survey. In addition to other evaluation techniques which may be implemented over the time frame of the project, the BCA will establish as part of their credit procedures a select group of farmers from which base line data will be gathered as part of the credit process. A suggested copy of a questionnaire is attached as Annex V.*⁸

A good evaluation plan was outlined, and there is some evidence that BCA made at least the beginning of an attempt to implement their part of the job, but the job was never undertaken as outlined in the CAP. Part of the problem is that the CAP¹⁰ put the responsibility for data on BCA which probably did not have the capacity to do the job. Contractors cannot be faulted for not doing what AID does not ask them to do, it should be said of both earlier efforts¹¹ that their scopes of work did NOT include AID asking them to do the evaluation the way the CAP appropriately outlined it.¹² Determining it not to be part of their scope of work, the DAI team appropriately recommended to AID that after the project had been "redesigned" based on their evaluation results, AID should return to the original design and gather the necessary data to decide if the project had or would accomplish its basic objectives.¹³ Why AID did not ask, or the contractors suggest, that the CAP evaluation plan with its farm survey questionnaire be seen as the contractor's direct responsibility or at least a necessary prelude to their work is a moot question now, at least DAI, after their evaluation effort was done, emphasized the necessity of getting on with serious evaluation work based on the kind of data called for in the original CAP. At the same time, both the CUNA 76 and DAI 77 evaluations successfully analyzed many of the institutional and delivery system objectives (CAP Objectives 5, 6 & 7 see CAP page 4) and allow the current evaluation to focus on what DAI appropriately termed "Impact" evaluation.

1.9/ See CAP 74, Annex V

1.10/ The CAP (at page 133) states "The Government of Haiti, accepts the responsibility for the collection of the necessary data by BCA, IHPCADE, or other instruments of the Government of Haiti . . ."

1.11/ The DAI 77 Evaluation stated, "The lack of a baseline study and the absence of any systematic attempt by the project to gather time-series data on the well-being of the target population precluded the possibility of conducting a proper impact evaluation. There were no data at all, for example, on the differential yields of project and non-project farmers or even on the changes over time in the yields of farmers using project fertilizer. Moreover, constraints of time and transportation made it impossible for the evaluation team to collect these data themselves. The evaluation had, thus to concentrate on an assessment of whether the project has accomplished its internal objectives. (See DAI 77 page 8)

1.12 It is clear that the CUNA scope asked them to concentrate on sub-issues of the organization of the credit delivery mechanism, on institutional issues and not on the issue of whether the project was accomplishing its basic objectives

1.13/ In its recommendations Chapter (4) DAI states "The project was found to be almost completely lacking in any system by which pertinent data could be gathered, by which the data could be transformed into information and by which the information could be channeled to decisionmakers in forms by which and at a time when the information would be most useful. No baseline study had been conducted, no pertinent farm information was being gathered. . . ." (See DAI 76 page 161) . . . Several measures are called for . . . 1. At the time of or shortly after project re-design, a baseline study should be conducted in order to establish a basis for future evaluations and in order that the progress of the project can be measured against some established situation. (See DAI 77 page 162)

C. Methodology for Impact Evaluations

1. Project Objectives: What Impacts to Measure?

The effectiveness of a project evaluation depends largely on two things:

1. The degree to which project designers articulated explicitly and accurately what the project intends to achieve; and
2. The degree to which the evaluation DIRECTLY addresses impact on THOSE objectives.

This framework may seem very simple, yet failure on these two simple issues characterizes most AID project evaluation effort.

a. Were Project Objectives Clearly and Measurably Stated?

The simple answer to this question is yes. If there was later some confusion on the part of project implementation agencies and evaluation contractors,¹⁴ there was no confusion in the CAP or in the minds of designers. This project contains a statement of objectives in both the summary (Part One) and program description (Part Three) sections of the project paper. Since so much emphasis in this evaluation is on measuring or estimating the right things, these statements are *re-quoted* below:

D. Purpose of the Loan. *The program seeks to increase the income and standard of living of the Haitian small farmer through increased production of improved coffee. This increased production is also expected to result in significant improvements in the Balance of Payments and revenue accounts of the GOH.*

*The program seeks to establish a delivery system whereby a package of improved technology, fertilizer, credit, and training may be channeled to the small farmer. Complementary goals are the capitalization of a small farmer credit fund and the establishment of small farmer cooperatives.*¹⁵

1.14/ DAI stated "A study of the project documents proved not to be very useful in ascertaining either what the principal objective of the project was meant to be or how its attainment is supposed to be measured." (See DAI 77 page 21) and later, "To clear up the confusion surrounding the issue of the project's primary objective, project documents were perused and extensive discussions were held with project participants.

From this exercise, the conclusion was reached that the bottom-line purpose of the project, the objective toward which all other project activities should be directed and on which all higher level goals should depend, is a sustainable increase in the productivity of small farmer coffee plantations and in small farmer income." (See DAI 77 page 24) The final DAI position is the same as that taken by the current evaluation and the same as that in the first page of the CAP (See CAP page i) where income is mentioned first and production second. CUNA 76 saw the same confusion "If one is going to assess a project, it is essential that the criteria of assessment be clearly established. In the absence of agreed upon standards of

judgment it is evident that an objective assessment is impossible. Thus the initial point of departure for this assessment was a review of those documents that could provide the needed criteria . . . in this first phase of work the assessment team encountered two distinct problems. The first problem was that none of the documents reviewed (CAP PROP & CUNA scope) were organized in a manner which would provide an adequate frame of reference for the assessment . . . it was decided that the project analysis narrative contained in the CAP should be carefully examined in order to extract from it any inherent project design elements which could be used to prepare a more complete definition of the purposes, outputs, inputs and assumptions related to the **credit** component of the project. The 'reconstructed' design consists of 3 project purposes, 7 assumptions, 31 output statements and 6 input statements" (See CUNA 76 pages 5 & 6)

1.15/ See CAP page i

To say that the statement of objectives is clear and evaluate-able is not to say that it is simple to accurately measure these impacts and to control all of the factors besides THIS project which may have been influential. But it is important to start with reasonably unambiguous objectives so the measurement process, however difficult and innaccurate, can at least focus on the right things.

In this project the CAP outlines seven of these overall goals. The last three of these (create a viable credit system, viable cooperatives, and increase GOH agricultural investment) are dealt with in the CUNA and DAI evaluations better than they can be examined with the data and methodology of this study. Their results are summarized in the Executive Summary of this document. This study attempts to estimate impacts on the first two objectives directly (Increased income, standard of living, production) and make indirect estimates of increased exports and GOH revenues (objectives 3 & 4). There will be comments on objectives 5, 6, & 7 in this document based on the data available, but they should be viewed as a by-product only, the CUNA and DAI staffs were both more interested and more qualified on these issues than the current evaluation team.

b. Structure of this Evaluation Document

This evaluation document will be structured around the objectives as stated in the CAP. There are seven of these objective statements in the CAP. The three most important potential impacts are contained in the first objective statement. That statement reads,

1. *Increase small farmer income^(a) and standard of living^(b) through increased production^(c).*

Objective number two deals with quality and quantity of **Coffee** in particular. These four possible impacts of the project are the principal subjects of this evaluation. The treatment of these and the other objectives in the document may be seen in the Chapters indicated in Table 1 .

The indicators used to measure each of the general impacts noted in Table 1 are defined in detail at the beginning of each chapter so that the reader can see the particular methodology related to each indicator at the time that the indicator is used rather than at the beginning of the document.

2. Control Group (Cross-sectional) and Over Time (Longitudinal)

Comparisons for Estimating Project Impacts

This section deals with "how to" measure the impacts, and leaves the "what" to measure (the specific indicators) for discussion at the beginning of each chapter. The basic method of impact measurement is **comparison**, that is a comparison of the indicator in question between two groups of small farms. There are two kinds of these comparisons, longitudinal comparisons in which the farms are the same farms before and after project participation, and cross-sectional comparisons in which project participants are compared after participation with a control group of similar farms who have not participated.

These two methods (cross-sectional and longitudinal) each have strengths and weaknesses for this type of impact evaluation. The major problem of impact comparisons of both types is that factors besides project

Table 1
Impact Types by Chapter in This Document

Impact Type	Chapter Number and Title	Source and Indicators
Increased Small Farmer Income (Objective 1)	Two: The Impact of Credit and Technical Assistance on Income	PCI-AID Control Group Survey Farm & Off Farm Cash Income plus Subsistence Consumption
Increased Standard of Living (Objective 1)	Three: Non-Income Indicators of Project Impacts on Standard of Living.	PCI-AID Control Group Survey and BCA time series data Housing quality, value, water supply & livestock inventory
Increased Production (Objective 1)	Four: The Impact of Project Participation on Farm Production and Resource Productivity	PCI-AID Control Group Survey Output value & Quantity Yields, Land Productivity
Coffee Technology	Five: Project Impacts on Coffee Production Technology	Yields, Varieties, age of stand, fertilizer use
Create a Viable Ag. Credit System (Objective 5)	Six: Demand Analysis of Agriculture Credit	PCI-AID Control Group Survey, CUNA 76 & DAI 77 Studies

participation will influence indicators like income, production, etc. It is difficult to separate out what difference THIS project made and what differences in income and other indicators were caused by non-project influences. Separating out non-project influences is the main job of an evaluation survey design, through careful structuring of before-after and participant-nonparticipant comparisons much of the possible distortion of non-project influences can be eliminated.

Before explaining the design used in this study it is important to mention the advantages and disadvantages of cross-sectional and longitudinal surveys for separating out non-project influences.

a. Distortion Caused by Over-Time Non-Project Changes

Comparing the same farms before and after project participation has the disadvantage that non-project changes over time will influence income, production and welfare. In this project situation the dramatic change in coffee prices on the international market is an excellent example of the kind of over-time change in the environment which distort before and after comparisons. DAI 77 found that:

*In the past two years, small farmer productivity and, to an even greater extent, small farmer income have increased significantly. This has not been due in any important sense, however, to the work of the project per se, but rather, to the effect of market forces, in particular, to the fact that the price of coffee at all levels has doubled, even tripled in the past year or two."*¹⁶

This weakness of before and after comparisons is particularly important for coffee in Haiti and therefore for this project impact evaluation. The susceptibility of over-time comparisons to over-time non project influences is compensated for in cross-sectional comparisons by the fact that participants and a control group of non-

1.16/ See DAI Page 11.

participants are observed at the same point in time, they face the same coffee price, the same input prices, same political situation, same weather etc. This implies that cross-sectional control group comparisons can take care of distortion caused by over time changes in the farming environment which are not caused by the project.

b. Distortion From Differences Between Participant and Non-Participant Control Farms not Caused by the Project

Cross-sectional control group comparisons of participant and similar non-participant farms have the disadvantage that it is difficult in practice to find farms similar in all ways EXCEPT that they have or have not participated in the project. Project participants may be more aggressive than non-participants and that could explain why their incomes are higher. This is the mirror image of the problem with over-time comparisons. Cross-sectional control group surveys control non-project caused differences in the farms or farmers themselves control for comparison. Over time surveys succeed in controlling for differences in the farms or farmers (they are identically the same ones before and after) but fail to control distortion from non-project changes outside the farm which change the farmer or his farm over time and hence influence indicators like income.

The ideal design is a combination of **both** and such a combination is both possible and practical for most AID projects, and with reasonable care is still possible for the Haiti Small Farmer Improvement Loan, but only in the future. The survey which is used as the basis of this document was so designed to play the role of the baseline for an over-time measurement of participants (the new 78 borrower group sampled) as well as a control group (the matched non-participants). The use of the design for measuring impacts in this document is slightly more complicated, the complexity was forced by the availability of only limited before and after data on current participants.

c. Over-Time and Cross-Sectional Comparisons Used in This Study

The principal workhorse of impact measurement in this study is a cross-sectional comparison of participants with matched non-participants. Two separate over-time (before and after) samples are used to check and modify these cross-sectional results. The design is, then, a hybrid mixing of both methods to avoid the weaknesses of each, but the hybrid is not as complete as the classical design which will be possible if the 1978 survey is repeated at a later date.

The design used for this study is best understood by examining Table 2. Three separate groups of farms are included in the design. These farms are observed at different points in time with differing levels of detail in the data. Each group (A, B & C) and each point in time (denoted in the diagram by 1, 2, or 3) create a new potential for over-time and cross-sectional control to eliminate non-project influences of both endogenous and exogenous types. To see how this works we must begin with definitions of each group and time point of observation.

Group A Group A is made up of 175 BCA project participants with loans starting **before** 1978. This group includes those with single loans and repeating borrowers. Data on this group for the crop year "Fiches d'Information"¹⁷ before their first loan (before project participation) is available from the BCA for that year. The crop years preceding the first year of participation were 1974, 1975, 1976 and 1977. BCA "Fiches" contain only a limited number of indicators: numbers of animals, value of house, farm size, crop mix. Group A were given the complete questionnaire containing all indicators (see Appendix B) in 1978 and could be given the same questionnaire again in 1980. For this group before & after comparisons are currently available on only the limited number of indicators, but in the 1980 survey three points in time, covering up to six year span will be available on the limited indicators, and two points (both after participation) on all indicators.

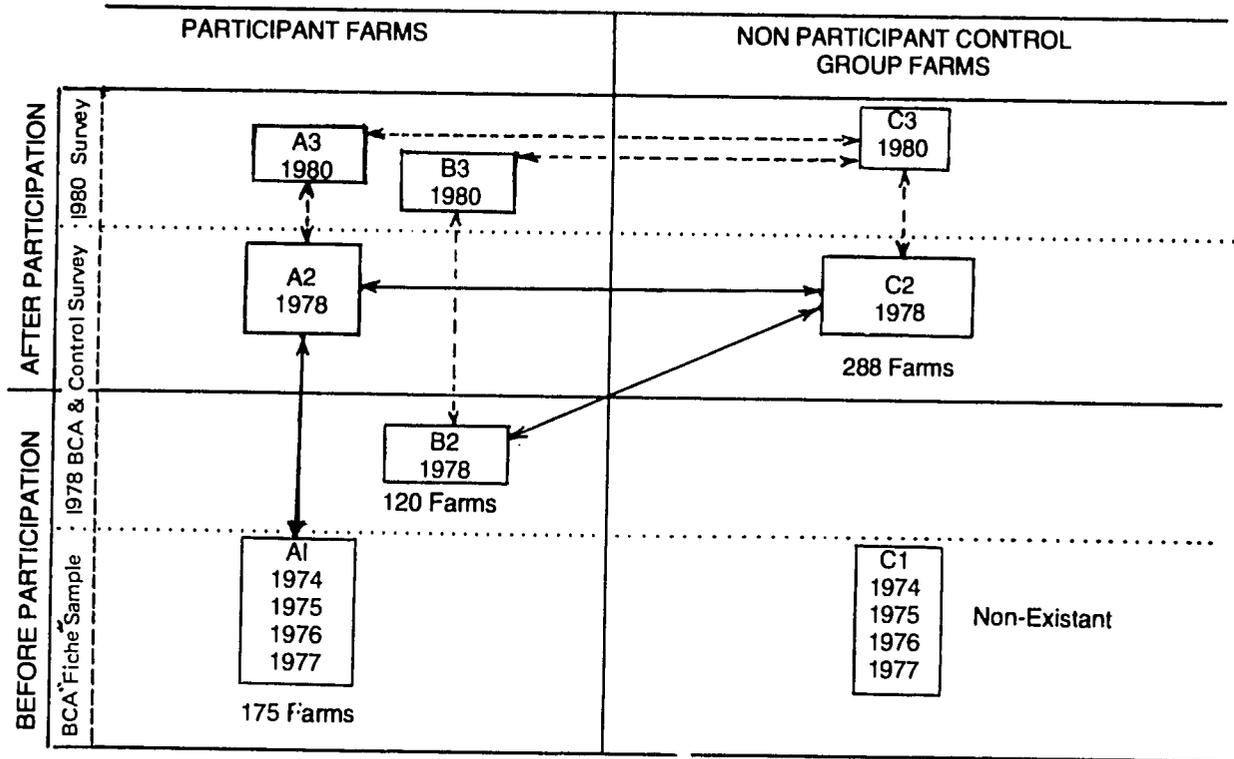
Group B Group B is composed of 120 new BCA borrowers in 1978, the information in the questionnaire covers the 1977-78 crop year, ie the year BEFORE they became project participants. This group provide the baseline for the before & after comparison to be made in 1980 if this group is re-surveyed.

Group C This group is the control group used for both cross-sectional comparison in 1978 (Compared to A) and for longitudinal control in the 1980 survey. There are 288 farms in this group matched to be similar to the BCA group in location, size of farm, and size of coffee holdings. If the C group had been surveyed in 1974-77 the design would have matched the classic longitudinal with control group methodology.

The main source of comparisons in this impact evaluation are drawn from the comparison of A2 with C2 i.e. between participants and the control group of non-participants. Even if the A1 Fiche¹⁷ sample had contained information on all of the indicators included in the A2 survey, the overtime comparison of A1 to A2 would have likely been largely discarded as a valid comparison mechanism. The reason for this is the large change in coffee prices which intervened during this period and changed income, and many other farm financial variables. It is a fact of some consolation to realize that even if the CAP evaluation survey had been completed it would have been rendered mostly useless by the course of events since it did not contain in its design a control group (C1) which could have been used to adjust for over-time distortions. Given the events of the last four years the comparison which is now available (cross-sectional comparison A2 vs C2) would be preferable to the before-and-after comparison (A1 vs. A2) which would have been the result of a complete baseline and follow-up design as outlined in the CAP.

1.17/ "Fiches d'Information" are BCA forms which elicit limited baseline information from borrowers prior to their first loan from the BCA.

Table 2
Survey Design for Impact Comparisons



The fact that the BCA "Fiche" exist (even with their limited number of indicators) and that a substantial group of new borrowers could be identified **before** their actual participation in 1978 (group B2) allow the current results to be subjected to two cross checks to estimate how well the cross-sectional results (A2 vs. C2) can be expected to perform.

d. Use of Over Time and New 78 Borrower groups as Cross-Checks on the Validity of the Basic Participant vs. Non Participant Comparisons.

The weakness of all cross-sectional comparisons with control groups is the possible distortion caused by non-project caused differences between the two groups. In our case there is the danger that the control group was not like the participant group BEFORE they participated. It is possible that BCA participants were better off before participation than farmers with similar sized holdings in their areas. We do not know what the limited indicators were for the 1978 control group in 1974-77. If known these indicator values could be compared with the A1 "Fiche" indicators to see if they were similar before participation in the project. Since income is the most important indicator for this study it would be important to the credibility of the participant vs. non-participant comparison (A2 vs. C2) that the incomes of these two groups were similar before the A group became BCA participants.

While the hypothesis that A and C are groups with similar incomes in the BEFORE participation situation (A1 vs. C1) cannot be proven or disproven from data now available there are two important checks which can be made. The first and most important uses the comparison of Group B2 (new 1978 BCA borrowers before participation) with the control group C2. If B2 farms have incomes similar to C2 this implies that at least in

1978 BCA new clients are being drawn from a similar income group as the control group, and this would imply (though not confirm absolutely) that the BCA clients (A2), if BCA is reasonably constant, were probably not drawn from a significantly different income group than the control. The net farm income of the B2 group (1977-78 crop year) was \$641 the comparable figure for the control group was \$766 indicating that the average new BCA client in 1978 earned 16% **less** the year before project participation than did the average control farm. This implies that at least with reference to income the BCA clients appear to be well matched before participation to the control farms, in fact since they are actually poorer than control group farms, the impacts measured in this document probably underestimate project influence.

Since the control group are not drawn at random from the small farm population, the fact that BCA are similar to the control does **not** mean that the BCA clients are drawn from approximately average farms in their regions. BCA clients are drawn from an above average size and above average income stratum in their regions. The second check which can be made on the accuracy of the cross-sectional comparison is a less formal one than the B2-C2 match check, and involves comparing the over time change in the limited indicators present in the "Fiche" sample A1 with the differences observed between A2 and C2. If the two differences are in completely different directions (if asset values and livestock numbers decreased for participants after participation as shown by an A1 vs. A2 comparison, yet participants had significantly better incomes than non participants in an A2 vs. C2 comparison) both comparisons would be suspect. No disconcerting finding of this type is evident in the A1 vs. A2 comparison which would lead us to question the A2-C2 results. Both are in the same direction and with believable magnitudes.

A 1980 survey would have the benefit of an over time comparison in both the BCA and non-participant control groups (comparisons B2 vs. B3, and C2 vs. C3) as well as cross sectional comparisons between relatively new borrowers integrated into the program after redesign (B3 vs. C3) and multi-year clients (A3 vs. C3).

While no design can eliminate the possible distortion from non-project influences, the 1978 comparisons on which this study is based provide an acceptable structure, and the structure designed for 1980 is as good as practical sample designs can make it. The difficulties in measurement of the indicators and not defects in sample structure of the comparisons is likely to be the major source of error, both in this study and in a 1980 evaluation.

3. Recall Data for Small Farm Estimates

The survey utilized an interview schedule administered in Creole to selected farmers. The questionnaire is reproduced in Appendix A. The data asked for was designed to be simple enough that farmer recall would suffice as a gathering technique. In the field test it became obvious that some questions were not likely to function well based on recall. Shade cover in coffee plantings was one example of a question area which was dropped from the final survey. From the beginning it was recognized that annual recall data on labor use and

employment are of very questionable reliability, results reported in this document which deal with employment should be regarded as of little reliability. To simplify income estimates, no crop specific input accounts were asked for.

Throughout the study it should be remembered that the impact measurements are basically **COMPARATIVE** measurements between two groups of farmers given the same questionnaire by the same interviewers on the same day. The estimates need not be accurate **ABSOLUTE** measures of the indicator to be valid as comparisons. All that is necessary for the comparisons to be useful as impact comparisons is that there be no consistent differences in the bias or inaccuracy of the responses given by the two groups. At times the authors have used the results as "absolute" and not comparative estimates. Though such use may be justified in that no superior data source exists, it is true that their reliability when so used is less credible than when they are used as intergroup comparisons.

There are two areas in which recall estimates are particularly weak, the first is employment which has already been noted. The second is land area. It is very difficult for farmers to estimate based on recall, the specific areas in their parcels. This weakness reflects itself principally in unreliable yield estimates which are based on production quantities divided by parcel areas. The implication of this weakness for this document is that while income and production estimates are acceptably reliable, yield information is not, and therefore conclusions based on yield differences are more than normally suspect. This also implies that the production source indices found in Chapter Four are less reliable than findings in other parts of the Chapter because the computation of the indices involves the use of yield figures to compute even the non-yield sources of production impact.

CHAPTER TWO
THE IMPACT OF CREDIT AND TECHNICAL
ASSISTANCE ON INCOME

A. Real Income Definitions

The purpose of sub-section A is to provide concise definitions of the indicators used to estimate real farm and family incomes of small farm households in Haiti.

1. Cash Plus Subsistence Incomes

Gross value of farm output was estimated from the survey on a plot by plot basis. The average farm-gate selling price was used to value the harvested quantities if the farmer sold any part of the particular product in question. If all of the product was consumed, traded, exchanged, or stored for feed or seed, the product was valued at the average farm-gate price for sales of that product in the region in which the farm is located. Computation in this fashion will automatically include the value of subsistence consumption valued at producer prices. Producer prices are probably an adequate theoretical compromise since the netting of transport margins and losses in home storage imply that home consumption should be valued at less than retail prices if quantities are measured at harvest and not consumption.

From gross value of farm output, cash costs are subtracted. These cash costs include hired labor, (excluding rotational and festive exchanges) fertilizers, seeds, livestock costs, and other miscellaneous expenses. These inputs are not divided between the crops, there is a single farm level consolidated input account designed to simplify recall for the respondent farmer and reduce the implied error in the recall method.

2. Welfare Measure

The result of this computation is called "Net Farm Income: Welfare Measure". Since the imputed value of family owned assets, principally family labor and land are not subtracted this income measure says nothing about efficiency of resource use. Some families may provide a larger share of the labor bill from family sources with the result that the welfare measure of income would be higher yet efficiency of resource use would not be changed. While not purporting to be an efficiency indicator, the welfare measure of income is the best indicator of family income welfare, it is a measure of the cash and in-kind goods available to them for consumption.

Two principal errors are expected in this estimate. First, the value of in-kind home produced consumption is likely to be underestimated. Products from small home gardens, from single fruit trees etc. are not likely to have been always reported, this results in an underestimate of total welfare income. The second major problem relates to the inadequacy of costing for the land input. While most farmers in both participant and control groups own their own land, some kind of cash or in-kind rent is paid for 14% of the parcels operated by two groups. The welfare income measure fails to subtract that as a cost resulting in an overestimate of income. Since both participant and control groups have very similar (BCA 86%, control 86%) ownership proportions this consumption omission will not affect the comparative results.

3. Efficiency Measure

By subtracting the imputed values of family labor, owned land and capital it is possible to get a measure of net income which should reflect the **private** efficiency or profitability of the farm operation. This efficiency measure is not the same as social efficiency or productivity which will be discussed in Chapter 4. Since land is not valued in the survey, only family labor is subtracted to obtain efficiency measures. Since the attempt is to estimate private and not social efficiency, labor is costed at the daily wage paid to hired labor, and not at some estimate of "shadow wage" or "opportunity cost".

4. Family Income

The income from off-farm employment is added to net farm income (both welfare and efficiency measures) to estimate total "family" income. It should be noted that no attempt is made to estimate the size of "genetic" families, the word family is used loosely in this study to mean "household". Household members are defined as those living, sleeping and eating in the household a specified part of the past year.

B. Project Impact on Farm Income: Welfare Measure

1. Farm Size Differences in Income Impact

The principal objective of the project is to increase the incomes of participant small farms. In this most important respect it has succeeded significantly for farms up to five hectares in size and failed for those over five hectares. Table 3 contains the results of the study on the impact on net farm income of project participation. It should be remembered that these results do not indicate (as the Chapter 4 results do) the specific changes in the farm and its production process which have led to these income differences. The inputs from this project, credit, fertilizer, and technical assistance can be used for many different purposes and it is possible that many of the income differences come from project interventions but in different ways than those intended by project designers.

Table 3
Net Farm Income Impact of Project
Welfare Measure
(Values in all tables are in US\$)

Farm Size	US\$ Net Farm Income/Farm Participants	US\$ Net Farm Income/Farm Non-Participants	US\$ Added Income	Percent Increase or Difference in Income
0-3 Ha.	\$ 509	\$ 292	\$ 217	74 %
3-5 Ha.	981	881	100	11 %
5+ Ha.	1,757	2,076	-319	-22 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE Port au Prince, 1978 (172 participant and 172 non-participant farms)

For the purpose of evaluating the impact of the project on its major objective, participants must be divided into two groups, those over five hectares for whom the project has had a **negative** (22% impact, and those under 5 Ha. for whom the positive impact has been dramatic for the smallest farms (under three Ha.) almost doubling their incomes, and a 3-5 Ha. farms where an 11% increase is estimated. Since about 70 percent¹ of participant farms are in the less than 5 Ha. category where impact on income is significant. All participants are estimated to have increased their incomes on the average by 21%. This may underestimate total income impact of the project by as much as 16% as indicated on page 10. True income impact is probably in the range between 21-37%. The finding of strong positive project impacts on the smaller farms is the most important finding of the evaluation, not only does it indicate that the project has been a success on its most important final objective, but perhaps more significant is the fact that the poorest farms are the ones that make the largest improvement.²

2.1/ This footnote provides a profile of the size distribution of BCA participants. Since the survey was a random sample of all BCA participants in 1977, the size distribution for the sample should represent closely the true size profile of BCA project participants. Some distortion exists because no regional weights are included in these estimates. When regional weights are applied, the mean size is 4.07. This implies that the true, weighted size of the average BCA farm is 5% larger than the unweighted averages shown in this document and therefore instead of representing only 25% of the participants, 5+ Ha farms probably represent 28-32%

Farm Size Group	Average Size of Farms in Group	Percent of BCA Participants in Group
All BCA Farms	3.86 Ha	100 %
0-1.5 Ha	1.08 Ha	26.2 %
1.5-3 Ha	2.24 Ha	25.0 %
3-5 Ha	3.88 Ha	23.8 %
5+ Ha.	8.55 Ha	24.4 %

2.2/ The pattern of these findings parallels findings of a similar study of the impact of small farm credit and technical assistance in the poorest region of Guatemala. The following footnote table indicates that the impact on the farms over 5 Ha

Country	Percent increase in income (Haiti) or Value of Production (Guatemala) associated with a Small Farmer Credit Project			
	All Farms	0-3 Ha	3-5 Ha	5+ Ha
Haiti	21-37%	75 %	11 %	-22 %
Guatemala	32 %	54 %	99 %	-13 %

is negative from similar programs in both countries and the magnitude of negative impact is also very close. The very strong impact on the smaller farms is also very similar in trend and magnitude, except that the positive impact appears to fall off much earlier in Haiti (at about the 3 Ha level) whereas in Guatemala it doesn't fall until about the 5 Ha level. It should be noted that Haiti farms are rearranged in this footnote table so that farm size groupings coincide with the Guatemala study for comparison purposes. Guatemala results are taken from S. Daines et al. *The Impact of Small-Farm Credit on Income, Employment and Food Production*: Guatemala Agency for International Development, Wash.D.C., 1975, page 5.

It is impossible to determine exactly at what farm size the negative impact begins and some flexibility is probably warranted in fixing limits for actual project participation. Yet the results of the income impact analysis should be read as indicating that project potential for benefit decreases substantially over 3 Ha. and becomes negative somewhere between 5-6 Ha. **The project should clearly focus more exclusively on smaller farms.**

2. Project Impact on Net Farm Income

Table 4 indicates the change associated with project participation in per-capita net-farm incomes. Differences in family sizes by farm size and the understandable tendency of increase in income to be accompanied by increases in the number of non-genetic members absorbed into the household,³ create a slightly different pattern in Table 4 than observed in Table 3.

Table 4
Per capita Income Impacts of Project
Participation
(US\$ per capita)
(From Farm Sources Only)

Farm Sizes	US\$ Per Capita Participants	US\$ Per Capita Non-Participants	US\$ Per Capita % Increase Associated with Project
0-3 Ha.	\$ 77	\$ 57	35 %
3-5 Ha.	161	157	3 %
5+ Ha.	275	341	-19 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978 (174 Participant and 288 non participant farms)

2.3/ Two factors seem to be at work which account for the differences in household size between participants and non-participants. The first of these is a possible distortion in the matching procedure, but even if all the matching error is assumed to be passed along to final results, less than half of the family size differences observed in the two groups which show important differences (0-3 Ha. farms) can be explained by the matching distortion. The second influence is apparently the project itself, and probably the increased income which has come to the two smallest farm size groups as a result of the project. With increased incomes these farms (comprising more than half of all participants) apparently increased their household size by 29%. As mentioned above, part of this difference, probably 8-12% could be due to match distortion, but the fact that the larger groups should have had the same matching error, and that they experienced neither large income nor household size increases lead us to conclude that almost all of the household size difference is project caused. From the footnote table it can be seen that income increases seem to be very consistent in direction (+ or -0) and in general magnitude with income increases associated with the project.

	0-3 Ha.	3-5 Ha.	5+ Ha.	All Farm
Family Size Differences	+ 29 %	+ 9 %	-3 %	+ 21 %
Income/farm Differences	+ 74 %	+ 11 %	-22 %	+ 21-37
Household Size BCA	6.6	6.1	6.4	6.4
Household Size Non-BCA	5.1	5.6	6.6	5.3
Sample Size BCA	88	41	41	171

Additional evidence that the increase is project related can be seen in that the BCA farms do not follow the expected trend obvious in the Non-BCA control group of increasing household size with increasing farm size, but household size follows the trend related not to TOTAL income (which in both BCA and control groups rises as farm size rises) but to INCREASE in income. If household size were related to income level and not change in that level caused by the project, then total household size would be expected to increase as farm sizes increase for the BCA group. The only plausible explanation which makes the combined trends in *total income*, *farm size*, *income change*, *total household size*, and *change in household size*, understandable is that household sizes have increased as a result of the project.

3. Project Impact on Farm Income

The finding of positive income impacts of the project on more than 2/3 of participant farms directly contradicts the indirect and informal estimate of the earlier evaluations which estimated that the project had had no positive impacts. Small farm systems are complicated, providing added liquidity (credit and fertilizer which can be sold and not necessarily used) to a small farmer may change many different things in his farming system. While it may be important to examine institutional factors such as the training and organization of extension agents, the efficiency of accounting and disbursement procedures and the orderlines of the general operation, it oversimplifies a complex problem to use these indirect "institutional performance" indicators as indications of success or failure of a project in changing small farm incomes, or in fact in effecting any change at the farm or household level. Institutional performance evaluations may be very useful to rearrange institutional problems, but using them as indications of project success at meeting fundamental objectives can lead to situations like the one found here where two institutional evaluations both came to conclusions opposite to that arrived at by direct observation of household data.⁴

C. Household Income Impacts: Farm and Off-Farm Income

The contribution of off-farm employment to household income in BCA farms appears to be generally small and little different in percent terms from the match group, it therefore appears that the project has had no important impacts on household earnings outside the farm. Table 5 presents these results.

Table 5
Off-Farm Income Comparisons

Farm Size	BCA FARMS		NON BCA FARMS	
	Off Farm Income (US\$/Household)	Off-Farm Income as a % of Total	Off-Farm Income (US\$/Household)	Off Farm Income as a % of Total
All Farms	\$ 34.0	3.5 %	\$ 20.3	3.0 %
0-3 Ha.	33.2	6.1 %	19.8	6.3 %
3-5 Ha.	13.1	1.3 %	25.1	2.8 %
5 + Ha.	56.2	3.1 %	17.1	0.8 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince 1978

2.4/ DAI 77 found that: "Despite its indirect nature, the evidence collected paints a rather clear picture of a project with some quite serious problems. When pieced together, the evidence strongly suggests that the project had made very little, if any progress toward increasing productivity on small coffee farms or toward increasing the income of small farmers. The evidence suggests further that, under current conditions, little progress toward the attainment of this objective can be expected in the future." The "indirect evidence" which led DAI to this conclusion was described by them as follows: "Needless to say, time constraints and the difficulties of transportation in Haiti obviated any attempt to gather such hard data themselves. The evaluation thus had to rely on indirect evidence to reach certain conclusion about progress toward project objectives. Indirect evidence included observations of

coffee plantations, small farmer cultivation practices, and the use of fertilizer. It also included information on the participation of farmers in and their attitudes toward project activities. Knowledge and training of extension agents, the operation of the centers and the overall management of the project" (See DAI 77 pages 26 & 27). The fact that the data which DAI appropriately wanted but could not obtain (as described by them in DAI pages 25 & 26) resulted in conclusions so opposite leads one to wonder how valuable and cost-effective informal field trips by experts are. There is a plausible explanation which would explain this radical difference, if the DAI visits were biased toward the larger farms over 5 Ha. their finding of no or negative impacts would be consistent with the survey data. This is not likely since notes on DAI page 9 indicate that small farm centers like Pilate were visited.

It is interesting to note that almost all of the off-farm incomes comes from work in non-farm activities, only 2% of all off-farm reported labor was worked for wages on other farms. The predominance of non-wage labor exchanges confuses these measurements and it is possible that these estimates are therefore unreliable.⁵

D. Efficiency Measures of Income

Farm income may be divided in an accounting sense between factor shares. If complete micro-economic data is available on each farm, these shares can be divided between all factors including labor, management, land, capital and the residual or pure profit. In the Haiti Small Farm Survey situation only a division between labor share and all others as a group is possible. The labor share has been subtracted from net farm income by pricing family labor employed on household plots (or worked in festive and rotational exchanges) at the wage rate paid to hired labor. This method probably overestimates the labor share since theoretically family labor has a lower opportunity cost than the going wage rate. By subtracting out an imputed value for family labor it is possible to see the production of the base incomes, and project added income which can be reasonably attributed to non-labor returns (here loosely referred to as "profits" but more accurately termed "residual returns to land and capital").

1. Labor and Profit Shares

By separating labor and profit (returns to land, capital and management) we can determine what proportion of the income impact of the project is due to expanded on farm employment opportunity for participant farm families (labor share) and what part came from increased profits or non-labor returns. The results of this computation, contained in the indices presented in Table 6, indicate that for all participants taken as a group roughly two thirds of the increased project income impact was from labor and half from increased profits.

Increased employment opportunity to absorb the family labor force is an important source of the added income in the 0-3 Ha. farms where important project impacts are observed. Important income from added profits is observed also on the smallest farms.

2.5/ Annual recall studies like the one undertaken here are notoriously unable to obtain acceptable employment information even in situations where complicated non wage exchange systems are not the predominant cultural pattern. While every attempt was made to account for task labor rotational and festive exchanges ("eskouad & koumbit") the annual recall format is simply an inadequate survey mechanism to expect reasonable **absolute** measurements of employment quantities. The purpose of including these employment characteristics in the survey was not to obtain **absolute** estimates, but only to obtain some **comparative** ideas of differences in employment structure between BCA and control

group farms. Based on better data in a less complicated employment situation, a similar study in Guatemala estimated that small farm family workers were employed about 25% as contrasted to about 10% as indicated in this study. There is a large and highly productive agricultural region close to the small farm area in Guatemala (the South Coast) where most of the off-farm labor of small farm workers is absorbed. Given the absence of such an area adjacent to the Haiti small farms, the lower off-farm employment rate does not appear inconsistent. The predominance of off-farm employment in non-farm activities highlights the importance and potential of non-farm rural enterprises as a source of increased employment.

Table 6
Income share Indices: Dividing Increased
Project Income Between Labor and
Profit Income Sources ****

Farm Size	Percent Income Superiority of BCA over Non-BCA Farms*	Percent Income Superiority due to Increased Labor Income** Increased Profits***	
	(Percent)	(Percent)	(Percent)
0-3 Ha.	74 %	30 %	44 %
3-5 Ha.	11 %	6 %	5 %
5+ Ha.	-22 %	3 %	-25 %

Source: S. Daines computation based on S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE Port au Prince, 1978.

*/ The percent income superiority is obtained from Table 3 and indicates for example that BCA farms in the smallest category had incomes 74% higher than the non-participant control group (BCA = \$509, Non-BCA = \$292).

**/ The increased labor income is computed by comparing the labor share (value of family labor at the going wage rate) for the BCA and Non-BCA farms to see what part of the increased income on the BCA farm was from increased family labor. For example, in the case of the smallest farms, of the 74% increased BCA income, 30% came from increased opportunity to absorb family labor and 44% from increased profits. It is important to realize that the percent under the labor and profit columns sum to the value in the first column and not to 100%.

***/ Increased profits are better termed "non-labor returns" since they include returns to land, management and capital.

****/ The supporting tables from which this table derived are contained in Appendix B, Methodology for Computation of Indices.

2. Income Efficiency of Land Use

Income can be increased on the small farm by cultivating more of the available land, or from earning more income out of each unit already cultivated. The net income obtained from each Ha. of arable land may be a useful indicator of "private" efficiency where land is a very scarce factor relative to labor. It is unfortunate that the data do not permit the computation of financial profitability rates (net income per capital unit) since it is probable that capital (credit, money, or other forms of liquidity) is even more scarce than land in rural Haiti. Since population densities are high relative to available land, the assumption that land is scarce is a useful analytical assumption. Net income per Ha. may be useful as an indicator of "private" efficiency, but due to probable distortions in factor and output prices it is probably not as good a measure of "social" efficiency as indicators used in Chapter Four. Table 7 indicates the net income per arable Hectare (not netted of farm labor which implies a shadow price of zero on unskilled labor).

Two important findings are contained in Table 7, first that on an efficiency basis the smallest farms perform better than the larger ones, and secondly that the opposite trend is apparent in the non-BCA control group. It would appear from the combination of these two trends that the project has had an important impact on the efficiency of small scale farming, allowing the smallest holdings to become considerably more efficient, both when compared with their control group AND when compared with larger farms inside the BCA group. The 0-3 Ha. BCA farms receive \$305 per arable hectare which is 55% higher than the 5+ Ha. farms and 65% higher

than their control group. Though this figure seems rather high for a country as poor as Haiti it is considerably less than small farm coffee areas in other Latin American countries.⁶

Table 7
Net Income per Arable Hectare
(US\$/Ha.)

Farm Size	Net Income Per Ha. BCA Participants US\$/Ha.	Net Income Per Ha. Non-Participants US\$/Ha.	Percent Difference %
0-3 Ha.	\$ 305	\$ 185	65 %
3-5 Ha.	256	213	20 %
5+ Ha.	197	267	-26 %
All Farms	267	205	30 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey AID-BCA-IHPCADE, Port au Prince, 1978.

The rather efficient net income production per Ha. and the disappointing net income per capita highlight an important issue in small farm development for Haiti, the poverty of the small farmer is related more to the **size** of his business than to its efficiency. The small farmers, both BCA and non-participants are poor not because they are backward but mostly because they are small. It also focuses attention on crop alternatives (of which Coffee is probably the best) in which very high income per hectare is possible.

2.6/ A case in point is El Salvador with similar rural population densities but at a much higher per-capita income position. Based on an accounting procedure almost identical to that used in Haiti, a study of net income profitability of small farms in a major coffee region found that net income per arable Ha ranged from US\$505 for farms under 1 Ha. to US\$1,049 for farms between 5-10 Ha. (See, S. Daines, Analysis of Small Farm and Rural Poverty in El Salvador, Agency for International

Development, San Salvador, 1977, page 40.) In the El Salvador study it is interesting to note that the trend in net income per Ha. was exactly the same as that found in the non-BCA match group, net income per Ha. increased as farm size increased. Since there is a scarcity of rural credit for small farms in El Salvador this trend would be expected to be similar in direction though not in magnitude to Haiti.

**CHAPTER THREE
NON-INCOME INDICATORS OF IMPACTS
ON STANDARD OF LIVING**

A. Housing Indicators of Standard of Living

The principal measure of standard of living in this evaluation, as in the CAP is income. The measures of income are all on an annual flow basis and do not take account of the improvement in standard of living which comes from investment in durables such as housing and livestock. This chapter deals with non-income indicators of standard of living, of which housing is the principal type. The quality and adequacy of housing is assumed to be a useful indicator of the level of living of a family. A variety of housing indicators are utilized. While the value of housing, either market value or replacement, is likely to be difficult to obtain in poor rural households, this indicator is contained in the BCA "fiche" records and therefore provides a useful over-time measure. In addition to value of housing, certain quality indicators such as the percentage of houses with tin roofs, the material used for the floor, and the number of rooms are also estimated.

1. Housing Value

Estimating housing value is difficult at best. There is difficulty with respondents understanding the concept of market value and replacement value. There is difficulty with matching because small differences in location which make little difference in agricultural productivity, soils, or even access to roads, may still have significant effect on the value of housing. Respondents were encouraged to estimate only the value of the structure, not the site, but it is likely that some site influenced variance in prices is imbedded in the data. While all of these difficulties imply that findings on housing value are less reliable than other findings, the fact that the results move in similar direction to the other indicators, and in very roughly similar magnitudes, tends to strengthen confidence in the results. Table 8 presents the value of housing comparisons.

Table 8
Value of Housing Comparisons

Farm Size	Replacement Value of Housing		Percent Difference
	BCA Farms	Non-BCA Farms	
All Farms	\$ 822	\$ 565	46 %
0-3 Ha.	504	408	24 %
3-5 Ha.	860	671	28 %
5+ Ha.	1837	1137	62 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, BCA-IHPCADE-AID, Port au Prince, 1978

Table 8 uses replacement value of housing instead of market value in the hope of reducing the error entered into the computation from site influenced values. It is felt that replacement estimates are more likely to be related just to the structure than are market values.

The possibility that the results in Table 8 are distorted from problems in matching is higher than with almost any others reported in this document, of the estimated 46% overall increase, 15-39% may be due to match distortion and not to project influences.¹

Assuming the match distortion to fall somewhere in the middle of the upper and lower bounds indicted in footnote 1, it would imply that about half of the impact indicated in Table 9 is illusory and not due to project influences. Otherwise the numbers appear consistent with the possible explanation that the smallest farmers are the least likely to save initially in the form of additional housing, and most likely to use all, or almost all, of initial income increases for more urgent food and clothing needs. Table 8 indicates that the poorest group (even though they make the largest income increase) invest the smallest amount in housing. Even if the housing increase for the 3-5 Ha. farmers is reduced by half, the residual would imply that much of their income increase has been spent on housing improvements. Annual added income for this group is estimated at \$100, if we assume that they have obtained this benefit for an average of 2 years that implies about \$200 of added income from project participation. If we ignore repayment of loans, as most BCA borrowers appear to do², this would imply the family made additional investment in improved housing of \$96 or about 47% of their increased income. By contrast, the poorest households in the 0-3 Ha. category, by this measure would have invested only 11% of their income increase in improved housing with 89% going to other uses. This pattern is consistent with the hypothesis that the poorest, perilously close to nutritional insufficiency, would expend a large proportion of additional incomes on food and other nondurables.

2. Housing Quality Indicators

The materials with which housing is constructed are widely assumed to be related to its quality in a

3.1/ Match distortion in the case of housing is relatively complicated to estimate. This footnote outlines the procedure necessary to arrive at reasonable estimates of potential and probable distortion. Two basic tests are possible. First, the value of housing before and after participation can be estimated based on the Fiche (before) and the survey (after). It is assumed that the fiche concept was market value since the form was a credit form listing assets and it is reasonable to assume that what instruction or implication may have been given would tend in the direction of a market value measurement. Average fiche value of housing was \$219, the years for this valuation vary between 1974-1977. The "after" measure of this same concept is \$356. This implies a change of 63%, by this check the 46% estimated in the direct computation would not be suspect on its face. However, the influence of higher coffee prices, and general inflation imply that a part of this increase is not due to the project but to external influences. The over-time cross check is virtually useless except to suggest that some increase in housing value is consistent with the overtime check.

The second method of cross-checking and estimating match distortion is more satisfying. The sample of new 1978 borrowers

to obtain data on the last year (before participation) allows two cross-checking measurements to place bounds on the possible match distortion. These estimates are based on comparing the new 78 borrowers to the match group as a whole, in a perfect match situation these groups should be identical, if they are not it indicates that there is some problem in matching, if the direction of that distortion is in the same direction as the supposed impact then the impact measurement is suspect. The first compares the new 78 borrowers to ALL of the match group, and the second compares the 78 borrowers to the sub-set of the match group who MAY have been matched directly to the new 78 borrower group. Neither of these is more accurate, perhaps the comparison to all match farms is slightly to be preferred. The potential match distortion from the comparison to all match farms is 38% and 15% to the selected sub-group. Somewhere in between these extremes the actual match distortion should fall. This implies that actual increase in housing value, after allowing for possible match distortion is from 16-31%.

3.2/ See delinquency discussion in Chapter Six.

standard of living sense. Table 9 outlines the comparison between the BCA and control groups for the principal materials in wall, roof, and floor construction. The potential error in concept or recall is much less in the case of these indicators, the interviewers were standing in or near the structures and it is unlikely that the respondent could not recall, or tried to distort these findings. The fact that there is little match distortion in these measures leads us to conclude that the apparent match distortion in housing value is not really match distortion but reporting error (part recall error and part conceptual confusion). There is only 6.7% match distortion in roofing material (the new 78 borrowers show a "before" participation percent of tin roofs at 62.2%, the match non-participant group show a 58%) and only a 5.6% potential match distortion in flooring materials. Table 10 indicates that the project has resulted in an increase in housing quality as measured by the roofing indicator of between 11-18%.

Table 9
Housing Quality Indicators

Farm Size	Percent of Household with Tin Roofs		Percent Increase
	BCA Farms	Non-BCA	
0-3 Ha.	66 %	50 %	32 %
3-5 Ha.	73 %	63 %	16 %
5+ Ha.	95 %	87 %	10 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince 1978

3. Housing Space

The third housing indicator is the number of rooms. The number of rooms is taken to be a rough indicator of the space inside the house. Table 10 indicates that there has been a 14% increase in the number of rooms

Table 10
Housing Space Indicator, Number of Rooms

Farm Size	Number of Rooms BCA Households	Number of Rooms Non-BCA Households	Difference or percent increase
0-3 Ha.	2.97	2.60	14 %
3-5 Ha.	2.78	2.72	2 %
5+ Ha.	3.24	2.83	15 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince 1978

per household for the smallest farms. This indicator is probably not as stable an indicator of space as tin roofing is of housing quality. There is also indication that there may be match distortion in the space indicator.

B. Livestock as an Indicator of Welfare

It is widely held that the accumulation of livestock is the important method of wealth accumulation in rural Haiti. The accumulation of livestock could therefore be used as a non-income indicator of wealth in much the

same way that housing value was used in the last sub-section. It would appear to this author that there would be a limit on the ability of very small farmers to utilize this method of savings/investment to a very large extent because of the limited capacity of these small farms to sustain additional animals on available grass. While placing these animals on the pasture of other small farmers may be a common method of averting this limit for a few farmers, the total grass supply would appear to be severely limited among the smallest land-holders and likely would limit this type of saving. Table 11 presents the results of the survey on livestock inventories.³

Table 11
Livestock Numbers for BCA and
Control Group Farms

Farm Size	Number of Poultry (Chickens, Turkeys and other fowl)		Difference or % Increase	Numbers of Cattle, Swine, Sheep, and Horses		Difference or percent increase
	BCA Farms	Non-BCA		BCA	Non-BCA	
0-3 Ha.	6.6	7.0	- 6 %	4.3	3.9	10 %
3-5 Ha.	14.6	9.8	49 %	7.3	6.0	22 %
5+ Ha.	13.3	19.1	-30 %	10.3	11.3	- 9 %

While the poultry results appear confusing (particularly for the smallest farms) the pattern in non-poultry livestock appears to parallel the housing impact trends reasonably well. Using the cross-check of the over-time estimates from the "fiche" (before) and the survey (after) it appears that cattle numbers increased 29% and swine 53% for project participants. Using the before vs. after comparison, realizing that due to coffee price influences a large part of it is non-project related, it still appears that the direction and magnitudes indicated in at least the non-poultry classes are reasonable.

The combination of housing and livestock indicators of non-income welfare or standard of living, paint a picture of a participant group, the poorest component of which (0-3 Ha. farms) makes the largest income gain, but smallest increase in the accumulation of durables such as housing and livestock. Most of their increase in welfare is likely to show up in better diet, some increased land, and perhaps clothing. The middle group (3-5 Ha. farms) make a much smaller increase in relative terms in income, but their higher initial per-capita income places them in a position to invest larger absolute and relative amounts in housing and livestock durables. The results for the largest group (over 5 Ha.) is mixed, they appear to have accumulated over the years a significantly higher housing base, but perhaps due to more recent reverses they have lost current income relative to their non-BCA neighbors, disinvested in their livestock, but retained their improved housing. It should be noted that while this scenario is consistent with the data, it is not the only scenario which could be. It is possible that the match with reference to the older, and larger, borrowers is less accurate than for the newer and smaller BCA farms. In many respects the farms over 5 Ha. are a unique group, they are heavily weighted to repeating borrowers (3rd year repeaters) and are more heavily concentrated in Baptiste and Thiotte. Conclusions with reference to the over 5 Ha. groups should therefore be viewed with less confidence than with reference to the balance of farms.

3.3/ Livestock figures are based on a match to 174 Non-BCA Farms.

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CHAPTER FOUR: THE IMPACT OF PROJECT PARTICIPATION ON FARM PRODUCTION AND RESOURCE PRODUCTIVITY

A. Introduction

1. Small Farm Systems

The small farm is a complex system containing many different enterprises (crops and livestock activities). This Chapter attempts to examine these systems to discover the structure of production and technology in BCA small farms and also to estimate the impact of the project on these systems. The AID-BCA-IHPCADE project focuses on coffee, yet it is obvious that many of the impacts may involve other crops, since all crops compete for resources and provide a part of the income. It is impossible to adequately examine project impact without looking at the complete farm system. Chapter Four focuses on a systems overview of the small farm while Chapter Five looks at the coffee component. Coffee issues will therefore be treated, but only lightly, in Chapter Four, the intensive discussion of coffee impacts and technology will be left for Chapter Five.

2. Production vs. Productivity

It is very possible to increase production without increasing productivity. As used in this document (and generally by economists) **productivity** refers to output per unit whereas **production** refers simply to total output. Total output may be increased by simply adding resources in the production process, but unless output per unit of input is increased productivity remains constant. Since farmer welfare is the aim of the project it is conceivable that farmer total welfare could have increased substantially without any increase in productivity. It is useful to keep this distinction in mind as the discussion of this chapter proceeds.

3. Market and Subsistence Production

Total production is estimated by farmers in the survey for each of the plots operated during the last crop year. All production is included, both that which was sold and that which was held for consumption, feed, seed, or barter. All of this output is valued at farm-gate producer prices. If the farmer did not have any sales of a particular product, his production would be valued at the average producer price for the region in question.

B. Overall Impact on Farm Production

1. Total impact on Output

The project impact on farm production has been substantial, for all farms there has been an apparent project related increase of 36-53 percent. For the smallest farms (0-3 Ha.) participant production is almost double the control group. As in the case of net income, the most important impacts are on the smallest farms, in fact the production impact on farms over 5 Ha. is slightly negative. Total production impacts are indicated in Table 12.

Table 12
Total Production Impact of Project
(US\$ Gross Value of Output per Farm)

Farm Size	Percent Increased Value of Output Association with Participation
0-3 Ha.	87 %
3-5 Ha.	20 %
5+ Ha.	-9 %

Source: S. Daines and K. Hancock computation based on data from the Haiti Small Farm Survey, AID-BCA-IHPCADE Port au Prince, 1978.

The possibility that these large differences are due to problems in matching is small. A comparison between the new 1978 BCA borrowers (who have not yet participated) and the control group indicates that the match worked acceptably. In fact the actual figures indicate that Table 12 underestimates project impacts by 17%.

2. Internal Rate of Return on Cash Costs

Since production increases (87% for 0-3 Ha. farms) are slightly higher than net income increases (74% for the same group) it would appear that there has been a slight decrease in the internal profit margin. Increased **volumes** of production and not the internal **profitability** of the production process itself have been responsible for the net welfare increases.

It would appear that the profit margin on cash costs actually decreased. Table 13 contains these computations.

Table 13
Internal Profit Rate on Cash Costs

Farm Size	Net Farm Income per Cash Cost Unit BCA Participants	Net Farm Income per Cash Cost Unit Non-Participants	Percent Difference in Internal Profit Margin
Welfare Measure*			
0-3 Ha.	5.3	9.0	-41 %
3-5 Ha.	4.2	6.7	-37 %
5+ Ha.	3.7	12.0	-69 %

*Welfare measure means that family unpaid labor is not subtracted as a cost to arrive at net farm income. It is the best figure for analyzing "welfare efficiency".

Source: S. Daines computation based on S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince 1978.

Cash and other forms of liquidity are scarce resources in Haiti; one of the principal reasons for including credit in the project was to provide small farmers with the necessary cash and purchased inputs to support technical improvements. The rate of return on cash cost inputs is therefore a useful indicator of the amount of welfare obtained per scarce resource unit. From Table 14 it is clear that this rate of return has been negatively influenced by project participation, yet this finding is not necessarily a "negative" finding. This finding is added evidence of a point made earlier, that the principal cause of poverty on small farms is the size of the business and not the efficiency of the business. Increasing the cash input into the farm system (BCA participants used more than double the purchased inputs of non-participants) appears to have substantially increased output per farm and welfare (income) per farm by increasing "size" (volume of gross value of output) but at decreasing rates of return to cash.

The other important finding in Table 13 is that small farms participating in the project appear to reverse the trend apparent in the match farms where rate of return appears to increase as farm size increases, for participants the rate of return actually INCREASES as farm size DECREASES. This indicates that while project participation and its increased cash, result in a decrease in the rate of return, small farms respond much more "efficiently" to increased cash resources than do larger farms.

3. Proportion of Impact Attributable to Coffee

Coffee is responsible for about two thirds of all of the positive impacts of the project as is indicated in Table 14. In the smallest farms where total production almost doubled, 73% of the impact came from coffee increases, in 3-5 Ha. farms where production increased by 20%, half of the increase was coffee. In the largest farms (5+ Ha.) where production actually decreased, coffee is seen to have been responsible for about half of the decrease.

Table 14
Proposition of Increased Production
Attributable to Coffee

Farm Size	Difference in Total Value of Farm Production (BCA-Non-BCA) (US\$ per Farm)	Difference in Value of Coffee Production (BCA Non-BCA) (US\$ per Farm)	Proportion of Total Production Difference Attributable to Coffee (Percent)
0-3 Ha.	\$ 281	\$ 205	73 %
3-5 Ha.	200	118	59 %
5+ Ha.	-208	-105	50 %

Source: S. Daines computation based on S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978.

To make quantitative correspondence between the coffee share in production value and coffee share in net income is not possible with the data available. It is possible that the coffee share in net income is higher than its production value share, but it is also possible that it is lower. Individual crop by crop input accounts would be necessary to arrive at net income shares for specific crops. It is possible to make an educated guess at this correspondence relationship, but readers are cautioned that there is little evidence to support the guess. There is little reason to believe that this guess is any more than DAI and CUNA "educated guesses".¹

Our educated guess is that since fertilizer and cash inputs were meant for coffee, that most of the increased cash expenses went into coffee. If we assume that most of the added expense (BCA vs. Non-BCA) was in coffee, then the coffee share in added net income would be less than the coffee share in total value of production. If we assume that **all** added cash and fertilizer went on coffee, it would imply that instead of roughly two thirds of the net income increase being attributable to coffee it would account for only about half.

It is important to realize that at least one third of the total impact on farm production, and perhaps one half of project impacts on net income are due to farm impacts outside of coffee.

4. Sources of Increased Production

In order to understand what specific farm level changes were caused by the project which led to increases in production, it is helpful to divide increased output into proportions attributable to changes in area cultivated, increased crop yields, changed crop mix or composition, and differences in prices received. The process of computing these indices in an accounting process described in detail in Annex B². These indices do not attempt to quantify the ultimate causes for the differences in production, they only divide the total change into a conceptually complete set of alternative accounting sources. The intent of these indices is to assist in understanding the "**process**" level changes which the project apparently caused to see if these are similar to the farm level changes which the project INTENDED to cause. The fact that yield estimates are unreliable implies that results based on the Indices are less credible than production figures.

4.1/ See footnote 5 in Chapter Two (2.5 at page)

4.2/ See Appendix A, Methodology for Computation of Indices, page

Table 15
Sources of Increased Output

Farm Size	Sources in Change between BCA Participant and Non-Participant Farms. Percent Increases in Value of Production				
	Total % Difference	Intensification of Land Use	Differences in Crop Mix	Increased Physical Crop Yields	Higher Prices
0-3 Ha.	(87 %)	7.6 %	0.3 %	6.9 %	10 %
3-5 Ha.	(20 %)	12.2 %	-6.6 %	10.2 %	4.2 %
5+ Ha.	(-9 %)	-1.3 %	0.9 %	-3.6 %	-5.0 %

Source: S. Daines & K. Hancock computation based on data from the Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince 1978

Before presenting analysis based on these specific indices it may be useful to remind readers that the individual "source" indices add horizontally to the total percentage of increased production (in column 1) and NOT to 100%. For example, the total increase in production estimated for 0-3 Ha. participant farms is 87% (in column 1). The largest source of that increase is higher physical crop yields which accounts for 69% out of a total of 87%.

a. Increased Yields: The Largest Apparent Project Impact

Increased yields (principally in coffee) are the largest single source of increased output on participant farms. In the smallest farms increased yields account for 69% out of a total of 87% and on 3-5 Ha. farms yields account for about half of the total production increase. Unfortunately, yield findings are less dependable than production and income and should be used with caution.

b. Intensification of Land Use

Intensifying the use of existing arable land in the farm is the second largest contributing factor to increased production. Intensification is defined to include either interplanting/multiple cropping or increasing the proportion of arable land in crops. Increasing the proportion of land in crops can be accomplished either by incorporating natural grass into crop use or reducing rotation cycles and fallow land. Of these two, the most important has been interplanting and multiple cropping, supporting other evidence that arable land is extremely scarce in even the larger farms. Half of the total production increase on 3-5 Ha. farms comes from increased land use intensity, but only about one tenth in farms under 3 Ha.. This is consistent with the supposition that these smallest farms have virtually no land slack and can only achieve increased income through growing higher value crops or increasing yields on existing high-value crops.

c. Differences in Unit-Prices Received for Products

Unit prices can be affected by three possible differences. The first is a difference in marketing channel or bargaining power. The second is a difference in quality. The third is possible distortion in the matching procedure. There appears to be very little match distortion³, and it would appear therefore that there are real price differences related to project participation. At this point all that is necessary to note is that while there is no direct data which would reveal the quality of coffee or other products sold, it appears that the principal price influence is from differing marketing channels and the increased bargaining power of larger volume sales.

The farms making the largest volume increases in relative terms would be expected to gain the largest relative bargaining position, the fact that the smallest farms obtain the largest production value increase (10%) attributable to price is consistent with the "bargaining power" hypothesis. Harder to explain is the negative price difference for the largest farms since the very small negative difference in volume of coffee marketed could not explain the significantly inferior prices. BCA large farms received 5 cents per pound less for their coffee than did non-BCA farms in the same size category. It is possible that some of this difference is error in matching (though match tests indicate otherwise) but it is more likely that it is due to regional differences in prices not adequately balanced by farm size, or reporting error of a few very large farms. This finding, could well be from errors in the data, rather than actual indication of project impact, therefore the negative impact findings for large farms ought to be viewed with caution, it is possible that the project has been essentially neutral with reference to these farms.

The importance of prices indicates the potential of project interventions directed at changing marketing channels and bargaining power of small farmers.

d. Crop Mix or Composition

Changing the proportions of land devoted to different crops can give rise to substantial changes in output and income without alteration of any other of the possible sources of increased output. For example, increasing the area in coffee at the expense of maize could increase the value of output even if coffee and maize yields are constant because coffee value per hectare is probably higher than maize even at relatively low yields for both crops.

Changes in the proportion of crops grown has made little difference in production on the smallest farms but has figured importantly in a negative direction for 3-5 Ha. farms. Shifting out of higher value, but non-coffee, crops in favor of lower value cereals crops has caused this difference.

4.3/ There is only a 1.1% difference between coffee prices received by New 78 BCA Farms and the control group.

e. Livestock Changes

Increased livestock production might be expected to result from project participation as a result of increased income and perhaps not as a cause. It is commonly held in Haiti by those who have studied the rural sector, that livestock accumulation is a method of saving for small farmers. It is possible therefore, that increased livestock production could result from the increased income generated by project participation. The proportion contributed by livestock is insignificant and does not even appear therefore in Table 15.

C. Physical Yields

Yield differences account for the predominant share of increased output on the smallest farms (0.3 Ha.) and are one of the two most important factors in the 3-5 Ha. group. Since coffee represents two thirds of the value of production in these two groups, coffee yields are the most important single factor. A discussion of coffee yields will be presented in Chapter Five.

1. Yield Patterns in Cereals

From Table 16 it is apparent that there are important differences between BCA and non-BCA groups in cereals yields. The difference in maize, the most important of the cereals crops, is almost 20%.

Table 16
Differences in Cereals Yields

Farm Size	Percent Superiority of BCA Yields		
	Maize	Millet	Beans
0-3 Ha.	13 %	34 %	15 %
3-5 Ha.	21 %	*	24 %
5+ Ha.	20 %	-6 %	63 %
All Farms	20 %	17 %	60 %

* Insufficient number of observations to provide acceptable reliability.

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

It should be noted that figures in Table 16 are likely to be less reliable than other findings since it is difficult to get accurate area measurements on a recall basis.

D. Land Use Intensity, Tenure and Productivity

1. Land Use Intensity

From Table 16, it can be observed that differences in land use intensity (increased interplanting, multiple cropping, and proportion of land cropped) is the second most important factor contributing to the apparent project impact on farm production. Table 17 indicates that most of this influence is associated with differences in interplanting and multiple cropping, well under half results from increasing the proportion of land cropped.

Table 17
Land Use Intensity Impact Separated into
Two Components

Farm Size	Proportion of Total Production Increase Attributable to Land Use Intensity	Land Use Intensity Separated into Two Components	
		Proportion of Land	Increased Interplanting and/or Multiple Cropping
0-3 Ha.	7.6 %	3.6 %	4.0 %
3-5 Ha.	12.2 %	3.6 %	8.6 %
5+ Ha.	-1.3 %	-2.2 %	0.9 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

The insignificance of the proportion of land cropped emphasizes the critical nature of the land constraints on small farms. Table 18 indicates the proportion of land in multiple uses, either interplanted with two crops at the same time, or cropped more than once each year in different crops.

There appears to be a consistent superiority on the part of the BCA group in interplanting, most marked in the 3-5 Ha. group, but important for all farm sizes. From the data available it is difficult to indicate the exact crop combinations which compose this increased interplanting and multiple cropping, but it is likely that an increment in the cultivation of traditional crop associations is responsible for the difference.

Table 18
Multiple Use of Cropland

Farm Size	Multiple Use of Cropland	
	BCA (% of land multiple cropped)	Non-BCA
0-3 Ha.	73 %	67 %
3-5 Ha.	70 %	54 %
5+ Ha.	50 %	51 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

2. Land Tenure and Farm Size

BCA clients are drawn from much larger than average farms. The average BCA farm is 4.07 Ha., and only about 30% are smaller than the census size category of 1.29 Ha. The 1971 Census indicated that 71% of all farms are under this limit, illustrating the skewed nature of the BCA client universe. It should be remembered in all parts of this study that the control group is not drawn from average non-BCA farms, but is drawn from a group intended to be similar to BCA clients before participation. Land tenure is presented in Table 19.

Table 19
Land Tenure Patterns

Farm Size	Percent of Purchased	land by Inherited Lease	Tenure Multi-Year Rent	Type Annual itance Grand	Pre-Inher-Cropped	Share
0-3 Ha.						
BCA Farms	49%	28%	4%	7%	6%	3%
Non-BCA	42%	34%	3%	7%	8%	6%
3-5 Ha.						
BCA Farms	63%	24%	1%	4%	5%	3%
Non-BCA	60%	25%	1%	11%	3%	0%
5+ Ha.						
BCA Farms	63%	20%	1%	9%	2%	2%
Non-BCA	67%	18%	1%	8%	3%	0%
All Farms						
BCA Farms	60%	22%	2%	7%	4%	2%
Non-BCA	57%	25%	1%	8%	4%	2%

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

3. Land Productivity

Physical yields are inadequate measures of land productivity since there is no way to weight different quantities of different crops to arrive at an estimate which crosses crop boundaries. A better measure, is the total value of production per hectare. Table 20 contains such a computation for the BCA clients and non-participant control group.

The first important finding in Table 20, is that project participation has apparently had a significant impact on land productivity. This finding is consistent with, and actually adds little information to the findings of similar impact on income. Table 20 also reinforces and extends the findings on land profitability in Chapter Two. There is a clear trend of increasing land productivity on BCA farms as the size of farms decrease, the smallest farms (0-3 Ha.) have 40% higher land productivity than those over 5 Ha.

Table 20
Land Productivity Estimates

Farm Saize	Value of Production (Crop & Livestock per Ha. Operated BCA-Participants	Value of Production (Crop & Livestock) per Ha. Operated Non-BCA Farms	Difference
Farm Size			
0-3 Ha.	\$ 367	\$ 199	85 %
3-5 Ha.	313	255	23 %
5+ Ha.	261	307	-15 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BAC-IHPCADE, Port au Prince, 1978

These findings would indicate that project participation has had a fundamental impact which has not only increased productivity relative to non-participants, but also changed the farm size trend in productivity, since productivity rises as farm size increases for non participants.

By comparison the Haitian small farmer without credit or technical assistance has a much lower productivity than similar sized farms without these services in Guatemala and El Salvador. However, with the addition of credit and technical assistance, the productivity level is very similar. The implication of this comparison is that the approximately 80% of Haitian farms without credit and technical assistance (under 3 Ha.) would respond to these inputs by achieving levels of productivity not only superior to larger Haitian farms, but comparable to small farms in countries with considerably higher percapita incomes.⁵

4.5/ Results from Guatemala and El Salvador are presented by comparison to the Haiti findings in the following footnote table. Farm size groups are not exact and adjustments were made in the data of all three countries to make the data more comparable. All figures are in US\$ of gross value of output per hectare operated.

Farm Size	Haiti		Guatemala		El Salvador	
	Credit	No-Credit	Credit	No-Credit	No Credit	***
0-3 Ha.	\$ 367	\$ 199	\$ 374	\$ 354*	\$ 383	
3-5 Ha.	313	255	267	243	476	
5+ Ha.	261	307	264**	247**	628**	

*Guatemala farms from 1-3 Ha

**Guatemala and El Salvador farms from 5-10 Ha.

***El Salvador farms were randomly drawn from the small farm universe, since less farms in Haiti are receiving credit in the general population than in El Salvador the higher figures for El Salvador may therefore exaggerate the difference.

The very close figures for the Haiti 0-3 Ha. credit farms, and the Guatemala and El Salvador farms in the same size class, supports the idea that credit and technical assistance could bring the Haiti small farmer up to a comparable productivity basis with similar sized farms in other countries. (For Guatemala estimates see S. Daines, et al, *Guatemala Farm Policy Analysis*, Agency for International Development, Washington D.C. 1975, page 24. For El Salvador Estimates, see S. Daines & D. Steen, *Analysis of Small Farms and Rural Poverty*, El Salvador, AID, San Salvador, 1977 page 21)

CHAPTER FIVE PROJECT IMPACTS ON COFFEE PRODUCTION TECHNOLOGY

The focus of this project is on coffee production, its major objectives were planned to be achieved through increasing coffee production through improved coffee technology. From Chapter Four it can be seen that at least one half, and perhaps as much as two thirds of the positive income impact of the project is due to coffee. This chapter examines coffee directly and explores the impact of the project on production, technology, marketing and prices. In addition, this chapter explores alternative project interventions in marketing and other areas which could be aimed at further increases in small farmer incomes through coffee.

A. Coffee Production Impact

The value of coffee produced appears to have been increased by 40% as a result of the project. This is probably an underestimate of project impacts since the match group have higher production levels than the test group of new 1978 borrowers. This implies that the true project impact on coffee production is between 40-70%¹.

Table 21
Project Impact on Coffee Production

Farm Size	Value of Coffee BCA Participants	Production per Farm Non-BCA Farms	Percent Increase Associated with Project Participation
0-3 Ha.	\$ 399	\$ 194	106 %
3-5 Ha.	791	673	18 %
5+ Ha.	1623	1728	-6 %
All Farms	792	569	39 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince 1978

5.1/ It would appear from the data gathered that the project participants have lower coffee production levels BEFORE participation than similar sized coffee farms in similar areas. This does not imply that the project is selecting farms which are below average in their coffee production, participants are above average in both size and coffee production. The finding indicates only that participants BEFORE participation have lower coffee production than the selected CONTROL group

The result of this match distortion is that the impact findings underestimate the production impact of the project by perhaps as much as 30%. New 1978 borrowers had \$387 in coffee production BEFORE project participation, the matched control group had \$569, this implies that BCA participants probably had up to 32% less coffee production than the match control group before they participated in the project.

As would be expected from earlier chapters, the smallest farms experienced the largest difference, more than doubling the total value of coffee output. It would appear from these results that the smallest farms expanded their gross output about 20% more than their net farm income, indicating a drop in efficiency levels and rate of return. This is consistent with the idea discussed in Chapter two that small farm poverty is less a function of efficiency than of scale, small farms appear to be more benefitted by expansion in the volume of output than by improvements in the efficiency of their operation.

Coffee production increased by 18% on the 3-5 Ha. farms and decreased by 6% on those over 5 Ha.. For the 3-5 Ha. group, net income increased only 11% yet coffee production increased 18%, this indicates but does not confirm the hypothesis that the project increases the total value of production, but not the efficiency of that production if measured by rate of return to invested capital and operating expenses. This trend is also followed (although in the negative) by the farms over 5 Ha..

B. Coffee Production Technology

For the purposes of this section, coffee production technology will be defined as the farm level process by which coffee is produced. Four major indicators of production technology will be examined: fertilizer use, physical yields, coffee varieties, and age of coffee stand.

1. Fertilizer Use

Table 22 outlines fertilizer use both in coffee and in the farm as a whole, and estimates the impact of the project on this component of production technology.

2. Coffee Yields

As has been mentioned earlier, yield estimates require the farmer to recall the areas in each of his coffee plots. There is ample evidence from other studies that farmers do not know the actual areas in their plots and cannot be expected to provide reliable information in a survey such as that undertaken here. Therefore the yield information contained here is illustrative only and should not be used for project evaluation purposes. To obtain reliable yield figures, direct measurement of plot areas would be required. Coffee yields for participants appear to be about 485 pounds of natural coffee per hectare, smaller farms have slightly higher yields, but this may be due simply to an underestimation bias on areas in smaller farm plots. There appears to have been an impact on yields due to the project, but because of the unsuitability of the data it is impossible to estimate the magnitude of that impact.

Table 22
Fertilizer Use Impact of Project Participation

	0-3 Ha.	3-5 Ha.	5+ Ha.	All Farms
Percent of Farms using Fertilizer on Coffee				
BCA Participants	85 %	91 %	87 %	87 %
Non-BCA Farms	3 %	6 %	9 %	5 %
Number of Sacks Utilized on Coffee				
BCA Participants	4.8	11.4	19.0	9.8
Non-BCA Farms	0.1	0.2	1.3	0.3

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

The impact of the project on fertilizer use is clear, there is almost no fertilizer use for non-participants while BCA clients purchase, and apparently utilize fertilizer in 80-90 percent of the cases. It may be that there is some fertilizer purchased for use in coffee which is sold or used on other crops but that is unlikely. The comparison with the test group indicates that there is less than 5% match distortion in these findings. There has clearly been a substantial impact of the project on fertilizer use as would be expected from the way fertilizer is provided in kind as a part of the project.

3. Coffee Varieties

Introduction of new varietal stock into coffee stands is one of the project's intended effects. In this respect, the project appears to have had only limited success. Table 12 indicates the percentage of farms with the improved variety (catura) in their coffee stands.

Table 23
Improved Coffee Varieties

Farm Size	Percent of Farms with Improved Coffee Variety (Catura)	
	BCA Participants	Non-BCA Farms
0-3 Ha.	3.4 %	1.7 %
3-5 Ha.	4.9 %	-0-
5+ Ha.	11.9 %	5.7 %
All Farms	5.8 %	2.1 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE Port au Prince, 1978

BCA participants have the improved variety more than twice as often as do the non-BCA farms yet the total frequency of use of the improved variety even among the BCA farms is so low that no significant achievement on this objective is implied. Less than one out of ten BCA farms has any improved variety in their stand, even though almost 40% record having purchased additional seedlings or other seeds.

4. Age of Stand

The project aimed to encourage renovation of coffee plantings with a view to decreasing the age of the stand. Table 24 indicates the age of stand as estimated from the survey.

Table 24
Age of Coffee Stand

Farm Size	Percent of Farms with more than half of their Coffee Stand planted in last seven years.		
	BCA Participants	Non-BCA Farms	% Difference
03- Ha.	5.8 %	4.9 %	1.1 %
3-5 Ha.	10.1 %	7.7 %	2.4 %
5+ Ha.	13.8 %	3.9 %	9.9 %
All Farms	8.5 %	5.3 %	3.2 %
		Percent of Farms with more than half of stand Planted since 1976	
0-3 Ha.	2.6 %	1.2 %	1.4 %
3-5 Ha.	8.7 %	-0-	8.7 %
5+ Ha.	6.9 %	2.0 %	4.9 %
All Farms	4.9 %	1.1 %	3.8 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

From Table 24 it can be observed that BCA has had some impact on new plantings, participants have younger stands in every case than the non-participant match group, yet the magnitudes are small and the differences are not large. If the three crop years from 1976-78 can be assumed to be the years of project impact, it would appear that renovation rates have not been significantly increased by the project since renovation in the 1972-1975 period is roughly the same as the renovation in 1976-1978 for all but the 3-5 Ha. farms. By comparing the test group with the match it appears that there is little match distortion, the impacts shown in the table should represent impacts of the project. The conclusion is that there has to be an observable and project impact on stand renovation, but that the impact is small in actual magnitude.

C. Coffee Marketing and Prices

This section explores three different marketing issues. First, prices are examined to see if there are patterns with implications for alternative project interventions in marketing which would increase small farmer incomes. Second, the marketing channels through which coffee is sold by small farmers are explored. Third, the stage of processing at which coffee is sold is outlined.

1. Coffee Prices and Alternative Marketing Interventions

Prices for coffee vary by region and by farm size. The most important pattern appears to be the farm size difference and appears to be a function largely of the volume of coffee sold. There has been considerable discussion as to the degree of competition in coffee marketing. The evidence from this survey appears to support the competitive view in which there has been a shortage of coffee at the processor level, and in which processor-brokers are competing for supplies from farmers on a price basis. There is some evidence that marketing channels and/or quality differences between participants and non-participants has been a factor in determining price.

There are, therefore, two apparent factors which have influenced coffee prices, first the volume of coffee sales per farm, and second, other quality or marketing channel influences of the project.

Coffee prices rise consistently as farm size increases in both BCA and control groups with the single exception of the BCA farms over 5 Ha. in size. This exception appears to be the result of recall error on the part of a few large farms. Farms transacting smaller amounts of coffee receive a lower price whether or not they are participants. In addition, however, participant farms obtain higher prices even when compared to non-participant farms with comparable production levels. It appears that the project has increased the price

Table 25
Coffee Prices by Farm Size

Farm Size	BCA Participants US\$/lb	Non-BCA Farms US\$/lb
0-3 Ha.	\$ 0.89	\$ 0.88
3-5 Ha.	0.94	0.91
5+ Ha.	0.88	0.93

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

received by participants by increasing their total output which has permitted them to have a stronger quantity bargaining position with processors and/or brokers. There has been an additional impact which may be due to the marketing channel and stage of processing at the point of sale.

2. Marketing Channel

Superior price may be related to the marketing channel in which the product is sold. It might be hypothesized that eliminating marketing intermediaries, or cooperative marketing should increase the price received. It appears that the project has had an impact on the marketing channels utilized by participants. Table 26 presents the findings on the marketing channels used by both BCA and comparison groups.

Table 26
Coffee Marketing Channels

Farm Size	Percent of Farms Selling More than Half of their Production in Each Channel					
	Middlemen		Coffee Washing Factory		Coffee Cooperative	
	BCA	Non-BCA	BCA	Non-BCA	BCA	Non-BCA
0-3 Ha.	76 %	80 %	13 %	13 %	12 %	3 %
3-5 Ha.	71 %	79 %	20 %	14 %	9 %	0
5+ Ha.	81 %	82 %	14 %	4 %	2 %	0

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince 1978

There is an obvious trend of participants to sell less frequently to coffee middlemen than the match control group. A comparison with the test group of new 1978 borrowers indicates that this tendency is not nearly so marked before participation. It should therefore be concluded that most of the difference in marketing channel observed in Table 26 is due to the project. The use of cooperative marketing channels would appear to be about half due to the project and half due to match distortion since 4% of the BCA clients apparently sold more than 50% of their coffee through cooperatives before project participation.

A comparison of Table 26 with Table 25 indicates that with only one exception, higher prices for coffee are associated with avoidance of middlemen. The highest price received for coffee by any of the groups was obtained by 3-5 Ha. BCA farms (.94/lb), this same group had the least dependence on middlemen in the marketing of their coffee. The two groups with the highest dependence on middlemen (with the exception of the 5+ Ha. group in the Non-BCA farms) also had the lowest prices (.88 & .89/lb.). The reasonably close correspondence between marketing channels other than middlemen and higher prices supports the idea that significant income improvement could be achieved through a re-structuring of the coffee marketing channels through which small farms sell their product.

3. Processing Stage

Coffee is sold at different stages in the processing chain, Table 27 explores the impact of the project on the stage of product at sale.

Table 27
Processing Stage of Coffee Sales

Farm Size	Percent of Farms Selling More than 50% of Coffee at Each Stage					
	Green Cherries		Dried Cherries		"Natural" Coffee	
	BCA	Non-BCA	BCA	Non-BCA	BCA	Non-BCA
0-3 Ha.	20.9%	20.4%	3.8%	7.2%	76.6%	73.1%
3-5 Ha.	11.6%	15.1%	7.2%	1.9%	79.7%	83.0%
5+ Ha.	10.2%	9.4%	5.1%	5.7%	84.7%	84.9%

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

There is no obvious pattern in Table 27 which would lead to the conclusion that the project has had any significant or consistent impact on the processing stage at which coffee is sold. The only pattern is one of increasing volumes sold at later processing stages by larger farms.

D. Extension and Technical Assistance Impacts of the Project

Project participants receive technical assistance from IHPCADE agents as an explicit part of the project. This section explores the distribution and intensity of this service and the perception of its impact on coffee income as seen by the farmer. Technical assistance services are provided in the coffee growing areas in which this project operates to non-participants as well as participants, this provides some comparisons of the utility of linking credit and extension services.

Table 28
Coffee Extension Services

Farm Size	Percent of Farms Visited by Coffee Extension Agent		Percent of Farmers Visiting Coffee Agent at Center		Percent of Farmers Indicating that they Feel the Advice Increased their Income	
	BCA Farms	Non-BCA	BCA Farms	Non-BCA	BCA Farms	Non-BCA
0-3 Ha.	99%	78%	85%	63%	82%	64%
3-5 Ha.	100%	56%	95%	48%	98%	52%
5+ Ha.	100%	55%	86%	55%	89%	59%

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

It is interesting to note that there is considerable penetration of technical assistance services in the coffee producing areas among non-participant farmers, 78% of the smallest non-participant farms indicated that they were visited by extension agents. The general farmer view of the income impact of the assistance is very favorable, but is increased substantially for project participants who also received credit support. Advice without credit and fertilizer (non BCA farms) left 36-48% of the visited farms with the impression that no income impact had occurred. When advice was linked with financial support the proportion of those so served who felt that no income increase had resulted was only 2-18%. It would appear from this data that credit has a strong influence in the perception of farmers that income increases resulted.

E. Farmer Opinions on Ways of Improving Coffee Income

The literature of development is replete with studies which indicate that small farmers are "rational economic persons". This section reviews the responses which participant and non-participant farmers gave

to the question of what would they rank as the most important, and second most important ways to improve their coffee income. Their responses were classified into six general categories and two "other" or residual non-classified categories. These results are presented in Table 29.

Table 29
Farmer Opinions on Ways to Improve Coffee Income

	0-3 Ha.	3-5 Ha.	5+ Ha.	All Farms	
	Percent of Farmers Responding that this alternative is the most important to raise coffee income				
				1st Priority	2nd Priority
Use More fertilizer					
BCA Participants	47%	34%	36%	41.6%	25.9%
Non-BCA Farms	40%	37%	31%	37.5%	23.3%
Prune Trees					
Non-BCA Farms	24%	34%	29%	27.7%	23.0%
	31%	43%	44%	35.5%	26.5%
Reduce Shade					
BCA Participants	10%	16%	13%	12%	20.4%
Non-BCA Farms	15%	7%	8%	12%	22.9%
Sell Through a Cooperative					
BCA Participants	9%	11%	9.5%	9.5%	6.2%
Non-BCA Farms	2%	4%	6%	3.3%	3.6%
Plant more Trees					
BCA Participants	5%	3%	6%	4.4%	18.6%
Non-BCA Participants	4%	9%	12%	6.5%	18.9%
Plant Improved Varieties					
BCA Participants	5%	3%	2%	4.0%	3.3%
Non-BCA Participants	6%	0	0	3.6%	2.9%

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

Fertilizer ranks as first priority for 42% of participant farms and 38% of non-BCA farms. The importance of fertilizer is obvious to almost half of all coffee farmers and there is little difference in that perception between participant and non-participant groups. Management of existing stands by pruning and reducing shade are the next important changes as viewed by both participant and non-participant farms. Selling product through a cooperative is seen as critical by only one in ten participants and significantly less of non-participating farmers. Attitudes on the benefit of cooperatives is the only area in which the project has had an impact on the farmer's view of what is important, and this difference can be explained almost completely based on match distortion. The introduction of improved varieties is the least often seen as a priority change. Expansion of plantings and reduction of shade are relatively unimportant as first priorities but seen as critical as second priority alternatives.

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CHAPTER SIX DEMAND ANALYSIS OF AGRICULTURAL CREDIT

A. Credit Distribution and Availability

Table 30 outlines the borrowing patterns of BCA and non-BCA control group farms. It should be noted that since BCA farms are larger and wealthier than the average farm, the match group is also not representative of all farms. Both groups probably have much better access to credit service than the average Haitian farmer and consequently the credit distribution information contained in this section substantially overestimates the availability and use of credit in rural Haiti.

Table 30
Credit Distribution for BCA and Matched Non-BCA Farms

Farm Size	US\$ Borrowed in 1977			% Difference	
	BCA Participants	Other	Total	Non-BCA Farms	Total
0-3 Ha.	\$ 33	\$ 21	\$ 54	\$ 19	184 %
3-5 Ha.	81	76	157	48	227 %
5+ Ha.	121	82	203	38	434 %
All Farms	66	48	114	26	338 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

Table 30 indicates a consistent and substantial impact of the project on credit use, not just from BCA sources but from others as well. While the BCA credit is obviously the result of the project, the increase in the use of other credit sources for BCA clients requires clarification. In order to determine if the increase in the use of other sources of credit is associated with participation in this project or is the result of some match distortion we use a comparison with the new 1978 borrowers. It is possible for example, that BCA clients are drawn from those farms which normally have more active credit relationships with all sources. The new 1978 borrowers (which represent the BCA group BEFORE participation) borrowed a total of \$26 from non-BCA sources, which is exactly the same amount borrowed by the non-BCA match group of farms. From this comparison it appears that there is very little match distortion, BCA participants have very similar borrowing patterns before participation as do farms in the non-participant control group. Therefore, the additional borrowing from non-BCA sources by participants is apparently the result of project participation. This influence could be explained by their expansion and additional need for credit, by their increased awareness

of the potential benefits of borrowing, or by their additional borrowing capacity created by the rise in income. For whatever reasons, it appears that the project has increased not just the BCA borrowing of participants but has also increased borrowing from other sources by approximately 85%. The smallest farms, where income increases have been substantial, have experienced the smallest increase in non-BCA borrowing, only 11%.

Table 31 outlines the distribution of credit by source.

Table 31
Credit Distribution by Source
(US\$ borrowed per farm)

	0-3 Ha.		3-5 Ha.		5+ Ha.		All Farms	
	US\$	Percent	US\$	Percent	US\$	Percent	US\$	Percent
Total Borrowed								
BCA Farms	\$ 54	100%	\$157	100%	\$203	100%	\$114	100%
Non-BCA	19	100%	48	100%	38	100%	26	100%
From BCA								
BCA Farms	\$ 33	57%	\$ 81	52%	\$121	60%	\$ 66	58%
Non-BCA								
From IDAI								
BCA Farms	\$ 0	0	\$ 3	2%	0	0	\$ 1	1%
Non-BCA	\$ 1	5%	0	0	0	0	0	0
From Coffee Middlemen								
BCA Farms	\$ 7	13%	\$ 58	37%	\$ 60	30%	\$ 32	28%
Non-BCA	\$ 5	26%	\$ 31	66%	\$ 27	71%	\$ 14	54%
From Merchants								
BCA Farms	\$ 2	4%	\$ 1	1%	\$ 4	2%	\$ 2	2%
Non-BCA	\$ 2	11%	\$ 9	19%	\$ 3	8%	\$ 3	12%
From Moneylenders								
BCA Farms	\$ 2	4%	\$ 4	3%	\$ 14	7%	\$ 5	4%
Non-BCA	\$ 5	26%	\$ 2	4%	0	0%	\$ 3	12%
From Family & Friends								
BCA Farms	\$ 10	19%	\$ 10	6%	\$ 4	2%	\$ 8	7%
Non-BCA	\$ 6	32%	\$ 6	13%	\$ 8	21%	\$ 6	23%

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE Port au Prince, 1978

Approximately half of the borrowing of BCA clients is from BCA, the largest other source is a coffee middleman. Coffee brokers account for almost one third of all credit to BCA clients and over half of the credit extended to non-BCA farms. It is interesting to note that the smallest farms have the least dependence or access to credit from coffee middlemen. It appears that BCA credit substitutes principally for coffee broker credit as evidenced by the fact that non-BCA percentage dependencies are considerably higher in this category.

Merchants and moneylenders are the least important informal source of credit except for the smallest group of non-BCA farms. BCA credit allows clients to significantly decrease their reliance on family and friends for loans, for the non-BCA group this is the second most important source of credit and their dependence on family or friends for cash is three times heavier than for BCA clients.

B. Credit Demand

Credit demand in small farm agriculture may be estimated in many different ways. The method used in this study is to use farmer estimates of three concepts. First, farmers were asked to indicate whether they needed additional funds in their farming operation in the coming agricultural year. Secondly, those who indicated that they had a need, were asked if they wanted to borrow these funds. Thirdly, they were asked to estimate how much they would borrow at 10% interest. These three questions were aimed at weeding out those who might say they need credit but who are not really interested in borrowing additional money. Table 32 outlines the responses to these questions.

Table 32
Credit Demand Estimates

Farm Size	Percent of Farmers Indicating a need		Percent of Farmers Wishing to Borrow		Amount of Credit Desired by Farmer who wish to Borrow	
	BCA Farms	Non-BCA	BCA Farms	Non-BCA	BCA Farms	Non-BCA
0-3 Ha.	89 %	93 %	73 %	79 %	\$ 110	\$ 82
3-5 Ha.	90 %	92 %	81 %	90 %	327	245
5+ Ha.	95 %	96 %	85 %	90 %	465	268

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

Credit need is apparently very strong in both BCA and non-BCA groups, nine out of ten farmers indicate a need in the coming agricultural year for additional funds. The project appears to have satisfied only a small part of the demand, BCA clients express a need for additional funds only 2% less frequently than non-BCA farmers.

Interest in borrowing to cover the need for additional funds was indicated by 78% of BCA clients and 83% of non-project farms. About one out of ten farms indicated they had a need for credit but would not be willing to undertake the risk, cost, or other disadvantages of borrowing to meet that need. While the proportion of farmers interested in borrowing is little different between the BCA participants and the control group, (15%) the amount of money each would want to borrow is 72% higher for BCA clients than for non-participants. This indicates that the project has generated an increasing level, but not an increasing frequency, of demand for credit.

Inside the BCA client group there are 7,779 borrowers, 4,942 of whom have had loans previous to 1978, and 2,837 who are new borrowers in 1978. There is demand evidenced in the survey INSIDE the BCA current

client group for \$1.02 million of additional credit for pre-1978 borrowers and \$.47 million for new 1978 borrowers. Inside the already accessed farms there is therefore about 1.5 million dollars of additional annual credit demand. It is impossible to guess from the survey the number of non-BCA farms of which the control group is representative, and it is impossible to estimate the latent demand for credit of this group. The indication of the survey is that about eight out of ten of these farmers are interested in borrowing an average of \$154 each for the coming agricultural year. In using these figures it should be remembered that the control group was not designed to be representative of the total non-BCA universe of farms, it represents farms of similar size and coffee production to the BCA participants and therefore is composed of farms significantly larger than average farms and probably significantly wealthier. It is probably true that the average Haitian farm would be less willing to borrow, less able to borrow, though not less able to make good use of additional credit.

C. Proposed Use of Additional Credit

Farmers indicating a desire to borrow additional credit for the coming agricultural year were asked to indicate what they would use the additional funds for, and how much of the desired amount of money would be dedicated to each potential use. These results are outlined in Table 33.

Table 33
Proposed Use of Additional Credit Funds

	0-3 Ha		3-5 Ha.		5+ Ha.		All Farms	
	BCA	Non-BCA	BCA	Non-BCA	BCA	Non-BCA	BCA	Non-BCA
	(Percent of Farms Indicating they would use additional funds to:)							
Purchase or Rent Land	6%	5%	10%	6%	3%	9%	6%	6%
Invest in Livestock	35%	33%	33%	31%	44%	28%	36%	32%
Plant More Coffee	20%	11%	20%	9%	24%	17%	21%	12%
Improve Existing Coffee	13%	11%	25%	15%	32%	17%	20%	13%
Purchase Fertilizer	11%	11%	14%	13%	25%	11%	15%	12%
Purchase Non-Coffee Seeds or plants	39%	42%	43%	46%	42%	47%	41%	44%
Hire Non-Coffee Labor	27%	28%	35%	41%	42%	53%	32%	35%
Purchase Tools	2%	0%	1%	0%	3%	2%	2%	0%
Build a Coffee Drying Platform	3%	2%	4%	2%	7%	8%	4%	3%
Other Uses	22%	22%	22%	19%	27%	11%	23%	16%

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID BCA-IHPCADE, Port au Prince, 1978

The three most frequently indicated uses for additional credit funds were the same for BCA and non-BCA farms, purchase of non-coffee seeds and plants, invest in livestock, and hire non-coffee labor. These are conspicuously the only three alternatives which have nothing to do with coffee. The other alternatives are either explicitly coffee or could be partly for coffee. This is a finding which cannot easily be explained from the

results of this study. Certainly the propensity to save in livestock form is well known, but it is unclear exactly what non-coffee activities are the subject of the other two major choices.

Coffee alternatives, plant more and/or improve existing stand, rank second in importance. BCA participants indicate these coffee uses almost twice as often as do non-participants illustrating a fuller commitment to coffee. Fertilizer purchase is the only other credit use with a significant following, 12-15% of those surveyed would use additional funds for fertilizer.

The amount of money requested for each use is outlined for the average of all farms in Table 34.

Table 34
Amount of Additional Credit Requested by Type of Proposed Use

Loan Purpose	All Farm Average* BCA Participants US\$ Requested	All Farm Average* Non-BCA Farms US\$ Requested
Invest in Livestock	\$ 78	\$ 71
Purchase non-Coffee Seeds	55	48
Hire Non-Coffee labor	67	50
Plant more Coffee	67	120
Improve Existing Coffee	100	52
Purchase Fertilizer	50	51
Purchase or Rent Land	303	295

*These averages are for all farm sizes but include only those farms which requested additional funds for the particular use listed in the "Loan Purpose" Column.

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

BCA farms requesting additional funds to plant more coffee request only half as much as non-participants with the same intent, indicating that there is considerable demand for additional coffee in non-participants which has been absorbed for existing BCA clients. Just the opposite is true for loan requests to improve existing coffee stands, BCA clients request double the loan amounts for this purpose as do non-participants.

D. Credit Burden and Delinquency

From the "Fiche", which contain limited asset data, it is possible to elaborate a profile of credit burden for the BCA farms. Table 35 estimates the value of liabilities divided by the value of assets (which include livestock and housing). These figures are less reliable than others in this document because they are drawn from the "Fiche" which are of limited credibility.

There is little pattern to the credit burden borne by different farm sizes, since wealth seems to be related to farm size this would tend to question the common hypothesis that the closer a rural family is to subsistence, the more reluctant they are to incur additional liability because of the risks involved.

Table 35
Credit Burden Estimates

	Total Value of Liabilities (BCA & Others)	Liabilities/Assets (Excluding land)
All BCA Participants	US\$ 128	30.9%
Farm Sizes		
0-1 Ha.	\$ 68	37.3%
1-1.5 Ha.	88	26.9%
1.5-2 Ha.	114	43.3%
2-3 Ha.	138	40.3%
3-5 Ha.	145	20.1%
Over 5 Ha.	309	50.2%
Number of Loans		
First loan and non-repeaters	70	14.1%
Second year repeaters	91	28.8%
Third year repeaters	106	60.6%

Source: S. Daines & T. Ahlers, Survey of 300 BCA Small Farm Coffee Client Files, 1978, Port au Prince, Haiti

There is a striking pattern when farms are sorted according to the number of loans they have received. The value of loan is computed by taking an average loan liability during the years of participation. Table 35 indicates that the borrowers who repeat incur increasingly larger debt/asset burdens the longer they are with the program. What this does not reveal is whether program involvement causes compensating increases in the value of their assets.

2. Delinquency

The purpose of this section is to present available data on delinquency and relate it to other important variables. Table 11 presents the delinquency rate by farm size and time in the program.

There is little pattern by farm size and delinquency except that it appears that the smallest farms are the least delinquent and the largest are the most often delinquent, the inbetween sizes show contradictory patterns.

The pattern of delinquency by the number of loans is very clear and disconcerting. First loan borrowers have understandably low delinquency rates which can partly be explained by the fact that their loans may not even be due yet. There are some of these single borrowers who have paid off their loans but most are in the category of having taken out loans in 1977 which are not yet due and could not therefore be delinquent. A total of 80% of the first year borrower loans are not yet due and could not be delinquent. This implies that the remaining 20% of borrowers in the first year category have a delinquency rate of almost 60%. It would appear, therefore that delinquency rates are very high for all borrowers who have loans outstanding for a long enough period to be due. Repeating borrowers would almost appear to be refinancing their delinquency from earlier

borrowing periods, the delinquency rate of the three loan borrowers is approximately three fourths. If Table 36 is an accurate picture of the delinquency pattern of the BCA operation, there is considerable danger that the program is destined to have much more serious delinquency problems as more borrowers mature in time.

Table 36
Delinquency

	Percent of Borrowers Never	Delinquent Once	Twice
All BCA Participants	70%	20%	10%
Farm Sizes			
0-1 Ha.	72	27	1
1-1.5 Ha.	62	26	12
1.5-2 Ha.	65	23	12
2-3 Ha.	73	12	15
3-5 Ha.	84	9	7
Over 5 Ha.	57	19	24
Number of Loans			
First Loan and non-Repeaters	87%	12%	-0-%
Two Loans	54	38	8
Three Loans	23	7	70

Source: S. Daines & T. Ahlers, Survey of 300 BCA Small Farm Coffee Client Files, Port au Prince, Haiti 1978

CHAPTER SEVEN
ANALYSIS OF AGRICULTURE CREDIT AND TECHNICAL ASSISTANCE
IN NON-COFFEE AREAS

Two non-coffee areas were selected for inclusion in the study for possible use in making comparisons and for future use if the AID mission determines to proceed with project development plans in non-coffee credit. This chapter analyzes these two areas and compares their performance and potential to the coffee areas already included in this report.

A. Income

Table 37 outlines the income performance of credit in the two non-coffee areas in comparison to the performance of BCA credit in coffee.

Table 37
Non-Coffee Agriculture Production Credit of BCA

Farm Size	Net Farm Income		Percent Increase in Income
	BCA Farms	Non-BCA Farms	
Non-Coffee Areas	\$ 492	\$ 488	0.8 %
Coffee Areas	926	766	21.0 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

There is essentially no difference in income between the BCA and match control group in income, credit has apparently had no observable impact on income in non-coffee areas. Given the severe land constraint on small farms it is possible that the only serious alternative open to increasing income is to promote the cultivation of high value crops like coffee which can produce very high levels of income per cultivated hectare under improved conditions.

B. Production and Technology Impacts of Credit and Technical Assistance in Non-Coffee Areas

There has been a slight apparent impact of production credit on the gross value of output in the non-coffee areas. Table 38 outlines production and technological impacts in these areas as compared with coffee areas.

Table 38
Production and Technical Assistance Impacts in Non-Coffee Areas

	BCA Farms	Non-BCA Farms	Difference
US\$ Value of Output			
Non Coffee Areas	\$ 646	\$ 570	13%
Coffee Areas	1147	846	36%
Value of Rice Production			
Non-Coffee Areas	234	230	2%
Land Productivity (Net income per Ha.)			
Non-Coffee Areas	221	242	-9%
Coffee Areas	263	206	28%

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

The production on BCA farms in non-coffee areas is only slightly higher than match farms (13%) and the fact that net income is almost identical suggests that net income efficiency is substantially lower on BCA farms. Land Productivity is actually negatively impacted by credit in the non-coffee areas, and the value of rice produced, the major crop in non-coffee areas, is only 2% higher on BCA farms.

It would appear that from the two most important perspectives, income and production, non-coffee credit as represented by La Vallee and St. Marc areas has had little positive impact on participant farms.

Technological level has been significantly effected by credit in non-coffee areas as evidenced by the proportion of farmers purchasing fertilizer. Table 39 presents fertilizer use comparisons between credit groups in non-coffee areas and with similar groups in coffee areas.

Table 39
Technology and Credit in Non-Coffee Areas

	BCA Farms	Non-BCA Farms	Difference
Percent of Farms Purchasing Fertilizer			
Non-Coffee Areas	55 %	18 %	37 %
Coffee Areas	62 %	6 %	56 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

Almost three times the proportion of credit farms purchase fertilizer as do non-credit farms in non-coffee areas. Since income is almost identical one can only conclude that the investment in fertilizer has been an ineffective one. In addition, production with triple the fertilizer has only increased about 13%. Considerable

careful analysis on data more detailed than that available from this study will be necessary to identify the precise reasons for these rather disappointing findings.

findings.

C. Technical Assistance in Non-Coffee Areas

Technical assistance in non-coffee areas reaches a significantly smaller proportion of both credit and non-credit farms. Table 40 outlines technical assistance coverage and farmer opinions about its income impact for non-coffee and coffee-areas.

Table 40
Technical Assistance in Non-Coffee Areas

	BCA Farms	Non-BCA Farms	Difference
Percent of Farms Visited By Extension Agents			
NON-Coffee Areas	78 %	50 %	28 %
Coffee Areas	99 %	69 %	30 %
Percent of Farmers who Feel that Extension Advice Increased Income			
Non-Coffee Areas	67 %	50 %	17 %
Coffee Areas	82 %	64 %	18 %

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

There is 20% higher access of credit and non-credit farmers to extension services in the coffee areas and there is also a much higher opinion about the income impact of these services. Coffee area farmers either receive a higher quality service or are convinced of its superior quality.

Table 41
Credit Demand Findings in Non-Coffee Areas

	BCA Farms	Non-BCA Farms	Difference
Percent of Farmers Indicating the need for Additional funds			
Non-Coffee Areas	98 %	91 %	7 %
Coffee Areas	91 %	93 %	-2 %
Percent of Farmers who Wish to Borrow to Cover Needed Funds			
Non-Coffee Areas	87 %	76 %	11 %
Coffee Areas	78 %	83 %	-5 %
Total Amount Requested			
Non-Coffee Areas	\$ 306	\$ 236	\$ 70
Coffee Areas	265	154	111

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

D. Credit Demand Analysis in Non-Coffee Areas

BCA farms in non-coffee areas; have a higher expressed need for additional funds, and a consequent higher willingness to borrow to cover those needs. Table 41 outlines the credit demand findings with reference to the non-coffee areas.

Even though there does not appear to be any positive impact from credit in the non-coffee areas, both BCA and non-BCA farms in those areas wish to borrow amounts in excess of what is desired in coffee areas. It would appear from the data on La Vallee and St. Marc that significant restructuring of the basic technology of production of basic grains, introduction of higher value crops as alternatives, or some other fundamental change will be necessary before production credit in these areas can make a significant welfare contribution to the small farm poor.

CHAPTER EIGHT
ANALYSIS OF POSSIBLE INTERVENTIONS BASED ON RESULTS
OF THE SMALL FARM SURVEY

As a part of the survey a series of questions were asked to elicit the opinion of interviewed farmers with reference to alternative project interventions. These responses constitute a body of target group preceptions about the utility of different development projects and approaches. This chapter explores these findings with a view to clarifying project alternatives.

Respondents were asked to volunteer their preferred projects and only if they were unable to respond were they given a set of alternatives to choose among. Most of the volunteered responses fit the classification scheme used for suggesting alternatives and it is therefore assumed that the open-ended responses are not dissimilar to those who selected among pre-named alternatives. Table 42 outlines these findings.

Table 42
 Farmer Opinions on Priority of Alternative Projects

	Coffee Areas		Non-Coffee Areas	
	BCA Farms	Non-BCA Farms	BCA Farms	Non-BCA Farms
(Percent of Farms Selecting Each Project as 1st Priority)				
More Roads	35%	32%	20%	0%
Health Facilities	14%	19%	3%	44%
Schools	22%	24%	30%	22%
Agriculture Extension	7%	2%	20%	33%
Potable Water	6%	6%	0%	0%
Non-Agricultural Jobs	3%	5%	0%	0%

Source: S. Daines & T. Ahlers, Haiti Small Farm Survey, AID-BCA-IHPCADE, Port au Prince, 1978

In coffee areas, additional roads are the highest priority to BCA and match group farmers. In non-coffee areas the priority is much lower, non-BCA clients did not even mention roads as a first priority in any single case.

Health facilities are the most important alternative noted in the non-coffee areas by both credit and non-credit farmers. Of the three principal alternatives; roads, schools and health facilities, health scored third in the coffee areas.

Schools were second most important in the coffee areas but were almost identically scored with agriculture extension in the non-coffee areas.

Table 43 indicates the project preference by farm size.

Table 43
Project Preferences by Farm Size in Coffee Areas

	0-3 Ha.		3-5 Ha.		5+ Ha.	
	BCA	Non-BCA	BCA	Non-BCA	BCA	Non-BCA
	(Percent of Farmers indicating each alternative as 1st priority)					
More Roads	33 %	27 %	34 %	43 %	40 %	39 %
Health Facilities	18 %	23 %	15 %	15 %	6 %	14 %
Schools	20 %	25 %	22 %	24 %	27 %	23 %

Source: S. Daines, & T. Ahlers, Haiti Small Farm Credit Survey, AID-BCA-IHPCADE, Port au Prince, 1978

The desire for roads increases significantly as farm size increases indicating a more serious interest in transportation as the size of the harvest increases. The interest in health facilities experiences an opposite trend, smaller farm families apparently feel health needs to be more acute than larger and relatively wealthier farmers.

If projects are to fit the perceived needs of the rural target group, roads would be the most important alternative in coffee areas.

APPENDIX A

Small Coffee Farmer Survey: Haiti 1978

ENQUETE HAITIENNE SUR LES PETITS PRODUCTEURS DE CAFE

METHODOLOGICAL SUMMARY

Theodore H. Ahlers

21 September 1978

Objectives

1. To measure the impact of the Petits Producteurs de Cafe project (PPC) on the income of project participants.
2. To measure the impact of the PPC on crop mix, land use, yields, land productivity, labor use, fertilizer use, and technological practices.
3. To explore the impact of alternative coffee marketing channels.
4. To measure additional credit demand in a) PPC participants, b) non-coffee BCA borrowers, and c) a non-participant control group.
5. To estimate the impact of non-coffee BCA lending, in order to examine the potential of an expanded small farmer credit program.

Methodology

The study consists of two parts: 1) an examination of a sample of **Fiche d'Information** (see Appendix A) available in BCA files and 2) a field survey of 400 borrowers matched with a control group of 400 non-borrowers.

"Fiche" Study

Fiche d'Information contain information on a borrowers age, number of dependents, area farmed, crops grown, tenure status, value of assets, and amount of debt. Theoretically, these **Fiches** are to be filled out prior to each loan from the BCA, thus providing baseline data on all borrowers and time series information on repeat borrowers. In practice, **Fiches** are filled out, at most, one time for each borrower. Despite the lack of time-series information, it was decided to code the information from a sample of **Fiche** as this was the **only** source of baseline data available on BCA borrowers and PPC participants.

A sample of **Fiches** were to be selected from each of 10 regions--the areas served by the 8 coffee centers and 2 non-PPC regions in which the BCA operates. As the **Fiche** were available only in local offices, a total of 13 BCA offices had to be visited. **Fiches** were readily available at 6 of these offices, were in the hands of the **Societe Agricole de Credit** (SAC) in 5 offices, and had never been filled out at the remaining 2 offices.

In the offices at which they were available, **Fiches** for all 1977 borrowers were separated according to the number of loans their respective SAC's had received. Independent subsamples were then drawn of first loan, second loan, and third loan borrowers in 1977. The minimum size of each of the subsamples was to be 20, with a minimum size per center of 40. A systematic (interval) sample was drawn by numbering the **Fiches**, choosing one **Fiche** at random (using a table of random numbers), and then selecting every N th **Fiche** where $N = \text{number of Fiches from the sub-population divided by desired sample size}$. Information from the sample of **Fiches** and their corresponding loan records was then transferred on to coding sheets (see Appendix B).

In offices at which **Fiches** had to be gathered from the SAC's a systematic sample was selected from BCA loan records and the **Fiches** were gathered for this sample only. This procedure proved to be extremely time-consuming as it required at least one return visit to the local office or an almost indefinite wait for the **Fiches** to be sent to Port-au-Prince.

The information recorded on the **Fiche d'Information** appears to be of poor quality. Many **Fiches** were only partially completed. The information on area cultivated and area by crop appears to be particularly incomplete because of the wording used on the **Fiches** (in French not Creole). Interpretation of what land was to be reported varied from center to center and among agents at the same center: all land operated, all land owned, all land in coffee, land in coffee to be fertilized, etc.

Field Survey

Questionnaire Design. The author designed a Creole questionnaire to elicit the information needed to meet the objectives of the study. The first two drafts of the questionnaire were prepared in Port-au-Prince in consultation with Haitian and expatriate colleagues with extensive experience in rural Haiti. The questionnaire was further revised after each of two field tests conducted as part of the enumerator training program.

In this author's opinion, the use of a Creole questionnaire--and not simply a translation into Creole of a questionnaire conceived of in French or English--and extensive field testing were absolutely essential given the nature of the information which was to be elicited in a single, relatively short interview.

In order to facilitate processing, the questionnaire was also pre-coded and designed such that data elements from numbered cells could be keyed directly on to tapes.

Enumerator Training. Nine enumerators and an additional field supervisor were hired and trained by the author with the help of Gary Smith (TDY from AID/Guatemala). All enumerators had completed secondary school, were familiar with rural areas, and had previous survey experience in rural Haiti.

Because of scheduling difficulties the enumerators were trained in two groups. The first team of enumerators were trained during a five-day period. The first day was devoted to acquainting the enumerators with the purposes of the survey, study of the survey materials, and conducting mock interviews. Mock interviews were continued the second day and were followed by detailed discussion of each question and the problems likely to be encountered in asking it. The third and fourth days were spent field-testing the questionnaire and observing the performance of each enumerator. The final day of training was devoted to critiquing the performance of enumerators, discussing problems encountered in the field, and revising particularly problematic questions. The second team of enumerators were trained during a four-day period structured in the same manner as that outlined above.

Time constraints dictated the length of the training period. Given the quality and previous experience of the enumerators recruited, one week of training was deemed adequate. It was certainly far from optimal, however, and a two week training period is certainly recommended for any further such survey effort.

Sampling Procedures. A sample of 40 borrowers was selected from each of ten regions (the 8 coffee centers and 2 non-PPC BCA offices). The sample in each consisted of an equal number of borrowers from each of 4 categories:

- a) new 1978 borrowers
- b) first loan borrowers in 1977
- c) second loan borrowers in 1977
- c) third loan borrowers in 1977.

Two coffee centers had borrowers in all four categories and thus had samples consisting of 10 borrowers from each category.

Two coffee centers had borrowers in the first three categories only and, thus, had sample consisting of 14 borrowers from category a), 13 borrowers from category b), and 13 borrowers from category c).

Four coffee centers had borrowers in categories a) and b) only; one center began operation in 1977 and three others had no loan renewals in 1977. Three of these four centers had samples consisting of 20 borrowers each from categories a) and b). The fourth center, Fond des Negres, had only 3 1977 borrowers; these 3 were included in the sample along with 17 1976 borrowers who did not renew their loans in 1977 and 20 borrowers from category a).

One of the non-PPC BCA offices had borrowers in categories a), b), and c); the other had borrowers in all four categories. Identical procedures to those outlined above were followed.

The new 1978 borrower part of the sample was selected systematically from BCA files and the 1977 borrower part of the sample randomly from the **Fiches** sample. In the two offices for which no **Fiches** exist the entire sample was selected systematically from BCA files.

The 40 borrowers per region selected in this manner were matched in the field with 40 producers not participating in the project.

Survey Procedures. Two survey teams, the author and a team of 5 enumerators and a second field supervisor with 4 enumerators, completed the survey during a six week period. A total of 290 enumerator-days were spent in the field. An average of 2.5 interviews were completed per enumerator per day.

As noted above, a total of 80 interviews, 40 participants and 40 matches, were to be conducted in each region. This proved to be extremely taxing since the random selection procedures naturally resulted in a

3,1

widely scattered sample. **After** arrival in each center, approximately three fourths of each enumerator day was spent travelling, mostly walking, to reach the selected producers.

Upon completion of an interview with a producer selected from the project files the enumerator was instructed to move in a clockwise spiral pattern from the interviewee's home until finding a non-participant producer operating approximately (50%) the same quantity of land and the same quantity of land planted in coffee. In practice this meant leaving the house of the interviewee's house by the principal path, making right hand turns at each cross path, and contacting every household along this route to see if it qualified as a match.

A total of 2,694 households were contacted in this manner. Interviews were completed with 372 (see Appendix 1) of the 400 participants selected from project files. 2,322 households were contacted in an attempt to match these project participants with non-participants; 364 successful matches were made. Thus, a grand total of 736 interviews were completed.

Questionnaires were checked by the field supervisor each evening for inconsistencies, missing information, and highly suspect responses in order that a re-interview could take place the following day if it proved necessary.

1. Identification of borrower.

- First two digits: Area Code 01 = Pilate
02 = Dondon
03 = Baptiste
04 = Thiotte
05 = Jacmel
06 = Fond des Negres
07 = Changieux
08 = Beaumont
09 = St Marc
10 = La Vallee

Second two digits identify borrower on sample list.

2. BCA number of the Societe Agricole de Credit (SAC)
3. Age of borrower.
4. Number of dependents.
5. Number of parcels operated.
6. Total area operated.
7. Area owned.
8. Area rented.
9. Area sharecropped.
10. Area operated under other modes of tenure.
11. Area in coffee.
12. coffee and plantains.
13. coffee and root crops.
14. maize and beans.
15. plantains.
16. root crops.
17. maize.
18. beans.
19. millet.
20. rice.
21. sugar cane.
22. non-specified food crops.
23. other perennial crops.

For parcels with multiple uses, area was divided by number of multiple uses except for combinations listed as variables 12, 13, and 14.

All area figures are in carreaux: 1,00cx = 1,29ha

62

24. Number of horses, mules, and donkeys owned.
25. Value of "
26. Number of pigs owned.
27. Value of "
28. Number of goats owned.
29. Value of "
30. Number of cattle owned.
31. Value of "
32. Number of poultry owned.
33. Value of "
34. Value of non-specified livestock.
35. Number of houses owned.
36. Value of houses owned.
37. Value of other assets
38. Debts (non-BCA).
39. Year in which Fiche was completed.
40. 1977 BCA fertilizer loan.
41. 1977 BCA cash loan.
42. 1976 BCA fertilizer loan.
43. 1976 BCA cash loan.
44. 1975 BCA fertilizer loan.
45. 1975 BCA cash loan.

All values reported in Haitian currency: ₣1.00 = \$US0.20

46. Delinquency.

Indicates if the SAC of which this individual is a member was delinquent in its payments as of 31 March 1978.

0 = not delinquent
 1 = payment overdue 2-12 months
 2 = payment overdue 12-24 months

47. Weight.

Number of borrowers in each sub-group (1st loan, 2nd loan, 3rd loan) per center divided by number of selected cases in that sub-group per center, assigned to selected cases.

FICHE SAMPLING INFORMATION

AREA	1st LOAN 1977 pop./sample	2nd LOAN 1977 pop./sample	3rd LOAN 1977 pop./sample	1st LOAN 1978 (no loan 1977) pop./sample
Pilate	174/41 (0101-0141)			
Dondon	175/23 (0201-0223)	43/22 (0224-0245)		
Baptiste	351/21 (0321-0341)	397/20 (0301-0320)		
Thiotte	773/0	201/20 (0421-0440)	169/20 (0401-0420)	
Jacmel	770/23 (0512-0517, 0533-0545, 0549, 0565-0567)	684/24 (0506-0511, 0518, 0523-0532, 0546-0548, 0550-0551, 0568-0569)	189/22 (0501-0505, 0519-0522, 0552-0564)	
Fond des Negres	3/3 (0601-0603)			159/20 (0604-0623)
Changieux	137/21 (0701-0721)			73/20 (0722-0741)

Beaumont (fiche never filled out)

St. Marc (non-coffee)	248/23 (0922-0943)	45/21 (0901-0921)		
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Jacmel (fiche never filled out)
(non-coffee)

TOTAL	1858/155	1169/87	189/22	232/40
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ENQUETE HAITIENNE SUR LES PETITS PRODUCTEURS DE CAFE

CONFIDENTIELLE
INFORMATION STRICTEMENT
RESERVEE A LA RECHERCHE

IDENTIFICATION DU PRODUCTEUR

NOM DE LA COMMUNE: _____
 NOM DE LA SECTION: _____
 NOM DE L'HABITATION: _____
 NOM DU PRODUCTEUR ENQUETE: _____
 NUMERO D'ORDRE: _____
 DATE: _____
 NOM DE L'ENQUETEUR: _____

001

-ta rinmin pran kèk ranséyman sou moun ki viv dèmi lèvé nan ay la, ni sa yo nan fanmi ou ni lòt moun ki rèt ak ou.

1. Konbyin moun té viv dèmi lèvé lakay ou ané pasé?.....

DETERMINER LE NOMBRE DE PERSONNES QUI'Y ONT DORMI ET MANGE PENDANT AU MOINS 6 MOIS EN 1977. FAIRE CITER LE NOM DE CHACUN POUR CONTROLLER LE NOMBRE ET PUIS DEMANDER:

2. Èské ou gingnin lòt moun, pa égzanmp jèn timoun ousoua ti bébé, nou poko pran non yo?.....

SI OUI, CORRIGER LA REPONSE A QUESTION #1

3. Èské ou gingnin lòt moun ki abité isit ké nou poko pran non yo, pa égzanmp moun ki pa manm fanmi ou?.....

SI OUI, CORRIGER LA REPONSE A QUESTION #1

002

003

1 OUI 2 NON

004

1 OUI 2 NON

4. A pa tout moun sa yo, èské ou gin lòt moun ankò sou kont ou?...

SI OUI; 5. Konbyin lòt moun ou gingnin sou kont ou?.....

005

1 OUI 2 NON

006

RESERVER LES CARACTERISTIQUES DU LOGEMENT PRINCIPAL
LES NOTER CI-DESSOUS

6. MATERIAU PRINCIPAL DES MURS.....

007

1 PALISADÉ 5 PLANCHI
 2 KLISÉ 6 ROCH
 3 BOUZIE 7 BLÒK
 4 KRÉPI 8 LÒT

7. MATERIAU PRINCIPAL DU SOL.....

008

1 TÈ 3 SIMAN
 2 PLANCH 4 LÒT

8. MATERIAU PRINCIPAL DU COUVERTURE.....

009

1 TACH 3 TOL
 2 PAY 4 LÒT

9. NOMBRE DE PIECES.....

010

10. Ki bò ou pran dlo pi souvan?.....

011

1 RIVYÈ 4 POU
 2 SOUS 5 TIYO
 3 KANAL 6 LÒT

11. Konbyin tan sa pran pou rivé nan dlo sa-a a plé?.....

012

___ h. ___ min.

dulyé-a m-ta rinmin pran kèk ranséyman sou jadin ou gingnin yo.

2. Kalkilé ou byin. An tou, konbyin jadin ak konbyin plantasyon kafé ou té gingnin ané pasé?

DETERMINER LE NOMBRE DE PARCELLES A LA DISPOSITION DE L'ENQUETE
ENTRE MARS 1977 ET MARS 1978.....

013

3. Ki bò jadin sa yo yé?				
4. Ki kantité tè gingnin nan jadin sa-a?	014	039	064	089
5. Sou ki kondisyon ou tap travay tè sa-a?	015	040	065	090
6. Kisa ou té gin nan tè sa-a ané pasé, ni nan prémie sèzon an, ni nan dènyè sèzon an?				
CULTURE #1	016	041	066	091
SUPERFICIE	017	042	067	092
RECOLTE	018	043	068	093
PRIX RECU/UNITE	019	044	069	094
CULTURE #2	020	045	070	095
SUPERFICIE	021	046	071	096
RECOLTE	022	047	072	097
PRIX RECU/UNITE	023	048	073	098
CULTURE #3	024	049	074	099
SUPERFICIE	025	050	075	100
RECOLTE	026	051	076	101
PRIX RECU/UNITE	027	052	077	102
CULTURE #4	028	053	078	103
SUPERFICIE	029	054	079	104
RECOLTE	030	055	080	105
PRIX RECU/UNITE	031	056	081	106
CULTURE #5	032	057	082	107
SUPERFICIE	033	058	083	108
RECOLTE	034	059	084	109
PRIX RECU/UNITE	035	060	085	110
"TÈ POZÉ"/SUPERFICIE	036	061	086	111
PATURAGE/SUPERFICIE	037	062	087	112
NON-CULTIVABLE/SUP.	038	063	088	113

KI bô...						
KI kantite	114	139	164	189	214	
tè...						
Sou ki	115	140	165	190	215	
kondisyon						
CULTURE #1	116	141	166	191	216	
SUP.1	117	142	167	192	217	
RECOLTE	118	143	168	193	218	
PRIX	119	144	169	194	219	
CULTURE #2	120	145	170	195	220	
SUP.	121	146	171	196	221	
RECOLTE	122	147	172	197	222	
PRIX	123	148	173	198	223	
CULTURE #3	124	149	174	199	224	
SUP.	125	150	175	200	225	
RECOLTE	126	151	176	201	226	
PRIX	127	152	177	202	227	
CULTURE #4	128	153	178	203	228	
SUP.	129	154	179	204	229	
RECOLTE	130	155	180	205	230	
PRIX	131	156	181	206	231	
CULTURE #5	132	157	182	207	232	
SUP.	133	158	183	208	233	
RECOLTE	134	159	184	209	234	
PRIX	135	160	185	210	235	
POZÉ"	136	161	186	211	236	
CULTURE #6	137	162	187	212	237	
URAGE						
-CULTIV.	138	163	188	213	238	

ARQUES:

17. Ané pasé konbyin gason té gingnin ki té dòmi lèvé nan kay la ki té gingnin ant 12 é 65 an?... 239

18. Kijan yo rélé?	19. Ané pasé konbyin moua li té travay nan jadin li oubyin jadin moun nan kay la?	20. An tou, konbyin jou li té travay nan you (koumbit, korvé) ané pasé?	21. An tou, konbyin jou li té travay sou té lòt moun nan you (èskouad, ranpono, kolonn, veyé asocié) ki pa-t touché lajan?	22. An tou, konbyin jou li té vann jounin li oubyin travay anpéyan ané pasé?	23. Lè li vann jounin li oubyin travay anpéyan kòb li konn touché pa jou?	24. A pa travay tè é travay lakay, ané pasé konbyin moua li té gin you lòt travay oubyin you lòt aktivité?	25. A pé prè konbyin kòb li té konn fé nan travay sa-a chak moua?
	240	241	242	243	244	245	246
	247	248	249	250	251	252	253
	254	255	256	257	258	259	260
	261	262	263	264	265	266	267
	268	269	270	271	272	273	274
	275	276	277	278	279	280	281

26. Ané pasé konbyin fi té gingnin ki té dòmi lèvé nan kay la ki té gingnin ant 12 é 65 an?..... 282

DEMANDER QUESTIONS 18, 19, 20, 21, 22, 23, 24, ET 25 POUR CHACUNE

	283	284	285	286	287	288	289
	290	291	292	293	294	295	296
	297	298	299	300	301	302	303
	304	305	306	307	308	309	310
	311	312	313	314	315	316	317
	318	319	320	321	322	323	324

A-13-

1. Ané pasé, konbyin foua ou té fè you (koumbit, korvé) nan jadin ou yo?.....	325	
S'IL A FAIT DES KOUMBIT:	326	
28. Konbyin moun té konn vi-n nan (koumbit, korvé) sa yo?..		
2. Ané pasé, konbyin foua you (èskouad, ranpono, kolonn, lavéy, vèyé, asocié) té vi-n travay nan jadin ou yo san sé pa achté ou achté-l?.....	327	
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30. Konbyin moun té gingnin nan (èskouad, ranpono, kolonn, lavéy, vèyé, asocié) sa-a?.....		
3. An tou, konbyin jounin ou té achté ané pasé? DETERMINER LE NOMBRE DE HOMME-JOURS.....	329	
S'IL EN A ACHTE:	330	GDES
32. Konbyin kòb ou té konn hay chak moun pa jou?.....		
4. Ané pasé, konbyin foua ou té bay anpéyan oubyin bay djòb nan jadin ou yo?.....	331	
S'IL A FAIT:	332	GDES
34. An tou, konbyin kòb ou té dépansé pou travay anpéyan oubyin pou djòb ou té bay?.....		
35. An tou, a pé pré konbyin jounin moun té travay nan jadin ou yo pou té djòb sa yo? DETERMINER LE NOMBRE DE HOMME-JOURS.....	333	
Èské ou té achté angré ané pasé?.....	334	1 <input type="checkbox"/> OUI 2 <input type="checkbox"/> NON
SI OUI: 37. Konbyin sak ou té achté ané pasé?.....	335	() 50 () 100 LIVRES
38. Pou konbyin kob ou té achté chak sak?.....	336	GDES
39. Nan ki kilti ou té sévi ak angré-a?.....	337	
5. Èské ou té achté sémans oubyin achté plan ané pasé?.....	338	1 <input type="checkbox"/> OUI 2 <input type="checkbox"/> NON
SI OUI: 41. An tou, konbyin ou té dépansé pou sémans é pou plan ané pasé?.....	339	GDES
6. Èské ou té achté kèk zouti, sak, oubyin lòt bagay pou travay jadin ou yo ané pasé?.....	340	1 <input type="checkbox"/> OUI 2 <input type="checkbox"/> NON
SI OUI: 43. An tou, konbyin ou té dépansé pou bagay sa yo ané pasé?.....	341	GDES
7. Oulyé-a m-ta rinmin pran kèk ranséyman sou plantasyon kafé ou yo.	342	1 <input type="checkbox"/> TYPICA, KAFÉ PAYI-A" 2 <input type="checkbox"/> CATURA 3 <input type="checkbox"/> AUTRE 4 <input type="checkbox"/> PA CONNU
8. Ki kalité kafé ou gingnin nan jadin ou yo?.....		
9. Èské ou té sévi ak angré nan plantasyon kafé ou ané pasé?.	343	1 <input type="checkbox"/> OUI 2 <input type="checkbox"/> NON
SI OUI: 46. Ak konbyin sak ou té sévi?.....	344	() 50 () 100 LIVRES

63

• Èské gingnin ajan ki konn vi-n oué ou pou ba ou konséy sou kafé ou?.....	345 1 <input type="checkbox"/> OUI 2 <input type="checkbox"/> NON
• Èské ou konn al oué you ajan pou pran konséy sou kafé ou?.....	346 1 <input type="checkbox"/> OUI 2 <input type="checkbox"/> NON
SI OUI A QUESTION #47 OU #48:	347
49. Èské ou pansé konséy sa-a ap pèrmèt ou fé plis kòb ak jadin kafé ou?.....	1 <input type="checkbox"/> OUI 2 <input type="checkbox"/> NON

JR QUESTIONS 50 a 52 ET 54 a 58, TIMER LES PROPORTIONS ET COCHER LES CASES APPROPRIÉES

	PLUS QUE LA MOITIÉ,	MOINS QUE LA MOITIÉ	PAS DU TOUT
• Nan tout plé kafé ké ou travay koulyé-a, ki pòsyon ladann yo té la dépi avan Fransoua Divalyé té vi-n prézidan?.....	348 (1)	(2)	(3)
• Ki pòsyon ladann yo té planté sou Fransoua Divalyé?.....	349 (1)	(2)	(3)
• Ki pòsyon ladann yo té planté dépi Jan Klòd vi-n prézidan?	350 (1)	(2)	(3)
• Konbyin plé kafé ou réussil planté dépi ané 76?.....	351		
• Kafé sa-a ké ou planté dépi ané 76, ki pòsyon li yé nan tout kafé ou?.....	352 (1)	(2)	(3)
Nan dényè rékolt kafé-a, èské ou té vann nan kafé ou a you (tchokè, delakè, voltijè, pirat, zombi, soumarin, révandèz).....	353 (1)	(2)	(3)
56. ...a you éspékulatè?.....	354 (1)	(2)	(3)
57. ...a you uzin?.....	355 (1)	(2)	(3)
58. ...a you koopérativ?.....	356 (1)	(2)	(3)
Nan dényè rékolt kafé-a, èské ou té vann (kafé an sériz, kafé vèrt)?.....	357 (1)	(2)	(3)
60. ...kafé tchoka?.....	358 (1)	(2)	(3)
61. ...kafé an kòk?.....	359 (1)	(2)	(3)
62. ...kafé pilé?.....	360 (1)	(2)	(3)

Nan dényè rékolt kafé-a, ki pri ou té jouèn pi souvan pou kafé ou té vann an sériz (kafé vèrt)?.....	361
64. ...kafé tchoka ou té vann?.....	362
65. ...kafé ou té vann an kòk?.....	363
66. ...kafé pilé ou té vann?.....	364
Nan tout kafé ou té vann nan dényè rékolt la, ki piro pri ou té jouèn?.....	365
68. ...ki piba pri ou té jouèn?.....	366
INDIQUER LE STADE DE TRANSFORMATION	367

69. Ané pasé, èské ou té prété lajan oubyln pran angré nan min BCA-a?.....	<input type="checkbox"/> OUI <input type="checkbox"/> NON	368	GDES
70. ...prété nan min IDAI?	<input type="checkbox"/> OUI <input type="checkbox"/> NON	369	GDES
71. ...prété nan min you èspèkulatè?	<input type="checkbox"/> OUI <input type="checkbox"/> NON	370	GDES
72. ...prété nan min you komèsan oubylnachte krédi?	<input type="checkbox"/> OUI <input type="checkbox"/> NON	371	GDES
73. ...pran kout pongnar oubyln èskonté lajan?	<input type="checkbox"/> OUI <input type="checkbox"/> NON	372	GDES
74. ...prété nan min fanmi ou oubyln zanmi ou?	<input type="checkbox"/> OUI <input type="checkbox"/> NON	373	GDES
75. Èské ou ta ka utlizé plis lajan pou fé jadin ou yo ané prochèn?	1 <input type="checkbox"/> OUI 2 <input type="checkbox"/> NON	374	
SI OUI: 76. Èské ou ta vlé prété lajan an ou ap bézouln?.....	1 <input type="checkbox"/> OUI 2 <input type="checkbox"/> NON	375	
SI OUI: 77. SI ou ta ka prété lajan a 10% Intéré pa ané, sa vlé di pou chak 100 goud ou tap prété ou ta péyé 10 goud Intéré pa ané, konbyln ou ta prété ané prochèn?.....		376	GDES
78. KI sa ou ta fé ak lajan an ou ta prété? NE PAS LIRE LA LISTE DE REPONSES A L'ENQUETE. COCHER LES CASES DEVANT LES REPONSES DONNEES.		377	
a) <input type="checkbox"/> ACHTÉ OUBYIN ANFÈMÉ TÈ.....			GDES
b) <input type="checkbox"/> ACHTÉ BÈT.....		378	GDES
c) <input type="checkbox"/> PLANTÉ PLIS KAFÉ.....		379	GDES
d) <input type="checkbox"/> AMÉLYORÉ JADIN KAFÉ LI.....		380	GDES
e) <input type="checkbox"/> ACHTÉ ANGRÉ.....		381	GDES
f) <input type="checkbox"/> ACHTÉ LÒT SÉMANS É LÒT PLAN.....		382	GDES
g) <input type="checkbox"/> ACHTÉ JOUNIN POU LÒT KILTÌ.....		383	GDES
h) <input type="checkbox"/> ACHTÉ ZOUTI.....		384	GDES
i) <input type="checkbox"/> FÉ YOU GLASI.....		385	GDES
j) <input type="checkbox"/> LÒT BAGAY: _____		386	GDES
k) <input type="checkbox"/> LÒT BAGAY: _____		387	GDES
9. KI sòt dé projé ta Intérésé ou plis bò Isit? NE PAS LIRE LA LISTE DE PROJETS A L'ENQUETE. INDIQUER CEUX DE 1 ^{ere} ET 2 ^{eme} IMPORTANCE A LUI.		388	
a) PLIS ROUT.....			
b) DISPANSÈ É SANT BÒ LAKAY LI.....		389	
c) PLIS LÉKOL.....		390	
d) PLIS KRÉDI.....		391	
e) KONSÉY SOU AGRIKILTÌ, SÉMANS, É ANGRÉ.....		392	
f) JOUÈN TRAVAY ANDÉYO AGRIKILTÌ.....		393	
g) LÒT BAGAY: _____		394	
h) LÒT BAGAY: _____		395	

80. D-aprè ou, kisa ta pl Inpòtan pou pèrmèt ou fè plis kòb ak Jadin kafé ou?

NE PA LIRE LA LISTE DE REPONSES A L'ENQUETE.
INDIQUER CEUX DE 1^{ère} ET 2^{ème} IMPORTANCE A LUI.

- a) RÉPLACÉ ANSYIN PIÉ KAFÉ AK NOUVO KALITÉ..... 396
- b) SÉVI AK ANGRÉ POU FÉ KAFÉ-A DONNÉ PLIS..... 397
- c) NÉTOUAYÉ PIÉ KAFÉ YO..... 398
- d) NÉTOUAYÉ PIBOUA YO KI BAY TROP OMBRAJ..... 399
- e) PLANTÉ PLIS KAFÉ..... 400
- f) VANN KAFÉ NAN YOU KOOPERATIV POU JOUÈN PIBON PRI..... 401
- g) LÒT BAGAY: 402
- h) LÒT BAGAY: 403

Koulyé-a m-ta rinmin pran kèk ranséyman sou bèt ou gingnin yo.

81. Kalkilè ou byin. An tou, konbyin poul, kodinn, pintad, ò kanar ou gingnin koulyé-a?.....
- | POUL | KODINN | PINTAD KANAR |
|------|--------|--------------|
| 404 | 405 | 406 |
| 407 | 408 | 409 |
| 410 | 411 | 412 |
| 413 | 414 | 415 |
| 416 | 417 | 418 |
82. Si ou ta vann yo konbyin ou ta Jouèn pou chak grèn?.....
83. Konbyin ou té achté ané pasé?.....
84. Konbyin ou té vann ané pasé?.....
85. Konbyin ou té tuyé pou manjé lakay ou ané pasé?.....

86. Konbyin kabrit é mouton ou gingnin koulyé-a, ni sa-k nan min ou ni sa-k ou bay lòt moun gadé pou ou?..... 419
87. Si ou ta vann yo, konbyin ou ta Jouèn pou chak grèn?(PRIX MOYEN) 420
88. Konbyin kabrit (ak mouton) ou té achté ané pasé?..... 421
89. Konbyin kabrit (ak mouton) ou té vann ané pasé?..... 422
90. Konbyin ou té tuyé pou manjé lakay ou ané pasé?..... 423

91. An tou, konbyin kochon ou gingnin koulyé-a, ni sa-k nan min ou ni sa-k ou bay lòt moun gadé pou ou?..... 424
92. Si ou ta vann yo, konbyin ou ta Jouèn pou chak grèn?(PRIX MOYEN) 425
93. Konbyin kochon ou té achté ané pasé?..... 426
94. Konbyin kochon ou té vann ané pasé?..... 427
95. Konbyin kochon ou té tuyé pou manjé lakay ou ané pasé?..... 428

96. An tou, konbyin bèf ou gingnin koulyé-a, ni sa-k nan min ou ni sa-k ou bay lòt moun gadé pou ou?..... 429
97. Si ou ta vann yo, konbyin ou ta Jouèn pou chak grèn?(PRIX MOYEN) 430
98. Konbyin bèf ou té achté ané pasé?..... 431
99. Konbyin bèf ou té vann ané pasé?..... 432

ENQUETE HAITIENNE SUR LES PETITS PRODUCTEURS DE CAFE

CODING INFORMATION

<u>Cell Number</u>	<u>Variable Description</u>	<u>Code</u>
001	a) Five-digit identification number First two digits: Area identification	01 = Pilate 02 = Dondon 03 = Baptiste 04 = Thiotte 05 = Jacmel 06 = Fond des Nègres 07 = Changieux 08 = Beaumont 09 = St. Marc (non-coffee) 10 = La Vallée (non-coffee)
	Last three digits: Borrower identification	***
	b) Amount of 1978 fertilizer loan	G 0,00 (G1.0 = \$USG:20)
	c) Amount of 1978 cash loan	999 = borrowed in 1978, loan amount unavailable blank = non-participant
002	Number of persons who slept and ate in household for at least six months in 1977.	***
003	Presence of children not included in 002, if yes, 002 corrected.	1 = yes 2 = no
004	Presence of other persons not included in 002, if yes, 002 corrected.	1 = yes 2 = no
005	Existence of other dependents not present in household.	1 = yes 2 = no
006	Number of dependents not present in household.	***
007	Walling material of principal dwelling unit.	1 = palm bark 2 = wattle 3 = wattle & daub 4 = wattle & mortar 5 = planks 6 = rock masonry 7 = cement block 8 = other
008	Flooring material of principal dwelling unit.	1 = dirt 2 = planks 3 = cement 4 = other

- 009 Roofing material of principal dwelling unit. 1 = palm fronds
2 = straw
3 = tin roofing
4 = other
- 010 Number of rooms in principal dwelling unit ***
- 011 Source of drinking water 1 = river
2 = spring
3 = canal
4 = well
5 = pipe
6 = other
- 012 Walking time to source of drinking water ___ hours ___ minutes
- 013 Number of plots operated during 1977 cropping year ***
- 014 Area of first plot. ALL AREA FIGURES REPORTED IN CARREAU
1 cx. = 1.29 ha. 0,00 cx
- 015 Tenure status regarding first plot. 1 = purchased
2 = inherited
3 = multi-year lease (full payment in advance)
4 = annual rent
5 = pre-inheritance grant
6 = sharecropped
7 = other
- 016 Crop #1 in first plot 1 = coffee
2 = plantain
3 = maize
4 = millet
5 = rice
6 = beans
7 = yams
8 = sweet potatoes
9 = manioc
10 = taro
11 = sugar cane
12 = potatoes
13 = pumpkin
14 = fruit
15 = tobacco
16 = vegetable pear (chayote)
17 = other annual crop
18 = sisal
19 = vetiver grass
20 = cabbage
21 = ground nuts
22 = cacao
23 = tomato~~s~~
24 = onion

017	Area in crop #1 in first plot.	0,00 cx
018	Quantity of crop #1 harvested in first plot First digit: unit of measure	0 = cash @0. 1 = pounds 2 = marmite 3 = bidon 4 = barik 5 = charge 6 = small sack 7 = large sack 8 = stalk 9 = basket
019	Price received per unit of 018	@0,00
020--023	Crop, area, quantity and price for crop #2 in first plot (same as 016--019).	
024--027	Crop, area, quantity, and price for crop #3 in first plot (same as 016-019).	
028--031	Crop, area, quantity, and price for crop #4 in first plot (same as 016--019).	
031--035	Crop, area, quantity, and price for crop #5 in first plot (same as 016--019).	
036	Area in fallow in first plot.	0,00cx
037	Area in pasture in first plot.	0,00cx
038	Area not cultivable in first plot	0,00cx
039--063	Second plot (same as 014--038).	***
064-088	Third plot (same as 014--038).	***
089--113	Fourth plot (same as 014--038).	***
114--138	Fifth plot (same as 014--038).	***
139--163	Sixth plot (same as 014--038).	***
164--188	Seventh plot(same as 014--038).	***
189--213	Eighth plot (same as 014-038).	***
214--238	ninth plot (smae as 014--038).	***

239	Number of males between 12--65 years of age who slept and ate in household for at least six months in 1977	***
240	Number of <u>months</u> worked by male #1 in household <u>plots</u> during 1977 crop year	***
241	Number of <u>days</u> worked by male #1 in festive exchange labor (<u>kombit</u>)	***
242	Number of <u>days</u> worked by male #2 in rotational exchange labor (<u>eskouad</u> , etc.)	***
243	Number of <u>days</u> worked by male #1 on non-household plots for wages.	***
244	Daily wage received for 243	¢0,00
245	Number of months worked by male #1 in non-agricultural activities	
	First two digits: occupation/activity code	
		1 = commerce
		2 = mason
		3 = woodcutter
		4 = carpenter
		5 = shoemaker
		6 = truck driver
		7 = tailor/seamstress
		8 = military personnel
		9 = (same as 5)
		10 = religious personnel
		11 = cabinet maker
		12 = teacher
		13 = traditional religious personnel (<u>bokò</u>)
		14 = coffee factory worker
		15 = medical personnel
		16 = cane cutter (Dom. Rep.)
		17 = whitewash maker
		18 = saddle maker
		19 = hat maker
		20 = baker
		21 = lottery sales
		22 = extension agent
		23 = mining (Reynolds Alum.)
		24 = fish net maker
		25 = mechanic
		26 = butcher
		27 = domestic help
		28 = road construction(Dumcz)
		29 = clairin maker
		30 = rock breaker
		31 = basket maker
		32 = barber
		33 = rope maker

	Last digits: Number of <u>months</u> worked	

246	Average monthly earnings from 245	0,00
247--253	Male #2 (same as 240--246).	
254--260	Male #3 (same as 240--246).	
260--267	Male #4 (same as 240--246).	
268--274	Male #5 (same as 240--246).	
275--281	Male #6 (same as 240--246).	
282	Number of females 12--65 years of age who slept and ate in household for at least six months in 1977.	***
283-289	Female #1 (same as 240-246).	
290--296	Female #2 (same as 240--246).	
297--303	Female #3 (same as 240--246).	
304--310	Female #4 (same as 240--246).	
311--317	Female #5 (same as 240--246).	
318--324	Female #6 (same as 240-246).	
325	Number of <u>times</u> festive exchange labor worked on household plots.	***
326	Average number of persons participating in 325	***
327	Number of <u>times</u> rotational exchange labor worked on household plots	***
328	Average number of persons participating in 327	***
329	Number of <u>person-days purchased</u> for work on household plots	***
330	Average daily wage paid for 329	0,00
331	Number of <u>times</u> contracts given for task labor.	***
332	Total amount spent for 331	0,00
333	Total number of person-days worked on household plots by task workers	***
334	Purchase of fertilizer in 1977	1 = yes 2 = no

335	Number of sacks purchased	****
336	Price paid per sack	₡0,00
337	Crops fertilized	(see crop code for 016)
338	Purchase of seeds or plants in 1977	1 = yes 2 = no
339	Total amount spent on seeds and plants	₡ 0,00
340	Purchase of tools, sacks, or other Agricultural equipment in 1977	1 = yes 2 = no
341	Total amount spent on tools, etc.	₡ 0,00
342	Coffee varieties in present stand.	1 = typica 2 = catura 3 = other 4 = not known
343	Use of fertilizer on coffee holdings in 1977	1 = yes 2 = no
344	Number of sacks used to fertilized coffee	*****
345	Receive visits from coffee extension agent.	1 = yes 2 = no
346	Make visits to coffee extension agent	1 = yes 2 = no
347	Visits to and from coffee extension agent raise coffee income	1 = yes 2 = no
348	Proportion of current coffee stand more than 21 years old	1 = more than half 2 = less than half 3 = none
349	Proportion of current coffee stand 7--21 years old.	(same as 348)
350	Proportion of current coffee stand 0--7 years old.	(same as 348)
351	Total number of coffee trees planted in 1976, 1977, and 1978	*****
352	Proportion of current coffee stand planted since 1976.	(same as 348)

353	Proportion of 1977-78 coffee crop sold to unlicensed middleman. (<u>tchokè</u> , etc.).	(same as 348)
354	Proportion of 1977-78 coffee crop sold to licensed middleman (<u>èspukulatè</u>).	(same as 348)
355	Proportion of 1977-78 coffee crop sold to coffee washing factory.	(same as 348)
356	Proportion of 1977-78 coffee crop sold to a coffee cooperative.	(same as 348)
357	Proportion of 1977-78 coffee crop sold as green cherries (<u>sériz</u>).	(same as 348)
358	Proportion of 1977-78 coffee crop sold as milled green coffee (<u>tchoka</u>).	(same as 348)
359	Proportion of 1977-78 coffee crop sold as dried cherries (<u>an kòk</u>).	(same as 348)
360	Proportion of 1977-78 coffee crop sold as natural coffee (<u>café pilé</u>).	(same as 348)
361	Price received for coffee cherries sold.	⌘ 0,00/ <u>bidon</u>
362	Price received for milled green coffee sold.	⌘ 0,00/ <u>marmite</u>
363	Price received for dried coffee cherries sold.	⌘ 0,00/ <u>marmite</u>
364	Price received for natural coffee sold.	⌘ 0,00/lbs
365	Highest price received for 1977-78 coffee.	⌘ 0,00
366	Lowest price received for 1977-78 coffee.	⌘ 0,00
367	Transformation stage of coffee in 365 and 366.	1 = cherries (<u>sériz</u>) 2 = milled green coffee (<u>tchoka</u>) 3 = dried cherries (<u>kòk</u>) 4 = natural coffee (<u>pilé</u>)
368	Amount borrowed from BCA in 1977.	⌘ 0,00
369	Amount borrowed from IDAI in 1977.	⌘ 0,00
370	Amount borrowed from coffee middlemen (<u>speculatemè</u>) in 1977.	⌘ 0,00
371	Amount borrowed from merchants in 1977.	⌘ 0,00
372	Amount borrowed from moneylenders in 1977.	⌘ 0,00

373	Amount borrowed from family and friends in 1977.	Q 0,00
374	Need for additional funds for agricultural operation next year.	1 = yes 2 = no
375	Desire to borrow money to meet need expressed in 374.	1 = yes 2 = no
376	Amount of money would borrow next year if available at 10% annual interest.	Q 0,00
377	Amount would borrow to purchase or rent additional land.	Q 0,00
378	Amount would borrow to raise livestock.	Q 0,00
379	Amount would borrow to plant more coffee.	Q 0,00
380	Amount would borrow to upgrade existing coffee stand.	Q 0,00
381	Amount would borrow to purchase fertilizer.	Q 0,00
382	Amount would borrow to purchase seed and plants other than coffee.	Q 0,00
383	Amount would borrow to hire labor for work on crops other than coffee	Q 0,00
384	Amount would borrow for the purchase of tools	Q 0,00
385	Amount would borrow to construct cement drying platform.	Q 0,00
386	Amount would borrow for other use #1	Q 0,00
387	Amount would borrow for other use #2	Q 0,00
388--395	Projects of most interest to interviewee	1 = Project of most interest 2 = project of second most interest blank = project not mentioned as being of most or second most interest
388	More or improved roads	
389	More or improved health facilities	
390	More or improved schools	
391	More credit	
392	More extension help	
393	Create more non-agricultural employment opportunities.	
394	Other project	
395	Improved drinking water	

396--403	Most important ways of raising own coffee income	(same as 388--395).
396	Replace existing stand with new varieties	
397	Use fertilizer to improve yields	
398	Prune existing coffee trees	
399	Reduce shade	
400	Plant more coffee	
401	Sell coffee through a cooperative in order to receive better price.	
402	Other #1	
403	Other #2	
404	Number of chickens currently owned	***
405	Number of turkeys currently owned	***
406	Number of guinea fowl and ducks currently owned	***
407	Mean value of chickens owned	Ø 0,00
408	Mean value of turkeys owned	Ø 0,00
409	Mean value of guinea fowl and ducks owned	Ø 0,00
410	Number of chickens purchased in 1977	***
411	Number of turkeys purchased in 1977	****
412	Number of guinea fowl and ducks purchased in 1977	****
413	Number of chickens sold in 1977	****
414	Number of turkeys sold in 1977	****
415	Number of guinea fowl and ducks sold in 1977	****
416	Number of chickens consumed by household in 1977	****
417	Number of turkeys consumed by household in 1977	****
418	Number of guinea fowl and ducks consumed in 1977	****
419	Number of goats and sheep currently owned	****
420	Mean value of goats and sheep owned	Ø 0,00
421	Number of goats and sheep purchased in 1977	****
422	Number of goats and sheep sold in 1977	****
423	Number of goats and sheep consumed by household in 1977	****

424	Number of swine currently owned	***
425	Mean value of swine owned	£ 0,00
426	Number of swine purchased in 1977	***
427	Number of swine sold in 1977	***
428	Number of swine consumed by household in 1977	***
429	Number of cattle currently owned	***
430	Mean value of cattle owned	£ 0,00
431	Number of cattle purchased in 1977	***
432	Number of cattle sold in 1977	***
433	Number of donkeys currently owned	***
434	Number of mules currently owned	***
435	Number of horses currently owned	***
436	Mean value of donkeys owned	£ 0,00
437	Mean value of mules owned	£ 0,00
438	Mean value of horses owned	£ 0,00
439	Number of donkeys purchased in 1977	***
440	Number of mules purchased in 1977	***
441	Number of horses purchased in 1977	***
442	Number of donkeys sold in 1977	***
443	Number of mules sold in 1977	***
444	Number of horses sold in 1977	***
445	Number of houses owned	***
446	Total replacement cost of houses owned	£ 0,00
447	Total market value of houses owned	£ 0,00

ENQUETE HAITIENNE SUR LES PETITS PRODUCTEURS DE CAFE

FIELD SURVEY SAMPLING INFORMATION

AREA	1st LOAN 1977 pop./sample	2nd LOAN 1977 pop./sample	3rd LOAN 1977 pop./sample	1st LOAN 1978 pop./sample	MATCHES
PILATE	174/20 ¹⁸ (01001,01002, 01004,01005, 01007,01011, 01013, 01014 , 01016 ,01020, 01021,01024, 01025,01027, 01030,01034, 01035,01036, 01038,01041)	***	***	218/20 ¹⁹ (01042-01047, 01048 , 01049-01061)	37 (01062-01098)
DONDON	175/13 (02003,02005, 02006-02008, 02011-02013, 02016,02017, 02020,02021, 02023)	43/13 (02024,02025, 02030-02033, 02035-02037, 02039,02041, 02042,02045)	***	192/14 ¹³ (02046,02047, 02048 , 02049-02059)	39 (02060-02098)
BAPTISTE	351/13 (03021,03023, 03024,03026, 03027,03028, 03031,03034, 03036,03037, 03039-03041)	397/13 (03001,03002, 03004,03006, 03009-03013, 03015,03017, 03018,03019)	***	236/14 ¹² (03042, 03043 , 03044-03054, 03055)	34 (03056-03089)
HLOTTE	773/10 ⁷ (04041 , 04042 , 04043-04045, 04046 , 04047-04050)	201/10 (04021,04023, 04025,04027, 04029,04031, 04033,04035, 04037,04039)	169/10 ⁹ (04002,04004, 04006,04008, 04010,04012, 04014 ,04016, 04018,04020)	427/10 ⁷ (04051 ,04052, 04053 ,04054, 04055 , 04056-04060)	32 (04061-04092)
ACMEL	770/10 ² (05014 ,05015, 05016,05033, 05034, 05037 , 05038,05039, 05041,05042)	684/10 ⁹ (05008,05011, 05024,05025, 05027 ,05030, 05032,05046, 05048,05050)	189/10 (05002,05003, 05005,05009, 05053-05055, 05057,05061, 05063)	724/10 ⁹ (05070-05077, 05078 ,05079)	35 (05080-05114)
OND DES EGRES	3/3 ² (06001, 06002 , 06003)	(1st LOAN 1976, NO LOAN 1977) 159/17 ¹² (06005 , 06006-06009, 06010 , 06012-06014, 06015 , 06016 , 06017-06019, 06020 ,06021, 06022)	***	119/20 (06024-06043)	33 (06044-06076)

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HANGIEUX	137/20 ¹⁹ (07001-07006, 07008-07012, 07013 , 07014-07021)	***	***	297/20 (07042-07061)	39 (07062-07100)
EAUMONT	227/20 ¹⁹ (08001-08004, 08005 , 08006-08020)	***	***	426/20 (08021-08040)	39 (08041-08079)
MARC	248/13 (09024-09027, 09029,09030, 09032,09033, 09035,09036, 09038-09040)	45/13 (09002,09003, 09005,09006, 09009-09014, 09016-09018)	***	94/14 ¹³ (09044-09049, 09050 , 09051-09057)	39 (09058-09096)
VALLEE	42/10 ⁹ (10021 , 10022-10030)	110/10 (10011-10020)	45/10 (10001-10010)	104/10 (10031-10040)	37 (10041-10077)

INTERVIEWS NOT COMPLETED

01014 Absent during survey period.
 01016 "
 01048 "
 02048 Currently residing New York.
 03023 Absent during survey period.
 03043 "
 03055 "
 04014 Currently residing Port-au-Prince.
 04041 Absent during survey period.
 04042 "
 04046 "
 04051 "
 04053 "
 04055 "
 05014 "
 05027 "
 05037 Not a farm operator, Jacmel resident.
 05078 Absent during survey period.
 06002 "
 06005 "
 06010 "
 06015 Currently residing French Guiana.
 06016 "
 06020 Absent during survey period.
 07013 "
 08005 Not a farm operator.
 09050 Absent during survey period.
 10021 "

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APPENDIX B
METHODOLOGY FOR THE COMPUTATION OF PRODUCTION
INDICES

Two types of production indices are utilized in this document. The first deals with the separation of farm income between labor and profit shares, the second with the separation of total production increases associated with the project among different sources.

The first of these indices separates net farm income into labor and profit shares based on an imputation of market value to family labor, the residual being considered profit. These indices are shown in Table B-1:

Table B-1
Labor and Profit Share
Indices

	Net Farm Income	Imputed Labor Income	Profit Share
BCA FARMS			
All Farms	\$ 926	\$ 295	\$ 631
0-3 Ha.	509	183	326
3-5 Ha.	981	374	607
5+ Ha.	1757	454	1303
NON BCA FARMS			
All Farms	\$ 766	\$ 189	\$ 577
0-3 Ha.	292	95	197
3-5 Ha.	881	319	562
5+ Ha.	2252	375	1877
DIFFERENCE (BCA minus Non-BCA)			
All Farms	\$ 160	\$ 106	\$ 54
0-3 Ha.	217	83	129
3-5 Ha.	100	55	45
5+ Ha.	-495	- 79	-574
PERCENTAGE DIFFERENCE			
All Farms	21%	14%	7%
0-3 Ha.	74%	30%	44%
3-5 Ha.	11%	6%	5%
5+ Ha.	-22%	3%	-25%

Based on Haiti Small Farmer Survey, AID-IHPCADE-BCA, 1978

The methodology for the computation of the output source indices for the Haiti Small Farmer Evaluation is identical to that used in S. Daines & H. Howell, The Impact of Small Farmer Credit on Income, Employment & Food Production, Guatemala 1975. The explanation presented below is drawn from that document.

The Calculation of the Sources of Differences in Output Between Credit and No-Credit Farms

A. ALLOCATION OF THE CHANGE IN TOTAL VALUE OF OUTPUT TO FOUR PRIMARY SOURCES

1. A Description of the Indices Used

The value of output on a given farm is the sum of the value of each crop produced. This crop level value in turn is the product of three factors: the area cultivated in the crop, the yield per hectare and the price received when selling the crop. Thus, if we consider the typical credit farm:

a_{ic} = the area (hectares cultivated) in crop i on farm c

y_{ic} = the yield (kgs/ha) of crop i on farm c

p_{ic} = the price (Quetzales/kg) of crop i on farm c

then

$$v_{ic} = a_{ic}y_{ic}p_{ic}$$

where v_{ic} is the value of the i^{th} crop on the c^{th} farm. If we then add up the v_{ic} 's for all the crops grown on

that farm, we will have the total value of production on the farm. Using summation notation, we can say:

$$\text{Total value of production on farm } c = \sum_{i=1}^q a_{ic}y_{ic}p_{ic}$$

where q is the number of crops grown on farm c . If we let farm c be a credit-receiving farm, then we may define a corresponding no-credit farm as farm n . The total value of output for the no-credit farm would be

$$\sum_{i=1}^q a_{in}y_{in}p_{in}$$

The ratio of the value of output of the credit and no-credit farm is then

$$\frac{\sum a_{ic}y_{ic}p_{ic}}{\sum a_{in}y_{in}p_{in}}$$

If this ratio is greater than one it indicates that the credit farm did better than the other farm. If it is less than one, the reverse is true.

The four sources of change between the credit and no-credit farm may be isolated by means of an algebraic identity. This identity is expressed as follows:

$$\frac{\sum a_c y_c p_c}{\sum a_n y_n p_n} = \left[\frac{\sum a_c y_n p_n}{\sum a_n y_n p_n} \cdot \left(\frac{\sum a_n}{\sum a_c} \right) \right] \cdot \left[\frac{\sum a_c y_c p_c}{\sum a_c y_c p_n} \right] \cdot \left[\frac{\sum a_c y_c p_n}{\sum a_c y_n p_n} \right] \cdot \left[\frac{\sum a_c}{\sum a_n} \right]$$

Total Value
Crop Mix
Price
Yield
Area

The subscripts referring to the crops have been dropped for the sake of clarity in the presentation, but it should be remembered that the summation is over crops. By inspection it may be observed that various of the numerators and denominators on the right hand side "cancel

out", leaving nothing more than the terms on the left hand side. Underneath each of the terms in brackets on the right hand side is a label of the component of change which it measures. These are index numbers which will differ from one only if there is variation between farms

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at the crop level in the indicated source. Essentially these are a set of weighted indices whose product is equal to the change in total value.

The index numbers measuring price and yield variation are largely self-explanatory, however a few words should be said about the measure of crop mix variation. Basically it answers the question: What would have the credit farm revenue been if this farm had been subject to the prices and yields of the no-credit farm, restricted to a land area equal to that of the no-credit farm yet been allowed to use this land in its "credit proportions"? The revenue so earned is divided by the revenue of the no-credit farms. The quotient is a measure of the change in total revenue due to changes in crop composition.

The area planted in a given crop may change for one or both of two reasons. First, the credit farm may in fact have fewer hectares in low-valued crops and more in high-valued crops while maintaining a total area equal to the no-credit farm. Secondly, the credit farm may just have a greater total area under cultivation. This second possibility does not reflect shifts in crop mix but merely differences in area under cultivation. Therefore, the "area effect" must be separated from the changes in crop composition. This is accomplished by deflating the first term in the mix brackets by the ratio of total area planted on no-credit farms to total area planted on credit farms. This area effect is then considered separately as noted in the last term of the identity.

2. Some Comments on the Indices

a. Alternative Weighting Schemes

Looking at the equation presented in the last section, it can be seen that the measure of change in crop mix is a deflated area index weighted by the no-credit price and yield values. The price index uses credit-farm area and yield weights while the yield index uses a combination of area weights from the credit farms and price weights from the no-credit farms. These combinations of weights are essentially arbitrarily assigned. The mix index could have had credit farm price and yield weights and the other indices would have been adjusted correspondingly. The area index is unaffected by this problem as its computation does not involve a weighting system.

In general there is no "right answer" to the problem of which set of weights to use. The reader must decide for himself which set of weights are most appropriate and then be guided in policy formulation by the resulting magnitudes. Alternatively he may decide to trust only those findings in which the values are close and certainly of the same sign, when converted to percentage changes.

b. Conversion from Multiplicative Index Values to Additive Percentages

The problem concerns the basic issue of interaction between the sources of overall change. This interaction issue is perhaps best dealt with by an example. Suppose yield were 10 percent higher on credit farms while all other potential sources of difference were identical. Then one would expect gross value of output to be 10 percent higher on the credit farms. Now suppose that yield showed a 10 percent difference while area showed a 5 percent superiority on the credit farms. One might conclude that overall output would be greater on credit farms by the sum of these two percentages, namely 15 percent. However, this would ignore the fact that yield increases were registered not only on the original land but on the 5 percent additional area. In other words, there is an interaction effect between the change in yield and the change in area. Thus the true increase in total value is greater than 15 percent. Specifically it is 15 percent plus 5 percent of 10 percent or 0.5 percent. So the total increase in output is 15.5 percent in this example.

The interactive nature of the sources of change in total output is captured in the equation presented above. For the four sources of change specified this interaction is quite involved. Each source is related to each other source on a bilateral basis as discussed in the example, then each is related to two of the others and finally they all are interrelated. The numerical implication of this interaction effect is that the sum of the percentage changes of each of the sources is less than the percentage change in total output.

This conversion from a multiplicative to an additive relationship among sources was done for ease of understanding. The way the conversion was performed was by computing the difference between the percentage change in total output and the sum of the percentage changes in each of the sources. This difference was then allocated proportionately among the sources according to their relative importance. In this way the interaction effect which was picked up as this difference was allocated back into each of the sources. Thus an essentially artificial additive relationship was established among factors which are multiplicatively related.

d. Derivation of Price and Yield Figures When None Exist

Another technical point deals with the problem differences in crop mix so great that some crops grown on credit farms are just not grown at all on no-credit farms. In this case, the no-credit price and yield data are not available. An estimate must be made of what they would have been if they had been grown. This estimate is necessary so as not to bias the index numbers unduly. Two approaches were followed in the course of the analysis. The first was to search among no-credit farms in other size classes to find the needed price and yield data. The second was to use the credit farm data when no-credit information was unavailable. The results were compared and found to be essentially the same in all but a few isolated instances. These discrepancies do not affect the basic conclusions drawn in the text. Thus only one set of results, those based on the second approach, are reported. In general the approach used will conservatively bias the findings. In other words the results derived will be closer to unity than they would have been if another method had been used to derive the missing price and yield data. This is so because the numerator and denominator of the index number in question have a greater number of identical elements.

B. ALLOCATION OF THE DIFFERENCES IN AREA TO FOUR COMPONENTS

1. A Description of the Method Used

Area per farm is defined as the sum of all land planted in temporary and permanent crops where multiple cropped land is counted a multiple number of times and interplanted land is counted twice. Thus given this definition it is possible for a farmer's total "area" to be greater than the extent of his farm due to the multiple counting of some areas.

There are several reasons this measure of cultivated area may be larger on credit farms than on no-credit farms or vice-versa. One of the two farms may be larger in size. In other words one farm may have more land (as conventionally measured - no double counting) than the other. A second possibility is that the two farms are of equal size but on one farm a larger fraction of the farm is dedicated to crops. One group of farmers may, as a third possibility, do more double and triple cropping than the other.¹ Finally the farmers of one group may dedicate more of their land to interplanted crops, corn-and-beans, corn-and-sorghum, etc. Thus four possible explanations of the difference in "area" as defined above have been identified. They are:

1. Size of Farm
2. Cultivated Area
3. Multiple Cropping
4. Interplanting

Other components such as planting density could also be considered, however these should be reflected in the yield measure discussed in the previous section. In fact multiple cropping and interplanting may also be related to yields although not necessarily proportionately. (In some cases interplanting may be associated with higher yields.) There is then some overlap in coverage of the various sources and components considered in this appendix, however they are in the main independent.

The index of farm size is defined as:

$$\frac{A_c}{A_n}$$

where

A_i = Total area (but no double counting) of farm i

$i = c$ (i.e. credit)

$i = n$ (i.e. no-credit)

The index of cultivated area adjusted for differences in farm size is defined as:

$$\frac{T_c / A_c}{T_n / A_n}$$

where

T_i = Area dedicated (but no double counting) to permanent and temporary crops on farm i .

The index measuring differences in rates of multiple cropping is defined as:

$$\frac{M_c / T_c}{M_n / T_n}$$

where

M_i = Total cropped area on farm i counting multiple cropped land the corresponding multiple number of times but counting interplanted land only *once*.

Finally the index measuring differences in the rates of interplanting is defined as:

$$\frac{I_c / M_c}{I_n / M_n}$$

where

I_i = Total cropped area on farm i counting interplanted land *twice* as well as counting multiple cropped land a multiple number of times.
Therefore,

$$I_i = \sum a_i$$

where a_i is defined in the preceding section.

Notice that these four indices are multiplicatively related to the "area" index which they "explain". This area index is in fact (I_c/I_n) and the identity expressing this relationship is:

$$\left[\frac{I_c}{I_n} \right] = \left[\frac{A_c}{A_n} \right] \cdot \left[\frac{(T_c / A_c)}{(T_n / A_n)} \right] \cdot \left[\frac{(M_c / T_c)}{(M_n / T_n)} \right] \cdot \left[\frac{(I_c / M_c)}{(I_n / M_n)} \right]$$

Gross "Area" Size of Farm Cultivated Area Multiple Cropping Inter-planting

2. A Few Thoughts About the Components of the Area Index

The identity just defined is similar in some respects to the identity relationship between index numbers specified in the last section. It is used to further examine one of the terms in that expression, namely

$$\frac{\sum a_c}{\sum a_n}$$

In fact it is possible to concatenate the two identities and get a seven term expression which quantifies the components of the ratio of total value of output on credit to that on no-credit farms. In summary these seven components are:

- Crop Mix
- Price
- Yield
- Size of Farm
- Cultivated Area
- Multiple Cropping
- Interplanting

As just explained the last four involve no weighted summation as do the first three. Thus the problem of choosing appropriate weights is not present in the case

of the area components. Also there is no problem of deriving estimated values for those weights when there are none available.

On the other hand, the problem of converting from multiplicative index values to additive percentages changes still besets the analysis. The technique used in this latter case is the same as was used previously. The index values are converted to raw percentage changes. These are summed. This total is subtracted from the refined total percentage change in area as derived in the preceding section. The difference is allocated proportionately among the raw component values. Specifically each raw component is multiplied by the ratio of the refined area total to the sum of the raw components. The resulting refined component percentage changes by definition sum to the refined total area percentage change.

It should be noted that this technique will tend to exaggerate the refined component percentage change values if the ratio of the refined to raw total area is large. For example, if the adjusted (refined) area is two percent higher on credit farms and the sum of the raw components is one percent, then each raw component value will be doubled when converting it to an adjusted value. Currently, an alternative adjustment technique is under study which involves proportional distribution of the absolute value of the residual. This is discussed in greater detail in a forthcoming Methodological Working Document of the Sector Analysis Division.