PDKAT847

UNCLASSIFIED

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

HAITI

PROJECT PAPER

COFFEE REVITALIZATION

AID/LAC/P-563

Project Number: 521-0216

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number: — DOCUMENT CODE: 3

COUNTRY/ENTITY: Haiti

3. PROJECT NUMBER: 521-0216

4. BUREAU/OFFICE: LAC — 05

5. PROJECT TITLE (maximum 40 characters): COFFEE REVITALIZATION

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 02 DD 28 YY 95

7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4)
A. Initial FY 90 B. Quarter 2 C. Final FY 94

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY 90 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(711)	(361)	(1,072)	(3,226)	(1,914)	(5,140)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country (PL 480 L.C.)		277	277		3,793	3,793
Other Donor(s)						
TOTALS	711	638	1,349	3,226	5,707	8,933

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ARDN	200	240				882		5,140	
(2)									
(3)									
(4)									
TOTALS						882		5,140	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 010 | 030 | 042 | 079 | 140 | 11. SECONDARY PURPOSE CODE: 250

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	BS	ENV	NUTR	PVON	TECH	TNG
B. Amount						

13. PROJECT PURPOSE (maximum 480 characters)

To upgrade the quality of small farmer coffee cultivation in Haiti by improving production technology and farming practices, thereby increasing the yield and the consistency of the coffee product.

14. SCHEDULED EVALUATIONS
Interim MM 02 YY 93 | MM YY | Final MM 08 YY 94

15. SOURCE/ORIGIN OF GOODS AND SERVICES: [X] 000 [ ] 941 [X] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of 2 page PP Amendment.)

I have reviewed and approved the methods of implementation and financing for this project.

Igor Nesterczuk
Controller USAID/Haiti

17. APPROVED BY
Signature: Gerald Zarr
Title: Director USAID/Haiti
Date Signed: MM 03 DD 19 YY 90

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

2X

Clearances: PPS:RFanale Date 2-16-90
PPS:AFord Date 2-16-90
ADO:LHarms Date 2-16-90
CONT:INesterczuk Date 2/22/90
D/DIR:FHerder Date 2-22-90

PROJECT AUTHORIZATION

Name of Country : Haiti

Name of Project : Awareness and Prevention of Drug Abuse

Number of Project : 521-0221

1. Pursuant to Section 104 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Awareness and Prevention of Drug Abuse Project in Haiti involving planned obligations of not to exceed Four Hundred Eighty-six Thousand Two Hundred Eighty-Eight ($486,288) United States Dollars in grant funds in FY 1988, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs of the project.

2. The project consists of a cooperative agreement with the Association for the Prevention of Alcoholism and Other Chemical Dependencies (APAAC), a Haitian non-profit organization, for a program to (1) develop and disseminate information on drug abuse and its prevention through the media and personal contacts; (2) establish baseline and evaluative data on public awareness of drug abuse in Haiti; and (3) strengthen a local nongovernmental institution through training and technical assistance as a sustainable national drug awareness and prevention resource.

3. Goods and services financed by A.I.D. under the cooperative agreement shall have their source and origin in A.I.D. Geographic Code 935.

4. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to such terms and conditions as A.I.D. may deem appropriate.

Gerald Zarr

Gerald Zarr
Director, USAID/Haiti

September 29, 1988
Date

Clearances:

PPS : R. Fanale
R. Burns
HRO : M. White
CONT : C. Brooks 9/29/88
A/D/DIR : A. Ford

HAITI COFFEE REVITALIZATION PROJECT

TABLE OF CONTENTS

		PAGE
	Map	i
	Acronyms	ii
I.	EXECUTIVE SUMMARY	1
II.	PROJECT BACKGROUND AND RATIONALE	4
	A. Background	4
	1. Agricultural Sector Trends vis-a-vis Coffee	
	2. Historical Role of Coffee in Haiti	
	3. Performance of the Coffee Sector: 1950 - 1988	
	4. USAID Involvement in the Coffee Sector through 1988	
	5. Current Activities of Other Donors in the Coffee Sector	
	6. Elements of a MARNDR Strategy for the Coffee Sector	
	B. Rationale for Project Intervention	13
	1. Problem Statement	
	2. Rationale for Intervention	
	3. Relationship with USAID/Haiti Development Strategy	
III.	DETAILED PROJECT DESCRIPTION	17
	A. Goal, Purpose and Outputs of the Project	17
	B. Project Inputs	18
	C. Project Strategy	20
	D. Pilot Zones	22
	1. Selection of Pilot Zones	
	2. Activities in Pilot Zones	
	a. Technology Transfer and Training: Technical Assistance in Production	
	b. Applied Research: Field Testing of Improved Technologies	
	c. Production: Seedling Production and Distribution	
	d. Credit: Provision of Production Inputs	
	e. Institutional Strenthening: Support to Local Organizations	
	E. National Outreach Activities	34
	1. Technology Transfer and Seedling Propagation	
	2. Mass Media	
	3. National Coffee Seminars	

5X

IV. DATA COLLECTION, MONITORING AND EVALUATION PLAN 36

A. The Special Need for Close Monitoring 36
B. Project Management Planning 37
C. Formal Evaluations 39
D. Audits 40
E. Financial Resources for Monitoring, Evaluation and Audit 40

V. FINANCIAL PLAN 40

A. Funding Components 40
B. Administration of Dollar Funds 41
C. Administration of Local Currency Funds 42
D. Methods of Disbursement 42
E. Project Budget 42

VI. ADMINISTRATIVE ANALYSIS 51

A. Inter-American Institute of Agricultural Cooperation (IICA) 51
B. Project Management 52
C. Institutional Arrangements between IICA and Local Organizations 53

VII. IMPLEMENTATION PLAN 55

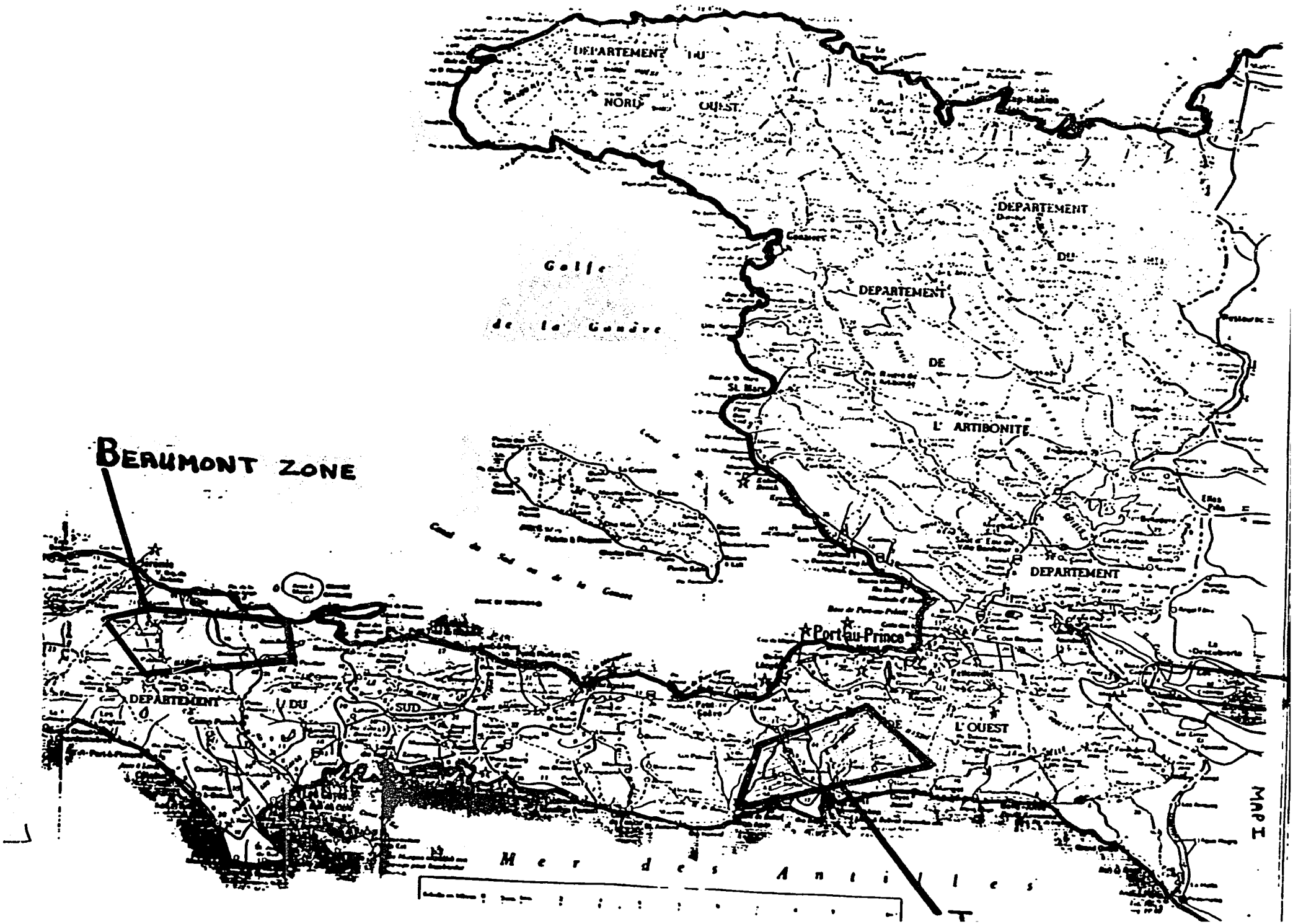
VIII. PROCUREMENT PLAN 59

IX. SUMMARY ANALYSES 60

A. Agronomic Analysis Summary 60
B. Institutional Analysis Summary 62
C. Social Soundness Analysis Summary 66
D. Economic and Financial Analysis Summary 70
E. Environmental Assessment 75

ANNEXES
A. Logframe
B. Approval Documents

VOLUME II: Annexes
A. Logframe
B. Agronomic Analyses
C. Social and Institutional Analyses
D. Economic and Financial Analyses
E. Environmental Assessment
F. Project Evolution Since the PID
G. Statutory Checklist


BEAUMONT ZONE
DEPARTEMENT DU NORD OUEST
DEPARTEMENT DU
DEPARTEMENT DE L' ARTIBONITE
DEPARTEMENT
Golfe de la Gonâve
Port-au-Prince
DEPARTEMENT DU SUD
DE L'OUEST
Mer des Antilles
MAP I

A C R O N Y M S

ACDI	Canadian International Development Agency
ADO	Agricultural Development Office (USAID)
ASDEC	Association of Coffee Exporters
CADCO	Coffee Advisory Committee
CCH	Coopératives Cafeières d'Haiti
CECOPASE	Fédération of Multipurpose Coopératives for the Southeast
DAI	Development Alternatives, inc.
EA	Environmental Assessment
FAC	Official French Aid Agency
FIOP	GOH Form for Identification and Operation of Project
FRLC	Federal Reserve Letter of Credit
GOH	Government of Haiti
HAVA	Haitian Association of Voluntary Agencies
IICA	Inter-American Institute for Cooperation on Agriculture
MARNDR	Ministry of Agriculture, Natural Resources and Rural Development
NGO	Non-Governmental Organization
PCC	Small Farmer Marketing Project
PPC	Small Farmer Improvement Project
SOCODEVI	Societé de Coopératives pour le Dévelopement International
SOFIHDES	A Haitian Private Development Bank

I. EXECUTIVE SUMMARY

Coffee has been a leading Haitian export ever since the eighteenth century, when Haiti was the world's dominant producer (60% percent of world coffee exports at the time of the French Revolution). Coffee is still Haiti's largest agricultural export, but declining production, exhaustion of mature Typica trees, the arrival in Haiti of coffee rust disease and a deep drop in world coffee prices in the summer of 1989 have combined to devastate Haitian coffee production to the point that if prompt action is not taken to reverse the passive state of coffee cultivation, the crop could disappear from Haiti by the turn of the century. Indeed, if dramatic steps are not introduced to revitalize Haitian coffee production in the next several years, farmers may be forced to abandon coffee production in such large numbers that the trend could become irreversible.

USAID has had a long association with coffee production and marketing in Haiti, beginning with the Point Four Program in the 1950's. Since the mid-1970's USAID has supported: the Small Farmer Improvement Project (PPC), the Small Farmer Marketing Project (PCC) and the Strengthening Coffee Cooperatives II project.

The evolution of these projects and indications of their successes and shortcomings are traced in the Background section of this paper. Although the PCC project is credited with increasing and strengthening cooperatives in Haiti, which brought a better return to the farmer, previous projects have generally fallen short in the area of technology transfer to the small farmer. This can be attributed to inadequate training and local level technical support of the farmer, owing in part to reliance on multiple, fragile and inexperienced government agencies to coordinate a complicated input, extension, and credit delivery system.

The present Coffee Revitalization project seeks to profit from the lessons learned from the earlier projects. It emphasizes production, technology transfer and training, with extensive use of private local organizations (NGO's and cooperatives). The bulk of the project's activities will concentrate on two pilot zones of historically successful coffee production, Jacmel in the south and Beaumont in the southeast (see Map). In addition, a national outreach effort will extend throughout the country a program designed to inform and assist local organizations in new coffee technology and the propagation of rust tolerant varieties. The project will have a five-year lifespan, with a PACD of February 28, 1995.

The **goal** of the project is to increase coffee productivity and farmer income among small producers in Haiti. Its stated **purpose** is to upgrade the quality of small farmer coffee cultivation in Haiti by improving production technology and farming practices, thereby increasing the yield and the consistency of the coffee product. The combination of new technology, technical assistance and training provided by the project will also help combat the danger of coffee rust disease and will help maintain coffee cultivation as an ecologically sound production system for the steeply sloped mountain soils.

9X

Activities under the project will seek to achieve five distinct yet interrelated **outputs:**

a) Propagation of coffee varieties with high yield and rust-tolerant capabilities produced in local nurseries. At least 5.5 million quality seedlings of high yield varieties will be produced.

b) Adaptive research undertaken in coffee-based farming systems, to develop at least four tested technological packages.

c) Coffee production/rehabilitation packages introduced to small farmers in Jacmel and Beaumont pilot zones. Approximately 8,200 farmers will be trained in the proper cultivation techniques of high yield varieties and on average will adapt at least 50% of these new techniques.

d) Information disseminated on improved coffee cultivation through a national outreach program involving radio broadcasts and farmer training sessions. Weekly radio programs will reach an audience of 150,000. Approximately 2,100 farmers will receive two days of training in coffee production technology and practices.

e) Local organization capacity in South Haiti strenghtened to support improved coffee cultivation. Approximately 20 local NGO's will participate in the two pilot zones, plus those which seek help through the national outreach program. Training in improved coffee technology and cultivation practices will be provided to 164 animateurs from the pilot zones and 60 of the regular NGO management staff (an average of three per organization).

The project will operate at two levels in the field: intensively in the two pilot zones of Jacmel and Beaumont, and extensively at the national level through the outreach program, which will assist local organizations and coffee growers throughout the country through the supply of coffee seedlings and the provision of training on a demand driven basis. Media outreach will take place through weekly radio broadcasts on coffee production and technology.

Operational components of the project include:

Training and technology transfer in improved coffee production;

Field testing of improved technology;

Propagation and testing of improved coffee varieties;

Provision of production inputs; and

Institutional support to local organizations.

The project will be implemented through a grant to the Inter-American Institute for Cooperation in Agriculture (IICA), an established public international organization. IICA is well suited as an institutional vehicle for the project, since it has extensive relevant experience in coffee research and production; has had a long-term association in Haiti and maintains a well-staffed resident office; and has managed other A.I.D. projects in Haiti and elsewhere. IICA will furnish four long-term technical advisors under the grant and two others from its own resources. The IICA grant will fund 17 regional field personnel, extensive support to local organizations working with farmers and will conduct more than a hundred training sessions in coffee technology and farming practices for NGO staff and participating farmers. Various commodities will be procured by IICA under the grant, including seeds and other inputs for nursery production and for farmers (fertilizer, fungicides, hand tools, etc.), vehicles, training supplies and equipment. USAID will retain a small portion of project funds outside the IICA grant for monitoring, evaluations and audits.

The five-year life of project funding level is $5.14 million in DA funds. In addition, the project will be supported by a host government contribution of $3.8 million local currency equivalent from PL 480 generations.

It should be recognized that this is a relatively high risk project which presents hazards, both external and within the project itself, that threaten its successful completion. First, the effect of the spread of coffee rust is a very serious new factor in the overall coffee production equation in Haiti. If left unaddressed, Haitian coffee exports will almost certainly disappear by the end of the century and perhaps sooner. This fact presents a powerful argument for proceeding with the project despite the risks, since the price of inaction is so heavy. Second, very low current coffee prices and future price uncertainty are factors over which the project has no control but which could directly affect its success. Finally, there is the major question of farmer acceptance of the new varieties and technologies promoted under the project. These involve expenses by farmers for inputs not incurred before, on the promise, or at least the expectation, of an improved tolerance to rust and a better yield in the future. The rapid advance of coffee rust may, in fact, leave the farmer with only two choices: adopt the new varieties offered and apply inputs, or abandon coffee as a crop.

Because of these uncertainties, especially close monitoring has been built into the project design, with annual in-house assessments planned, drawing on independent technical expertise as needed. The Mission is prepared to introduce adjustments and corrections of both a technical and administrative nature in response to problems identified in these assessments.

After careful consideration of the risk factors, the dramatic potential benefits of the project, and the dire consequences of not responding to

11X

the current coffee crisis, it is the conclusion of the USAID/Haiti and the project design team that the Coffee Revitalization project is aworthwhile undertaking. The stakes may be nothing less than the survival of the coffee industry in Haiti.

II. PROJECT BACKGROUND AND RATIONALE

A. Background

Planning for the Haiti Coffee Revitalization Project has taken place against a backdrop of national upheaval and economic disarray. In developing the strategy and design for this project, a special effort was made to consider the coffee sector and persons involved in it from a long range perspective. Thus, before embarking on a detailed analysis of the project, following is a brief discussion of the historic context of the agriculture and the coffee sector.

1. Agricultural Sector Trends vis-a-vis the Coffee Sector

Agricultural production in Haiti has been in decline since at least 1960. Per capita output fell on average over the 1960-1976 period by 10%. In addition, the structure of production has changed most noticeably in marginal coffee producing areas, with export crops declining in favor of food crops. The switch away from coffee to foodcrops in the most productive coffee zones has been much less marked, but is emerging nonetheless.

Concurrent to this, the country has become a net food importer, as food production output has not kept pace with the rise in domestic demand. Thus the declining performance of the coffee sector is but one illustration of the general stagnation in the agricultural sector as a whole.

The primary cause for the shifts to food crops and away from coffee, particularly in the most marginal production zones, is probably a result of periodic rises in food prices relative to coffee, coupled with decreasing yields from aging coffee trees.

2. Historical Role of Coffee in Haiti

Coffee has long occupied a prominent role in Haitian agriculture. Coffee was introduced into the country around 1725 in the northern part of the island, with the north becoming the most important coffee growing area of French Saint-Domingue. Production increases were dramatic, so that on the eve of the French Revolution Saint-Domingue supplied 60% of the world's coffee. Sugar exports at that time were of even greater economic importance to the colony. After Haitian independence from the French, when land redistribution was instituted and the large plantation estates were subdivided, coffee became the leading agricultural export and remains so today.

Early coffee production was concentrated in the mountains of northern Haiti, viewed as the 'traditional' coffee area of the country. Over the years continued division of land holdings through inheritance has resulted in small farm plots (0.2 - 1.5 ha. in size) where coffee is grown in association with other crops. In the South and central regions of the country, other zones of moderate to high elevation have become increasingly important as coffee growing areas, and now overshadow the North. Although multicropping on small landholdings is widely practiced in these areas, some monocropping of coffee exists. However, plots are rarely larger than 5 ha. The latest estimate by the GOH for coffee area under cultivation is 132,960 Ha. There are about 200,000 families engaged in coffee production. This estimate excludes those farms and families with very few trees that produce only for home consumption.

3. The Performance of the Coffee Sector: 1950-1988

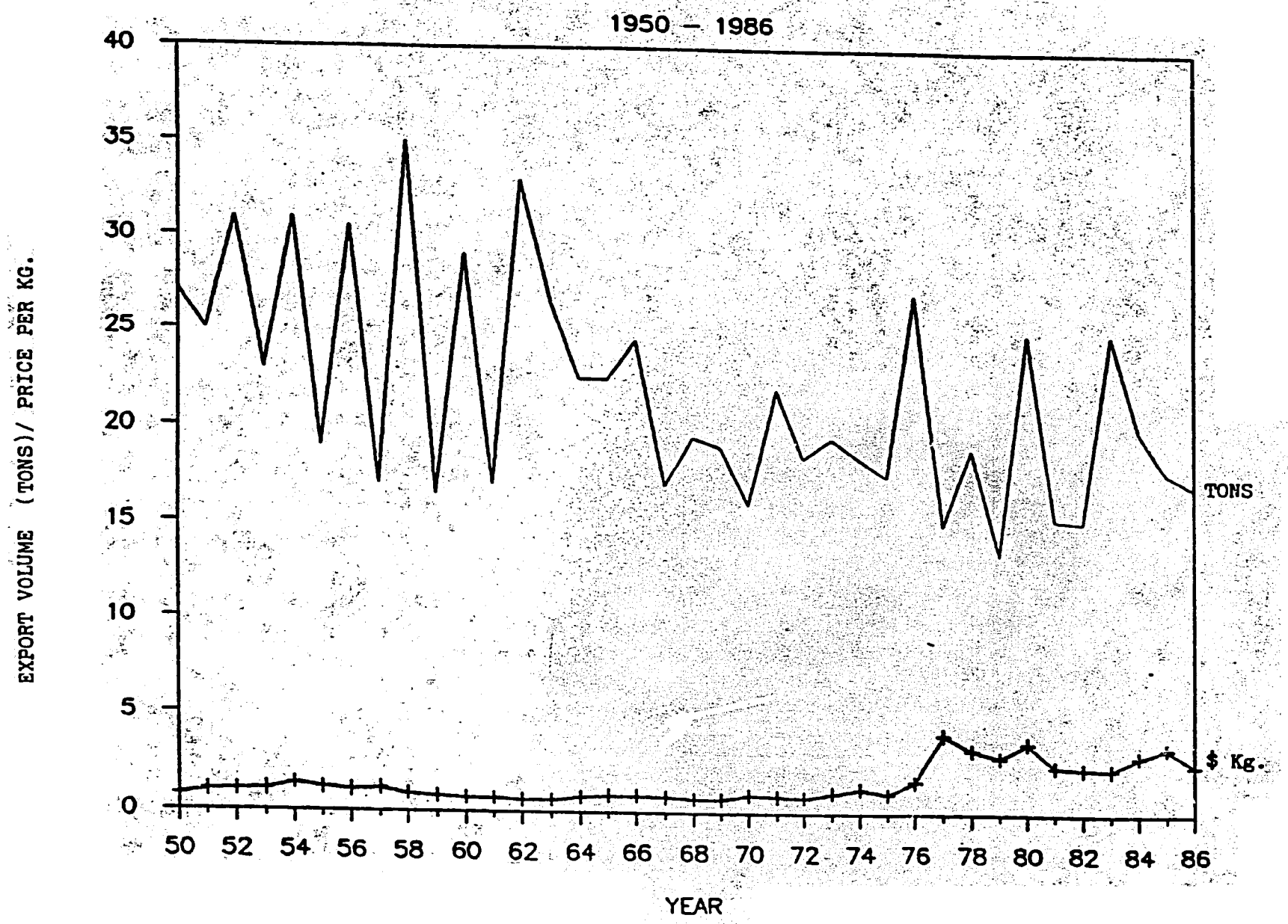
Coffee's position as Haiti's leading export commodity is weakening. In 1970, revenue from coffee exports represented 39% of total export revenues. From 1981 to 1986, coffee export revenues ranged from 20% to 30% of the total. Much of coffee's loss in relative importance is due to increases in exports from the industrial sector, and coffee remains important as a foreign exchange earner. In evaluating the performance of this sector it is more important to look at export volume, domestic consumption and total production, and factors affecting production at the farm level.

Statistical records on coffee export volumes provide a perspective on activity in this sector for the period 1950 - 1988. (Figure 1) The early part of this period (1950 - 1963) shows wide annual fluctuations, with a high of 34.6 thousand tons exported in 1958, and a low the year following of 16.7 thousand tons. The following 12 years (1964 - 1975) were less volatile, with export volumes ranging from 24.4 to 17.8 thousand tons. Beginning in 1976, the market again became more volatile, and exports in 1976, 1980 and 1983 exceeded the volumes of all but one of the years in the 1964 - 1975 period. Since 1984, statistics on export volumes show a continued decline. However, because of political upheavals and generally anarchic conditions in many sectors of the Haitian economy in the last four years, the accuracy of these recent figures should be viewed with scepticism. However, the long term trend demonstrated in Figure 1 is one of slow decline, with periods of high variability.

World coffee prices, also shown on Figure 1, were relatively stable until the late 70's when they increased sharply. In 1980 good volume (24.9 thousand tons) and high prices brought revenues from Haitian coffee export to a record $90.0 million. This was $27 million higher than the previous record income years, 1977 and 1978. However, the fifty percent drop in world coffee prices resulting from the elimination of coffee quotas in July, 1989 has dramatically changed this picture for the present.

13X

FIGURE I


HAITI COFFEE EXPORTS & WORLD PRICES
1950 – 1986
EXPORT VOLUME (TONS)/ PRICE PER KG.
40
35
30
25
20
15
10
5
0
50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86
YEAR
TONS
$ Kg.

14

Domestic consumption, more stable than export volume, was estimated to range between 13,200 tons and 16,500 tons during the ten year period 1972 - 1982. Domestic consumption exceeded exports in 1979, and possibly in 1982 (1982 figures on export volume show a discrepancy between sources of 3,000 tons). Thus, while coffee's role as an export commodity is extremely important, its role in the domestic economy is also significant. Should there be a continued or accelerated decline in production and exports, the danger exists of the eventual demise of coffee as a foreign exchange earner.

There is general agreement among agronomists and farmers that coffee yields in Haiti have been declining. Current production is believed to average about 250kg/hectare. In marginal coffee areas, farmers are tending to switch away from coffee to food crops, as their coffee trees age and production declines. In areas of higher production potential, farmers do not have access to improved, appropriate technologies that would enable them to maintain or augment production. The general degradation of the environment coupled with the traditional system of coffee production -- no inputs, little or no care, and reliance on self seeding for new trees -- means ever decreasing yields in the future unless farmers and those concerned for their welfare take action.

Concerning farmgate prices, Haitian farmers have been receiving between 50-75% of the world market price for their coffee. This is considered very favorable, especially in light of the fact that Haitian coffee is considered by specialists to be subject to impurities and other quality control problems. This price ratio is better than in other Latin American countries, where farmers' share of the world market price can reach as low as 30%. Haitian farmers have recently benefited from reductions and ultimate elimination of the coffee export tax, which increased the producers' share of revenue, and should work in favor of higher quantities of product reaching the market place.

Much controversy has been centered on the purported oligopsonistic marketing structure of the Haitian coffee industry and its effect on market supply. Review of the literature on coffee marketing is inconclusive on this point. However, it is evident that the decline in coffee production in Haiti is a combination of internal and external factors. It appears reasonable to attribute much of the recent drop in coffee production to poor agricultural practices in Haiti which cannot sustain, let alone increase, the coffee harvest. This condition is greatly exacerbated by the steep drop in world coffee prices this year, brought about by abandonment of quotas under the International Coffee Agreement, which has cut both the retail and farmgate price almost in half.

There is a final and crucial element to be considered which has the potential of overshadowing all other factors currently affecting the coffee sector. That is the recent appearance in Haiti of coffee leaf rust, (Hemileia vastatrix), a fungus disease that has devastated coffee production in many parts of the world. The traditional variety of coffee grown in Haiti (Arabica typica) is particularly susceptible to this disease. While there are ways of mitigating the effects of coffee leaf rust, prompt and concerted action is required to prevent a precipitous drop in production.

4. USAID Involvement in the Coffee Sector Through 1988

USAID has been involved in both coffee production and marketing activities in Haiti since the 1950's when the Point Four Program was established. Since the mid-1970's USAID has supported: the Small Farmer Improvement Project (PPC), the Small Farmer Marketing Project (PCC), the Strengthening Coffee Cooperatives II project, and the PL480 reflow program in local currency funding for propagation of improved rust tolerant varieties distributed over the last two years by the MARNDR.

The overall objective of both the PPC and PCC was to increase small farmer income. From 1974-1981 PPC attempted to achieve this objective through increasing smallholder coffee production. The project was evaluated as not having fully realized its objectives, although some temporary increases in production were recorded among farmers who availed themselves of the project's subsidized in-kind (fertilizer) and cash (for labor) group credit scheme run through the Banque Credit Agricole (BCA). Construction of coffee buying centers and coffee access roads were also part of the activity.

To achieve project objectives, agricultural credit societies (SACs) were formed to receive inputs and credit. These societies were not, however, based on pre-existing local organizational structures. Nor did they succeed in transferring technologies in an appropriate manner, as they relied on multiple, fragile, and inexperienced government agencies to coordinate a complicated input, extension, and group credit delivery mechanism. At the time however, the failure to increase production was attributed to inferior market prices paid to farmers through the oligopsonistic marketing structure.

As a result of this experience, USAID initiated a marketing project (PCC) in 1977 to develop a network of coffee cooperatives and build a coffee processing facility. The PCC was considered successful at strengthening the cooperative movement, as the number of cooperatives marketing coffee doubled over the life of the project. The cooperatives succeeded in offering prices through 1983 that, with patronage refunds and quality bonuses included, were 8-26% higher than those offered by speculators.

These gains in fact were evaluated (DAI, 1984) as occurring not because of cooperatives taking advantage of alleged speculator inefficiencies (such as collusion, price-fixing, and exorbitant profits) as envisioned in the project design, but rather because cooperatives realized economies of scale which permitted the payment of quality bonuses and patronage refunds to farmers.

In 1977 PCC exported 2,224 sacks of coffee; by 1983 this had increased to 10,299 60 kg (120 lbs.) sacks. It was estimated in the PCC project design that the Pilot Center for Cooperative Coffee Exporting (CEPEC which subsequently became the Cooperatives Caféieres d'Haiti, or CCH) would need to export 24,200 sacks (2.9 million pounds) to cover costs without subsidies.

The end-of-project evaluation was quite clear in its recommendations in regard to: (a) the cooperative movement; (b) coffee marketing; (c) the role of institutions; (d) coffee production and Government of Haiti policies; (e) and (f) lessons learned to serve as a base for a coffee technology transfer project.

In regard to the latter point, a four pronged approach was suggested. This was to focus on: (a) marketing; (b) production; (c) institutional development; (d) Government of Haiti policies.

Assistance to the new processing plant was to continue, along with provision of working capital credit for coffee purchases by local coops and the new plant. It was underlined that a "clear limit" exists to the income transfer benefits that cooperatives' marketing can secure for small farmers, and that sustained increases in income can only occur through increases in production.

The marketing and institutional development aspects of this recommendation were implemented through the Strengthening Coffee Cooperatives II Project, which began in 1985. At the beginning of the project it was anticipated that the CCH -- the non-governmental Cooperatives Cafeieres d'Haiti -- would be fully self-sufficient within a period of 18 months. Due, however, to (a) management problems; (b) inappropriate accounting and record-keeping; (c) weakening relations with member cooperatives over coffee pricing, patronage refunds, and overall operational "transparency"; (d) errors in marketing decisions; and (e) increased price competition from major exporters, the goal of self-sufficiency has still not been reached. Efforts to achieve the necessary improvements in management and reach the break-even point are still ongoing; the project has been extended several times and now has a PACD of December, 1989.

17X

More recently, local currency funding provided by USAID to the MARNDR, totalling $1,000,000 over the past three years, has resulted in the propagation and distribution of eight million coffee seedlings, some of which are rust tolerant. Most of these plants were distributed in the high-potential production zones shown in Figure II. The MARNDR program focused entirely on seedling production and distribution. Genetic material currently available in Haiti was used for the seedling production. Thus, the most advanced varietal selections for Central America and the Caribbean were not used, and distribution was done without support of extension education on improved cultural techniques. Although fairly low cost for seedling production, this MARNDR activity is too narrowly focused on seedling distribution and is without adequate technical backstopping to serve as a foundation for the new project.

5. Current Activities of Other Donors in the Coffee Sector

Many donors continue to be interested in supporting coffee projects in Haiti. This USAID project is consistent with planned activities of other key donors.

The French FAC and the Caisse Centrale are planning an ambitious 10 year integrated development project for the north in the zones of Dondon, Plaisance, Marmelade and Pilate, all key coffee growing areas. They have signalled swine repopulation as the key entry point into the farming system. Swine will be provided to participating farmers on highly concessionary terms. Coffee is not targeted specifically but is one of several crops with which the project will work. The project as now designed will not have a significant phytosanitary component to control coffee rust. Given that the major points of outbreak are in the north, and that most of the coffee in these zones is raised at elevations below 600 meters -- prime zones for rust infestation -- the FAC project faces daunting technical challenges. The French project will be implemented through the MARNDR and BCA structures.

In the northeast, the MARNDR is implementing the World Bank financed Operation du Nord (ODN), an integrated rural development activity in the Mont Organise and Carice zones. Coffee activities are included in the project, but on the national level these areas are of limited importance for coffee production.

In the southeast, in Jacmel, the Agence Canadienne Pour le Développement International (ACDI), through the implementing agency of Société de Coopération Pour le Dédeveloppement International (SOCODEVI) started a five year project in 1989. The project goal is to increase farmer income through strengthening the CECOPASE cooperatives in management and targeted production aspects which correspond to farmers' production agendas. For many CECOPASE cooperative farmers this will involve notably coffee.

The ACDI project officer in Port-au-Prince indicated to the PP design team that complementarity between the two projects could be reached regarding coffee technology transfer so as to maximize the two agencies' resources. SOCODEVI gave the design team a strong indication of its interest in establishing a complementary program in the CECOPASE zone. Since the USAID-funded coffee project will focus on the technical aspects of technology transfer while the ACDI project is more oriented towards institution-building, the possibilities for achieving complementarity in operations are excellent.

The European Economic Commission (EEC) is presently designing a project which will be centered in a coffee growing area. At the time of PP preparation the EEC design was in the early phase of conceptualization. USAID and EEC will continue to coordinate activities for complementarity.

The FAO has been requested by the Ministry of Agriculture to conduct a national study on coffee sector needs and possible sectoral orientations. This could lead to the FAO assuming a coordinating role in the coffee sector. Such a coordinating role at the national level is very much needed. As it now stands, programming activities in the sector are ad hoc on the national level. Each donor brings a slightly different set of priorities and methodologies to bear on the coffee sector.

Last but not least, numerous small PVO's which make up the Haitian Association of Voluntary Agencies (HAVA) group work in almost every domain of rural development activities, coffee being no exception. Someof these PVO's also participate in the USAID-funded Agroforestry Outreach Project and have proven capable of achieving group objectives. The PVO's operate in their own manner, with some having backup resources from home offices to maintain consistent programs over time, while others due to financial constraints participate in a variety of small-scale activities. Anecdotal evidence indicates that many of the PVO's participate in highly circumscribed coffee outplanting programs. These outplanting programs do not include training in improved cultural practices and generally use inferior, locally procured seed. These programs are not enough to make a substantial difference in achieving increases in either output or coffee quality on a national basis, particularly in light of the improved technological demands required to address the rust problem.

6. Elements of a MARNDR Strategy for the Coffee Sector

The Ministry of Agriculture, Natural Resources and Rural Development (MARNDR) has proposed a strategy for addressing problems of the coffee sector. The strategy voices the opinion of various specialists that if the problems cannot be resolved, coffee could disappear as an export item by the year 2000, destined to figure instead on the future list of Haitian imports. For the seasons 1972-73 to 1985-86, exports averaged 55% and internal consumption 45% of total production.

19x

Several factors are sited as causes for the decline of coffee, including:

Loss of interest on the part of the producer as a result of low and highly variable prices and competition from food crop production;

Decrease in the acreage under coffee cultivation (1.0 to 1.6% per year since 1960);

Land tenure and micro parcelization of land;

Intensive deforestation over several decades, modifying the ecological environment;

Technical factors (including the recent arrival of coffee rust disease in Haiti);

Isolation of coffee areas as a result of non-existent or deteriorating roads;

Absence of national policy and will regarding coffee production.

The MARNDR strategy recommends that a favorable policy environment be created as a first step. Few details are available, but the general orientation of the strategy calls for a national policy on coffee production to be developed and followed, a measure of stability to be introduced into the coffee market, and the development of other agricultural exports, in order to diversify away from dependence on coffee.

The first step of the proposed strategy of the MARNDR was to define zones of intervention and approximate allocation of resources.

Zone	Resource Level
Zones of Strategic Intervention Southeast and West Center and Artibonite Grande Anse and South	60%
Zones of Stabilization North, Northeast, Northwest, and parts of Artibonite, Southwest and Southeast	25%
Microzones	15%

The Zones of Strategic Intervention are estimated to have 60,000 ha in coffee and a potential coffee growing area of 121,000 hectares. The total area in coffee at present is estimated to be 132,960 hectares producing an estimated total of 545,000 60-kg. (120 lb) bags of coffee.

Short term measures to increase output concern reducing harvest losses, both quality and quantity. Medium term activity recommended is regeneration of coffee plantations and application of improved technology. Long term activities concern creation of a national coffee board.

The objective is to reach production levels that would permit Haiti to export its 1987 ICA quota of 363,000 bags, about 63,000 bags over current exports (300,000 bags).

B. Rationale for Project Intervention

1. Problem Statement

In the broadest sense, the primary problem confronting the coffee sector at this time is low productivity. A major determinant of coffee sector productivity is the harvest yield obtained from existing coffee stands, which in Haiti is very low (approximately 250kg./ha.). These low yields may soon be further reduced by the incursion of coffee leaf rust (Hemileia vastatrix). The circumstances which now limit the production of Haiti's coffee plants also increase their susceptibility to the rust disease.

a. Circumstances Leading to Reduced Coffee Production

Agriculture in Haiti, especially in remote hillside areas, is characterized by poor and eroding soils, and lack of inputs and management. Coffee culture, which exists mainly in just such areas, is no exception. These conditions can only result in ever decreasing yields. In the case of coffee, a perennial crop, lack of management also results in aging plants and further yield reductions each year. In fact, the view of coffee as a "wild" plant, which produces harvestable berries, is widespread. There is then, a lack of understanding on the part of farmers of the need for and benefits of better management. Even when they are aware that such options exist, access to necessary information and inputs is limited. Moreover, the cost of many inputs may be perceived by farmers to be beyond their financial means.

Another factor which affects coffee production is the recent increase in prices of some food crops combined with (until recently) an onerous tax on coffee exports. Some farmers, especially those on marginal coffee lands, have begun to replace low producing coffee trees with other cash crops, such as beans or corn. On the smallest farms, with available land diminishing as a result of continued subdivisions from one generation to the next, often basic family food needs leave no room for low producing coffee plants.

21X

b. Coffee Leaf Rust and Implications

The fact that coffee leaf rust (Hemileia vastatrix) is now known to exist in Haiti brings a new threat to future coffee production. This fungus disease, which attacks the coffee leaves causing premature defoliation, can drastically reduce tree viability, and in the most severe cases will destroy it. Older, uncared for trees, growing in shaded areas (the norm in Haiti) are most vulnerable, as is the Arabica Typica variety, which is the variety most commonly found throughout the country.

c. Fall in World Coffee Prices

Another dramatic event affecting Haitian coffee production is the demise in 1989 of the International Coffee Organization, the 72-nation producer/consumer group that for many years has set coffee prices on the international market. This intensely political move, fully supported by the U.S. Government, was aimed at restoring a free market basis to coffee prices. The effect has been to precipitate a sharp fall in world wholesale coffee bean prices, at least 45% since the beginning of 1989, to 70 cents a pound, the lowest level since the Depression in inflation-adjusted terms. With a glut brought about by abundant fall harvests worldwide, the price could fall even lower over the next few months before heading back up.

This decline will have a severe impact on the economies of major coffee producing countries, including Brazil, Colombia, Mexico and Ivory Coast, the value of whose sales collectively will be at least $5 billion lower this year than in 1988. The effect on Haiti will be similar, if on a smaller scale.

Present plans do not call for a renegotiation of the coffee agreement before 1991, but political action for stronger anti-drug measures in Colombia includes pressure to restore price support for coffee, Colombia's largest legal export (40 percent of total official exports). Haiti would be an incidental beneficiary of any early political action to reinstate coffee price supports.

2. Rationale for Intervention

The problems described above are considered to be the overriding ones now affecting the coffee sector. They do not lend themselves to easy solution. The decision to undertake a new project in Haiti's coffee sector is the result of protracted study and careful analysis. The economic, social and ecologic importance of coffee in Haiti provide the underlying motive for this decision. By the same token, the expected consequences of inaction in this sector are deemed to be extremely serious.

Coffee has historically been and remains Haiti's most important agricultural export, in spite of a long term trend of decline. Thus it continues to bring in substantial amounts of foreign exchange and to have a large influence in the economy. The export volume, about 55% of total production, generates considerable employment in the agro-industrial sector - in grading, processing, transport, packaging and sales.

Concerning on-farm income, approximately 20% of Haitian families count on the income they are able to earn each year from their coffee harvest. The fact that coffee can be dried and stored, then sold at the time cash is needed increases its importance within the small farm system. The possibility of being able to obtain credit and sell coffee in advance of its harvest to coffee speculators to meet financial emergencies is considered to be another advantage.

Coffee in Haiti has been the ultimate perennial, mountain cash crop. It has few, if any, replacements among perennial cash crops for its ecological niche. Virtually all of the approximately 120,000 - 130,000 ha. where coffee is grown are covered by a shade canopy of forest trees. Areas with forest tree cover may be there precisely because they shade coffee. Further reductions in coffee acreage could lead to accelerated tree harvesting for wood and charcoal.

The sector presently is thrust to the fore because of the coffee rust problem. The analysis of the PP team agronomist in late 1988 was that coffee production, as a result of rust, will decline in northern areas as early as the 1989/90 marketing season and that the rust will spread rapidly to the southern producing areas. The medium to long term affects of coffee rust, if unaddressed, will be severe. By mid-1989, the presence of coffee rust was confirmed in all coffee areas except part of the southeast.

Given the long-term decline of this sector, will coffee rust only hasten an inevitable decline? What are the factors that have caused the trend? Are they still in force? Have they, or can they be mitigated? Are there new forces that support innovative technologies and renewed interest in coffee on the part of the farmer?

This PP considers and attempts to answer all these questions. All things considered, the options concerning coffee can be summarized as severe consequences from inaction -- or a project undertaken with calculated risks. The calculated risk is that this project will succeed in elevating on-farm coffee technology, an objective previous coffee projects have failed to achieve. The design of the project has been developed recognizing these risks, and where possible, it incorporates strategies and approaches which have previously been successfully applied in other projects in Haiti.

23X

Another objective is to raise farmer income from coffee, a difficult proposition in light of today's low coffee prices. However, a modest increase in income is considered possible through higher yields resulting from improved technology. Stated another way, a major project benefit not to be overlooked is the avoidance of a serious decline in income of coffee farmers caused by a combination of lower prices, rust disease and the declining productivity of older coffee plants.

3. Relationship with USAID/Haiti Development Strategy

The FY 1989 - FY 1990 USAID/Haiti Strategy Paper outlines a two-pronged orientation of the agricultural portfolio toward development of sustainable production systems for hillside agriculture and promotion of agricultural exports. All projects in the agricultural sector are geared toward increasing small farmer income.

Among the policies instituted with the GOH to complement this orientation were: (a) continuation of coffee export tax reduction; (b) inducements for owners and users of hillside lands to employ sound conservation measures.

With the elimination of the export tax in 1987, a key constraint to production and equitable distribution of benefits from coffee production was eliminated. This action showed the GOH policy environment to be responsive to USAID and other donor concern.

The coffee tax reduction helps support the rationale for the proposed production activities. It also minimizes the necessity for a focused effort on coffee marketing activities. The reform has enabled farmers to receive a higher proportion of world market share than ever before, although the actual amount received is now less than before because of the fall in the world price of coffee.

The threat posed to hillside agriculture by erosion is to be addressed in the Mission Strategy by changing production patterns on 290,000 hectares of hillside land. The strategy of targeting activities to improve productivity in high potential watersheds is regionally focused in the south. Accompanying this strategy is a stress on private sector development and employment generation.

The Coffee Revitalization Project fits squarely into the USAID/Haiti priorities for the agricultural and rural sectors. These priorities include focusing on export promotion and sustainable hillside farming systems while addressing the key constraints to successful implementation of the strategy -- soil erosion, low technology in terms of inputs of fertilizers and seeds, a weak institutional base in both the public and private sectors, and lack of successful adaptive research on Haitian agricultural systems.

The Coffee Revitalization Project addresses each of these constraints. Coffee can both increase farmer income and contribute to soil conservation and improved land management practices. Improved technological packages, centered around economically viable stands of rust tolerant varieties recently extended by the MARNDR, and improved rust tolerant varieties to be propagated and extended by the project, will help sustain coffee production and exports. This will enable increases in farm income to be achieved by the end of the project, a key USAID strategy objective.

The project will work with beneficiaries consisting entirely of private sector farmers and local private organizations. Thus, the project also serves USAID/Haiti's policy objective of supporting private sector initiatives.

III. DETAILED PROJECT DESCRIPTION

A. The Goal, Purpose and Outputs of the Project

1. Project Goal

The goal of the project is to increase coffee productivity and farmer income among coffee producers in Haiti. The project will reach at least 10,240 farmers, who will receive seedlings and information on improved coffee technology. Of this number, 8,200 will be in the two pilot zones and an estimated 2,040 will be reached through the outreach program. It is expected that on average, both the production yield and project farmers' income from coffee will increase by more than 100% by the time the trees planted under the project reach maturity, several years after the project ends.

2. Project Purpose

The purpose of the project is to upgrade the quality of coffee cultivation in Haiti by improving production technology and farming practices, thereby increasing the yield and the consistency of the coffee product and reducing the ill-effects of coffee rust. By the end of the project, it is estimated that at least 1,343 hectares will be planted in improved varieties in the two pilot zones. The combination of new technology, technical assistance and training provided by the project will not only permit the participating farmers to increase yields and help combat the danger of coffee rust disease, but also will help maintain coffee cultivation as an ecologically sound production system for the steeply sloped mountain soils.

25X

3. Project Outputs

Activities under the project will seek to achieve five distinct yet interrelated outputs:

a) Propagation of coffee varieties with high yield and rust-tolerant capabilities produced in local nurseries. At least 5.5 million quality seedlings of high yield varieties will be produced.

b) Adaptive research undertaken in coffee-based farming systems, to develop at least four tested technological packages. Research modules will include: introduction and evaluation of high-yield, rust tolerant varieties; seedling production and distribution systems; development of alternative technological packages involving fertilization and fungus control; and cropping systems management.

c) Coffee production/rehabilitation packages introduced to small farmers in Jacmel and Beaumont pilot zones. Approximately 8,200 farmers will be trained in the use of high yield varieties and cultivation techniques and on average will adapt at least 60% of these new techniques.

d) Information disseminated on improved coffee cultivation through a national outreach program involving radio broadcasts and farmer training sessions. Weekly radio programs will reach an audience of 150,000. Approximately 2,100 farmers will receive two days of training in coffee production technology and practices.

e) Local organization capacity in South Haiti strenghtened to support improved coffee cultivation. Approximately 20 local NGO's will participate from the two pilot zones, plus those which seek help through the national outreach program. Training in improved coffee technology and cultivation practices will be provided to 164 animateurs from the pilot zones and 60 of the regular NGO management staff (an average of three per NGO).

The challenges facing this project make the art of predicting numerically quantified indicators to measure the End-of-Project Status a rather speculative exercise. During implementation, as experience is gained and results become evident, the specific numerical targets indicated here, especially production figures, should be reviewed and revised.

B. Project Inputs

Inputs to the Coffee Revitalization Project to be purchased with funds provided to IICA under the USAID grant fall into four major categories: technical assistance, agricultural supplies, training, and equipment. In addition to the IICA grant, USAID will retain $657,000 in DA funds, $287,000 for monitoring, evaluations and audits, $220,000 for membership fees to Promecafe, and $150,000 for contingency. A few project support costs will be borne by other collaborating organizations.

A.I.D. Dollar and P.L. 480 Local Currency Financed Inputs

Item	Quantity
Personnel	
4 Long-term senior advisors	20 Person years
Coffee Production Specialist	
Field Operations Coordinator	
Administrative Officer	
Credit Coordinator	
3 Regional field supervisors	15 Person years
17 Regional field support staff	54 Person years
Administration support	5 Person years
Short-term consultants	10 Person months
Support to Local Organizations	
Buy back of seedlings	4.5 million seedlings
164 extension animator - trainers	432 person years
Commodities	
Nursery and production inputs	
Seeds	2.3 tons
Plastic nursery sacks	5.5 million
Fertilizers	1057 tons
Commodities	
Item	
Fungicides and pesticides	7.3 tons
Hand tools	200 sets
Backsprayers	405 units
Water hoses, watering cans, water pumps	
Agricultural Supply Stores	
Construction materials	
Cement, roofing, metal doors & windows	
Sand, gravel, labor	
(provided by local organizations)	
Vehicles	
4x4 3/4 ton pick-up trucks	5
Utility vehicle	1

27X

Office equipment and supplies

Training

Training of field personnel, short-term outside Haiti	30 person months
In-country training of extension workers	186 person months
Field days, demonstrations for coffee growers	200 field days

In-kind Inputs from Other Organizations Supporting Project Activities

ASDEC - Research/Demonstration sites

Local Haitian organizations
- Land for nurseries and demonstration sites
- Time of NGO managers devoted to training under the project

IICA
- 2 Long-term part-time technical specialists (IICA funded)
- Transfer of selected equipment from Swine Repopulation Project
- Office furniture
- Executive supervision time by IICA Haiti Director

C. Project Strategy

This five year project is the first phase of an intended longer term A.I.D. effort to revitalize coffee production. The basic project strategy is to develop and extend adaptable coffee technologies that will mitigate the impact of rust, while increasing production and improving the quality of coffee produced on a per hectare basis. The project will promote a higher level of technology for coffee culture, primarily within a multicrop farming system. A multicrop system is the minority farming system for coffee culture worldwide, but support can be drawn from research results from numerous countries. The project will provide the inputs package in small units (300 tree package is the example in the economic annex) suitable to the wide range of conditions extant on Haitian coffee farms. It is expected that farmers will repeat as participants in the project over several years in succession, such that they gradually eplace existing coffee stands with new, rust tolerant varieties under improved management. The level of farmer participation will, of course, vary. Realistically, very few will apply all of the technology inputs precisely and adhere strictly to the range of cultural practices taught under the project. The best estimate of the ADO and

IICA is that on average, participating farmers will fully and correctly apply about 50% of the technology available. Benefits derived from this level of compliance, while not optimal, are considerable, and the project's economic and financial analyses assume this standard of farmer response to what the project offers.

The project will be administered primarily by the Inter-American Institute for Cooperation on Agriculture (IICA), a member agency of the Organization of American States. IICA will provide technical, financial and administrative support to local Haitian organizations which will have direct contact with farmers. In certain areas, IICA may hire the implementation staff directly, if local organizations are absent or unqualified to carry out the project. This implementation mode featuring a central management entity supporting local level institutions has been successfully used in USAID-funded agricultural projects in Haiti, the notable examples being the Agroforestry Outreach Project and its successor Agroforestry II, the Swine Repopulation Project, and the Targeted Watershed Management Project.

Listed below are the project's components, whose activities are in direct support of the project outputs. The project will operate at two levels in the field: intensively and comprehensively in two pilot zones of Jacmel and Beaumont, and extensively at the national level for selected project activities. The pilot zones will encompass all five components of the project. Two of the components, technology transfer and production, will operate directly in the outreach program also, but with a flexible methodology suited to a demand driven program. The components of research and institutional strengthening will have a less direct impact on participants outside the pilot zones, and there are no plans to offer project credit under the outreach program. These relationships are illustrated in the following table:

		Pilot Zones	Nat'l Outreach
1.	Technology Transfer and Training TA in Improved Coffee Production	X	X
2.	Applied Research Field Testing of Improved Technology	X	
3.	Production Propagation and Distribution of Improved Coffee Varieties	X	X
4.	Credit Provision of Production Inputs	X	
5.	Institutional Strengthening Support to Local Organizations	X	

29x

The remainder of the Project Description section describes the five project components in some detail as they relate to the pilot zones and ends with a summary of the scope and objectives of the outreach program.

D. Pilot Zones

1. Selection of Pilot Zones

In order to maximize returns to participating farmers and to have the greatest probability of success in the project, two pilot zones have been selected from among the optimal areas for coffee production in Haiti. Both are located on the southern peninsula and are shown on the Map as Jacmel and Beaumont. Both are traditional coffee areas and have excellent production potential with the following minimum characteristics:

- elevation of at least 700 meters;
- annual rainfall of 1800 mm or more, with no long dry season;
- soils that are adequately deep with the correct pH for coffee production.

Jacmel - Coffee Growing Areas

The Jacmel coffee growing areas comprise Decouze, Blockause, Macary, Fond Jean Noel, Cap Rouge and the hilly areas of Marbial and cover an estimated 10,000 hectares. In these areas, coffee is cultivated by small farmers, with 80% of the coffee gardens being less than 0.5 ha. Most of these areas are accessible by secondary agricultural roads except the hilly areas of Marbial. The Typica variety is the dominant variety cultivated by farmers in the region. However, in Blockause, Macary, and Fond Jean Noel, some pockets of Caturra can be found.

Beaumont - Coffee Growing Areas

The Beaumont coffee growing areas are some of the most important coffee growing areas of the country. These areas comprise Beaumont, Dichity, Pavillon, Debarrieres, Cassanet, Tozia and Lacombe, where coffee is cultivated extensively. According to the Ministry of Agriculture, the Beaumont coffee growing areas cover approximately 30,000 hectares. Presently, there are 16,000 hectares planted in coffee by an estimated 15,000 coffee growers.

2. Activities in the Pilot Zones

a. Component No. 1. - Technology Transfer and Training Technical Assistance in Improved Coffee Production

A key element in the achievement of the project purpose will be the farmers' understanding of the importance and methods of increasing their returns from coffee production. The various components of the project have been designed with the objective of providing the necessary technical base in terms of human capital.

a.1. Training Activities

Coffee agronomy training for Haitian project staff: Senior project staff and field extension agents will participate in training sessions in Haiti, led by visiting specialists with extensive international 1

experience in coffee production and technology transfer. Field experience and practical training at a major coffee center in Costa Rica will also be provided for key IICA extension staff. There will be additional advanced, short-term training for selected project technicians in specialized subject areas pertaining to project requirements.

Training for staffs of participating organizations: the project's success will depend on the effective collaboration of local organizations with varying degrees of experience with coffee. Their staffs will participate in formal and hands-on training in different skills necessary to carry out the project. Training is planned for: coffee tree nursery establishment and management; planting and care of coffee trees; managing coffee plantations within a multicropping system; extension methods and technology transfer; and the implications and requirements for dealing with the rust disease problem. In some cases organizational staffs will require training in management of input supply stores and credit programs. The project will provide or arrange this type of training, as necessary.

Village level training and extension: Three types of farmer involvement in the project are foreseen: pilot farmers, model farmers and participating farmers. The more innovative farmers, preferably selected by their peers, will be designated as pilot farmers to help in motivating others to become participants, and to collaborate with organizational staffs in carrying out training and follow-up activities in the rural zones where they live. Some of them, especially in early phases of project implementation, will receive additional practical training by carrying out demonstrations of improved coffee production on their own lands.

Model participants will be farmers in the pilot zones who use the adapted technology for coffee production on their own farms, and who follow through in applying it. These participants will receive initial training and follow-up extension throughout the project. Concomitant with the training provided to pilot farmers and model participants, the project will provide access to the inputs required to follow through in application of the training themes (seeds, fertilizers and fungicides) for use on their land.

Some farmers may wish to participate in training activities and receive improved coffee seedlings, but may decline or be unable to apply the full range of recommended inputs. These farmers will realize partial benefits from their contact with the project and are designated as participating farmers.

a.2. Principal Extension Themes

The major components of the extension program will be incorporated in a package of technologies which, when applied properly, will enable the farmer to maximize production from his coffee holdings. The most important themes in the planned extension program for the coffee project will include:

Coffee rust and its implications;

Improved varieties compared to traditional variety;

Fertility management:

- Composting and mulching;
- Chemical fertilization;

Seedling production: development and management of coffee seedling nurseries;

Seedling planting: Soil preparation, location, spacing, depth, timing;

Shade for coffee and interplanting with other crops;

Use of fungicides to control rust;

Pruning and other cultural techniques;

Harvesting, quality control, processing;

Comparison of results from good management vs. no management.

A full discussion on the development of technology packages is included in the Agronomic Analysis Summary and accompanying annex.

a.3. Methods and Materials for Farmer Training and Extension

Farmer training will be participatory in nature, and emphasize hands-on experience. Use will be made of demonstration plots and farmer trial sites as training locations.

Printed training and extension materials such as booklets or leaflets will incorporate large, detailed graphics with minimal use of text. Text will be in both Creole and French, since older persons who are literate may read only French, while younger people may read only Creole.

Other important communication methods will include radio broadcasts and posters. Both can be effectively utilized for public information and motivational purposes, as well as for training and extension.

Initial group training will be tied as closely as possible to "enrollment" for participation in the project and receipt of seedlings. Follow-up group training will be through field days at demonstration sites. Information on the optimal combination of inputs for maximum production and control of coffee rust will be provided along with acceptable variations. Farmers will be free to select the combination of inputs they wish to apply. Thus, the term "technological packages" in this project refers to the delivery of information to, and exchange with. farmers, the provision of improved rust tolerant coffee seedlings, and making available recommended inputs of fertilizer and fungicides to farmers.

a.4. Organization for Technology Transfer (Extension Education)

The primary objective of this component is to deliver improved coffee technology to participating coffee growers to permit them to increase their skill and knowledge in improved methods of coffee cultivation. The organization and strategy of the project extension component will be as follows:

a.4.1. Extension Coordination Unit

This central unit will be composed of senior technicians and will be responsible for the overall planning, implementation, and coordination of extension activities in the project zones. The unit will consist of a coffee production specialist as the project coordinator, an extension specialist, a credit specialist, and a radio extension specialist. This core unit will establish the linkages with the other components of the project so that project services such as credit and technical assistance can be efficiently provided to all participants from the local organizations and their personnel and to the coffee producers. This unit will also provide all the necessary supervisory and technical support to the local extension staff of the project for the design and implementation of coffee extension activities and training. This central unit will supervise activities of both the pilot zones and national outreach activities.

a.4.2. Regional Extension Units

Each pilot zone will have a local extension staff composed of one coffee agronomist and 2 extensionists. During the LOP, each zone unit will provide supervisory and technical support to approximately 10 local organizations affiliated with the project as follows:

33X

- Identify and select local organizations through which project input can be delivered to coffee growers;
- Assist these local organizations in establishing coffee nurseries and managing demonstration plots;
- Organize and implement farm level training;
- Design and monitor extension activities at the field level implemented by local organizations;
- Establish and operate supply stores for production inputs; and
- Encourage farmers to provide feedback to allow for quick adjustment in extension activities.

a.4.3. Local Organizations and Outreach to Coffee Growers

The local organizations will be the link between the project's regional extension units and coffee farmers. All project inputs must be effectively coordinated at the level of the local organizations for delivery of benefits to the farmer including extension education services, nursery production and distribution, and provision of production inputs. Concerning extension education, participating local organizations will recruit an estimated 164 animators who will have direct contact with coffee growers. Each animator will have responsibility for a group of about 50 coffee growers. The animators will supervise the operations of demonstration sites, work intensively with pilot farmers, organize group training activities for farmers, enroll farmers for seedling distribution, provide follow-up after seedling distribution and track selected project performance indicators at the farm level.

b. Component No. 2. - Applied Research
Field Testing of Improved Technologies

An important component of this project will be field testing of improved coffee technology. The purpose of this component is to test and generate appropriate coffee technology packages for subsequent transfer to coffee growers. The applied research and testing component is expected to lead to the development of at least four technological packages for on-farm application in the pilot zones and later extension to all coffee growers in Haiti.

Haiti's membership in Promecafe, the regional (8 countries) "Program for the Protection and Modernization of Coffee Production" will permit access to state of the art coffee leaf rust control research, and integrate Haiti's effort to develop and reproduce rust-resistant varieties with the regional network. IICA will provide from its own resources the research specialist to support the research activity. IICA will provide support for the operation and management of field testing through the local organizations.

Observational and trial plots will be established on land donated by local organizations and members of ASDEC, or on land leased by the project from private farmers. The IICA-funded advisor will have direct responsibility for the management and organization of these plots. His work will include:

- Obtaining land sites for the establishment of the plots;
- Maintaining the plots;
- Designing the field testing program;
- Selecting and training of Haitian staff in varietal observation procedures;
- Collecting and analyzing data on yield, fertilizer requirements, planting density and other variables.

Field testing of new varieties and adaptation of the most appropriate cultural techniques will begin concurrently with seedling production and distribution and other production activities of the project. Given the urgency of the rust problem, initial production will be with seed developed and procured from Promecafe participating countries. Varietal selections for Haiti will be made on the basis of research in Central America and other Caribbean islands. The primary lines of investigation are discussed briefly below.

b.1. Varietal Observation

The purpose of this activity is to select and identify high yielding, rust tolerant varieties for multiplication and propagation. IICA, in collaboration with the International Coffee Research Institutions, will identify and introduce at least three or four of the latest lines of rust resistant materials which have been successfully tested in other countries. The genetic potential of these materials will be evaluated with emphasis on production efficiency, their degree of resistance to coffee rust, and their performance under various levels of input management.

b.2. Intercropping

The Haitian farmer cultivates coffee in association with other crops. Multicropping has been practiced for years by Haitian farmers but not in a rational or scientific way. To refine this practice, the project has proposed an intercrop module. This module will be tested and fine-tuned on the basis of its efficiency and transferability to small farmers.

35X

b.3. Fertility Management

Preparation and use of compost will be encouraged as the first level of fertility management for participating farmers. The IICA research element will evaluate how small coffee growers can maximize organic fertilization through utilization of coffee pulp and other unused farm by-products to make compost.

Fertilizer use is a prerequisite for high yields from improved coffee varieties. However, the type of fertilizer to use and the schedule of application are not well known by coffee growers. IICA will conduct fertilizer trials in order to make specific recommendations for fertilizer application under different technical variables.

b.4. Chemical Control of Coffee Rust

At this stage, there are no commercially certified rust resistant varieties readily available for immediate planting and distribution in Haiti. Given this, coffee growers will need to rely on chemical fungicides for the control of coffee rust in their gardens. IICA research will develop and define a control strategy to reduce coffee rust infection through the utilization of fungicides combined with appropriate cultural practices.

b.5. Demonstration Plots

The project will establish demonstration plots on which the recommended technologies will be applied. These demonstration plots will be used to train farmers in appropriate coffee technologies including: fertility management, pruning, shade control, pest management, coffee intercropping and rust control. These demonstration plots will permit participating coffee growers to observe the utilization of appropriate cultural practices to increase the productivity of their coffee gardens. Demonstration plots will be established at the level of the local organization and with pilot farmers.

b.5.1. Local Organization Demonstration Plots

These plots will be established on land provided by the local organizations identified by the project extension staff. The local organizations will be responsible for the management of these plots. The project will provide the logistical and financial support for the operation and maintenance of the plots. Project staff will supervise closely these plots in order to assure that they are adequately managed. These demonstration plots will be used for field day extension workshops which will be organized by the project.

b.5.2. On-Farm Demonstration Plots

The project will identify pilot farmers who will establish demonstration plots on their farms. These farmers will share some of the maintenance costs of these plots through the provision of all required labor. The project will provide financial support for the input costs. These plots will also be used as sites for training and field days.

For each type of demonstration plot, the project is responsible for the following activities:

- Assisting the farmer and the organization to identify suitable sites;
- Supplying seedlings, fertilizers and fungicides;
- Providing technical assistance and the necessary supervisory support for management of the plots.

c. Component No. 3 - Production Seedling Production and Distribution

Project nurseries will produce and distribute an estimated 4.5 million coffee seedlings which will be delivered to 8,200 coffee growers in the two pilot zones. The seedling production and distribution program will permit coffee growers to establish new coffee gardens and to replace their old Typica trees with higher yielding, rust tolerant coffee varieties.

c.1. Propagation and Distribution of Improved Varieties

The existence of coffee rust in the country has forced a radical change in coffee technology for the future. The Typica variety now common in Haiti will not be produced under the project because of its susceptibility to coffee rust and poor productivity. Project nurseries will initially propagate the variety Caturra which is adapted to conditions found in southern Haiti. This is known as a high-yield variety, with some rust tolerance characteristics. If Caturra is properly managed, it may be feasible to control rust economically. Seeds of this variety can be obtained in various coffee growing areas in Haiti, the Dominican Republic and through IICA in Costa Rica. If better rust-resistant lines of Catimor or other varieties prove adapted to the agro-ecologic conditions of Haiti, the project will propagate the improved varieties for distribution.

c.2. Organization and Management of the Nurseries

IICA will set up decentralized nurseries in areas which are easily accessible to coffee growers, preferably within walking distance of participating farmers. The type of nurseries may include collective

37X

nurseries and individual nurseries. The collective nurseries will be established on sites of local organizations while the individual nurseries will be operated by qualified, individual coffee growers. Coffee seedlings will be produced directly by the local organizations and individual coffee growers under contractual agreement with the project. The organizations and the individual farmers will provide the land sites for establishment of project nurseries along with the personnel for management and maintenance. In return, the project will guarantee the following:

- Provide the necessary supervisory and technical support for the management and maintenance of the nurseries;
- Assist in obtaining all necessary inputs (seeds, fertilizer, materials) for nursery operations;
- Purchase of all quality seedlings produced at a cost which covers all nursery operating expenditures and provides a small profit margin. The purchase price is currently estimated at 17 cents per seedling.

c.3. Seedling Distribution

Following quality control and purchase of the seedlings, the project will distribute them free to participating farmers. Participation entails enrollment and attendance at extension training sessions on improved coffee husbandry as a condition for receiving coffee seedlings. Present planning is to distribute seedlings in lots of 300, sufficient to plant 0.1 hectares. It is anticipated that the farmer will return in subsequent years, so that over time he gradually replaces his existing coffee plantation. The figure of 300 seedlings is subject to review and adjustment based on implementation experience.

The lot of seedlings will be accompanied by an incentive package which will include the initial fertilizer application for planting and the fungicide for first year applications. The cost of this starter package is estimated at $7.50 (15 kg.) for fertilizer and $0.75 (150 gms) for fungicide, for a lot of 300 seedlings worth $51.00, bringing the total value of the starter incentive package to $59.25. Composition of the incentive package will be subject to review and adjustment throughout the project based on implementation experience.

d. Component No. 4 - Credit Provision of Production Inputs

d.1. Input Supplies

Successful coffee production with high yielding, rust tolerant varieties requires that the trees be maintained in strong physiological condition. This mandates the use of inputs such as fertilizer and fungicides, especially when the rust problem is present. IICA and the local organizations will assure that farmers have convenient access to these inputs. "Convenient" can be defined as no more than several hours travel

by foot or horseback. Recommended inputs must be available to project participants at the time seedling distribution begins. Although initially the project may need to import these inputs directly, it will be important that local organizations and or commercial enterprises take over this role as the project expands and quantities required increase.

Project activities will include determining that appropriate supply channels and ultimate points of sale exist or, if they do not, devising means to develop them. The retail supply points to farmers will be agricultural supply stores, operated either by the local organizations or local merchants.

In some communities, particularly in the Jacmel area, there are already agricultural supply stores operated by cooperatives. These stores usually sell to both members and non-members, and in areas where they are already operational, they may prove the most viable outlet to market coffee inputs. Most if not all of these supply stores already carry fertilizers, and with project assistance they should be well situated to expand operations to include other input supplies for coffee farmers.

In larger communities, commercial sellers of farm supplies already stock limited agricultural supplies and should need little encouragement to carry inputs needed by coffee farmers, especially in later phases of the project when larger numbers of farmers will be participating.

The Beaumont zone differs markedly from the Jacmel zone. The infrastructure, both physically and organizationally, is weak. IICA will have to provide a strong lead to assure the availability of input supplies to farmers. Organizations otherwise involved in project activities such as nursery operations and extension activities will be encouraged to participate in this aspect of the project. The establishment of agricultural supply stores by local organizations in the Beaumont zone will entail project assistance for the purchase of some building supplies (cement, roofing, nails), with the cooperating organizations providing local materials and labor. IICA will also seek to ensure that operating staffs have adequate management skills to operate the stores.

d.2. Financing of Inputs

Assuring that farmers have convenient access to production inputs also requires that financing is available to stock and purchase the inputs. The financial constraint occurs at two levels. First, local organizations must be able to stock the input supply stores, and secondly, the farmer must be able to purchase the inputs.

It must be recognized that substantial income from investments in coffee production are not realized before the third year after planting, and the direct use of project local currency funds for medium-term credit may be required. One important project objective is to help farmers get started

39X

with the new coffee technology and the financing required to purchase the inputs. A combination of a free starter incentive package and medium-term financing will help the farmer through the period before the first coffee crop using the new technology can be harvested. IICA will consider various options for medium-term credit, including the option of extending the free input package (fertilizer and fungicide) to farmers beyond the first year. Final arrangements for the project's credit element will be developed during the first year by IICA as the primary implementing organization. Any credit arrangement introduced would be on commercial terms. There would therefore be no credit subsidies to farmers, other than inputs supplied on a grant basis under the incentive package. Approval by USAID/Haiti of proposed credit procedures will be required prior to disbursement of funds for any credit operations. An IICA credit specialist will supervise project credit operations throughout the LOP. The parameters for credit operations to be considered by IICA are as discussed below.

d.2.1. Credit to the Input Supply Stores

IICA will assist in establishing lines of credit for local organizations to stock the recommended production inputs. These inputs are primarily fertilizers, fungicides, backsprayers, and selected hand tools. The lines of credit will be to the local organizations or merchants, not to individual farmers. At least initially, credit will be in-kind and will be restricted to production inputs. Repayment of credit will be in currency and not in-kind (coffee beans, for example).

IICA will advance a quantity of inputs based on projected requirements. Guidelines would be established with the local organizations to stock inputs based on the quantity of trees to be planted and the recommended package of technologies. Credit policies will assure that the retail price of inputs fully reflect costs so that neither input prices nor interest rates are subsidized.

To institutionalize the infrastructure required to support modern coffee production, IICA will try to transfer credit operations in the Jacmel zone from credit under the project to other existing credit institutions during the life of the project. The Beaumont zone is thought at present to be too weak institutionally to achieve a transfer of credit operations to other institutions.

Through its outreach staff, IICA can provide linkages between farmer organizations and credit institutions and can assist cooperatives or other organizations to complete their loan applications. Potentially credit worthy organizations will be counseled and encouraged to meet with loan officers of credit institutions. The objective is to help establish lines of commercial credit for the participating local organizations. IICA will explore the possibilities of working with a range of lending institutions that will include commercial banks with branch offices near the pilot zones and rural credit unions (Caisse Populaires).

In the past, the volume of commercial bank loans in the agricultural sector has been small. Some commercial banks have occasionally made loans to large coffee producers and to coffee farmer cooperatives. Loans to cooperatives have, in large part, been guaranteed by a fund established by UNDP for loans to cooperatives. The guaranty facility has been used by banks for loans to about twenty different cooperatives in Haiti. In order to encourage credit institutions to undertake the risk of loans to rural organizations, some of the funds budgeted for inputs could be used to establish a guaranty fund. An example exists with the UNDP guaranty fund, supervised by the ILO and held by the National Council of Cooperatives.

Transfer of the credit function, to be successful, requires that there be a source of the inputs within Haiti. There are several existing agricultural supply houses through which IICA can establish the supply channels from foreign sources to major cities in Haiti. Cooperatives and other organizations having access to lines of credit can be directed to existing suppliers in Haiti.

d.3. Financing at the Farm Level

Concerning production inputs, the first problems to resolve are assuring that the farmer is properly counseled and that the inputs are easily accessible. The extension education and input supply stores will assure that these two problems are solved by the project. Ideally, local organizations will be encouraged to retail the production inputs for cash sales, at least initially. This is the operational mode of existing input supply stores in Haiti. This means that the farmer must have the cash or make his own credit arrangements to purchase inputs. Possible credit arrangements by the farmer include traditional lines of credit and local savings associations.

Local savings associations/credit unions (Caisses Populaires), traditionally serving as depositories for small savers with very limited credit activity, have recently begun expanding their loan portfolios. Members wishing to borrow funds must have a savings balance, usually totaling at least half of the loan amount, as well as collateral or an individual guarantor. The savings associations/credit unions, many of them in rural areas, by and large have very good repayment rates (at least 90%). Their loans are usually for very modest sums, and at the present time most are for purposes other than agricultural production. There is a network of Caisses Populaires in the Jacmel zone that may be able to assist farmers with credit. This institutional infrastructure is not present in the Beaumont zone.

Coffee has traditionally served as a resource for obtaining credit through traditional sources. The degree to which this could serve for farmers to pay cash for inputs from the supply stores will require close study by the project. There is in Haitian law an appropriate way for the

41 X

local organization or merchant to secure such a loan. It is found in the antichretic rights defined in articles 1852 to 1858 of Haiti's Civil Code. Antichretic rights serve effectively to secure a lender's credit with the fruits of a property without affecting ownership rights. In the case of a loan to a coffee grower, it secures the loan with the future harvest.

The last source of farmer credit would be one organized at some level in the project. Given the difficult history of rural credit and the wide range of problems associated with it, this should be the last option. There may, however, be no alternative. In this case, IICA would avoid making direct loans to farmers, but rather would provide for local organizations to on-lend to the farmers. While in-kind lending and cash repayments are usually preferable, it would be possible in some cases for the local organization both to lend in-kind and collect in-kind (in coffee beans, which the coop or merchant markets to the coffee exporters).

Credit options for farmers will be thoroughly studied and procedures proposed for USAID review and approval during the first six months of project implementation.

e. Component No. 5 - Institutional Strengthening Support to Local Organizations

Local organizations play a key role in the project and must be capable of coordinating project resources for delivery to coffee farmers. IICA will fund a specialist in institutional support. USAID will pay for certain operational costs to support his activities in the field. His responsibilities will be to assess and upgrade the capabilities of the local organizations to manage project activities and resources. The objective is not institution-building per se, but rather assuring that a diverse group of organizations has the management and record-keeping capabilities to administer the project at the local level. He will assist in the initial assessment of management capabilities and selection of local organizations, determine training needs and organize training to upgrade capabilities of local organizations. The areas of concern will be organizational management, financial management and record-keeping. He will also coordinate with other intermediary organizations that play the role of strengthening local organizations, for example HAVA and CCH, the national association of coffee cooperatives that has previously been assisted by USAID/Haiti.

USAID, IICA and the Peace Corps have undertaken discussions and have reached agreement concerning the assignment of Peace Corps Volunteers to assist in strengthening management capabilities of local organizations. Plans are to assign four to six PCVs in the summer of 1991. The Peace Corps will cover the financial costs of fielding and supporting the volunteers. Volunteers will be assigned to work at the level of the local organizations and will work under the technical supervision of the IICA institutional specialist.

E. National Outreach Activities

1. Technology Transfer and Seedling Propagation

Transfer of coffee technology on a national basis can be described as

extensive, in contrast to its intensive nature in the pilot zones. It will be entirely demand driven by local organizations in coffee growing areas that have an existing response capability to their client groups. Benefits of the outreach program are also available to individuals not associated with local organizations; in fact, to any serious coffee farmer, large or small, who is willing to learn and apply new coffee technology. Through this activity, an IICA training team comprising a coffee agronomist and a trainer, operating out of the IICA office in Port-au-Prince, will, upon requests from local organizations, provide training in improved coffee production techniques. The initial training module will consist of two day-long training sessions which will concentrate on coffee nursery technology, and on the problem of coffee rust and the introduction of modern production technology if the Haitian coffee industry is to survive. Following this training, the project will provide to the local organization all nursery inputs (seeds, plastic sacks, fertilizer and pesticides) for a 10,000- seedling nursery, and the local organization will organize the labor for nursery production. Distribution of seedlings will be to members of the organization. Additional training or follow-up from IICA would have to be initiated by another request from the organization.

The outreach activity assures that organizations that have an interest and a capability to assist their client groups have access to a source of expertise in coffee production technology and to improved coffee seeds of known quality for nursery production. The target group of local organizations include those being assisted by other donor projects, cooperatives, and PVOs/NGOs outside of the pilot zones. Within the USAID agricultural portfolio, it includes local organizations participating under the Agroforestry II, the Targeted Watershed Management project and the LORD projects.

The training team will undertake an estimated 102 training sessions in the outreach program over the life of project. The project target for this activity is to produce and distribute one million seedlings of improved coffee varieties to at least 2,000 farmers outside the two pilot zones through the National Outreach program. These targets have been adopted for planning and budgeting purposes, but this activity will be demand driven and demand responsive. For this reason, targets may be revised during project implementation.

2. Mass Media

One member of the IICA team will be a Media Expert, who will be responsible for media support to technology transfer activities in the two pilot zones and the national outreach. This work will feature regular weekly radio broadcasts disseminating information on coffee technology and related farming practices, which the Media Expert will adapt for radio and perhaps occasionally for video from project-developed written material and interviews. Listener interest and response will also be carefully evaluated, and the material presented will be as

43 x

practical and relevant as possible. Material extended through radio programming will make information about new coffee technology and the rust problem available on a nationwide basis and will generate demand for the outreach program.

3. National Coffee Seminars

During the first year, IICA, through its Coffee Coordination Committee (CADCO), will chair a seminar on the results of their review of the rural coffee credit situation, with a view towards harmonizing policies and finalizing a proposal to provide credit in the pilot zones.

In the second year of project implementation, a national coffee seminar will bring together persons from diverse local and international organizations having a mutual interest in Haiti's coffee sector. Because of island-wide ramifications of many coffee issues, representatives from the Dominican Republic will be invited. The seminar will enable an exchange of information on coffee in Haiti and on the island of Hispaniola, successes achieved and problems encountered, constraints and conditions currently affecting the sector, and the activities planned for the Coffee Revitalization Project. A major part of the seminar agenda will include the presentation of information on advances and practices in coffee technology in other countries, and discussions of their applicability in Haiti. It is anticipated that this seminar will be repeated later in the project if it proves valuable.

IV. DATA COLLECTION, MONITORING AND EVALUATION PLAN

A. The Special Need for Close Monitoring

It has already been noted that this project faces special problems, including the effect of the spread of coffee rust, very low current coffee prices and future price uncertainty. There is also the fundamental question of farmer acceptance of the new varieties and technologies promoted under the project, which involve expenses by farmers for inputs not previously purchased. It is clear that farmer motivation and performance must be carefully monitored from the outset. If farmers do not apply fertilizers and other inputs correctly and in a timely manner, coffee yields will be seriously affected, although even partial application of the new technologies using the improved, higher yielding Caturra seedlings should produce better results than continuing with the present Typica trees.

If project targets are to be achieved, constant monitoring of project procedures and farmer compliance will be needed. This is recognized by IICA which plans continued monitoring of farmers' activities and feedback on farmer attitudes through the local organizations. Ongoing monitoring will be required not only by the IICA team, but will also be provided on regular occasions by a disinterested party, i.e. knowledgeable observers outside the IICA team, including a coffee production specialist. Such

monitoring should include assessments of the propagation process and the applied varietal research being done under the project, as well as an analysis of the effectiveness of project extension, NGO and farmer training, and credit arrangements.

Accordingly, USAID/Haiti plans on approximately an annual basis, an assessment of the project's performance with a view to identifying problems and obstacles and devising solutions. These assessments, which will be more informal and more specifically focused than the formal project evaluation, will be undertaken largely by USAID's ADO staff, assisted by one or more external specialists as deemed necessary. Financing of external personnel will come from the project's evaluation budget. Annual assessments by USAID/Haiti will be coordinated with IICA's monitoring and planning calendar and will involve IICA's participation. Mutually agreed adjustments and refinements to project components and implementation methodology may arise from the annual assessments, based both on project performance and exogenous factors.

B. Project Management Planning

Each regional and technical officer will regularly and systematically review the outputs of the components for which he or she is responsible. Instead of a separate unit for Monitoring and Evaluation (M/E), IICA will hire one person whose whose responsibility will be limited to coordinating the annual planning exercise and the submission of periodic progress reports. This individual will essentially serve as liaison between the Project Director and field operations, to ensure that management directions are translated into verifiable indicators and that data to support these indicators are collected.

1. Annual Planning Cycle

Management plans are essential to securing needed information on project progress. Project plans will be an integral part of project execution. The project will use the annual planning process to consider project strategy and design. The process will relate annual output targets to end-of-project impact targets and planned actions to annual outputs. An examination of these relationships will bring out feasibility issues and provide management with a basis for measuring progress and making decisions concerning policies, priorities, and design. This process will begin in October, with field staff providing their contributions to the project directorate by the end of that month. The M/E officer will coordinate preparation of an annual planning document, transmitting the plan format and directions, advising staff and preparing issues papers. Essentially, contributions from each regional and central unit will consist of:

-- a listing of each output, with annual and end-of-project target;
-- actions required to achieve output targets for that year; and
-- detailed presentation of required inputs.

45X

The annual budget will be prepared by early November to help assure that the actions identified by the regional and technical units is consistent with available financial resources. Each annual plan should reflect the accomplishments and problems of the past year, identify goals for the coming year and actions that will have to be taken to achieve those goals.

A joint reflection on goals, priorities, and strategies will be part of the annual assessment to be conducted by AID and IICA. The assessment should be scheduled for the last quarter of each calendar year to ensure that the structure and vigor that is built into the planning process is used as the context within which to think about basic issues facing the project.

Quarterly planning will differ from the annual plan in that the focus will be on important actions to be accomplished rather than on design and feasibility. The quarterly plan is a workplan, planned actions and end-of-year targets are to be clearly linked. They will be drafted by Section Chiefs, as a help in scheduling activities and informing staff of the actions to occur during the next three months. They will also provide the occasion to consider whether progress toward end-of-year targets is satisfactory, identify constraints, and detail whether special efforts or changes in objectives are necessary.

2. Special Data Collection

It must be noted that measurement of project progress will require documentation of the project's impact on farmers and the rural population. Assessment of impact involves good baseline data, data on changes over time, and an analysis relating perceived changes to project activities. The IICA individual responsible for monitoring and evaluation will also coordinate identified short term analyses and studies and see that their results are integrated into annual assessments and reporting documentation, as appropriate.

IICA will undertake an initial baseline study early in the first year to collect information on the pilot zones at the outset of the project. This information will serve not only as a data base for measuring project impact, but will also form a basis for planning interventions in the farming system. Data to be collected will include:

- detail on farmer attributes, goals, preferences, skills, current management practices;
- estimate of current farm income from coffee;
- degree of involvement and role of each family member in all aspects of crop production, from land preparation to harvesting;
- farmers' current interest in coffee production, in view of the present low selling prices;
- farmer experience to date with extension services and credit from GOH or private sources;

- farmers' current experience with rust disease;
- farmers' involvement with local organizations and identification of these NGO's which farmers have found genuinely helpful;
- estimation of the degree of farmer interest and motivation in accepting new coffee technology.

In addition, a specialized questionnaire will be developed for selected farmers in the two pilot zones. The initial results will be updated annually in order to monitor change over the life of the project. IICA anticipates that these data will be collected by local NGO extensionists, with the assistance of IICA field staff. Information likely to be collected includes demographic, social and economic data on the farm household; coffee cultivation practices; pest and plant disease control practices; soil conservation practices; credit utilization; membership in farmer organizations; constraints to market access; and local land tenure.

3. Project Progress Reports

One application of the data collection process will be to provide sound information for inclusion in quarterly progress reports. IICA will be responsible for preparing the progress reports, to be submitted to the USAID Agricultural Development Office (ADO). They will concisely record major project actions since the previous report, noting adherence to project targets and benchmarks and explaining deviations or delays. The quarterly report mechanism will facilitate USAID's monitoring function and will serve as the basis for USAID's semi-annual project implementation report to Washington.

IICA will use a computerized management information system to monitor project activity achievement. Data collected at the field level will be tabulated on a quarterly basis in order to assure timely feedback to the project programming function, as well as reporting to USAID. The "Harvard Total Project Manager II" is currently being considered as a possible software program. This program permits calendar creation, outlining of project parts and building a work breakdown structure, preparation of detailed information about individual tasks and milestones, listing resources and their allocation to specific tasks, as well as tracking of costs.

C. Formal Evaluations

Because of the use of the mechanism of annual assessments, it may or may not be necessary to conduct a formal mid-term evaluation using independent, external resources. A decision of the need for an additional level of evaluation will be made in the third year. If deemed appropriate, such an evaluation would assess project accomplishments to date and analyze assumptions, problems, obstacles, and failures, etc., with a view to identifying appropriate mid-course corrections. Corrections could be technological, managerial, or institutional, based

on performance of IICA, the participating local organizations and the coffee farmers in the pilot zones and those covered by the outreach program. By the third year of the project, it may be feasible to make a preliminary judgment on the effectiveness of the new coffee technologies and their acceptance by Haitian farmers. Among major measurement indicators will be coffee planting rates, production yields, quality, selling price and overall farmer income, the effectiveness of farmer training sessions, and the rate at which farmers both in the pilot zones and outside are adopting improved coffee technology.

A final evaluation in the fifth year of the project is scheduled. This would become a major analytical document and provide a decision point for any prospective follow-on activity relating to coffee production. It should also render an authoritative verdict on the success of the new coffee technologies and provide a solid indication of the future of the coffee industry in Haiti.

D. Audits

IICA is an international organization which was the recipient of a USAID/Haiti grant for the implementation of the Swine Repopulation Project. Annual audit reports submitted by IICA under that project did not comply with GAO standards. A RIG supervised Non-Federal Audit is scheduled for the 2nd quarter of FY 90 to close-out the grant under the Swine Repopulation Project. The agreement with IICA for this coffee project will provide for audits in accordance with GAO standards. Assuming such audits are performed and no major concerns arise, there would be no need for additional audit at close-out. However, funds have been budgeted for a close out audit to cover this contingency.

E. Financial Resources for Monitoring, Evaluation and Audit

The total project budget for external monitoring, evaluations and audits over the life of the project is $287,000, or 5.6% of the project's dollar budget of $5.14 million. This amount will be held by USAID outside the grant to IICA to carry out the project.

V. FINANCIAL PLAN

A. Funding Components

The proposed project budget totals $5.14 million in Development Assistance funds. In addition, a $3.8 million in local currency equivalent from PL 480 generations is planned as a host country contribution. IICA will also make a significant contribution-in-kind, in the form of two professional staff, equipment transferred from a completed USAID-funded project and executive supervision by the IICA Director in Haiti.

Most project funds will be used for the provision of technical assistance and the purchase of the commodities required for the technical interventions. Funding will be primarily to IICA, which will have overall responsibility for project implementation. The IICA budget includes funds for technical assistance, training and support to local organizations and pilot farmers, the testing and distribution of new plant materials and credit for agricultural inputs. USAID will retain control of $507,000 in project funds for monitoring, evaluation and audits, and Promecafe membership fees, and $150,000 for contingencies.

B. Administration of Dollar Funds

Except for the sum of $657,000 to be retained by USAID, the balance of dollar and local currency funds will be obligated by means of a Handbook 13 grant to IICA, as a Public International Organization. Funds will be disbursed through a Federal Reserve Letter of Credit (FRLC). The initial obligation is planned for the second quarter of FY 1990, and subsequent obligations will be made in each successive year. Because of the annual assessments built into the design, forward funding beyond the requirements for 12 months of operations will be minimized.

All dollar costs will be covered by DA funds (salary for expatriate staff, consultants, the purchase of imported equipment, commodities, spare parts and materials, overseas training, audit, evaluation, overseas communication, membership fees to PROMECAFE). Project local costs will be shared between PL 480 funds and DA funds. Because of the problems associated with the timely availability of local currency funds, DA funds will be used to cover the salary of some key regional field staff, to purchase some training equipment, to support a portion of the in-country per diem costs for project personnel, to cover the initial annual costs of seedling production and most of the administrative and vehicle operation costs. PL 480 funds will be used to cover all the remaining local costs of the project (credit, purchase of supplies and material, seedling production, the salary of local personnel, travel/per diem and in-country training). Currently, the equivalent of $1.6 million in PL480 local currency is already available, with the balance to be generated from future PL480 generations. Since some degree of uncertainty exists at the moment regarding future food aid to Haiti, other options to obtain local currency may have to be considered, if necessary, including seeking additional Development Assistance funds from AID/W, cutting back on project activities, or seeking other donor assistance (e.g. Canada) to share this expense.

USAID will obligate by separate contractual arrangement the funds budgeted at $287,000 for external monitoring, audits and evaluations. UASID will also maintain control over Haiti membership dues to Promecafe and the contingency amount of $150,000 (DA funds). Any portion of this amount can later be added to the IICA grant by amendment to the Grant Agreement, as deemed necessary by USAID.

49X

C. Administration of Local Currency Funds

PL 480 local currency funds will be obligated by joint agreement between the GOH and USAID, using as a program document the GOH Standard Form for Identification and Operation of Project (FIOP). IICA will have responsibility for preparation of FIOPs in cooperation with USAID and the GOH Management Office. Advance of funds will be according to standard Management Office procedure, not to exceed requirements for more than 60 days. Funds required for loan operations with participating NGOs will be deposited into a separate account. The actual mechanism for credit operations and the accounting and reporting requirements for the credit fund will be defined in the credit program proposal to be developed by IICA.

Suggested credit procedures are outlined in Section III.D.2.d. Before credit operations are undertaken or any funds disbursed for credit, IICA will propose final procedures for approval by USAID. If a loan guaranty fund is proposed, the agreement for its administration and implementation will be negotiated between IICA and the participating commercial banks and approved by USAID.

Another subject for negotiation during preparation of the FIOPs and the IICA credit proposal is the disposition of credit funds at the end of the project.

D. Methods of Disbursement

A grant agreement for implementation of the project will be drawn up between USAID and IICA, a recognized "Public International Organization." The primary method of payment will be a Federal Letter of Credit (FRLC) as shown in the table below. AID will contract directly for monitoring assessments, evaluations and audits.

Methods of Implementation and Financing

Method of Implementation	Financing	Financing ($'000)
Grant to IICA (PIO)	FRLC	$4,483
AID direct contracts for:		
Membership Fees	Direct Payment	$ 220
Evaluation	Direct Payment	$ 208
Audits	Direct Payment	$ 79
Contingency	Direct Payment	$ 150
TOTAL		$5,140

E. Project Budget

The proposed project budget is provided in Tables I and II and the Budget Notes, which follow:

TABLE I

Coffee Revitalization Project

Estimated Budget by Year With Inflation ($000)

	YR 1				YR 2				YR 3			
	FX	LC	PL 480	TOTAL	FX	LC	PL 480	TOTAL	FX	LC	PL 480	TOTAL
PERSONNEL	332	76	102	510	318	55	204	577	324	52	315	[illegible]
Expatriate Staff	317	0	0	317	302	0	0	302	307	0	0	750
Local Staff	0	76	102	178	0	55	204	259	0	52	315	[illegible]
Consultant	15	0	0	15	16	0	0	16	17	0	0	17
EQUIPMENT AND FREIGHT	165	25	28	218	0	0	31	31	0	0	11	11
Vehicles	140	0	0	140	0	0	0	0	0	0	0	0
Construction Mat	0	0	8	8	0	0	10	10	0	0	11	11
Pilote Zone Equip	0	0	20	20	0	0	21	21	0	0	0	[illegible]
Training Equip	25	25	0	50	0	0	0	0	0	0	0	0
COMMODITIES/SUPPLIES	5	36	0	49	6	46	65	117	31	65	110	206
Seedlings	5	36	0	41	6	46	53	105	31	65	96	192
Trial Plots	0	0	6	6	0	0	7	7	0	0	8	8
Mat. for Outreach	0	0	2	2	0	0	5	5	0	0	6	6
TRAVEL/PER DIEM	0	25	23	48	0	27	23	50	0	29	24	53
TRAINING	40	0	68	108	21	0	75	96	44	0	75	119
Overseas	40	0	0	40	21	0	0	21	44	0	0	44
In-country	0	0	68	68	0	0	75	75	0	0	75	75
CREDIT FUNDS	0	0	11	11	0	0	43	43	0	0	104	104
VEHICLE OPER/MAINT	13	77	0	90	12	83	0	95	12	87	0	99
POL/Maint	13	77	0	90	12	83	0	95	12	87	0	99
ADMINISTRATIVE COSTS	3	74	0	77	3	87	0	90	4	79	0	83
Office Rental	0	27	0	27	0	28	0	28	0	30	0	30
Office Supplies		18	0	18	0	20	0	20	0	20	0	20
Office Maint.		6	0	6	0	18	0	18	0	7	0	7
Communications		15	0	18	3	13	0	16	4	13	0	17
Misc.		8	0	8	0	8	0	8	0	9		9
IICA Overhead	67	38	29	133	43	36	53	132	50	38	77	165
EVALUATION	25	0	0	25	26	0	0	26	68	0	0	68
AUDIT	0	0	0	0	0	0	0	0	0	0	0	0
MEMBERSHIP FEES	40	0	0	40	42	0	0	42	44	0	0	44
CONTINGENCY	21	11	8	39	14	10	15	39	17	11	21	49
GRAND TOTAL	711	361	277	1349	485	344	509	1338	594	367	737	1698
TOTAL DA FUNDS		1072				829				961		

Best Available Copy

514

Table I, cont.

	FY 1	IC	PL 480	TOTAL	FY 2	IC	PL 480	TOTAL	FY 3	IC	PL 480	TOTAL
PERSONNEL	350	[illegible]	477	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Supervisory Staff	341	0	0	341	480	0	0	480	1747	0	[illegible]	[illegible]
Field Staff	0	41	457	498	[illegible]	[illegible]	[illegible]	[illegible]	0	712	[illegible]	1910
Consultant	9	0	1	[illegible]	[illegible]	[illegible]	0	18	34	0	0	34
EQUIPMENT AND FREIGHT	0	0	2	2	[illegible]	[illegible]	0	[illegible]	[illegible]	25	[illegible]	[illegible]
Vehicles	0	0	0	0	[illegible]	[illegible]	0	[illegible]	[illegible]	0	[illegible]	[illegible]
Instructional Mat	[illegible]	0	2	2	[illegible]	[illegible]	0	0	0	0	[illegible]	[illegible]
Off of Tech Equip	[illegible]	0	0	0	[illegible]	[illegible]	0	0	0	0	41	41
Training Equip	0	0	0	[illegible]	[illegible]	[illegible]	0	[illegible]	25	25	[illegible]	[illegible]
[illegible] SUPPLIES	79	[illegible]	137	261	[illegible]	[illegible]	[illegible]	500	127	229	[illegible]	[illegible]
Feedings	79	37	127	243	46	37	142	235	127	229	[illegible]	[illegible]
Total Sites	0	0	9	9	0	0	9	9	0	0	[illegible]	[illegible]
Mat. for Outreach	0	0	6	6	0	0	6	6	0	0	25	25
TRANSPORT ITEM	[illegible]	[illegible]	25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TRAINING	[illegible]	0	[illegible]	[illegible]	10	0	10	79	178	0	364	[illegible]
Overseas	27	0	0	27	17	0	0	10	178	0	0	[illegible]
In-Country	[illegible]	0	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	0	0	364	[illegible]
CREDIT FUNDS	0	0	191	191	0	0	299	299	0	0	648	648
VEHICLE OPER/MAINT	[illegible]	91	0	104	13	96	0	109	87	434	[illegible]	[illegible]
Oil/Maint	17	91	0	104	13	96	0	109	87	434	0	[illegible]
ADMINISTRATIVE COSTS	5	81	0	86	5	90	0	95	20	411	[illegible]	[illegible]
Office Rental	0	32	0	32	0	33	0	33	0	150	[illegible]	150
Office Supplies	0	21	0	21	0	22	0	22	0	101	0	101
Office Maint.	1	7	0	[illegible]	0	12	0	12	0	50	0	50
Communications	5	12	0	17	5	13	0	18	20	66	0	86
Misc.	0	9	0	9	0	10	0	10	0	44	0	44
IICA Overhead	53	42	104	199	69	46	132	246	281	199	395	875
EVALUATION	[illegible]	0	0	29	60	0	0	60	208	0	0	208
AUDIT	0	0	0	0	79	0	0	79	79	0	0	79
MEMBERSHIP FEES	46	0	[illegible]	46	43	0	[illegible]	43	200	0	[illegible]	[illegible]
CONTINGENCY	17	12	29	58	25	17	37	75	94	56	110	260
GRAND TOTAL	594	401	1002	[illegible]	352	441	1268	2561	2226	1913	[illegible]	[illegible]
TOTAL DA FUNDS		995				1293				5140		

Best Available Copy

Table II

ESTIMATED BUDGET BY ACTIVITY ($000)
COFFEE REVITALIZATION PROJECT

	SEEDLING PRODUCTION	TECHNOLOGY TRANSFER	CREDIT (PROV OF INPUTS)	FIELD TESTING OF TECHNOLOGY	INSTITUTIONAL SUPPORT	TOTAL
PERSONNEL	359	2836	460	95	30	3780
Expatriate Staff	0	1402	345	0	0	1747
Local Staff	335	1404	100	50	30	1914
Consultant	24	30	15	15	0	84
EQUIPMENT & FREIGHT	0	231	31	0	0	262
Vehicles	0	140	0	0	0	141
Construction Mac	0	0	31	0	0	31
Pilote Zone Equip	0	41	0	0	0	41
Training Equip	0	50	0	0	0	50
COMMODITIES/SUPPLIES	895	0	0	38	0	933
Seedlings	870	0	0	0	0	870
Trial Plots	0	0	0	38	0	38
Mat. for Outreach	25	0	0	0	0	25
TRAVEL PER DIEM	30	180	25	20	13	268
TRAINING	0	502	0	0	0	502
Overseas	0	138	0	0	0	138
In-country	0	364	0	0	0	364
CREDIT FUNDS	0	0	648	0	0	648
VEHICLE OPER/MAINT	80	300	54	33	30	497
ADMINISTRATIVE COSTS	63	280	43	43	22	431
IICA OVERHEAD 12%	169	519	151	24	11	875
EVALUATION	50	90	38	15	15	208
AUDIT	23	40	10	3	3	79
MEMBERSHIP FEE	110	110	0	0	0	220
CONTINGENCY 3%	53	153	44	7	4	250
TOTAL USAID	1812	5241	504	248	128	8933
IICA						
TECHNICAL ASSISTANCE	0	0	0	162	250	412
Expatriate Staff	0	0	0	0	250	250
Local Staff	0	0	0	162	0	162
TOTAL IICA	0	0		162	250	412

Available Copy

53X

BUDGET NOTES

	Year 1	Year 2	Year 3	Year 4	Year 5	Totals
1. PERSONNEL	$510,251	$577,304	$697,412	$856,808	$1,109,229	$3,751,004
Expatriate	317,139	301,940	307,071	340,942	480,006	1,747,098
Proj. Coord.	97,345	89,484	86,389	100,059	158,938	532,215
Ext. Leader	81,836	78,562	81,739	89,167	121,052	452,356
Adm. Officer	68,128	67,765	70,433	76,167	95,756	378,249
Spec. Credit/Mktg	69,830	66,129	68,510	75,549	104,260	384,278
Local	178,112	259,364	373,341	497,866	611,223	1,919,906
3 Reg'l Agronomes	51,900	54,495	57,220	60,081	63,085	286,781
Asst. Agronome (1)	35,600	68,502	112,740	161,029	191,178	569,048
Radio Ext. Off.	25,530	26,807	28,147	29,554	31,032	141,070
Data Analyst	17,768	18,656	19,589	20,569	21,597	98,179
Secretary	11,791	12,381	13,000	13,650	14,332	65,153
Driver	7,133	7,490	7,864	8,257	8,670	39,414
Machine Operator	3,795	3,985	4,184	4,393	4,613	20,970
Clerk	3,795	3,985	4,184	4,393	4,613	20,970
Formateurs (2)	20,800	63,063	126,413	195,940	272,103	678,318
Consultants	15,000	16,000	17,000	18,000	18,000	84,000

3 persons/month/year

1) Assistant Agronomist - Year 1 = 4; Year 2 = 7; Year 3 = 11; Year 4 = 15; Year 5 = 17.
2) Formateurs - Year 1 = 16; Year 2 = 44; Year 3 = 84; Year 4 = 124; Year 5 = 164.

2. EQUIPMENT AND FREIGHT

a) Vehicles

1 administrative vehicle	15,000
5 field vehicles	125,000
	140,000

b) Construction Material

			Cost without INF	Cost with INF
Year 1 =	7 organizations	x $1,200	$8,400	$8,400
Year 2 =	8 "	x 1,200	9,600	9,900
Year 3 =	8 "	x 1,200	9,600	10,100
Year 4 =	2 "	x 1,200	2,400	2,600
Year 5 =				
		Total Cost:	$30,000	$31,000

c) Pilot Zone Equipment

	Year 1	Year 2
Office Equipment (2 zones)		
- Typewriters	4,000	0
- File cabinets	2,000	2,000
- Sets of desks and chairs	3,000	1,000
- Sets of portable computers	6,000	3,000
Communication Equipment (radio)	3,000	7,000
Agroextension Equipment		
- Soil test kits	1,000	1,500
- Clysimeters (slope)	800	800
- Altimeters (altitude)	400	1,200
- Miscellaneous (ag. research equip.)	-	3,300
	20,200	19,800

Total Year 2 with INF = 21,000

d) Training Equipment

Video Studio Equipment

- 3 radio recorders	$2,995
- Turntable	525
- Stereo mixer	2,150
- 3 cassette duplicators	3,000
- 2 electromixers	250
- 2 speakers	450
- Accessories	500
- Studio/construction	4,000
- U.P. Supply	2,400
- Battery (video)	50
- AC adapter	50
- VCT- tripod.	93
- Elec conditioner	110
- 3 video cassette recorders	3,940
- Video camera recorder	690
- Triniton display unit	515
- Cassette players	1,249
- Carrying case	70
- Purchase and installation of 4 A.Cs.	4,000
- Miscellaneous	3,000
TOTAL	$30,037

55X

3. OTHER EQUIPMENT

- Video cassettes	10,000 (1,250 video cassettes @ $8.00)
- 3 sets of cameras and projectors	5,000
- 200 sets of slides	1,000
- Miscellaneous (film process)	4,000
SUBTOTAL	50,000

4. COMMODITIES AND SUPPLIES

a) Seedlings

	Cost without INF	Cost with INF
Year 1 - 240,000 x 17 c	40,800	-
Year 2 - 588,000 x 17c	99,960	105,000
Year 3 - 1,018,800 x 17c	173,196	191,000
Year 4 - 1,261,441 x 17c	214,445	248,000
Year 5 - 1,380,958 x 17c	234,763	285,000
		869,800

b) Trial Plots

Year 1 - 1,000 x 6 ha	6,000	6,000
Year 2 - 1,666 x 6 ha	7,000	7,000
Year 3 - 1,666 x 6 ha	7,000	8,000
Year 4 - 1,666 x 6 ha	7,000	8,000
Year 5 - 1,666 x 6 ha	7,000	9,000

c) Material for Outreach

Year 1 - 100,000 x .0221c	2,000	2,000
Year 2 - 240,000 x .0221c	5,000	5,000
Year 3 - 240,000 x .022c	5,000	6,000
Year 4 - 240,000 x .022c	5,000	6,000
Year 5 - 240,000 x .022c	5,000	6,000

5. PER DIEM

a) Years 1 thru 4

Project Director	8 days/mo. x $43 x 12mos.	$4,128
Extension leader	15 days/mo. x $43 x 12mos	7,740
Credit specialist	15 " " " "	7,740
Radio Ext. specialist	10 " " " "	5,160
Peasant Org specialist	10 " " " "	5,160
Plant specialist	12 " " " "	6,192
2 regional agron.	4 " " " "	2,064
1 regional agron.	9 " " " "	4,644
Regional Ass. agr.	9 " " " "	4,644
TOTAL	(1,104 days)	47,742

Total cost with INF: Year 2 = 50; Year 3 = 53; Year 4 = 55

b) Year 5

Because of final evaluation and more data collecting in the final year, additional days of travel will be needed by project core extension staff: total cost (8 days x 43 x 12) + 84,128 + 47,742 = 51,870 with INF = 62,000.

6. TRAINING

	Year 1	Year 2	Year 3	Year 4	Year 5
Training material	$12,000	$28,500	$40,500	$30,000	$30,000
-Pilot zones	(800x3sessionsx5)	(190Jx30x5)	(2700x30x5)	(2000x3x5)	
	1,000	2,400			2,400
-Outreach	(200x1sx15)	(480x5)	2,400	2,400	2.400
Broadcasting (Radio Ext. 15m/day= $2,089/month	25,000	25,000	25,000	25,000	25,000
National conference	30,000	-	-	-	-
Oversea training	40,000	20,000	40,000	30,000	8
Extension materials		15,000	-	-	
Total:	108,000	90,900	107,900	87,400	65,400
Total cost with INF	108,000	96,000	119,000	100,000	79,000

7. CREDIT

	Fertilizers	Fungicides	Sprayers	Total	Costs w/inf.
Year 1	$11,621	$405	$2,000	$11,621	$11,621
Year 2	35,789	1,764	3,500	41,053	43,105
Year 3	85,217	4,709	5,000	94,226	103,884
Year 4	151,437	9,126	5,000	165,563	190,728
Year 5	226,560	14,577	5,000	246,137	298,810
Total					$648,148

8. VEHICLE OPERATION & MAINTENANCE
(6 new vehicles plus 11 IICA vehicles to be used for the project)

	Gas	Insurance	Tires	Repairs	Total Costs w/inf.
Year 1	20	13	12	45	90
Year 2	21	15	11	48	95
Year 3	22	16	11	50	99
Year 4	23	17	12	52	104
Year 5	25	18	13	53	109
Total					$497

57X

9. ADMINISTRATIVE COSTS	77	90	83	86	95	431
Office rental	27	28	30	32	33	-
Office supplies	18	20	20	21	22	-
Office Maintenance	6	18	7	7	12	-
Communication	18	16	17	17	18	-
Miscellaneous	8	8	9	9	10	-

10. IICA OVERHEAD (12%)

Year 1 - 133
Year 2 - 132
Year 3 - 165
Year 4 - 199
Year 5 - 246
Total - 875

11. EVALUATION

Year 1 - monitoring surveys (4 months)	25,000
Year 2 - monitoring surveys (4 months)	26,000
Year 3 - Mid-term evaluation 7 p/month	68,000
Year 4 - Monitoring surveys (4 months)	29,000
Year 5 - Final evaluation 6 p/month	60,000
Total w/inf.	$208,000

12. AUDIT

Year 5 - Final audit $79,000 w/inflation

13. MEMBERSHIP FEE

Year 1 to 5 - $40,000 with 5% inflation/year = $220,000

14. CONTINGENCY (3%)

Year 1 to 5
Total $260,000

VI. ADMINISTRATIVE ANALYSIS

The administration of the project involves an array of local organizations, with overall management authority held by one principal international organization. Certain specific project needs for technical assistance, primarily short-term such as monitoring, evaluation and audit, will be identified and contracted separately by USAID with project funds outside the IICA grant.

A. Inter-American Institute for Cooperation on Agriculture (IICA)

The project will be authorized by the USAID/Haiti Mission Director. Project implementation will be though a central management entity, the Inter-American Institute for Cooperation on Agriculture. IICA will provide financial, administrative, and managerial support to local level institutions. These local non-governmental organizations (NGO's) will have direct contact with coffee farmers in the project zones, the primary beneficiaries of the project.

IICA is a member institute of the Organization of American States, and maintains a permanent office in Port-au-Prince. As such, it is well known by the GOH. It will provide the GOH, specifically the Ministry of Agriculture and Natural Resources (MARNDR) with updated reports of all project activities. AID's obligating instrument will be a Handbook 13, Chapter 5 Grant to IICA as a Public International Organization.

USAID/Haiti will designate a project officer from the Agricultural Development Office to monitor project progress, assure compliance with the terms and conditions of the grant, and assist the implementing organization with any problems and any policy or procedural issues that may arise. The USAID project officer will coordinate the two external project evaluations.

In summary, USAID's responsibilities for the project will be to:

- Authorize the project and establish contractual agreements to assure project implementation;
- Provide dollar funding as specified in the grant;
- In cooperation with the GOH Management Office for PL 480 local currency, assure provision of PL 480 local currency to supplement dollar funding;
- Monitor project operations to ensure that project implementation is in accordance with the terms and conditions of the grant and the local currency agreement;
- Undertake an annual assessment of project progress; and
- Initiate and supervise the necessary evaluations and audits as called for in the grant.

59X

B. Project Management

IICA will establish a Coffee Advisory Committee (CADCO) to provide general policy direction and coordinate project implementation. The CADCO will consist of NGO representatives and a farmer from each pilot zone and the national outreach program, a representative each from ASDEC, the MARNDR, USAID and two IICA project staff and one or two senior coffee experts. The functions of CADCO will be to advise the project management on technical, political, economic and social matters related to the project and to coordinate with other coffee activities in Haiti. CADCO will meet at least once a quarter. The Committee will serve in an advisory capacity only and is not an executive steering body.

As principal implementing agent, IICA's main responsibilities will be to:

- Provide overall direction of project implementation activities;
- Prepare and submit to USAID annual work plans and budget estimates for project operations;
- Effect the procurement of supplies, equipment, services and commodities necessary for project implementation;
- Prepare and submit the required technical, financial and progress reports as called for in the grant.

IICA will also be responsible for administering project credit funds as described under the Project Description (III.D.2.d.). This function is likely to constitute the administration of two prospective financial accounts:

- A production loan fund housed in an interest bearing account at a financial institution in Port-au-Prince over which IICA has direct management and financial control. Funds from this account will be made available to local NGO's to assist farmers in financing coffee inputs.
- Later in the project (Year 3 or 4), to facilitate the planned transition to commercial credit, a guaranty fund housed as a Trust Fund Account at a Haitian financial institution may be established by IICA, as needed, to cover any loan defaults incurred by project beneficiaries towards other financial institutions.

Because the depth of the need for credit to finance required inputs under the project cannot be accurately determined in advance, IICA will, during the first year of the project, design a specific credit mechanism with the local organizations in the pilot zones, based on empirical evidence of the actual need for credit. IICA will consult with USAID as it develops a proposal for credit activities under the project and will submit this proposal to USAID for review and approval. USAID and the GOH Management Office will approve the proposed credit arrangements before funds are disbursed for credit.

C. Institutional Arrangements Between IICA and Local Organizations

The project will be implemented at the local and farmer level primarily through local organizations supported technically, administratively and financially through IICA. IICA will sign contracts with these local organizations estimated to number about 30 over the life of project. USAID approval of these subcontracts will not be required.

Local organizations may include coffee cooperatives, Haitian PVO/NGO, foreign based PVO's/NGO's operating in coffee areas, and in rare instances, local groups without a registered legal identity. In the latter case, contracts will depend entirely on the good will of each party.

IICA will not be expected to create local organizations under the project, but rather will provide institutional support to existing local NGO's. These entities have regular contact with area farmers at the grassroots level and are in the best position to provide the encouragement, guidance and supervision necessary for the successful introduction of new coffee technology. They can perform a critical function at the farm level which neither IICA nor USAID could provide. USAID has proven successful implementation experience through local organizations in two agricultural projects, in operation since the early 1980's. This project builds on those successes, which include a project implemented by IICA. Thus IICA enters the project with relevant field experience with this implementation mode.

Table III shows an illustrative list of collaborating organizations, indicating the locations and types of activities in which they might be involved.

61X

Table III. Possible Collaborating Organizations

ACRONYM	NAME	LOCATION			SERVICES				
		B	J	O	S	E	T	R	C
ADRA	Adventist Development and Relief Agency	x	x	x			x	x	x
ANK	Afe Neg Konbit			x			x		
AEDC	Alliance pour l'Enfance et le Developpement Communautaire	x		x	x	x	x	x	x
AS	Armee du Salut			x			x	x	
ANSH	Association Nationale des Scouts d'Haiti		x	x			x		
AEM	Association des Eglises Missionnaires		x			x			x
CP	Caisse Populaire		x						x
CECOPASE	Centrale de Cooperatives du Sud-Est		x		x	x	x	x	x
CECI	Centre Canadien d'Etudes et de Cooperation Internationale			x			x		
CHPF	Centre Haitien pour la Promotion Feminine			x			x		
MCC	Comite Central Menonnite			x			x	x	
CHADEV	Comite Haitien de Developpement			x			x		
CBP	Comite de Bienfaisance Pignon			x			x		
CPB	Comite Paroissial de Bainet		x				x		
COHAN	Cooperation Haitiano-Neerlandaise		x	x			x		x
CARE	Cooperation for American Relief Everywhere			x					
x									
NOCAT	Cooperative Nocat		x		x		x	x	x
CODEVA	Coude à Coude pour le Developpement Valleen		x		x	x	x	x	x
CRS	Catholic Relief Service		x	x			x		
EWDH	Eglise Wesleyenne d'Haiti		x				x		
IMO	International Mission Outreach								
x	x								
MEDA	Mennonite Economic Development Associates	x		x	x	x	x	x	x
MBCH	Mission Baptiste Conservatrice d'Haiti								
x	x								
MP	Mission Possible			x			x		
PADF	Pan American Development Foundation	x			x				
PIP	Plan International de Parrainage		x				x		x
RT	Reboisement Total			x			x		
SCH	Service Chretien d'Haiti		x				x	x	x
UNHAD	Union Haitienne de Developpement	x			x		x	x	x
UNAPEL	Union des Assoc.pour la Prom. de l'Elevage			x			x	x	x

KEY:

Location: B = Beaumont, J = Jacmel, O = National Outreach

Technical Services:
S = Seedling production
E = Variety Trials
T = Training
R = Radio Extension
C = Credit

VII. IMPLEMENTATION PLAN

This is a five-year project, scheduled to begin in early calendar year 1990, with a planned Project Assistance Completion Date (PACD) of February 28, 1995. The implementation mode of this project will be a grant to IICA as a public international organization (PIO). It has been determined during the design process that IICA was the most qualified and suitable implementing agency, and the PIO grant mode was selected in lieu of a competitively awarded contract. Consequently, IICA was consulted closely during the preparation of the Project Paper and independently developed its own written project proposal, emphasizing implementation methodology, a generalized annual work plan and a detailed budget. IICA has suggested that the project be given a Creole name for easy identification by the farmers and local organizations and has proposed the title Pwoje Plante Kafe (PPK). This name captures the essence of the project, and its meaning is equally clear to French and English speakers.

Once the grant to IICA has been signed, IICA can complete recruitment of the one remaining member of the project team not already on the staff, the Project Director/Coffee Production specialist.

During the first three months of the project, the IICA project staff will finalize the operational design, begin recruiting and training the field extension staff and select an initial group of local organizations with which to work. During the same period, the project team will initiate the baseline monitoring surveys.

A major activity in the first half of year one will be the identification of economically viable stands of already-outplanted rust tolerant varieties in the pilot zones being targeted by the project. At the same time, a socioeconomic baseline study will be initiated to determine the situation at the outset of the project and to identify the most qualified and interested local organizations through which to work to implement the project.

First year activities will also focus on the identification of suitable rust tolerant coffee varieties for testing in Haiti and the establishment of test plots for these varieties in the two pilot zones. Selected test plots and varieties will become future sources of improved seed. IICA will develop for USAID approval a proposal to provide credit to farmers, based on a determination of the level of credit needed and the optimum mechanism to administer it. IICA will work with local organizations and farmer representatives to identify credit requirements under the project.

The establishment of nurseries will be initiated while varietal field testing is beginning. There are suitable tolerant varieties that have been widely tested in Central America, and varietal selection can be made with which to begin based on this research. Given the seasonality of outplanting coffee seedlings, an intense project effort will be made to begin initial nursery operations immediately at the project's outset, to permit initial seedling distribution in September/October, 1990.

63 X

By the second year, all major elements of the project should be in place and functioning. Participating NGO's and pilot farmers will have been selected and training of personnel begun. Extension and technology transfer activities will be in full operation, and the farmer training programs will be well established.

Implementation Schedule

Activity	1990 J	F	M	A	M	J	J	A	S	O	N	D
- PP authorized		F										
- Grant Agreement signed with IICA		F										
- Senior Project Staff hired & in place			M									
- First year workplan & budget prepared and approved		F--	-M									
- Initial selection of local organizations made in pilot zones		F-	----	-A								
- Trainer-training conducted			M									
- 1st year farmer extension and training materials finalized & training initiated				A								
- Farmer needs/participation survey (baseline study)			M-	----	----	----	----	----	----	----	----	-D
- First radio extension emissions made			M									
- Establish Coffee Coordinating Committee (CADCO)	J-	----	-M									
- Initial commodity order placed		F										
- Coffee nurseries established in pilot zones				A								
- First coffee seedlings planted												
- Credit policies, strategies & procedures finalized					M--	-J						
- Refine and finalize research priorities & strategies		F-	----	-A								
- Research trials initiated					M							
- First national coffee seminar (credit)						J						
- First annual project assessment												D

No.	Activity (By Calendar Year)	Year II				Year III				Year I			
		1	2	3	4	1	2	3	4	1	2	3	4
1.	Annual work plans submitted/approved	X				X				X			
2.	National Coffee seminar		X									X	
3.	Haitian/Promecafe Coffee Conference							X					
4.	Plant Testing and Propagation Activities												
4.a	Selection of participating local institutions/training	X					X				X		
4.b	Selection of sites for test plots	X				X				X			
4.c	Research test results reviewed, program modified	X				X				X			
4.d	Demonstration plots established					X				X			
5.	Training and Extension Activities												
5.a	Staff re-training		X	X				X	X			X	X
5.b	National outreach program												
	- field courses		X	X				X	X			X	X
	- radio extension program continues		X	X				X	X			X	X
6.	Input Supply and Credit Activities												
6.a	Credit situation evaluated and procedures modified		X					X			X		
6.b	Guaranty fund procedures developed and Haitian financial institutions enlisted						X						
6.c	Input supply options evaluated							X					

65X

No.	Activity (By Calendar Year)	Year II 1	Year II 2	Year II 3	Year II 4	Year III 1	Year III 2	Year III 3	Year III 4	Year IV 1	Year IV 2	Year IV 3	Year IV 4	Year V 1	Year V 2	Year V 3	Year V 4
1.	Annual work plans submitted/approved	X				X				X				X			
2.	National Coffee seminar		X								X						
3.	Haitian/Promecafe Coffee Conference							X									
4.	Plant Testing and Propagation Activities																
4.a	Selection of participating local institutions/training	X				X					X				X		
4.b	Selection of sites for test plots	X				X				X							
4.c	Research test results reviewed, program modified	X				X				X				X			
4.d	Demonstration plots established					X				X				X			
5.	Training and Extension Activities																
5.a	Staff re-training	X	X			X	X			X	X			X	X		
5.b	National outreach program																
	- field courses	X	X			X	X			X	X			X	X		
	- radio extension program continues	X	X			X	X			X	X			X	X		
6.	Input Supply and Credit Activities																
6.a	Credit situation evaluated and procedures modified	X				X				X							
6.b	Guaranty fund procedures developed and Haitian financial institutions enlisted					X											
6.c	Input supply options evaluated					X											

No.	Activity	Year II				Year III				Year IV				Year V			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
7.	National Outreach																
7.a	Review/modification Training content	X	X				X	X			X	X			X	X	
7.b	Trainers retraining	X					X				X				X		
7.c	Development of national media program/review and modification	X	X			X	X				X	X			X	X	
8.	Reports/Evaluations																
8.a	Quarterly financial report to USAID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8.b	Project progress reports to USAID	X		X		X		X		X		X		X		X	
8.c	USAID project assessment			X								X					
8.d	Evaluations							X							X		

67

VIII. PROCUREMENT PLAN

The central management team for the project will be procured through a grant with the Inter-American Institute of Agricultural Cooperation (IICA) in accordance with Handbook 13, Chapter 5. IICA will prepare and execute sub-agreements with local organizations (PVO's, NGO's and cooperatives) to assure delivery of project services to the Haitian farmer. USAID will not be a party to or approve these agreements. Certain short-term technical assistance needs (evaluations and audits) will be procured separately through a combination of Personal Services Contracts, buy-ins to centrally funded projects or IQC's (both AID/W contracting actions). Procurement of technical assistance outside of the grant will be organized to maximize use of USAID/Haiti's contracting authority.

IICA will perform all commodity procurement. Under a Handbook 13 grant to a Public International Organization where A.I.D. is not the sole contributor, procurement rules and procedures of the grantee are followed. Therefore, IICA rules will apply for all commodities and most of the technical assistance to be procured. For the technical assistance contracting done directly by USAID for monitoring, evaluations and audits, the authorized source/origin is AID Geographic Code 000 (U.S.) and local.

The following commodity procurement is expected, using DA funds.

ITEM	QUANTITY	SOURCE/ESTIMATED VALUE US	HAITI
Vehicles			
Admin. vehicle	1	15,000	
4 x 4 Field vehicles	5	125,000	
Office Equipment and Supplies			142,000
Audio/Video equipment		25,000	25,000
Coffee Inputs and Supplies			
Plastic sacs (5.5 million)			40,000
Fertilizers (1053 tons)			576,000
Pesticides (7.3 tons)			57,000
Seeds (2.3 tons)		31,000 (3rd country)	
Construction Materials			31,000
Total		196,000	830,000

Pesticides (Fungicides and Insecticides) to be used in the project are cleared for use in the Environmental Assessment (Annex E).

68X

IX. SUMMARY ANALYSES

A. Agronomic Analysis Summary

Due to the recent discovery of coffee leaf rust, Hemileia vastatrix Berk. & Br. in the areas of Pilate and Dondon, in March 1988, any program for sustaining coffee activities in the zones of high production potential has to be viewed under a new, more urgent perspective.

A. Typica, the most common variety in Haiti, is the most susceptible of all Arabica coffees grown, and total defoliation resulting from rust is not uncommon. This is, of course, particularly true for old exhausted plantings found in marginal areas and supported with minimal management. In terms of coffee farmers, the smallest farmers will probably be hit the worst, and predictably many will simply lose their trees. This is because they have the oldest and weakest trees in the country. Proper management has not been a primordial concern to these farmers primarily due to a number of socioeconomic reasons.

First hand observations in the areas of Pilate and Dondon where rust was first observed, have confirmed that the rust is spreading very rapidly. Follow up surveys by IICA in late 1988 demonstrated that the rust was advancing rapidly through the northern areas already affected. The sporulation on the trees' leaves was virulent, and leaf drop was already occurring. Under humid conditions, even young Typica plants are heavily damaged from rust, portending serious times ahead for the northern coffee sector. The assumption is that rust will spread to all coffee areas on the island of Hispaniola within a period of a few years at most.

A large percentage of existing Haitian coffee plantings are now physiologically exhausted and will hardly respond to intervention with improved technologies. In all existing marginal Typica stands, chemical rust control is not economically viable at this late date. Efforts for these stands should be concentrated on the most basic maintenance only, with a replacement program envisaged, with either improved Caturra as available, or newly developed and Haitian adapted rust-resistant varieties. The stands at lower elevations would also be better replaced with a more adaptable cash crop such as cocoa or fruit trees.

Undoubtedly the best disease control would be obtained with fully rust resistant varieties. Particularly since the appearance of rust in Brazil, efforts have been under way to develop rust-resistant varieties. However, at this stage there are no commercially certified fully rust resistant varieties available for immediate nursery planting. Caturra and Catuai, if properly managed, can mitigate the threat which coffee leaf rust poses to the industry. These varieties can be utilized as part of the first step to sustain, and then revitalize, zones of high production potential in the coffee sector.

In a coffee project the "key player in the game", from the coffee agronomist's standpoint, is inevitably the coffee tree. It is therefore of the utmost importance that the coffee tree be properly treated, in terms of where and how it is planted, and how it is subsequently managed. In this project, a technological package has been designed for extension in areas where the natural resources and the soils are optimal. This will allow for the full genetic potential of the material to develop, in terms of productivity and quality of the beans. The technological package for rust control involves the use of the most rust tolerant varieties presently available, combined with good management practices of fertilization to maintain the trees in strong physiological condition, pruning, shade management for humidity control, and use of fungicides when infestation becomes severe.

Among the improved varieties, Bourbon is equally as susceptible as Typica, while the Caturra, Catuai and Catimor have some tolerance for rust. Particularly with Caturra, if properly managed with all the required inputs of fertilizers and phytosanitary treatments, rust control may be economically feasible.

There are very few areas in Haiti where there are no limitations or only moderately limiting factors for growing Arabica coffee. If it is not the rainfall or the altitude, there will be more or less serious constraints with the soil, either physically on the nutrient level, or as a result of the topography.

Coffee technology in Haiti is at a very low level, both in terms of inputs, as well as management. Due to the lack of a long-term coffee policy, most coffee technicians, some of whom have been trained outside the country, are not up to date on improved coffee technologies and management techniques. Haiti is one of the few coffee growing countries which has not switched from the Typica variety to more disease adapted and higher yielding varieties. For this reason, the technology to accompany these new varieties is practically non-existent in Haiti.

The new varieties require more attention, more inputs, and need closer spacing, which in turn is related to the pruning system to be adopted. The strategy to be adopted in the project is to work with the best of the improved rust tolerant varieties and train farmers in proper management techniques to get the most production and best quality out of their trees. If this technology transfer strategy is properly implemented in the zones of highest production potential in southern and south-central Haiti, the future of Haitian coffee production will be assured. If not, Haitian coffee may follow the route of 19th century Java and Ceylon after the invasion of rust in those countries. Both countries essentially lost their coffee industries.

70X

During the period of 1987-89, about eight million seedlings of primarily Caturra were planted in good Arabica growing areas. Several areas of concentrated plantings include Baptiste (280,000), the southern peninsula (290,000), and Jacmel at higher altitudes (100,000). High concentrations and easily accessible areas planted with these varieties should receive immediate attention. With the transference of high technology and management, these newly planted Caturra stands could be saved. As part of the technological packages being extended, low toxicity copper sprays should be applied by trained local technicians for use in the Caturra and Catuai stands. In some areas where economically important commercial stands exist and in which rust may be more endemic, additional punctual applications of copper spray (and possibly other pesticides for rust and other very serious diseases) will be needed. This will increase the costs of production on these farm stands, though the returns on properly managed coffee stands will warrant the investment. With the adaptive testing, nursery plantings, and ultimate extension of rust-resistant varieties over the long-term, phytosanitary costs should be reduced, as emphasis on improved cultural techniques coupled to the improved varieties will take precedence.

B. Institutional Analysis Summary

The evolution of the project design since the PID has resulted in more emphasis being placed on production, rather than marketing or institutional strengthening. The shift towards a highly pragmatic approach to technology transfer versus emphasis on an institution building activity supported by production activities is necessary now that the full implications of the coffee leaf rust threat to Haiti's industry are apparent. Haitians institutions which can most effectively participate in the project to help realize this objective will be supported.

The most appropriate institution to implement the project is the IICA, an international agricultural research organization based in San Jose, Costa Rica, with a permanent office located in Port-au-Prince. As an international public organization, IICA/Haiti is closely linked to IICA operations throughout Latin America and the Caribbean and can draw on the organization's many years of experience in agricultural research and development in these areas.

For a number of years, IICA has operated a coffee research facility in Costa Rica where it has experimented with ways to control coffee leaf rust and the development of rust resistant varieties. This program has been instrumental in the development of the most resistant varieties currently available. IICA/Haiti will be able to draw on the expertise available at the coffee research facility as well as make use of the plant materials being developed there.

IICA's direct experience in Haiti will also be of significant benefit to the project. Its swine repopulation project has given it a strong knowledge of Haiti's rural areas and a wide range of contacts with local

organizations and with farmers throughout the country. The field extension and farmer training components of that activity will be directly relevant to the extension tasks IICA will have under the coffee project.

The project will be directed from IICA/Haiti's headquarters in Port-au-Prince. Although the Representative of IICA in Haiti will be charged with executive oversight of the implementation of the project, the senior technical member of the IICA project staff responsible for the day-to-day operation of the project will be Project Director, who will also serve as the main liaison with USAID/Haiti. The next ranking member of the IICA team is the Field Coordination Officer (see IICA Project Organization Chart, Figure II). One of the two top positions, preferably the Project Director, will be filled by an experienced coffee agronomist who speaks English as a native language and can prepare status reports to USAID/Haiti. Linguistic requirements may complicate recruitment, since Spanish is IICA's main working language, and both French and Creole will be required to communicate effectively with the participating local organizations. However, IICA already has on its Haiti staff all permanent staff of the project team except the coffee production specialist and can cover the language requirements, except for technical drafting skills in English below the level of the IICA Representative.

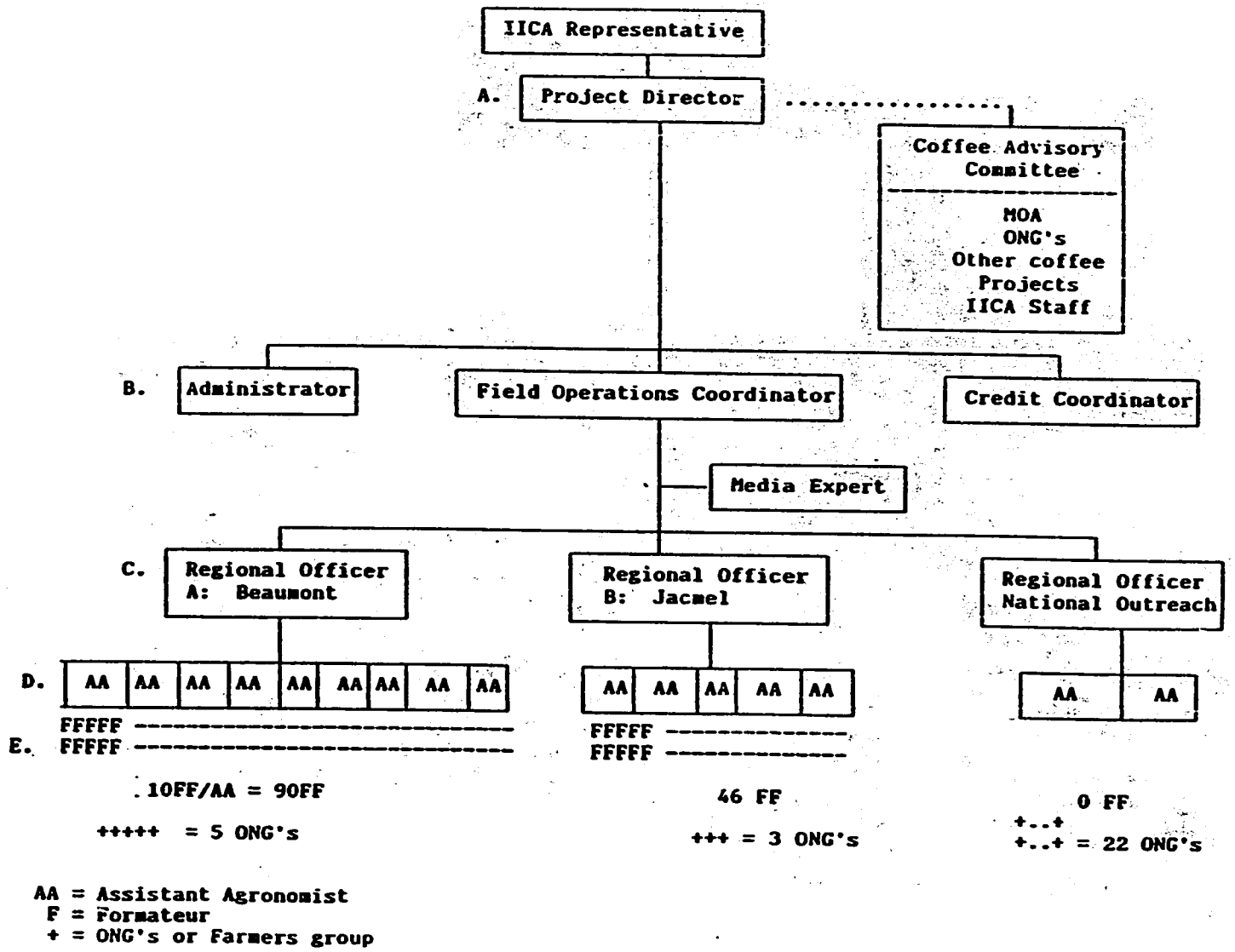
Institutional arrangements will be arranged between IICA and local organizations for the channeling of project services to member coffee farmers. Thus, most project activities will consist of interactions between IICA and local organizations. These organizations include: (a) local grass roots organizations; (b) Haitian PVOs supporting local organizations; and (c) private cooperatives.

An implementation model of a central management organization with substantial technical and administrative skills providing assistance to local level organizations, which in turn deliver project services to individual farmers, has been tested and proven in USAID-financed agricultural projects in Haiti. Projects implemented with this implementation structure include the Agroforestry Outreach Project (AOP), the Swine Repopulation Project, and the Targeted Watershed Management Project (TWMP). Both the AOP and Swine Repopulation Project worked with a relatively large number of local organizations.

The coffee project borrows heavily from the experience of the Agroforestry Outreach Project (AOP), especially that of the Pan American Development Foundation which works with about 85 local organizations.

72X

Figure II: IICA Project Organization Chart



Concerning project nursery activities, the tree seedling buy back program from the local organizations described in the PP's activities section (III.D.2), is patterned after successful experience in the AOP and should also work well in this project. Experience gained in the Swine Repopulation Project is also instructive; in this project, the participating local organizations found it in their interest to create the National Association of Livestock Producers (UNAPEL) which provides services to members in hog feed preparation and marketing. An interesting project outcome is that UNAPEL grew from the ground up rather than being founded top down.

The list of organizations that participate with AOP and Swine Repopulation has been reviewed for possible participation in the coffee project. The potential overlap with AOP is with only a few organizations. Potential overlap with Swine Repopulation, which was implemented by IICA, is somewhat greater. Neither of those two projects sought to work closely with cooperatives. CCH, the national association of coffee cooperatives which has been supported by USAID/Haiti, provides services to its member cooperatives. While CCH, as an association of cooperatives, will be involved with this project only indirectly (such as through sharing of information), overlap between CCH member cooperatives and IICA-selected local organizations that will participate in this project is very likely.

Institutional support will need to be provided in special areas of concern which may differ between organizations. The areas of concern are likely to be in managing finances and credit for nursery operations and input supply stores. IICA can draw support in institutional assistance from other than its own resources. Other donor projects, particularly the Canadian-financed project, will also provide institutional support to cooperatives in the Jacmel zone. The intent in all cases should be effective implementation rather than institution building as an independent objective.

IICA may collaborate with other international NGOs for support of local NGOs in specific areas. These international NGOs include: the Mennonite Economic Development Association (MEDA), the Société de Coopération Pour le Dédeveloppement International (SOCODEVI), and the Centre Canadien d'Etudes et de Coopération International (CECI). All these groups are currently, or will be, supporting local grass roots NGOs and/or cooperatives. Each of these international NGOs emphasizes institution building in their programs. There is therefore an opportunity for institutional collaboration between IICA and these institutions in support of achievement of project objectives.

Ideally, the project would draw on existing institutions to provide supporting services, primarily for credit operations and input supply. To date, there have been no significant commercial banking services available to the rural sector. Branch banks can be found only in the larger regional centers like Les Cayes, Cap-Haitian and Jacmel. Efforts at operating GOH supported rural lending institutions with donor support

74X

(including AID) have not been successful. A 1987 USAID rural credit report recommended that credit be evaluated and organized as needed by individual projects. It is thus necessary for the coffee project to set up its own credit arrangements. Likely credit arrangements are described in the section on provision of production inputs.

Project requirements for credit concern nursery operations for seedling production, fertilizers, fungicides and applicators. Nursery operations will be handled basically as advances repaid through seedling buy-back by IICA. This procedure was well tested by PADF in the Agroforestry Outreach Project.

Assuring grower access to other inputs, primarily fertilizers and fungicides, will be more difficult. Although inputs can be locally sourced through one of at least three Haitian agricultural supply companies, none of these firms have more than a few branch centers for distribution outside Port-au-Prince. The most suitable Haitian project examples to supply farmers with production inputs lie outside the USAID portfolio with organizations like the Mennonite Economic Development Association and the German organization, GTZ. These and other organizations have experience with input supplies stores managed by local organizations.

A long term objective for credit is that local organizations "graduate" with an adequate project track record and experience to obtain lines of credit through commercial sources. The project should not ignore the long-term objective. The project should continue initial efforts already made by USAID to investigate possibilities for establishing a guaranty fund for loans to the agricultural sector by the private banking sector. However, to date there has been no significant commercial banking investment in Haiti's rural agricultural sector. A donor funded trust or guaranty fund may encourage a commercial bank to provide credit to participating NGOs and grass-roots level farmer organizations.

C. Social Soundness Analysis Summary

Three-quarters of Haiti's population live in rural areas, with annual population growth trends projected at over 2%. Annual outmigration over recent years has kept the rural population growth rate at 1.75%.

The rural countryside is occupied almost entirely by peasant households. Each peasant household is an independent unit of production and consumption which is "grounded" to various parcels of land through either secure or insecure forms of tenure rights. The latter range from outright ownership, to undivided collective ownership among siblings of parents' plots, down to a mini-spectrum of sharecropping and/or rental agreements for either private or state owned lands.

The primary enduring social unit of organization in rural Haiti is the household. Generally this will refer to a nuclear family group, though often this household may consist of an extended family of married siblings. Households are not fixed units in terms of their personnel, with residential affiliation changing with relative ease and frequency for all members of the family.

Over the last few decades, Haitian farming systems centered around households have proven less and less viable. The result of this has been the breaking up of family units and significant overall rural outmigration to Haitian urban centers and to North American cities.

There are numerous factors responsible for the decreased viability of Haitian farming systems. Among the key factors are: (a) a complex land tenure structure rooted in the destruction of the French plantation system of the 19th century which created a system based on families' cultivation of multiple minifundia at different elevations; (b) a land inheritance system which in successfully providing security for all offspring leads inevitably to increased fragmentation of households' already-subdivided agricultural lands; (c) the absence of technological innovations developed and adapted to increase agricultural productivity or contend with spreading erosion and overall degradation of the resource base; (d) the perennial lack of investment capital for rural areas from within the agricultural sector and extremely limited formal institutional credit availability at the national, regional, and local levels.

Production activities for traditional cash crops in Haiti are primarily the responsibility of men, though in coffee cultivation women do participate in sowing and harvesting. Women play a much greater role in the cultivation of garden crops which are commercialized. In general women do not play a major role in coffee marketing as they do for other food crops for which they are responsible for production. Nevertheless, some coffee cooperatives have 10% - 20% female membership.

Coffee has occupied a central role in Haitian farming systems over the last several hundred years. Coffee has been produced principally by small farmers, many of them producing in zones of limited production potential. The highest production zones have been in southern Haiti, though farmers throughout the country cultivate coffee. While coffee cultivation was never practiced solely because of the conservation benefits it renders to Haitian farming systems, it has proven to be an important stabilizing factor in peasant farming systems. Thus the role which coffee can play both as a cash crop and soil conservation crop has important implications.

Particularly in the zones of highest production potential, farmers continue to exhibit great interest in the cultivation of coffee. This is demonstrated by the MARNDR's recent extension of over 8 million coffee seedlings to farmers over the last two years, along with anecdotal evidence from local NGOs and PVOs that farmers continue to actively seek out improved coffee varieties for outplanting. It also is evidenced through conversations with Haitian coffee farmers in these zones.

76X

In recent years, many Haitian farmers in marginal production zones have moved from coffee production to food cropping as their productivity on a per hectare basis has not justified sustaining coffee production activities. There have been both benefits and costs to farmers from this adjustment.

On the one hand, farmers in marginal coffee production zones switching to food crops are able to realize short-term earnings to pay for family consumption needs above and beyond what is utilized for internal consumption. They also are able partially to finance education and ritual needs through food crop production.

On the other hand this production process is environmentally degrading, so that the long-term sustainability of food cropping, particularly on the most precipitous Haitian hillsides, is not secure. Nor are market prices always attractive, particularly in present circumstances; farmers may find themselves unable to sell surpluses of beans or peas when other farmers have produced similar surpluses. And most importantly, farmers are unable to sell future food crop production for advances through private sector coffee exporters and coffee speculators or other intermediaries; it is through advances against future coffee crops that coffee farmers have been able to cover subsistence needs, finance their childrens' educations, as well as their families customary religious needs.

The recent incursion of coffee leaf rust into Haiti has threatened the viability of the key cash cropping component of Haiti's farming systems. Haitian farmers do not now possess the necessary technologies to combat this incursion of coffee leaf rust which threatens to endanger their already precarious livelihoods. The development of appropriate technological packages for extension to as many farmers capable of adapting the technology into their farming systems as possible, is therefore essential in a project such as the one proposed.

The technology development and extension methodology selected in a project such as this one must not compromise on achieving its purpose by reducing the probability for successful transfer of the technological package to farmers. Successful technology transfer to a nucleus of innovative farmers in the zones of highest production potential will be of paramount importance to sustain coffee production in Haiti over the long-term. This is because once the technological package has proven to be adaptable to Haitian farming systems, coffee farmers will be likely to adopt the package. Lessons in successful technology transfer in Haiti based on this principle do exist.

Haiti is a country in which many projects have floundered because of design and implementation of inappropriate technology transfer strategies. An approach such as that proposed, which maximizes the probability of development of an adaptable technological package to increase yields and combat coffee leaf rust, is therefore considered to be socially sound.

To transfer technologies successfully in Haiti, the element of risk as it fits into farmer decision-making must be understood. Multicropping as a hedge against crop failure and low market prices for any given crop is the most prominent risk-aversion strategy applied by Haitian farmers.

The basic package identified for initial extension will be scaled to a level where farmers can relatively easily afford to risk the investment from the perspective of cash purchase or credit assumed. The package at its most basic can be extended onto virtually any size plot which falls under the agronomic criteria for acceptance. This package will undergo modification during the project, as adaptive testing programs are put in place and farmer feedback is achieved through project monitoring. Without this approach, technology transfer will not occur and Haitian farmers in even the most productive coffee zones will be forced increasingly to cultivate foodcrops in lieu of coffee, due to the destructive effects of rust, combined with ever-decreasing yields.

Successful transfer of the package depends upon adequate technical assistance. The number of farmers receiving the package should not therefore exceed the number which the technical assistance staff can adequately support.

The strategy taken to achieve this objective will be to reach qualified farmers by working through local organizations. This will offer advantages for channeling of packages to farmers, provision of technical assistance to participating farmers, and extension and management of credit funds. This will permit a high rate of successful technology transfer, whereby the technological packages will have been proven to be economically attractive to farmers by the end of the project. This will create a demonstration effect to other farmers, so that a foundation can be built to attempt a widespread revitalization of the zones of highest production potential -- those zones capable of supplying the coffee production to fill Haiti's coffee quota.

The design approach taken in regard to the participation issue is therefore pragmatic; the technology transfer issues surrounding coffee are already sufficiently complex without setting preconditions that the project work with either X number of local organizations or Y number of different farmers. That said, the project will nevertheless target farmers through whatever organizations are most capable of adhering to the project's technology transfer plan. A strategy of targeting organizations versus individuals is socially sound, due to the necessity for developing technical capacities at the local level so as to sustain coffee production after the project. Other economy-of-scale benefits at the institutional level are also realized. This strategy is similar to that of the agroforestry project (AOP) and will identify methodologies to include as many women farmers as possible in the project, if in fact upon closer analysis it is determined that special methodologies will be required.

78X

The overall approach is considered appropriate given the dimensions of the coffee rust problem coupled with the already significant production constraints facing Haitian coffee farmers. Making technology transfer work is therefore considered to be a socially sound project objective.

D. Economic and Financial Analyses Summary

1. Farm Level Analysis

The potential benefits which Haitian farmers can realize by participation in the Coffee Revitalization Project will depend primarily on these factors:

- the rate of adoption by farmers of improved coffee technology;
- the prices paid to farmers for their coffee crops; and
- the degree to which coffee rust reduces yield on traditional coffee plantations.

In preparing this analysis, every effort has been made to consider, within ranges of reasonable likelihood, the impact at the farm level of all of these factors.

In terms of the rate of adoption of technology three types of farmer participants have been defined:

- Those who apply optimal levels of inputs and care to their coffee plantations and obtain optimum yields and returns. Yields for these farmers are expected to reach 2,000 kg/ha when new coffee trees have matured.
- Farmers who adopt improved coffee management but use, on average, about half of the recommended inputs. They are referred to as Mid-level farmers. Average yields for these farmers are estimated to be 800 kg/ha for mature coffee trees.
- Farmers who apply only a small part of the recommended inputs, but do provide a moderate degree of plant care. These farmers are call Low-level input farmers and their yields are expected to average 500 kg/ha.

Returns to non-participants are based on two yield levels, 250 kg/ha, which has been considered the average yield under traditional farming methods in Haiti, and 125 kg/ha, a reduced yield that could be expected as a result of coffee leaf rust. This reduction of 50% from former levels is modest. In some areas of Haiti, three years after initial infestation coffee rust has affected yields by as much as 70%.

The analysis of costs and benefits for participant farmers is based on a three year program of replanting old coffee stands with new coffee seedlings, with .1 hectare being planted in each year.

Returns to the three types of participant farmers, as well as non-participants using traditional methods on .3 ha of old coffee stands, have been evaluated. Comparisons of these returns resulting from three possible coffee prices have been compiled in Table IV. The highest price, $1.90/kg, is slightly lower than the $1.98/kg which farmers were receiving for their coffee in 1988 (before the expiration of the International Coffee Agreement). It is reasonable to assume that when current international stockpiles of coffee are depleted that the price will return at least to its former level, perhaps within a year or two.

The lowest coffee price on Table IV, $0.90/kg, is the current low price being paid to farmers in Haiti. It does not seem likely that this price will prevail for very long. The third price used in the analysis is $1.40/kg. Halfway between the former price and the current one, it is considered to be a reasonable and conservative price for the mid and long term.

Table IV. Comparison of Returns to Project Participants and Non-Participants at Different Coffee Prices *

Type of Participant	Net returns at these coffee prices			Revenues less purchased inputs at these coffee prices		
	$0.90/kg	$1.40/kg	$1.90/kg	$0.90/kg	$1.40/kg	$1.90/kg
Optimal input	$138	$438	$737	$412	$713	$1,013
Mid-level input	$13	$133	$253	$151	$271	$391
Low-level input	$25	$100	$175	$108	$183	$258
Non-participants						
250 kg/ha yield without proj.	$46	$83	$121	$68	$105	$143
125 kg/ha yield without proj.	$23	$42	$61	$34	$53	$71

* For .3 hectares of mature coffee trees

The "net returns" columns (on the left in the Table) represent revenues received from coffee sales minus production costs. For project participants these include purchased inputs (fertilizer and fungicide) and labor. It is assumed that non-participants have no purchased inputs, and labor is used only for harvesting and processing. The three columns on the right of the table show revenues less purchased inputs only. Since labor on many farms is provided by family members and entails no cash outlays, this is probably a more realistic basis of comparison for many farmers.

80X

Because of investment costs and low yields of young trees, all of the participants will obtain lower net returns from their coffee in at least the first two years after planting. Net returns over six years, beginning with the first plantation of .1 ha are graphically represented in Figure III on the following page. Depending on coffee prices and yields on old plantations, in most cases optimal input farmers can expect to surpass net returns of non-participants in the third year after planting. Mid-level and Low-level input farmers must wait for the fourth or fifth year to realize positive returns. In the worst case scenario, at the lowest coffee price ($.90/kg), the Mid and Low-level farmers' income from mature coffee trees surpasses that of non-participants only if labor costs are not taken into account.

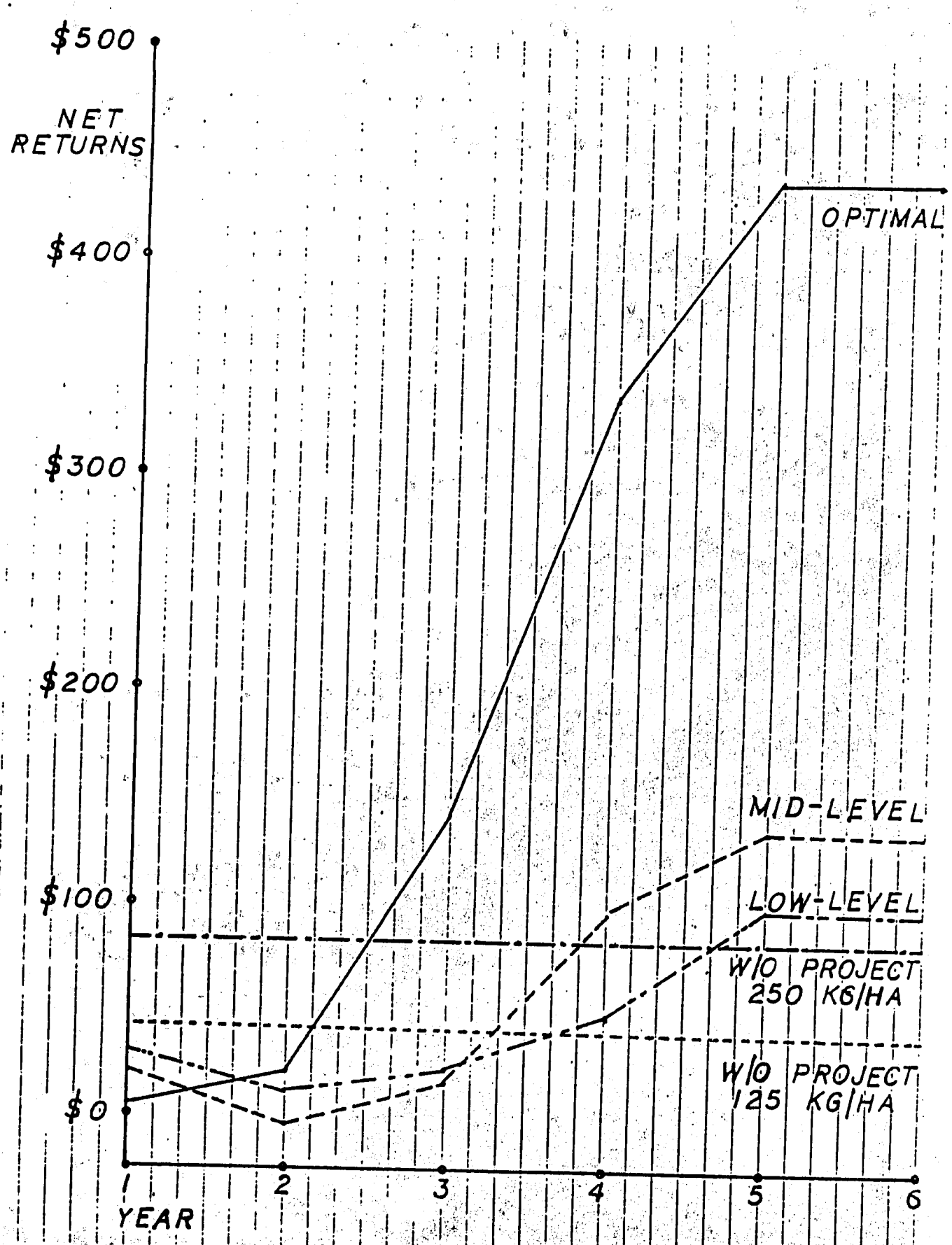
2. Overall Project Analysis

In order to prepare cost-benefit analyses for the overall project, estimates have been made as to the proportion of farmers who will participate at the optimal, mid and low levels of inputs. The project design entails intensive involvement and supervision in the pilot zones. In the national outreach zones, the degree of farmer participation will be affected by the level of collaboration and emphasis placed on coffee by the cooperating organizations. Projections of farmer participation levels are therefore more conservative in the outreach program. The percentage of farmers expected to participate at each of the input levels, for the two zones, is presented below:

	Level of farmer participation			Total No.
	Optimal	Mid	Low	Farmers
Pilot Zones	20%	60%	20%	8,200
Nat'l Outreach	10%	40%	50%	2,040
Weighted Average	18%	56%	26%	

Detailed information on input costs, amounts of inputs applied by each level of participant, composite, weighted input amounts, and resulting production yields and revenues, is provided in the Economic Annex. By adopting these "best" estimates, and incorporating the farmer participation schedule shown in Table V below, a stream of costs and benefits over a fifteen year period can be derived.

Figure III: Net Returns to Coffee Farmers Over a Six Year Period



Coffee Price: $1.40/kg

82X

Table V. Participating Farmers and Seedlings Distributed

	NUMBERS OF FARMERS New	Returning	Total	NUMBERS OF TREES
Year 1				
Pilot Zones	800	0	800	240,000
Nat'l Outreach	200	0	200	100,000
Year 2				
Pilot Zones	1,400	480	1,880	588,000
Nat'l Outreach	460	0	460	230,000
Year 3				
Pilot Zones	2,000	1,128	3,128	1,018,000
Nat'l Outreach	460	0	460	230,000
Year 4				
Pilot Zones	2,000	1,704	3,704	1,261,440
Nat'l Outreach	460	0	460	230,000
Year 5				
Pilot Zones	2,000	1,920	3,920	1,380,000
Nat'l Outreach	460	0	460	230,000
Totals				
Pilot Zones	8,200			4,489,200
Nat'l Outreach	2,040			1,020,000
Grand Totals	10,240			5,509,200

The Economic Annex includes two versions of the cost benefit stream, one which includes all farm level benefits and costs, the other encompassing the cost of USAID inputs as well. Because the coffee price is considered subject to considerable variation, IRRs (Internal Rates of Return) have been calculated based on several possible coffee prices, ranging from $1.40 up to the former price of $1.98/kg. These are shown below.

	Coffee Prices per kg. $1.40	$1.60	$1.80	$1.98
Farmers IRR	17%	38%	150%	150%
Overall Project IRR	(14%)	(5%)	1%	5%

The IRRs based on all farmer costs and returns are favorable, indeed extremely so, if coffee prices return to their former level. IRRs for the overall project are positive at price levels of $1.80/kg and above and negative at lower coffee prices. However, it should be noted that the purpose of this analysis has been to focus on what farmers can expect to gain from planting and proper maintenance of improved coffee plants. Long term benefits from research activities, positive soil conservation effects,

benefits to non-participants through radio extension services and demonstration effects, and benefits to participant farmers from crops interplanted with new coffee are not easy to quantify and have not been quantified for inclusion in this very conservative analysis. All of these factors would tend to increase the overall economic return and thus reduce the significance of the low IRR for the overall project. The returns to farmers should be the overrriding consideration in the decision to implement the project. Moreover, there is a significant amount of research and applied research incorporated in the project design. Experience gained in the pilot zones will permit replication in other prime coffee growing areas at much lower cost than in this project. Thus the results of this investment should be of great importance for the future development of the Haitian coffee sector.

E. Summary of Environmental Assessment

Coffee has traditionally been a major source of foreign exchange for Haiti, and an important cash crop for the country's peasant farmers. But, coffee rust (Hemileia vastatrix Berk. Br.), a serious disease of coffee, has recently spread to the country. Almost all of Haiti's coffee is the Typica variety, which is the most susceptible to rust. If steps are not taken to introduce resistant coffee varieties, and the cultivation practices they require, coffee will be eliminated as a cash crop in Haiti within a few years. The Haiti Coffee Revitalization Project is designed to introduce higher yield, rust tolerant varieties, accompanied by improved cultivation practices, to the peasant farmers in two pilot zones in southern Haiti and by extension to other coffee producers throughout the country.

An Environmental Assessment (EA) has been undertaken to examine the potential environmental consequences of the project's proposed activities. The use of pesticides in the project presents the greatest environmental concern and constitutes the main focus of the EA. Also considered are the project's potential effects on soil erosion, land-use, biodiversity, tropical forests, and pollution caused by the use of fertilizers.

The full test of the EA can be found as Annex E to the Project Paper (Volume II). Major recommendations and conclusions of the EA as summarized below:

Pesticides: Pesticides will only be used in the context of the Integrated Pest Management System to be developed by IICA under the project. If pesticides are required, only those listed will be permitted. These pesticides are recommended as relatively safe, if used according to label instructions. Their transportation, storage, application, and disposal will take place under the extension network to be developed by the project. Pesticides will only be handled by project personnel and the extension agents trained by the project.

Fertilizers: The use of fertilizers in the project does not present a significant environmental problem. The project's extension agents will be trained in the proper use of fertilizers to minimize what dangers exist.

84X

ANNEX A

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 90 to FY 95
Total U.S. Funding $5.14 million
Date Prepared 12/6/89

Project Title & Number: Coffee Revitalization Project (521-0216)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: (A-1)	**Measures of Goal Achievement:(A-2)**		**Assumptions for achieving goal targets: (A-4)**
To increase coffee productivity and farmer income among coffee producers in Haiti.	10,240 farmers have received training in improved coffee technology and in planting seedlings of improved varieties. Project farmer income from coffee increased by at least 100%.	IICA Studies and Progress Reports Mission M&E Monitoring	Haiti's general economic environment does not significantly worsen. Farmgate coffee prices stabilize at no less than 70% of the 1988 level. GOH does not reintroduce export taxes or other disincentive measures to coffee production.
Project Purpose: (B-1)	**Condition that will indicate purpose has been achieved End-of-Project Status. (B-2)**	**(B-3)**	**Assumptions for achieving purpose: (B-4)**
To upgrade the quality of coffee cultivation in Haiti by improving production technology and farming practices, thereby increasing the yield and the consistency of the coffee product and reducing the ill-effects of coffee rust.	1,343 hectares planted in improved, rust tolerant coffee varieties in the the two pilot zones.	Records of local organizations, cooperatives, etc.	Farmgate prices for coffee are at a sufficient level to maintain farmer interest in coffee as a cash crop. Farmers will, on average apply 50% of project-recommended inputs. Project purpose and implementation activities are compatible with GOH policy.
		IICA reports on research results.	
	Coffee yield increased by at least 100% by participating farmers.	Mission periodic M&E project assessment.	Coffee leaf rust disease will develop as a national problem capable of crippling the coffee industry, if not combatted with new technology and new varieties.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of:
From FY 90 to FY 95
Total U.S. Funding $5.14 Million
Date Prepared 12/6/89

Project Title & Number Coffee Revitalization Project (521-0216)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	**Magnitude of Outputs: (C-2)**	**(C-3)**	**Assumptions for achieving Outputs:(C-4)**
1) Propagation of coffee varieties with high yield and rust-tolerant capabilities produced in local nurseries.	Approx. 5,500,000 rust tolerant seedlings produced.	Nursery records	Rust tolerant varieties obtained from international production centers are adapted to local conditions.
2) Adaptive research undertaken in coffee-based farming systems.	At least 4 technological packages developed from IICA Research and testing in improved varietal selection, intercropping, fertilization, and chemical control of fungus and pests.	Project records Rapid, low-cost studies performed by the project M&E unit.	Farmers accept risk inherent in adapting new varieties and technologies, recognizing potential rewards.
3) Coffee production technology packages introduced to small farmers in the pilot zones of Jacmel and Beaumont.	8,200 farmers cultivating improved rust tolerant coffee varieties and practicing improved coffee technology techniques, including pruning, fertilization, rust control, etc.	Project records (NGO reports) Rapid, low-cost studies performed by the project M&E unit.	
4) Information disseminated on improved coffee cultivation through an outreach program involving radio broadcasts and farmer training sessions.	Weekly broadcasts on coffee technology and production practices; estimated audience of up to 150,000; 4,080 farmer training days.	Project records (NGO reports) USAID/CONT financial analysis Project records Rapid, low-cost studies performed by the project M&E unit. Project records CCH records	Farmers have access to transistor radios. Farmers are motivated to attend one-day training sessions. Farmers outside project zones continue to produce coffee despite rust and price problems.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of:
From FY 90 to FY 95
Total U.S. Funding $5.14 Million
Date Prepared 12/5/89

Project Title & Number Coffee Revitalization Project (521-0216)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: Cont'd			
5) Local organization capacity in South Haiti strengthened to support improved coffee cultivation.	a) 20 participating local organizations have established efficient service delivery systems for timely farmer input needs (seeds, fertilizer credit, etc.), using accepted business and accounting practices.	Project records (NGO reports)	Local organizations are motivated to accept and extend new varieties and technologies generated under the project.
		Project records (NGO reports)	
	b) 164 animateurs and 60 local NGO staff trained in improved coffee technology, including nursery operations and production technology.	Project records	
		Project monitoring	
		Training assessment	

X88

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of:
From FY 90 to FY 95
Total U.S. Funding $5.14 Million
Date Prepared 12/6/89

Project Title & Number Coffee Revitalization Project (521-0216)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Inputs: (D-1)	Implementation Target (Type and Quantity) (D-2)	(D-3)	Assumptions for providing intputs: (D-4)
Technical Assistance	4 L/T TA -Senior Advisors-IICA staff 3 Regional Field Supervisors (15 P/Y) 17 Regional Support Staff (54 P/Y) Admin. Support (5 P/Y) (IICA to finance Research and Institutional Specialist)	IICA personnel records and performance reports	IICA can assemble a capable and well-qualified team to implement project.
	S/T Consultants 10 p/m Reg. Field Support (PCVs)	Consultants' reports	GOH will allow IICA and local organizations a free hand in project implementation.
Training	S/T training of field personnel 30 p/m	Reports by regional personnel	
	In-country extension training 186 p/m	Project training records	
	Day demonstrations for farmers (200 sessions)		
Commodities/ Agricultural Supplies	Seeds 2.3 tons Fertilizer 1,057 tons Fungicides/ pesticides 7.3 tons Handtools 200 sets Backsprayers 405 units Plastic Nursery Sacks 5.5 million	PIO/Cs and IICA supply & commodity records	
Equipment	Vehicles Office equipment		
Total Inputs	A.I.D Dollar: 5.14 million Local Currency Equivalent : $3.8 million		

89

ACTION MEMORANDUM FOR THE DIRECTOR, USAID/HAITI

Date: November 10, 1988

From: Rosalie Fanale RF Project Development Officer, PPS

Subject: Coffee Cooperative Development (521-0216) PID

I. PROBLEM: The PID for the Coffee Cooperative Development (521-0216) project is in final form and requires your approval.

II. DISCUSSION

A. Description. The purpose of the project is to strengthen the institutional capacity of the National Association of Coffee Cooperatives (CCH) and affiliated cooperatives to provide expanded coffee production and marketing services to member small farmers.

Through the proposed project, the gains that CCH has realized in marketing as a result of previous AID support will be consolidated, its share of the coffee export market increased, and its services to cooperative members expanded. The PID discusses four project components. A project coordination unit will increase the capability of CCH to provide direction to the cooperative structure and monitor project progress. An institutional development activity will strengthen up to three regional unions and 70 local member cooperatives and pre-cooperatives. One new regional union with member cooperatives will be formed. Service capabilities of the cooperative to support coffee production as well as marketing will be expanded through the project's production/technology transfer and credit activities.

Importantly, the project incorporates the propagation and promotion of coffee varieties which are resistent to coffee rust, and thus it will lay the necessary foundation for a long term solution to the coffee rust problem. Project outputs include 2,000 hectares of rehabilitated, multicropped coffee plots, and 3,500 hectares of new coffee plantings. Coffee tree nurseries will be established at cooperative sites and will be a catalyst in the gradual conversion to rust resistant varieties.

The total project budget is estimated at $5.14 million. These funds will support technical assistance, commodities, training, and operating costs for the cooperative structure. In addition, $2.0 million equivalent in local currency counterpart has been programmed to support project activities as part of the Global Local Currency Solution, and another $1.6 million equivalent in local currency counterpart will be added subject to future availability. Local currency will be used to provide credit funds for CCH marketing and production-related loans to farmers.

90 X

It is planned that the project will be implemented through a grant to IICA (Interamerican Institute for Cooperation on Agriculture), a public international organization.

2. Mission Review. On September 9, a Mission Review was held of a previous version of the PID. At that meeting, the Project Committee was instructed to restructure the PID to reduce the project's overall scope and length, while maintaining the concept of a multiphase effort of which this project is a first phase. In addition, the cost of the project was to be cut, and wherever possible DA funds were not to be used to fund credit activities. The PID was subsequently revised to conform to this guidance, with the total funding reduced from $9.0 million to the current $5.14 million, the total project life reduced from 10 to 5 years, and a decision made to focus the project geographically rather than endeavor to support production initiatives nationwide. The number of anticipated beneficiaries has not been reduced.

A second Mission Review was held on October 21. At that review, it was agreed that the revised PID is responsive to the concerns raised at the previous review, and that the PID should be approved subject to certain changes in the text and guidance to the PP team, as follows:

First, concern was raised that the mix of project beneficiaries might require adjustment, and in particular that the project should also target elements of the private sector, outside of the cooperative structure, involved in coffee production. These coffee growers will also need access to rust resistent coffee varieties and should be able to afford the input costs for new coffee plantings. On the other hand, such input costs (including labor) may be beyond the practical reach of those cooperative members with the smallest farms and the most limited resources.

Accordingly, the PID has been revised to add a more comprehensive discussion of beneficiaries (p. 20-21), and private sector issues for PP design (p. 31). In addition, more detailed guidance to the design team has been prepared by OPE, which instructs the team to address fundamental issues of the cost structure and profitability of coffee production, especially given expanding pressures of coffee rust disease. The PP team must demonstrate that, if small holder coffee growers are targeted beneficiaries of this project, they will be likely to remain in production beyond the life of the project despite an anticipated substantial increase in production costs. Also, there needs to be broader examination by the PP team of other ways that the private sector might be involved in the project's production activities, such as suppliers of inputs on a commercial basis.

Second, given that IICA has been identified as the implementing group for the project, the PID should include an expanded rationale for selection of this international organization, including its general

capability in the coffee sector, its specific expertise in dealing with coffee rust disease, and its relevant experience in Haiti. This discussion has been added to the section, "Proposed Grantee and Implementing Agency," on p. 28.

3. Authority. Based on favorable review of New Project Descriptions submitted by the Mission, AID/W has delegated authority for PID and PP approval to the Mission.

A New Project Description for the project was originally included in the USAID/Haiti 1988/1989 Action Plan (reviewed in 1987). The Action Plan review cable (87 State 060700) gave the mission the authorization to approve the PID for this project, subject to guidance on two points. The first was that the Mission examine the viability, in terms of cost, of the coffee cooperative structure maintaining a technology development and dissemination function. This has been flagged as important in the PID and will be addressed by the PP team. The second was that "the Mission would use local currency on a loan basis for the credit activities." AID/W noted that further consultation would be required in the case of departures from this guidance.

The Mission subsequently decided to defer obligation of this new project until FY89, and to amend the ongoing OPG with CLUSA to provide interim support to CCH before initiation of the new project. An expanded New Project Description was submitted to AID/W and favorably reviewed (State 208458, dated 29 Jun 88), with the Mission delegated authority for PP review and approval. At that time it was assumed that local currency would not be available for the credit component, and the Mission was notified in the same cable that the use of DA funds for the credit component was approved in this case, subject to the condition that the credit component be sent to AID/W for approval prior to PP review. However, the "Global Local Currency Solution" has made it possible to fund the credit component with local currency. Since project funds are not being used for credit, the Mission can proceed with PP review and approval.

III. RECOMMENDATION

That you sign the attached facesheet, thereby approving the PID for the Coffee Cooperative Development (0216) project.

Attachments

Project Identification Document

92X

Drafted: PPS : RFanale RF

Clearances:

ADO	: LHarms	: CID
OPE	: JHorton	: CID
	: JVermillion	CID
CONT	: CBrooks	: CB 11/10/86
PPS	: MBailey	: CID
	ASchoepfer	: CID
	RBurns	: CID
A/D/DIR	: AFord	: CID

PROJECT IDENTIFICATION DOCUMENT
FACESHEET (PID)

A = Add
C = Change
D = Delete

Revision No.

DOCUMENT CODE 1

2. COUNTRY/ENTITY
HAITI

3. PROJECT NUMBER
521-0216

4. BUREAU/OFFICE
A. Symbol
B. Code 05

5. PROJECT TITLE (maximum 40 characters)
Coffee Cooperative Development

6. ESTIMATED FY OF AUTHORIZATION/OBLIGATION/COMPLETION

A. Initial FY 89

B. Final FY 93

C. PACD 94

7. ESTIMATED COSTS ($000 OR EQUIVALENT, $1 =)

FUNDING SOURCE		LIFE OF PROJECT
A. AID		5,140,000
B. Other U.S.	1.	
	2.	
C. Host Country		3,600,000
D. Other Donor(s)		
TOTAL		8,740,000

8. PROPOSED BUDGET AID FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	C. PRIMARY TECH. CODE 2. Loan	D. 1ST FY 89 1. Grant	D. 1ST FY 89 2. Loan	E. LIFE OF PROJECT 1. Grant	E. LIFE OF PROJECT 2. Loan
(1) ARDN	200	240		1,100		5,140	
(2)							
(3)							
(4)							
TOTALS				1,100		5,140	

9. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)
010 | 030 | 042 | 079 | 140

10. SECONDARY PURPOSE CODE
250.

11. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	BS	COOP	ENV	NUTR	PVON	TECH	TNG
B. Amount							

12. PROJECT PURPOSE (maximum 480 characters)

To strengthen the institutional capability of the National Association of Coffee Cooperative (CCH) and affiliated cooperatives to provide expanded coffee production and marketing services to member small farmers.

13. RESOURCES REQUIRED FOR PROJECT DEVELOPMENT

Staff: One social scientist, one cooperative development specialist, one coffee agronomist, one agricultural economist, and one crop protection specialist contracted through one IQC firm.

Funds: PD&S
$115,906.00

14. ORIGINATING OFFICE CLEARANCE

Signature: Larry Harms

Title: Supervisor, Agricultural Development Office

Date Signed: MM 11 DD 10 YY 85

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM DD YY

16. PROJECT DOCUMENT ACTION TAKEN
S = Suspended
A = Approved
D = Disapproved
CA = Conditionally Approved
DD = Decision Deferred

17. COMMENTS

18. ACTION APPROVED BY

Signature: Gerald Zarr

Title: Director, USAID/Haiti

19. ACTION REFERENCE

20. ACTION DATE
MM 11 DD 10 YY 85

AID 1330-2 (3-79)

ACT: AID-3 INFO AMB DCM [illegible])

ANNEX B.2 JUN 29 1988

VZCZCPUCSSS
RR PUERTO
DE RUEHC #1408 1801444
ZNY UUUUU ZZH
R 281442Z JUN 88
FM SECSTATE WASHDC
TO AMEMBASSY PORT AU PRINCE 2201
BT
UNCLAS STATE 209458

LOG: 190 [illegible]
28 JUN 88 1545
CN: 20951
CHRG: AID
DIST: AID

COFFEE PP
DELEGATION AUTHORITY

AIDAC

E.O. 12356: N/A
TAGS:
SUBJECT: COFFEE COOPERATIVE AND PRODUCTION PROJECT NO 521-0218

REF: A) STATE 060700; B) PORT AU PRINCE 04618

1. DUE TO NON-AVAILABILITY OF LOCAL CURRENCY FOR AID OPERATIONS IN HAITI PER REFTEL (B), AID/W APPROVES NEW PROJECT DESCRIPTION FOR THE COFFEE COOPERATIVE AND PRODUCTION NO 521-0218 WITH ALL RECENT CHANGES INTRODUCED INCLUDING THE USE OF DA FUNDING FOR THE CREDIT ACTIVITIES.

2. MISSION IS HEREBY DELEGATED AUTHORITY FOR PP REVIEW AND APPROVAL, WITH THE EXCEPTION OF THE CREDIT COMPONENT SECTION THAT WILL BE SENT TO AID/W FOR APPROVAL BEFORE FINAL MISSION REVIEW OF PP. THIS WILL INCLUDE THE DESCRIPTION OF THE FINAL CREDIT OPTION SELECTED AS WELL AS THE ANALYSIS FOR OTHER OPTIONS CONSIDERED.

3. ANY AID/W TDY ASSISTANCE FOR PROJECT DEVELOPMENT SHOULD BE COORDINATED THROUGH STEVE WINGERT, LAC/DR/RD. SHULTZ
BT
#9459

NNNN

DATE REC'D USAID ROUTER		
DIR		
D/DIR		
PDO		
EXO		
CONT		
HRO		
ADO		
OPE		
RF		
CF		
ACTION TAKEN:		
DATE:		
BY:		

07/11/88

UNCLASSIFIED STATE 209458

95

HAITI COFFEE REVITALIZATION PROJECT
(521-0216)
VOLUME II, ANNEXES

A. Logframe

B. Agronomic Analyses

C. Social and Institutional Analyses

D. Economic and Financial Analyses

E. Environmental Assessment

F. Project Evolution since the PID

G. Statutory Checklists

NOTE: The design of this project has evolved significantly from the PID prepared in 1987 and has been refined further from the initial PP draft in December 1988 to its final form in December 1989. This evolution is discussed in Annex F, herein. It should be noted that Annexes B and C, comprising the Agronomic Analysis and the Social/Institutional Analysis and Annex E, the Environmental Assessment, were prepared as part of the design effort carried out in November/December 1988. The authors of these annexes were not represented on the final design team. They present basic background information and analysis of factors bearing on the project and its design.

Certain institutional changes, shifts in emphasis and numerical indicators have changed during the final project design and are recorded in the body of the Project Paper. These changes may not be reflected in annexes B and C, which nevertheless retain their value as background reference material. The analysis and conclusions of Annex E, the Environmental Assessment, remain valid, although some numerical indicators may be different from the Project Paper. In case of such discrepencies, numbers in the PP govern, as do descriptions of institutional functions.

Annex D, Economic and Financial Analysis, was rewritten at the same time as the final Project Paper. It therefore reflects all the changes made and is fully consistent with the latest project design.

ANNEX A

LOGFRAME

ANNEX A

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 90 to FY 95
Total U.S. Funding $5.14 million
Date Prepared 12/6/89

Project Title & Number: Coffee Revitalization Project (521-0216)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: (A-1)	**Measures of Goal Achievement:(A-2)**		**Assumptions for achieving goal targets: (A-4)**
To increase coffee productivity and farmer income among coffee producers in Haiti.	10,240 farmers have received training in improved coffee technology and in planting seedlings of improved varieties. Project farmer income from coffee increased by at least 100%.	IICA Studies and Progress Reports Mission M&E Monitoring	Haiti's general economic environment does not significantly worsen. Farmgate coffee prices stabilize at no less than 70% of the 1988 level. GOH does not reintroduce export taxes or other disincentive measures to coffee production.
Project Purpose: (B-1)	**Condition that will indicate purpose has been achieved End-of-Project Status. (B-2)**	**(B-3)**	**Assumptions for achieving purpose: (B-4)**
To upgrade the quality of coffee cultivation in Haiti by improving production technology and farming practices, thereby increasing the yield and the consistency of the coffee product and reducing the ill-effects of coffee rust.	1,343 hectares planted in improved, rust tolerant coffee varieties in the the two pilot zones.	Records of local organizations, cooperatives, etc.	Farmgate prices for coffee are at a sufficient level to maintain farmer interest in coffee as a cash crop. Farmers will, on average apply 50% of project-recommended inputs. Project purpose and implementation activities are compatible with GOH policy.
		IICA reports on research results.	
	Coffee yield increased by at least 100% by participating farmers.	Mission periodic M&E project assessment.	Coffee leaf rust disease will develop as a national problem capable of crippling the coffee industry, if not combatted with new technology and new varieties.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of:
From FY 90 to FY 95
Total U.S. Funding $5.14 Million
Date Prepared 12/6/89

Project Title & Number Coffee Revitalization Project (521-0216)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	**Magnitude of Outputs: (C-2)**	**(C-3)**	**Assumptions for achieving Outputs:(C-4)**
1) Propagation of coffee varieties with high yield and rust-tolerant capabilities produced in local nurseries.	Approx. 5,500,000 rust tolerant seedlings produced.	Nursery records	Rust tolerant varieties obtained from international production centers are adapted to local conditions.
2) Adaptive research undertaken in coffee-based farming systems.	At least 4 technological packages developed from IICA Research and testing in improved varietal selection, intercropping, fertilization, and chemical control of fungus and pests.	Project records Rapid, low-cost studies performed by the project M&E unit.	Farmers accept risk inherent in adapting new varieties and technologies, recognizing potential rewards.
3) Coffee production technology packages introduced to small farmers in the pilot zones of Jacmel and Beaumont.	8,200 farmers cultivating improved rust tolerant coffee varieties and practicing improved coffee technology techniques, including pruning, fertilization, rust control, etc.	Project records (NGO reports) Rapid, low-cost studies performed by the project M&E unit.	
4) Information disseminated on improved coffee cultivation through an outreach program involving radio broadcasts and farmer training sessions.	Weekly broadcasts on coffee technology and production practices; estimated audience of up to 150,000; 4,080 farmer training days.	Project records (NGO reports) USAID/CONT financial analysis Project records Rapid, low-cost studies performed by the project M&E unit. Project records CCH records	Farmers have access to transistor radios. Farmers are motivated to attend one-day training sessions. Farmers outside project zones continue to produce coffee despite rust and price problems.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of:
From FY 90 to FY 95
Total U.S. Funding $5.14 Million
Date Prepared 12/6/89

Project Title & Number Coffee Revitalization Project (521-0216)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: Cont'd			
5) Local organization capacity in South Haiti strengthened to support improved coffee cultivation.	a) 20 participating local organizations have established efficient service delivery systems for timely farmer input needs (seeds, fertilizer credit, etc.), using accepted business and accounting practices.	Project records (NGO reports)	Local organizations are motivated to accept and extend new varieties and technologies generated under the project.
		Project records (NGO reports)	
	b) 164 animateurs and 60 local NGO staff trained in improved coffee technology, including nursery operations and production technology.	Project records	
		Project monitoring	
		Training assessment	

100X

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of:
From FY 90 to FY 95
Total U.S. Funding $5.14 Million
Date Prepared 12/6/89

Project Title & Number Coffee Revitalization Project (521-0216)

NARRATIVE SUMMARY Project Inputs: (D-1)	OBJECTIVELY VERIFIABLE INDICATORS Implementation Target (Type and Quantity) (D-2)	MEANS OF VERIFICATION (D-3)	IMPORTANT ASSUMPTIONS Assumptions for providing inputs: (D-4)
Technical Assistance	4 L/T TA -Senior Advisors-IICA staff 3 Regional Field Supervisors (15 P/Y) 17 Regional Support Staff (54 P/Y) Admin. Support (5 P/Y) (IICA to finance Research and Institutional Specialist)	IICA personnel records and performance reports	IICA can assemble a capable and well-qualified team to implement project.
	S/T Consultants 10 p/m Reg. Field Support (PCVs)	Consultants' reports	GOH will allow IICA and local organizations a free hand in project implementation.
Training	S/T training of field personnel 30 p/m	Reports by regional personnel	
	In-country extension training 186 p/m	Project training records	
	Day demonstrations for farmers (200 sessions)		
Commodities/ Agricultural Supplies	Seeds 2.3 tons Fertilizer 1,057 tons Fungicides/ pesticides 7.3 tons Handtools 200 sets Backsprayers 405 units Plastic Nursery Sacks 5.5 million	PIO/Cs and IICA supply & commodity records	
Equipment	Vehicles 6 Office equipment		
Total Inputs	A.I.D Dollar: 5.14 million Local Currency Equivalent : $3.8 million		

ANNEX B

AGRONOMIC ANALYSES

Agronomic Study

Andre Helfenberger
Date: Nov. 29, 1988

A. General observations about growing coffee.

1. Introductory remarks

In a coffee project the "key player of the game" is inevitably the coffee tree. It is therefore of utmost importance to plant coffee in areas where the natural resources and the soils are optimal to fully develop the genetic potential of the material used, both in productivity and the quality of the beans.

Coffea arabica supplies about 70 -75 % of the world's coffee. It is characterized by being self pollinated and can easily be reproduced by seeds.

Coffea canephora, and to a much lesser degree Coffea liberica, make up the rest of the production. These are cross-pollinated and should not be reproduced sexually, but rather by rooted cuttings.

2. General considerations for growing coffee

2.1 Climate and soil

Based on temperature and humidity, the optimal zone for growing C. arabica is located in the wet forest of the sub-tropics [Holdridge]. In other words, C. arabica ideally requires a tropical climate, temperate with contrasting seasons. Ideally the yearly average temperatures range between 18-25 C, with absolute minimum of not less than 13 C, and the maximum not exceeding 30 C. Because of these temperature requirements, the altitude at which arabica coffee is grown economically depends on the latitude, comprised between 25 N and 25 S of the equator. The range of the annual rainfall lies between 1500 and 2250 mm per year with a relative dry period of 2-3 months. The humidity of the air is less important, but is thought to be ideal between 70 and 95 C. For this reason the altitude above sea level for high quality arabica coffee in Haiti probably lies between 700 and 1500. Robusta coffee, on the other hand, thrives better under warm equatorial climates, with average annual temperatures between 24-26 C, and rainfall between 2000 and 2600 mm distributed evenly over 135 and 140 days of rain. Relevant humidity of between 80 and 90 % seems adequate.

103X

Soil structure, texture and topography for the cultivation of coffee should allow free drainage [porous] but a reasonable water retention [organic material]. Medium loams are ideal. Heavy loams and clays are unsuitable because of poor aeration as are sandy soils because they dry out too quickly. Deep soils are essential and, depending on circumstances, should be about 1.8 m. deep. This assures against drought and anchors the tree, keeping it from falling over from strong winds or under heavy production. A deep soil also helps to overcome a certain lack of nutrients, due to the extended root system. The pH of the soil, ideally between 6-6.5, permits a more rational absorption of the nutrients available in the soil. Soils with lower acidity still give excellence yields if the physical structure is satisfactory. As a rule, coffee shows a great adaptability to the pH as seen in alkaline soils with pH 8 and more. It is nevertheless recommended to maintain the acidity at a slightly acid level of between 6-6.5. To avoid lowering of the pH, lime is applied periodically, and flexibility in the choice of sources of nitrogen, such as ammonium or calcium nitrate instead of ammonium sulfate or urea, is recommended. The organic matter content of the soil is equally important and should ideally be around 5 %. The primary net productivity in an ecosystem is the product of the dynamic stability and is rooted in the continuous supply of leaves, which provides a recycling of nutrients. This is of extreme importance for Haiti, where most of the soils are already heavily depleted. The humus content of the soils is also particularly important for C. canephora. In deep soils coffee can very well be grown on slopes, but these should not exceed 25 to 30 degrees, and where mechanization is contemplated, not more than between 16 and 22 degrees.

3. Commercial varieties planted

The best known varieties of C. arabica are "Typica" and "Bourbon". In spite of the fact that C. arabica is 90 % self-pollinated, a few natural mutants have been identified. The best known of these are caturra, bourbon, pacas and others. Natural and artificial hybrids have also been distributed, among them Mundo Novo (a cross between Bourbon and Sumatra) and Catuai (a cross between Mundo Novo and Caturra). All of these are susceptible to the coffee leaf rust Hemileia vastatrix Berk. & BR. in various degrees. In recent years, and because of the rust, some interspecific hybrids have been developed. Some of them are natural, such as the Hybrid of Timor; some are artificial, such the ones developed in India and the Ivory Coast. All these inherited some resistance to rust. One of the most promising new varieties being studied at this time is the catimor (cross between the Hybrid of Timor and Caturra).

4. Quality of coffee

The quality of coffee is defined first of all by genetics, and all C. arabica are considered flavor coffees, the most famous of all being C. arabica, var. typica. The other commercial varieties, such as Caturra, Catuai etc., do not have the full flavor of typica. Another most important factor determining quality in arabicas is the elevation above sea level in combination with some seasonal changes, (a short dry season). The high altitude arabicas have more flavor. Considered as bulk coffees are robusta (C.canephora and C. liberica]).

5. Coffee in Haiti

5.1 Climate and soil

There are very few areas in Haiti where there are none or only moderately limiting factors for growing arabica coffee. If it is not the rainfall or the altitude, there will be more or less serious constraints with the soil, the nutrient level, or the topography.

A large percentage of Haitian coffee plantations are physiologically exhausted and will hardly respond to intervention required with modern techniques.

5.2 Varieties planted in Haiti

Predominantly, the coffee population is made of typica. Most new commercial, non-rust resistant varieties can be found, and since 1985 about 8 million trees have been produced (mostly caturra). Also present are some Catimors, more resistant to rust. The latter, however, has not been selected and belongs to the first generation, long since improved upon.

5.3 Coffee technology

Coffee technology in Haiti is at a very low level, and few inputs are used. Due to the lack of a long-term coffee policy, most coffee technicians, some of whom have been trained outside the country, are not up to date on modern coffee techniques. Haiti is also one of the few coffee growing countries which has not switched from the typica to more modern and higher producing varieties. For this reason the technology to grow and manage these new varieties is practically non-existent. The new varieties are demanding on inputs and need closer spacing, which is be adopted.

105X

B. The presence of rust, Hemileia vastatrix Berk. & Br., and its impact on coffee production in Haiti

1. Brief history of the rust and its impact on coffee in other countries

Sri Lanka, is cited to this day as an example of the impact that rust had on national coffee production and the economy. After the rust invaded Sri Lanka in 1869, most the plantations were devastated in four years, and in 28 years all coffee exports from that country stopped. Sri Lanka replaced its coffee with tea and rubber.

It is true that at that time little was known about the disease, and there were no modern means of controlling it. Since then, coffee technology has evolved, and there are efficient fungicides and spraying equipment. There is also hope for developing totally rust resistant varieties. Investigating and introducing new and efficient technologies to control rust is a process that has been carried out intensly over a period of thirty years. In many countries of South and Central America, even small farmers are aware of the need to fertilize, spray and practice other techniques to control coffee rust.

In 1970, the rust was found in the state of Bahia in Brazil, and has since spread throughout South and Central America, as well as to several countries in the Caribbean.

In Brazil millions of trees in more marginal areas were uprooted, and new plantations were established in new areas. Farmer access to credit for coffee was conditioned on the application of advanced technology, and now Brazil has some of the most efficient plantations in the world.

After the appearance of the rust in Nicaragua in 1976, it was, in the opinion of the experts, only a matter of months until the rust would move into Costa Rica. However, it moved all the to Mexico before appearing in Costa Rica seven years later. This gave the country a respite. By the time rust appeared, Costa Rica had eliminated the very susceptible and low producing typica variety and replaced it with caturras and catuais. Costa Rica had 7 years to prepare the farmers to learn how to cope with the threat of rust. When it arrived, farmers were prepared. The coffee in a few low altitude areas was abandoned, and in the rest of the country the rust has been kept under control without a major reduction in production.

2. Brief general comments on the situation in Haiti

The situation in Haiti is quite different from the rest of the countries in this hemisphere. Most of its coffee belongs to the typica variety, very susceptible to the rust. Its plantations are old, overshaded, physiologically exhausted, and in many instances grown in marginal areas. The change to modern varieties is slow, and the management of these has not been fully understood, even by the most progressive planters. Full, up to date fertilizer and spray programs are used by only a very few.

It would not be fair to compare this situation with the one that afflicted Sri Lanka upon arrival of the rust in the last century. Nevertheless, Haiti is one of the few countries in the hemisphere with most of its coffee still belonging to the typica variety, and with one of the lowest levels of applied technology. Also, there is no national consensus in the coffee sector, and no clear and long-term coffee policy in existence. This implies that Haiti will have a difficult time in dealing with the rust problem, in smoothly bringing about change in the coffee sector without a considerable drop in production, and without marginal planters loosing all their trees.

2.1 The effect of rust on typica plantations.

Typica is the most susceptible of all arabica coffees grown, and total defoliation is not uncommon. This is, of course, particularly true for old exhausted plantations in marginal areas and under marginal management. In terms of plantation owners, small farmers will be hit the worst and predictably, many will simply loose their trees.

First hand observations in the areas of Pilate and Dondon in late 1988 confirmed this fear. Trees were heavily affected, sporulation on the leaves was virulent, and leaf drop was already occurring. Under humid conditions, even young typica plants are heavily damaged.

2.2 The effect of rust on the improved varieties.

Among the improved varieties", Bourbon is equally susceptible, while the caturras and catuais are less so. Caturra is the sturdiest of the two varieties, and if properly managed with all the required inputs of fertilizers and phytosanitary treatments, rust control is economically feasible.

During the last two years large numbers of caturra have been and are still being planted in good arabica areas such as Batiste (280.000), the southern peninsula (290.000), and Jacmel at higher altitudes (100.000). The numbers were made available by the MARNDR.

3. Rust control

Generically speaking, arabica coffee plantations, grown at the recommended altitudes can live with the rust, if the inputs are correct.

3.1 Control of rust in the old typica plantations

In all marginal typica plantations, chemical rust control is not economically viable. These old plantings should be maintained only and replacement envisaged with the most suitable rust resistant varieties.

107X

3.2 Control of rust in plantations with improved varieties such as caturra and catuai.

These improved varieties are susceptible to rust. They are rust tolerant but not truly resistant. Nevertheless, it has been proven that under optimal agro-ecological conditions and with adequate management, these can be grown economically. These improved varieties have been reproduced and distributed in various parts of the country. Wherever concentrations of these varieties are available and easily accessible, they should receive immediate attention. With the transference of high technology and management, these plantations represent a potential source of production which should be saved. Three preventive applications of fungicide are recommended to deal with rust disease occurring in these coffee plantings. In some high rainfall areas or at lower altitudes additional applications may be needed to cope with the disease. This inevitably increases the cost of production, and it is therefore advisable to aim at resistant varieties on a long term basis.

4. Possibility of rust resistant varieties.

Undoubtedly the best disease control is obtained with totally rust resistant varieties. Ever since the appearance of the rust in Brazil, and even before, efforts have been under way to select rust resistant varieties. In some countries these have culminated successfully, and commercial varieties are being distributed to the planters, such as is the case in:

- Colombia

The generation of rust resistant varieties in Colombia was initiated by crossing the Hybrid of Timor which in itself is a natural cross between C. arabica and C. canephora and caturra. The selection has been made over a period of 6 years and 5 generations resulting in the "Variedad Colombia". Catimor, a physical mixtures of the three best materials with rust resistance, similar in their growth to caturra and with acceptable seed characteristics and flavor, are now being distributed in Colombia

- Kenya

Kenya has had one of the most ambitious selection programs for rust resistant varieties. They have been crossing Colombian catimors with SL Kenya selections and producing an F1 hybrid [Ruiru 11] resistant to rust and another devastating disease, CBD. They have been successful in maintaining the famous quality of the Kenyan coffee, in reducing the size of the tree, and in permitting higher planting densities. Ruiru 11 is probably the best rust resistant variety in existence. It is also fiercly protected by the Kenyan government and is not commercialy available.

- India

India has developed a Catimor in collaboration with the Coffee Rust Institute in Oeiras, Portugal (origin of all Catimors) called "Cauvery", now being widely distributed to the planters for replacement of their old coffee plantations.

- Costa Rica

For the last 10 years PROMECAFE, a regional program sponsored by AID/ROCAP, in collaboration with IICA and CATIE, has been working on the selection of rust resistant coffee varieties. Several generations of Catimors have been distributed to all member countries in Central America, Panama, Mexico and the Dominican Republic.

The decision, however, lies with each country to recommend and distribute certified material. There are some promising materials in existence, but only limited amounts have been released for experimental purposes. In Costa Rica the commercial distribution of resistant varieties is still forbidden by law.

4.1 Availability of rust resistant materials

AT THIS STAGE THERE ARE NO COMMERCIALLY CERTIFIED RUST RESISTANT VARIETIES READILY AVAILABLE FOR IMMEDIATE PLANTING AND DISTRIBUTION IN HAITI.

Jorge Hernan Echeverri, Head of PROMECAFE at CATIE in Turrialba, was contacted by phone during the project design. The fact that no commercial rust resistant varieties are available was confirmed. Assurance was given that PROMECAFE will send samples of the nine best lines to IICA, Haiti, for one or more evaluation trials. These seeds will be accompanied with detailed instructions for setting up the trial.

One of the lines comes from Finca La Margarita, Turrialba, Costa Rica, and in the hope it will prove successful two additional Kgs of this line as well as two each of three other similar lines have been provided to IICA/Haiti. This has been done with the specific purpose of planting them at the same time, in case one of these particular lines should prove to be among the better treatments. If so, substantial amounts of seed could be made available when these trees begin bearing (two kg of seeds give about 6500 seedlings).

Until sufficient rust-resistant varieties become available for large scale distribution to farmers, improved varieties such as caturras and catuais may safely be promoted for immediate planting in areas of optimal agro-ecological conditions and if improved management techniques are applied.

109X

The following institutions or persons may be approached for procurment of experimental quantities of seeds of rust resistant coffee varieties:

- Director
  Research Station
  Coffee Research Foundation
  Ruiru
  Kenya

Ask for F1 seeds of Ruiru 11. This is the best rust resistant variety available, because it is also resistant to CBD and has the flavor of Kenya coffee.

- Gerente General
  Jorge Cardenas Gutierrez
  CENICAFE
  Chinchina
  Caldas
  Colombia

Ask for seeds of "La Variedad Colombia"

- Dr.P.K. Ramaiah
  Director of Research
  Central Coffee Research Institute
  Coffee Research Station,
  P.O. Box 577117
  Chickmagalur District
  India

Ask for "Cauvery" seeds, these are probably somewhat drought resistant, since in India "San Ramon" has been used in the breeding program.

It is not certain that these institutions will share there rust resistant genetic materials. In Kenya, for example, permission of the President of the country is required to even see the "Ruiru 11" plants at the Research Station.

C. Proposed technological package

1. Criteria used for the development of the technological package

The criteria used for the development of the technological package are essentially based on the agro-ecological requirements for high productivity and quality coffee as described above in A.2.1. It is very difficult in Haiti to get reliable figures in terms of labor inputs for the activities to establish and maintain a coffee plantation. For this reason it was necessary to refer to the logistics in other countries and make adequate adjustments for Haitian conditions. Any technological package for revitalizing coffee production in Haiti differs radically from traditional methods of handling typica coffee. The new and improved varieties are more demanding and require a totally new approach, a fact that has been taken into consideration in designing the new technological package. This is necessary to maximize results and assure economic recuperation beginning the second year after field planting.

2. Propagation materials

2.1 Rust tolerant varieties

The existence of coffee rust Hemileia vastatrix Berk. & Br. in the country will force a radical change in the overall technology now used. Coffea arabica var. typica is particularly susceptible to this disease and should no longer be planted. Of the other commercial cultivars now available, caturra is probably the sturdiest, and at an elevation of 700 meters or more, and where the rains are interrupted with dry season of two to three months, may be used if the proposed technical package is applied. Under those circumstances, rust may be controlled economically.

2.2 Rust resistant varieties in Haiti

The material belonging to this category now available in Haiti belongs to the so called catimors of the series T 5100 from CATIE, Turrialba, Costa Rica. This is one of the early generations of rust resistant material. It is not recommended to reproduce and distribute this material. It has not been sufficiently selected and has shown to segregate more or less heavily with regard to the percentage of floating cherries, which negatively affects the recovery rate of fresh cherries to green coffee. Additionally, populations of this series have shown to be short lived and to contain a certain percentage of rust susceptible trees.

111X

3. Nurseries.

The timing of the establishment of a nursery must be adjusted to the requirements of every area. Six to eight month old nursery plants, which are obtained 9 to 10 months after sowing the seeds, should be planted in the field with the expectation of two months of well distributed rains before the dry season begins. It is also not convenient to transplant at a time of the year when daily rains alternate with strong sunlight.

3.1 Choice of the variety to be planted/Seed source

Before establishing a nursery, a choice has to made as to the variety to be planted. The source of the seeds must be guaranteed to come from carefully selected trees of known high productivity and quality beans.

3.2 The use of seeds from established plantations

Assuming that guaranteed varieties are on hand, seeds can be collected on the plantation by selecting healthy trees with fruit sets resembling a "corn cob". The fruit bearing branches should have very short internodes, so that between the clusters of berries the branch is no longer visible. Each cluster should have about 30 large cherries. This is a sign of high yielding potential. Only fully ripe and healthy berries should be used.

3.3 Preparation of the seed.

The freshly harvested cherries must be depulped immediately and thoroughly washed. At this stage all floating seeds must be eliminated since they will not germinate. This is a first step of selecting quality seeds. After the elimination of all mucilage, best achieved by placing them in a plastic bag or container, they should be dried in the shade to about 20 to 25 % humidity, which assures a germination of over 95 %. The second step follows after the seeds are dried and consists of eliminating all defective seeds, such as "caracolillos", "giants" and others. It is best to use fresh seeds for planting, but seeds may be stored from 6 months to a year if they are previously treated with a fungicide, such as Thiram 75 (Dust) at the rate of 1/3 of a teaspoon per pound, covered with charcoal dust and placed in sealed jars.

3.4 The germination of the seeds.

The germination beds should be located near a convenient water source, easily accessible, for constant control.

The soil to be used does not require high fertility as the seeds will germinate with the nutrients stored in the cotyledons. However, it is very important that the soil structure be loose and fine grained, so that the fragile tap root will not encounter resistance and grow straight. Seedlings with damaged or bent tap roots will not grow into healthy, productive trees. The loose and fine grained soil also facilitates the emergence of the young seedling, often called "match-stick" or "soldier".

Seeds can either be broadcasted or sown in shallow furrows up to 5 to 7 cm. apart, covered with 1 cm. of fine soil. This operation has to be carried out very carefully. Otherwise, the emergence of the seedlings will be uneven. Thereafter, the germination bed should be covered with a layer of dry mulch to retain the humidity of the soil and regulate the temperature, while at the same time avoiding splashing by heavy rains. The mulch should be chosen very carefully so as not to introduce weed seeds, which will germinate before the coffee.

When broadcasted, 1 sq. meter can easily accommodate 1 Kg. of seed, the number being between 3,000 to 4,000. Care should be taken that the seeds do not overlap.

If soil pathogens such as Rhizoctonia solani are known to be present, the soil should be treated with PCNB 75% at the rate of 40 gr/sq.m. in a water suspension of 4 liters, eight days before sowing the seeds.

The size of the germinations beds should not exceed 10 to 15 meters, with a width of 1.2 meters, leaving a border on each side of 10 cm. free of seeds. At the rate of 3.500 seeds per sq. meter, such a germination bed will hold between 35.000 to 52.500 "matchsticks". Around each germination bed a drainage ditch 10 to 15 cm. deep and 30 cm. wide should be dug. The top layer of about 8 cm. of friable loose soil is where the small tap root will develop.

The humidity in the soil should be checked periodically. Over watering must be avoided, since it may favor the development of molds which may hamper seedling emergence or encouage development of fungi, killing the small seedlings.

The protruding of the radicle occurs about 21 days after sowing and one week later the radicle is clearly visible. Forty days after sowing the seedling or "match-stick" breaks through the top layer of the soil, and the mulch covering it should be lifted very carefully and may be utilized as a temporary shade on a wooden frame at 1.5 meter above the ground. The eastern side of the germination bed should also be covered to protect the emerging "match-stick" from direct sunlight. Every zone has to experiment to find the optimum amount of light for proper growth and hardening of the "match-sticks". At this stage, the seeds are in a horizontal position and at a right angle to the young stem, exposing it at the curve to the sun rays. The tender tissue of the young stem will be burned and the emerging "match-stick" will die if not protected. From the emergence of the seed to the point of being perfectly straight, it takes about 10 days. The time from planting the seeds to transplanting is about 50 days. This time period may be extended to 60 days in cooler climates at higher elevations. At the time of transplanting a third selection takes place. All "match-sticks", "caracolillos", "giants", or those with crooked or otherwise damaged roots must be eliminated.

113X

3.5 Transplanting into the nursery

After the "match-sticks" begin emerging from the soil, a temporary overhead shade is established until they are in an upright position to avoid the burning of the tender stems. It is not convenient to go beyond the "match-stick" stage. When the cotyledonary leaves enfold, the small plantlet has already formed its first permanent roots. This makes transplanting to the nursery more difficult and risky and may cause a high percentage of loss. This task is also restricted to rainy days.

Before transplanting the "match-sticks", the top soil may have to be softened by watering. It is recommended to clip off the tip of the tap root with the nails of two fingers. Bundles of 100 hundred "match-sticks" are easy to handle and are useful for controlling the amount obtained.

3.6 Field nurseries versus nurseries with plastic bags

Although in some countries coffee nurseries are established in the field at very reduced cost, this method is not recommended for Haiti. It requires large areas of good soil which should preferably be used for establishing plantations. Also, Haitian farmers are already accustomed to prepare their nurseries in plastic bags, filled with a mixture of soil and compost.

3.7 Location of the nursery.

It is important to locate the nursery in a flat area or at least with a topography not requiring expensive terracing. A nearby source of water is needed for easy watering during the 8 months period the young seedlings are in the nursery.

A suitable area to store the soil and compost to be mixed prior to filling the plastic bags is also needed. For large nurseries ample time must be allowed to accumulate the potting soil, because the filling of the plastic bags is a time consuming operation.

A decision has to be made as to the size of plastic bags to be used. If the plants are transplanted at an age of between 5 to 8 months, that is before they emit lateral branches, smaller bags are indicated, which will reduce costs considerably. As a general rule, one with a diameter of 7-10 cm x 22 cm in height gives satisfactory results. In these bags a plant six months of age will have an unrestricted root system and will not suffer any trauma when transplanted to the field, if properly hardened before doing so.

3.8 Preparation of the plastic bags

The potting soil for the plastic bags should be mixed with 25 % well decomposed organic matter, such as obtained from compost, manure or coffee pulp. It cannot be stressed enough that organic material which is too fresh will use up nitrogen from the soil for decomposition, and thus the young plant growing in it will lack this very important element not develop properly. A recommended potting soil may be prepared in the following manner:

> 700 liters of top soil with 20% organic matter, 300 liters of well decomposed compost, 3 Kg. of Superphosphate and 1/2 Kg. of potash. These compounds should be mixed carefully and thoroughly.

It is also very important to take potting soil free of nematodes to avoid the dissemination of this devastating pest.

A well trained person can easily fill 500 to 700 plastic bags during an 8 hours working day. A light weight tube, slightly inferior in diameter than the bag, and of the same volume is a very useful tool. The bag is held tight to the tube with one or both hands.The tubes thrust into the heap of the potting soil, lifted and pushed down with a strong jerk, will fill the bag with the right amount of soil in one stroke.

The plastic bags should be placed in straight rows of 10 and up to a length of 10 to 15 meters. This makes it easy to keep control on the amount of nursery plants available at any time. A surrounding path of some 40 cm makes it easy to walk around for watering, weeding, fertilizing and spraying.

The establishment of a frame with bamboo or sticks is recommended to keep the bags from falling over.

3.9 Transplanting the "match-sticks"

In each of the previously filled plastic bags a hole is made, about 2 cm: in diameter and 7 cm. deep. At the bottom of the hole 2 to 3 gm. of triple superphosphate (about the amount which can be held with three fingers) is placed and covered with a little bit of soil. Two "match-sticks" are planted simultaneously and close together in one hole. This has to be done very carefully so as not to damage or bend the little root. It should also be checked very closely that the collar of the root is at the level of the potting soil. The soil around the two "match-sticks" must also be pressed firm so that there will be no air pockets around the roots. Otherwise, the plantlets may wilt and die or not develop as desired. This operation can easily be checked by softly pulling the two seedlings upwards to confirm that they are firmly established. With a little training, a person will soon be able to transplant more than 3000 such "match-sticks" per day.

115X

This is one of the most important part of the nursery operation, and a strict quality control is recommended.

Check that:

- Only healthy & vigorous "match-sticks" are used
- The roots do not get into direct contact
- The zone slightly above the root is at the level of the potting soil.
- The soil is firmly pressed against the two "match-sticks", so that when pulling them softly, they will not budge.

3.10 Shade or no shade

Under normal conditions and with good potting soil and the required amount of soil and foliar fertilizer, no or only very little shade is necessary to produce healthy nursery plants. However, Haiti has little experience with nurseries in full sunlight, and some shade should be provided by establishing a wooden frame at about 1.5 meters above the ground, on top of which palm leaves may be laid permitting a defused penetration of light. Alongside the borderline of the nursery, the growing of pigeon peas will provide shade and protection against the wind. Nurseries under the shade of large trees are not recommended because no shade regulation is possible and rain drops from these trees splashe forcefully on the plants.

Towards the last month, for most areas probably in April, the nursery shade should be thinned to permit hardening of the plants before taking them out to the field. Usually, nurseries in Haiti are too heavily shaded, giving excessively tall plants with few lower lateral branches on which the first crop is expected, thus lowering and delaying the first yields.

3.11 Maintenance of the nursery

The production of well developed nursery plants, free of mineral deficiencies, of a deep green color, vigorous in appearance without diseases and pests, requires constant attention.

About 10 to 15 days after transplanting the "match-sticks", the cotyledonary leaves appear. After a month the first pair of true leaves are developed, to be followed by another pair 15 to 20 days later.

Beginning with the appearance of the two cotyledonary leaves, specific requirements are necessary with regard to fertilizing, pest and disease control. These are described in detail below:

3.11.1 Prevention of diseases

To prevent disease problems from the beginning of the establishment of the nursery, fungicide applications should be initiated immediately. Of particular importance is a leaf spot caused by Cercospora coffeicola Berk. & Cooke, and Anthracnose, caused by Colletotrichum coffeanum Noak. At the first signs of yellowing at the edges of the leaves and appearance of spots, the plants should not only be sprayed with a fungicide, but also with fertilizers. This disease is very closely related to malnutrition, and fungicide alone will not do the job. At elevations above 1.000 meters, "Derrite", caused by Phyllosticta coffeicola, or Phoma costarricense, particularly where the young leaves have been damaged by wind or insects, may become a serious problem. For the latter, only Difolatan, either as a WP or a liquid formulation, succeeds in controlling the damage. "Derrite" should only be treated when warranted. The former two must be treated at least at three weekly intervals, and sometimes more frequently with alternate applications of copper, mancozeb and ferbam, or preferably with Trimiltox forte, which has extremely low toxicity and is well tolerated by the young coffee. In fact, this product has shown to stimulate the growth of coffee which may be due do to its high iron content. This is particularly useful in Haiti where most soils have a rather high pH, and iron deficiency is often highly visible.

3.11.2 Pest control

If the potting soil is carefully chosen, no major soil pests are anticipated. At an early stage cut worms may cause problems and should be controlled. However, in the nurseries no insecticide applications are recommended, and the larva can be destroyed by hand. For other insects, particularly scales, Malathion 50% may be used at the rate of 0.23 %, or 99 cc per gallon. Should nematodes become serious, a soil treatment with Furadan 3 % may have to be used at the rate of 1 to 1.5 gm. per sq. meter. This would at the same time help to control sucking insects, such as scales.

3.11.3 Fertilization

To obtain vigorous coffee seedlings, they must be periodically fertilized throughout development in the nursery. Foliar fertilizing, as mostly practiced here in Haiti, is not sufficient, and soil applications must be made as well. The first soil dressing has to be applied after the plants have developed their first two to threes pairs of true leaves. This occurs between two to three months after planting.

117X

At this stage a fertilizer high in nitrogen and phosphorous, with no or little potash is used (20-20-0, 12-24-24 or 10-30-10), the rate being 4.5 gm. per plant. Four holes of about 2.5 cm. depth are drilled near the border of the bag and the amount of fertilizer evenly distributed therein and covered with soil. These applications must be made when the leaves are totally dry, and direct contact of the fertilizer with the leaves must be avoided at all cost. If not done properly, leaves will be burned. A second application of fertilizer of a similar formula at twice the rate will be applied 2 1/2 to 2 months later, with a third one of ammonium sulphate 21 % at 7 gm. per plant. The fertilizer may also be applied in liquid form. The required amount has to be dissolved the night before the application. The calculation has to be based on 50 ml. per plant. At the recommended rates above, the concentrations would be 9, 9 and 14 % respectively. These concentrations are rather high and tests should be made before deciding on large scale applications. Possibly, the concentrations have to be lowered to a less dangerous levels, and the number of applications has to be increased correspondingly. The application is made with an ordinary Knap Sack sprayer without the spray nozzle, with none or only little pressure, the rate being 50 ml. per plant. The equipment used must be guarantied non drip to avoid burning of the leaves. This method has been developed in Guatemala. It gives faster growth and more vigorous plants, however it requires some initial trial work and well trained personnel.

In many instances foliar fertilization may be combined with the application of fungicides and insecticides, except with sever incidence of diseases. In this case, separate application of fungicides and insecticides will result in a higher efficacy.

Two to three kg. urea + 200 ml. zinc + 120 gm. boron/200 lt. water plus any other minor elements at the rates recommended by the manufacturers, gives excellent results. Foliar fertilizers of 16-32-16 or similar may also be added at the rate of 1 kg. or lt. in the same amount of water. The appropriate mixture is, of course, subject to a previous inspection by a technician.

3.11.4 Weeding in the nursery

Excellent herbicides, such as "Goal" from Rohm and Haas, totally selective to coffee, facilitate the task of maintaining the nursery free of weeds. Under present conditions in Haiti, however, handweeding is recommended.

3.11.5 Prevention of loss of turgency after transplanting

With six months old plants in plastic bags of the recommended size, proper potting soil, the right humidity and hardening at the time of transplanting, the seedlings are not likely to undergo a great stress. Nevertheless, in certain circumstances, if plants are older, or the transplanting takes place close to the dry season, a treatment preventing unnecessary wilting may be adopted, particularly if the site of transplantation has been exposed to the sun and wind. When transplanting the young seedling a water deficiency will result. To overcome this condition four applications at 24 hour intervals should be made with the following ingredients:

Sugar	10.00 %
Diazinon	0.15 %
Spreader/Sticker	0.10 %

A successful plantation of tree crops begins in the nursery, and as the Asians say: "A tree will be thankful to what has been done to it for the rest of its life."

4. Establishment of a plantation

4.1 Land preparation and soil conservation

Coffee is a perennial plant, producing optimum yields between years three and fifteen and declining thereafter. Depending on the characteristics of the ecosystem in which it is grown and the variety used, economic cultivation requires a more or less sophisticated package of cultural practices. These could be called "factors of productivity" and are the core of a successful coffee industry.

Prior to establishing a new coffee plantation, the land has to be cleared to facilitate the proper alignment and staking. Stones have to be removed and may be used to build retention walls for the purpose of soil conservation. Trees which are too big and not appropriate as shade trees must be eliminated, not by cutting them down in one stroke, but through gurdeling, which will kill them slowly, thus avoiding unnecessary exposure of the soil.

It is well known that erosion reduces the fertility of the soil. The high population densities in modern coffee production are already an excellent protection against soil erosion. Nevertheless, additional measures must be considered.

It has been demonstrated that the major factor of loss of soil occurs in plantation without shade, which are clean weeded, and where the ground remains exposed to sun and rain. This is particularly true during the first three years of the establishment of the plantation.

On slopes, of 5 to 10 % only minor soil conservation, adequate mulching prevents full exposure of the soil to the sun and rain. On slopes of more than 10 %, practices of soil conservation must be applied.

119X

In many of the coffee growing zones of the country the fields are covered with stones, which should be removed and used for the construction of retention walls. Along these walls pigeon peas or other legumes would be useful for wind protection, as well as for retaining the soil and sustain the stones of the retention wall.

Contour canals have to be constructed at intervals of 10, 20 or 30 meters, depending on the percentage of the slope. Built into this system of canals, every 30 to 50 meters holes of 50x 50x 50 cm. or bigger are dug. During heavy rains the excess water can flow into these holes, and the top soil can be recuperated and returned to the adjacent coffee plants. These contour ditches can easily be lined out with the help of the "A Frame" or a level of two meters in length. After finishing the construction of these ditches and during the first heavy rain, the runoff should be carefully monitored and possible failures in performance corrected.

At the site of each tree, the establishment of eyebrow terraces (around each tree) are convenient and relatively cheap. These individual terraces may be enlarged along the contour line and slowly converted into contour terraces over the one to two year peeriod following the initiation of the planting.

4.2 Planting distances, staking and digging of planting holes

The planting distance depends on the variety used, the climate, the fertility of the soil, and the pruning and management system of the plantation.

No reliable experimental data is available in Haiti as to optimum planting distances for the different circumstances. Long-term investigations in other countries have shown that high density plantings produce higher yields. Since Haiti should no longer plant typica but only the improved varieties, by rule of thumb a distance of 2 x 1 to 1.2 meters is believed to be adequate and is based on observations of the growth of these varieties in the different zones of the country. This is equal to 5.000 and 4.167 trees per Ha. The number actually refers to planting holes, but each of the planting bags really contains at least to seedlings, as described in the chapter of the establishment of the nurseries. This density is for pure coffee plantations. Coffee intercropped with other species will be planted at lower densities.

The planting holes should be dug well in advance of the planting time, to permit adequate soil aeration. The size of the holes is closely related to the fertility of the soil and should be between 30 to 50 cm on each side. The larger hole should be adopted for poorer or more heavy clay soils.

4.3 Planting of the young seedlings

The bottom of the hole should receive some 45 to 60 gm. of a high content phosphorous fertilizer, either Superphosphate or a formula of 10-30-10, 12-24-12 or similar. This fertilizer must be covered with top soil to avoid direct contact with the roots, which could easily cause death of the young seedling. The amount of soil in the hole must be such that the top of the soil of the nursery plant is at level of the soil in the field.

After carefully removing the plastic bag, the plant has to be inspected and all curled, bent or rotten roots must be removed. In some places it has become standard practice to remove a small slice of the potting soil at its bottom with a sharp knife, about 1 cm. thick. This assures that the plant will not have a bent tap root. After checking that the plant is at the right level with the ground, the remaining top soil and some well decomposed manure and/or compost is used as a filler. The previously separated soil from the bottom of the hole is placed at the top.

The planting time must be coordinated in such a manner that at least two months of normal rains will follow before any dry period begins.

4.4 Shade versus no shade

Investigations have proven that an excess of shade, 75 %, is detrimental to coffee and severely decreases its growth and productivity. A lighter shade of only 30 to 40 % is recommended.

Studies made in Costa Rica with reference to growing coffee with or without shade showed a highly significance effect in favor of coffee grown without shade. Data on the accumulation of six crops gave an increase in production of 35 % as compared to plots grown under shade. On the other hand, coffee grown in full sunlight produce smaller fruits which were often severely attacked by Cercospora coffeicola, thus reducing their quality. The yield in the coffee mill (Kg. of processed coffee per unity of volume or weight) was lower with sun grown versus shade grown coffee.

121Y

Three factors converge in favor of reconsidering a change in the attitude with regard to shade or no shade in coffee. The new dwarf varieties, as compared to the tall growing ones, and typica in particular, show better water management. The higher planting densities provide self shading, and the use of fertilizer improves water management which reduces loss of water through transpiration and increases water uptake from the soil.

Adequate fertilization and control of diseases with fungicides applications makes it possible to grow coffee successfully without shade under favorable environmental conditions.

On poor soils of low fertility and in areas with low relative humidity, a 40 % shade is advisable. The latter is recommended for areas such as Thiotte and possibly Beaumont. A no shade system might be used in Batiste and Mont Organise where higher rainfalls and humidity prevail.

4.4.1 Temporary shade

All new plantings should have temporary shade and can easily be provided by planting such leguminous plants as, Cajanus indicus, already well known in the country, Leucena glauca, Crotalaria spp., Sesbania punctata and Thephrosia candida. In many areas Bananas are widely used because they represent a valuable cash crop for additional income. A high population of bananas decreases the yield of coffee considerably because it absorbs about 20 times more nutrients from the soil than does the coffee.

4.4.2 Permanent shade

The use of permanent shade trees has been thoroughly studied. Preferably a legume tree, such as Ingas or Erythrinas, should be used and planted at 9 x 9 meters. These trees have to be pruned twice a year, before the initiation of the flowering period, and after a short dry period and initiation of the rains in the middle of the year. After cutting the branches they should be hacked to smaller pieces and distributed between the rows of coffee as mulch.

Since in Haiti coffee is overshaded, and plantations are intercropped with fruit trees, the planting of shade trees must be studied carefully.

If fruit trees are interplanted, the distance of shade trees should be increased to 12 x 12 meters, and pruning twice a year must be enforced.

In more humid areas a wider spacing might have to be recommended, particularly where Hemileia, Mycena and Kolleroga are present.

4.4.3 Protection against the wind

Although most of the dwarf varieties are more wind resistant than the tall growing ones, even a slight but constant wind will affect coffee, particularly on the border lines. In areas affected by the wind the leaves on the top often suffer some mechanical damage and lesions, through which fungi can penetrate. This is particularly true with Phyllosticta costarricense which occurs at elevations 1.000 m and above. Ultimately a more or less sever die-back may be the consequence. In wind swept areas deficiencies occur more readily and higher amounts of fertilizers are required to overcome this problem. Trees such as Eugenia jambos, Croton glabelus, Casuarinas or other species known to do well in every particular zone should be planted in exposed areas. Such a curtain of trees offer a protection of up to 8 to 10 times the height of the trees.

4.4.4 Weed control.

Weed control in Haiti should mainly be done by hand, under condition that the soil is not disturbed too much around the root zone of the coffee and that the ground is not exposed too long to sun and rain. This is particularly important during the time of the establishment of the plantation and until the plants are fully grown. During the time of the establishment of the plantation, the following system of cultivation may be adopted. After the weeds cover the ground, these are cut loose with a flat shovel, moved away from the row of the trees and piled between the rows. This material will dry and/or rot and by the time weeds grow back again, and after the application of fertilizers, the now rotten weeds mixed with soil are returned to the tree lines to cover the fertilizer applied at the root zone of the trees. This has given excellent results in Costa Rica and has only been given up because of labor shortage and high cost.

123X

For special cases or emergencies an excellent herbicide is now on the market. Goal, applied pre-emergent at the rate of 1 lt in 200 lt. of water sprayed with a coarse nozzle, will keep the ground clear of weeds for up to three months. If at the time of application some weeds are present, a post-emergent herbicide such as Paraquat must be mixed with Goal at the rate of about 500 to 700 ml. in 200 liters of water. Mulching with dead organic matter is advisable when possible, and the use of legume cover crops should also be encouraged.

5. Application of fertilizer

No improved coffee production can be conceived without the use of fertilizer to maximize production and increase the efficiency per unit area grown.

5.1. Chemical fertilizers

Urea is still widely used in coffee plantations of Haiti, mainly in view of the low cost of transport per unit of nitrogen. Since most soils in the main coffee growing areas of Haiti have a high pH of 7 or more, ammonium sulphate as a source of nitrogen should be used. Its capacity of acidifying is about 50 time greater than that of urea. The addition of sulphur contained in this fertilizer has proven to be beneficial in other coffee growing areas, and its inclusion in fertilizer programs has become standard practice.

Urea is also very hygroscopic and cannot be stored for any length of time. The main disadvantage of its use, however, is that applied on most alkaline soil, and particularly in presence of organic matter, it will be hydrolysed and volatilized into ammonia and carbon dioxide and loose its most useful component. This ill effect can be reduced if the urea is incorporated to the soil, but this in turn may damage the roots of the tree.

More rational fertilizing, however, can only be achieved on the basis of soil and leaf analysis.

On over shaded coffee, exceeding 50 %, the application of fertilizer is a complete waste.

At this stage only the guidelines for a fertilizer program can be suggested for the use in coffee. A more precise recommendation will have to wait for the availability of soil analysis performed in the different areas as well as some efforts to condition the soil with organic conditioners prior to the application of chemical fertilizers.

Nevertheless, some tentative recommendations may be given at this time under the reservation of making corrections at a later date when more soil analysis and some results of small scale fertilizer trials in the different areas will become be available.

In Costa Rica the formulas (NPKMgB) such as 20-7-12-3-1.2, 18-5-15-6-2, 18-10-15-4-1.2, 18-12-6-5.4-2 and 20-5-11-4-2 are the most frequent ones in use. The most recent formulas also contain a certain amount of sulphur.

During the first year after planting and after an initial dressing of phosphorus at the time of planting, another dressing about two months afterwards should be given with the formulas 10-30-10 or 12-24-12 at the rate of about 90 kg/hectare. Another application of 10-30-10 will be made during the year, accompanied with 175 kg/ha of ammonium sulphate.

Beginning with the second year, the following quantities of fertilizers are recommended, depending on the quantity of coffee anticipated to be harvested:

Production in kg/ha/year	Complete Fert. kg/ha	Time of application	Extra N. kg/ha
1.100	335	Apr-May	84
1.400-2.000	670	Apr-May	84
		Sept-Oct	84
2.000	1,000	Apr-May	84
		Sept.-Oct	84

5.2 Foliar Fertilizing.

Foliar fertilization is a valuable tool to correct nitrogen deficiencies as well as supply micro elements which cannot easily be applied to the soil. Also, pesticides may be mixed with these foliar fertilizers, if the need exists.

As a rule of thumb the following formula is suggested:

2-3 kg. urea + 200 ml. zinc + 120 gm. boron/200 lt. water plus any other minor elements at the rates recommended by the manufacturers. With the application of the fungicide, Trimiltox forte which contains 8 % iron. This deficiency is frequent in alkaline soil and thus will be corrected.

125X

5.3 Organic fertilizing and soil conditioners

The Haitian coffee farmer is generally very conscious of he need to use some sort of compost or other organic matter to help make his crop prosper, but he lacks the knowledge of how important it is to utilize only well decomposed material.

The coffee pulp, or other organic waste material can be converted into compost, which in turn helps to change into humus all organic material with which it comes into contact in the soil.

This humus is rich and alive and will facilitate the inter change of nutrients. At the same time, it will change the structure of the soil, aerate it, improve water equilibrium and assure soil-conservation.

One ton of soil-conditioner has the same effect as about 40 tons of manure per hectare. A twin cycle of fermentation at high temperatures is equivalent to a pasteurization, and the finished product will contain no pathogenic organisms, and no seeds of weeds or parasites. Such a biological fertilizer will not eliminate or substitute the chemical fertilizer, but will reduce the quantities normally required.

In the Philippines the use of such a soil-conditioner made of sugar cane mudpress and bagasse with 2 tons per hectare has increased sugar cane tonnage by 15 %, and has permitted the development of coffee on very bad soils and with full sun exposure producing yields as obtained in good coffee areas of Costa Rica.

For the above reasons it is suggested that the production of such a biological fertilizer should be encouraged and made available to the Haitian farmer.

Detailed information may be obtained at COFUNA, Thorigny-Lagny sur Marne, 7-9-1955, France. There may be other companies which produce similar compost starters of equal efficacy.

6. Pruning

Pruning is one of the most important aspects of all practices used in coffee production and is not always very well understood here in Haiti, particularly with regard to the new varieties. It consists of maintaining an adequate relation of yield and total leaf surface, regulating the level of production, creating accessibility for phytosanitary measures, and making harvesting easier.

The individual pruning, that is the pruning per plant, is reported to give the highest yield per area planted in Costa Rica. Since Haiti has no real large plantations, this method is most likely to give the best results here also. The basic idea behind is to have more than one stem, or orthotopic growths, in every planting hole. This was originally obtained by means of inclining the young tree to a 45 angle, which is maintained with a hook firmly anchored in the soil. Under this condition an unequal distribution of auxins stimulates and activates caulary buds. As a result the plant will have 3, 4, or more vertical growths (orthotopic). Each plant or production unit is pruned by eliminating 20 to 25 % of their orthotopic branches, which are exhausted after heavy yields. After these have been cut at a height of 30 o 50 cm. above the ground, the best of the new shoots will be selected as new producers. The rate and amount of the emission of these shoots is principally varietal, but care must be taken that the resulting pruned plant will not have more than the wanted 3 t 4 vertical branches. Carelessness in this operation will lead to plants with a high number of vertical shoots, resulting in low producing plants.

"Agobio" as described above is no longer practiced, and at least two seedlings are now being planted in the nursery bags. The principle behind it is, however, the same. The trees need regeneration, which may be after 3-4 heavy crops, depending on the agro-climatic condition of the area, the variety grown and the precision with which the technological inputs over the years of cultivation have been applied. These stems, which in reality are trees, are rejuvenated at the rate of 20 to 25 % per year by cutting them at the height of 30 to 50 cm. above the ground.

The so called "patch pruning" is very productive and consists of a rejuvenation pruning as described earlier, but in patches of more or less exhausted trees numbering at least 20 per patch.

There are, of course, a number of other pruning systems, such as the Beaumont & Fukunaga of Hawaii, in which the rejuvenation is done in rows according to different patterns, which will vary depending mainly on the agro-ecological situation. In view of the small size of the plantations in Haiti, this method is not recommended.

7. Control of diseases and pests

Many diseases and pests afflict coffee, but fortunately only a few are of economic importance. Nevertheless, sometimes changes occur, producing a disequilibrium in the biological control favoring the development of a specific disease or pest, which can cause economic damage of enormous proportions. They are a major factor in the production of any crop and are often an indicator for designating marginal zones.

Most of the time diseases are more virulent in adverse ecological conditions. Their effect is usually more virulent on poor soils and with inadequate cultural practices.

Some of the diseases and pests of economic importance in the country will be briefly described and control measures suggested.

7.1 Diseases

Coffee rust, Hemileia vastatrix Berk. & Br.

Probably the most devastating coffee disease in the world is the coffee rust, caused by Hemileia vastatrix Berk. & Br., which caused the collapse of arabica coffee in Shri Lanka and Java in 1870. It has since spread throughout Asia, Africa and recently most through most of the coffee producing areas in America.

A first observation of a rust infested coffee leaves shows a slight chlorosis on the upper side. At the lower surface of the leaf these spots have a diameter of up to 15 mm. The urediospores are produced from hyphae that protrude from the stomata of theses lesions, and eventually the surface becomes encrusted with masses of spores, forming bright orange pustules. One pustule is enough to cause premature abscission of the leaf. This disease was only identified in Haiti in March of 1988. It would be too early to define a control strategy, but chemical control in all the marginal plantings of typica coffee certainly does not warrant the effort and expense.

Control

The best preventive measure is to give proper management and adequate fertilizer applications. Young and vigorous plants are less susceptible, but with the stress of a heavy yield plants may be affected severely.

All plantations should constantly be monitored for the presence of rust in the following manner:

Divide every hectare of coffee into 8 imaginary lines of 100 meter each. Sample 3 leaves each in the second and lower third of every tree at 10 meter intervals, collecting a total of 480 leaves. Calculate the percentage of infestation with the following formula:

$$\frac{\text{number leaves with rust} \times 100}{\text{total number of leaves}} = \%\ \text{Infestation}$$

e.g. 75 leaves x 100 ÷ 480 = 15.6 %

Generally speaking, rust thrives best with a relative humidity of between 80 and 100, with temperatures ranging between 19 and 25 C, and with low light intensity. Preventive sprays with copper compounds are recommended at rates ranging between 1.5 and 7 Kg. per hectare in 300 to 600 liters water at infestation rates of below 15 to 20 %. Above that systemic fungicides may be used advantageously. It is too soon to talk about a spray calender for Haiti, which will have to be worked out for every ecological region in the country.

"Chasparria", Cercospora coffeicola Berk. & Cooke

Leaves affected with this disease have small spots, 5 to 12 mm. in diameter, brown in color. They can be seen on both sides of the leaves. In a more advanced stage the spots turn reddish brown with a white grayish center, the whole surrounded with a yellow circle. The disease also attacks the fruits, reducing the yield in the mill and affecting the quality of the coffee.

Control

One of the first control measures consists in regulating the shade and fertilizing the coffee properly. Three applications with copper compounds at monthly intervals at the beginning of the rainy season at the rate of 0.5 to 1.0 Kg. of copper,(depending on whether it is Cuprous oxide, hydroxide or a Copper chloride) in 200 liters of water should be applied.

American leaf spot, Mycena citricolor Berk. & Curt. Sacc.

This disease thrives in shady, humid conditions. The lesions on the leaves and fruits are round and, at first, dark brown in color, turning pale grey at a later stage. The border of the lesions are well defined and of about 3 to 6 mm. in diameter. During the rainy season, filaments emerging perpendicularly from the spots can be seen with the naked eye. This can best be observed by rolling the leaf over a finger where some of the spots are located and holding it at eye level. This disease causes the abscision of leaves and fruits. For the abscision of the leaves it is not the amount of lesions, but rather the location that is important. One lesion on the central vein near the petiole is required for the leaf to fall off.

129X

Control

The control of this disease begins with the reduction of shade and drainage of humid areas. Preventive copper applications as described for the control of "Chasparria" are recommended.

Root rot, Rosellinea bunodes Berk. & Br. Sacc.

This disease has been seen in many areas where coffee is grown in Haiti and is of real concern to the farmers because the tree dies. It is more frequent in trees of between 3 to 4 years. A general wilting of the tree occurs. At the base of the trunk, after removing some of the soil around it, a black crust and a great amount of mycelium can be observed. Such a plant will die within a few weeks.

Control

The diseased tree should be removed and burned. Before replacing it the hole must be treated with PCNB 75 % at 0.5 % and 4 to 8 liters per hole, to be repeated after planting the new tree with 4 liters of the same concentration. Around the affected area, including several healthy trees, a ditch 30 cm: wide and 60 cm: deep must be made, and the bottom should be covered with a layer of lime.

There are other diseases such as Anthracnose, Colletotrichum coffeanum Noak, Corticium salmonicolor Berk. & Br., Phyllosticta coffeicola Speg. and Pellicularia koleroga Cooke. These are controlled as the applications are made against the other diseases mentioned above.

The best control of Phyllosticta, however, is obtained with applications of Difolatan at the rate of 750 gm: in 200 liters of water.

7.2 Pests

As of now few pests present an economic threat to coffee production in Haiti. If insecticides are to be used, they should be targeted very specifically.

Coffee leaf miner, Leucoptera coffeella Guer

Usually the leaf minor is a more serious problem at elevatic" below 800 meters but can also be damaging of up to 1300 meters. For untrained eyes it is very difficult to see the adults of this pests, unless there is a massive infestation on hand. The plantation should be monitored, particularly during the dry season. With a little training, leaves affected by leaf miners are easily detected. The brown spots of irregular shape on any part of the leaf are quite distinguishable form necrosis caused by fungi. A random sample of 100 leaves should be collected and checked for the presence of live larvae. With a pen knife or a twizer, lift the necrotic part of the upper leaf surface carefully and count the number of larvas. With the presence of 40 to 50 larvas per 100 leaves, a chemical control is recommended. Below that level no insecticides should be applied.

Control

Apply Malathion 50 % of Dazinon 60 % at about 0.2 to 0,25 % of the product plus 0.1 % of a spreader sticker, such as Trithon or Citowet. With heavy infestations the treatment should be repeated 30 days later. If experimental data is available as to the effectiveness of pyrethroids against this pest, its use should be encouraged.

Scale insects, aphids and mealy bugs can be treated much in the same way, but a mineral oil at not more than 2% should be added.

Red spiders

In some areas considerable damage caused by red spiders has been observed. High humidity and rain are natural enemies of this pest and it is not very likely that chemical control is required at this time.

Scales, Coccus viridis, Saissetia hemisphaerica

From information gathered, many farmers are concerned about fumagina. It may be concluded that the scale insects are a problem, which are really the cause of the presence of this fungus. Malathion or Diazinon at the concentration mentioned above can be used with the addition of mineral oils at not more than 2 %.

8 Harvest and post-harvest practices.

From observations in warehouses and on drying floors it is evident that the grades go from the poorest to highest quality "Gourmet" coffee, the latter, of course, being high grown typica. But as a rule, coffee produced in Haiti is of a relatively low quality as compared to other producing areas. There is no control over the harvesting procedure used by the small farmers. Too often green cherries are harvested which has a negative impact on the quality of coffee, and it reduces the income of the farmer because the conversion from wet to dry is low.

8.1 The so called "cafe naturel"

This coffee is elaborated by directly drying the fruits on a drying floor, and if done properly, produces an acceptable coffee which is nevertheless very different from the one obtained through the "wet process". The main problem with this coffee is the total lack of uniformity, as well as the amount of unripe and sometimes fermented berries it contains. A few per bag of these latter will spoil the entire lot. In many instances the drying floors are dilapidated, and often the coffee is dried directly on a dirt floor.

131X

8.2 Washed coffee

In most cases in which coffee undergoes the wet process, the installations are deficient and the machinery used outdated, with the result that the quality of the coffee is very low. In some cases the whole process could be improved easily be introducing a few changes. In others, the entire installation should be changed.

9 Effect on the quality of the coffee.

The very heterogenous way of processing the coffee in Haiti makes it very hard to obtain a uniform quality that can compete on an already saturated world market. At a time of over production, it is natural that quality is sought after. A clear indication of this tendency is the ever increasing gourmet coffee shops that have mushroomed in Europe, the USA, and in particular in Japan. Melita, a German concern, has had a far reaching influence in the development of the quality market. Melita sells the whole package - grinder, percolator and filter paper, all attractively packed including roasted coffee from different coffee producing countries in the world.

Japan has a monopoly on the famous Blue mountain coffee in Jamaica. A similar project on the farm level is underway in Guatemala, and in Costa Rica European firms are getting more and more involved in the procurement of higher quality coffee.

Haiti is in a way a privileged country because it is still short by 130.000 bags to fill its quota. Along with the efforts of increasing production, the improvement of the quality should be a major target in any effort of revitalizing the coffee sector of the country.

9.1 Improvement of the quality the farm level.

A simple way of upgrading this coffee is by repairing the drying floors and by controlling the harvest and drying practices observed. By obtaining a better quality at this level, a minimal price increase would result. At present, the "speculateur" offers a lower price because he or the exporter has to dry and otherwise upgrade the coffee.

On the other hand, it is not impossible to think of depulping the coffee on the farm, let it ferment in a clean plastic bag or similar container for 24 to 36 hours, wash it thoroughly and dry it properly on a clean cement dry floor. That is really all it takes to obtain a high quality coffee in accordance with its genetic origin and the altitude at which it was grown.

9.2 Improvement of the quality on the local cooperative or private sector level

In some cases the whole process could be improved easily by introducing a few changes in the existing installations. In others, the entire equipment should be changed. In the old days, it was believed that coffee mills always had to be large to be economically profitable. This is no longer so. Small modular mills can now be purchased, which work with a limited amount of water, separate green beans from ripe ones, plus the floaters, depulp, acuapulp, and wash, producing 2 clearly defined qualities at the end of the process.

D. Multicropping Small Scale Modules

The recent appearance of the coffee rust in Haiti added a new and almost hopeless dimension to the fate of the small coffee farmer in the country. His typica coffee is the most susceptible arabica variety known. His trees are old and exhausted, and no chemical intervention will be able to stop the inevitable leaf drop caused by this deadly disease.

If there has been a slight hope of regenerating these coffee plantings before the arrival of the rust, by now it has all but vanished. The question is not if but when his coffee trees will have to be pulled out. The changes to a more advanced coffee technology is forced on the small farmer, or he will cease to be a producer for his own and the countries benefit. The only hope to keep coffee within his reach remains in the establishment of small plantings of new varieties of coffee, which require different inputs and management to which he is not accustomed. If the agro-ecological conditions are right, even small stands of coffee plants will thrive.

After careful studies and considerations of environmental, technical and sociological parameters, a multicropping; small scale module for the growing of coffee; fruit tress and foodcrops appears to be suitable to many small farm situations in Haiti.

As mentioned before, the existing small plantings have no viable way of rehabilitation. Moreover, the small farmer so badly needs the little coffee from his old trees that any intervention faces some real obstacles. Most of these farmers have some additional land not cultivated in coffee, and they are usually familiar with inter-cropping. The establishment of such a modular package will not disturbed his old coffee, but will utilize his experience with inter-cropping to establish a small, more productive coffee plot.

1. "Multicrop Module 1": Small Scale Coffee / Foodcrop

The model proposed for new plantings on small farms is based on the following assumptions:

1.1 The small farmer is reluctant to assume significant risk; and his existing coffee trees are "sacrosant" to him. Besides that, he desperately needs whatever coffee berries he can harvest from his trees, which doesn't cost him more than a weeding or two per year in addition to the picking.

1.2 The Haitian farmer is accustomed to multicropings his land. He is familiar with food-cropping, and therefore with working his soil with tools.

133X

1.3 The concept of using organic fertilizer or compost is familiar to him and means better yields.

1.4 Nursery plants in plastic bags are an accepted way of receiving young plants.

The above assumptions and experimental results from the "Finca La Margarita" in San Juan Norte, Turrialba, Costa Rica, will permit the development of a planting scheme that may help to overcome the crisis the small Haitian coffee farmer is going through while substantially increasing his income in a relatively short time, without altering his traditional way of life.

Multicropping has been practiced in one form or another for centuries, however, the scientific approach to it is relatively recent. It essentially consists in a more efficient way of utilizing time and space. In the "Multicrop Module 1": Small Scale Coffee / Foodcrop, the farmer is to do what he has done for decades with the difference of bringing some order by means of adapted technology and planned spacing.

This Multicrop Module for intercropping coffee with foodcrops, with four fruit trees and four bananas, is considered the smallest possible working unit at the family level.

Technically speaking this is feasible, under the condition that optimum agro-ecological requirements for growing arabica coffee are met.

The module consist of four fruit trees, four bananas, 7 rows of coffee with a total of 69 trees and six inter spaces of 2 x 12.5 meters to be cultivated with food crops for one full season. For a second season the space will be reduced considerably due to the growth of the coffee.

It also must be separated from any tall tress such as Saman, Mangos or others, which would cast an undesirable shade and reduce the potential productivity of the suggested Multicrop Module.

The land is prepared by the farmer as if for a food crop plot, much the same as he is used to do it, with only a few alterations in view of the future coffee plantation.

Nursery plants should not be produced at the farm but brought in from a certified nursery established by the project. The seedlings of a high and early producing variety, not more then 10 to 15 cm. in height and with about five to eight pair of leaves, well before they have produced lateral branches, are planted in previously made holes of about 25 cm: x 25 cm: x 25cm. At the bottom of each one 30 grams of a phosphorous fertilizer (10-30-10 or similar) will be placed and covered with some previously separated top soil so that the small plant will be at the right height in relation to the level of the soil. The plastic bag must

be carefully removed before putting the plant into the hole and inspected for bent, curled and rotten roots. Thereafter, well decomposed compost will be used for filling. It should be pressed firmly against the young plant, so that there will be no air pockets around the root system. The planting distances between the rows (1 to 7) will be 2.1 meter and within the row (A to B) 1.2 meters.

The inputs of fertilizer on coffee will be as follows:

-- year 1:	at the planting time 69 x 30 gm.	= 2.070 Kg.
-- month 2:	Ammonium sulphate 69 x 30 gm.	= 2.070 Kg.
-- month 6:	20-7-12-3-1.2 69 x 45 gm.	= 3.105 Kg.
-- month 10:	20-7-12-3-1.2 69 x 45 gm.	= 3.105 Kg.
Total		=10.350 Kg.
-- year 2:		
-- month 2:	Ammonium sulphate 69 x 80 gm.	= 5.520 Kg.
-- month 6:	20-7-12-3-1.2 69 x 60 gm.	= 4.140 Kg.
-- month 10:	20-7-12-3-1.2 69 x 80 gm.	= 6.210 Kg.
Total		=15.870 Kg.
-- year 3:		
-- month 2:	Ammonium sulphate 69 x 80 gm.	= 5.520 Kg.
-- month 6:	20-7-12-3-1.2 69 x 90 gm.	= 6.210 Kg.
-- month 10:	same	= 6.210 Kg.
-- Total		=17.940 Kg.

The fruit trees should receive the same amount of fertilizer per year as the coffee. Therefore 1.2, 1.8 and 2.1 Kg. of complete fertilizer must also be made available for the first, second and third year of the project. For one year of foodcrop 2 Kg. of 10-30-10 is also required. By supplying this fertilizer the farmer will not be tempted to use the coffee fertilizer for his foodcrops.

Remarks: The ammonium sulphate is applied at the onset of the rainy season, followed by two applications of complete fertilizer at four monthly intervals.

The application of the fertilizer should be performed by the farmer under the supervision of the technician in charge. It has to be done on weed free soil around the coffee plant at 25 cm. away from the trunk and to the length of the lateral branches of the trees.

The fungicide applications are not to be performed by the farmer but rather by the technician in responsible for the technical supervision for these small plots. In due process the farmer should be taught, and by the end of the project he should be able to do it by himself. The

135X

fungicide and foliar fertilizer formulas for treating coffee shall be taken from the proposed technological package. The same is true for the pruning of the trees when the time comes.

The farmer will be taught to respect the coffee the same as his foodcrops. The farmer may plant any kind suitable foodcrop to the area such as corn (preferably dwarf varieties) which will also serve as a windbreak at the early stage of the planting. Vegetables with vines, such as yam, or "mirlitant" should be avoided.

Beginning with the fourth or fifth year the technician in charge must teach the owner of each small plot to prune the coffee and fruit trees in accordance with the system proposed in the technical package.

The contribution of the farmer will be the input of labor, the fertilizer used and a proportional allocation for the spraying of his plants.

The farmer will have food crops coming in during the first year of operation, 12 months later the banana will begin bearing, and at the beginning of the second year a crop of coffee will come in, of higher consequence than any he has ever had from his old plantings. While doing this, his old coffee will produce as usual, or may have suffered severely from the impact of the coffee rust. Oranges, if that is the fruit tree chosen in the module, will be harvested beginning the third year.

The implications of a combined coffee, fruit tree and foodcrop program are that the field technician will also be responsible for transferring the basic techniques for the foodcrop considered in each module.

Trimiltox forte is a general low-toxic, all-purpose fungicide for foodcrops, and may used at the rate 0.375 %. For most pests a pyrethroid may be used.

2. Multicrop Module 2: Foodcrops /coffee

This module is basically the same as module 1, except that two areas of 26 sq.m. will ba available for one year of foodcropping, whereas two areas of 52.5 sq.m. will be used for foodcrops on a permanent basis. The allocations of fertilizer will therefore have to be adjusted correspondingly.

For the first year, the total requirement of the fertilizer for foodcrops (formula 10-30-10) will be 2.1 Kg, and the following years of 1.4 Kg.

With regard to the management of the coffee it is also the same, except that after the second year, or if warranted before, the coffee must be top pruned at 1.5 m: and kept at that height by constantly removing the suckers emerging at the top. The purpose of it is to provide the foodcrop areas with more light.

These modules are too small to afford equipment on a modular basis . One Knap Sack Sprayer, a pruning saw and scissor should be purchased by a group farming 10 modules and the cost shared proportionally.

In modules 1 & 2 coffee trees must be eliminated near the fruit trees, at the rate of 6 % in the fourth, followed by another 6 % in the seventh year after the establishment of the plantings.

In both modules it is important that if no intensive foodcropping is undertaken, pigeon peas should be planted to provide shade for the young coffee.

If larger than orange trees (avocados) are considered. one or two more coffee tress must be eliminated.

3. Closing consideration

From the technical standpoint these modules are viable. Whether they will be a success depends on the following assumptions:

- A constant flow of training is assured from the top management of the project down to the grass root level

- Feedback from the grass root level is encouraged and analyzed constantly, and extension flexibility is inherent to allow for quick adjustments

- The technicians should be from the area and live in the area where these modules are being established. He should not have to supervise more modules than he can visit every third day, within a short walking distance and a one hour visit. He must be close enough from every implanted module, so that he can visit anyone of them if an emergency visit may be requested. A reasonable number of modules would therefore be around 10.

- The technicians must have his own module and be capable to teach while doing, so as to assure sustainability of the extension effort project. At the same time his own modu'e could serve as a demonstration plot.

- The technicians must have a small storage room at his disposal, for two Knap Sack Sprayers and some chemicals, well ventilated and with a lock.

The establishment of these modules must be looked at as essentially an educational program, which is costly and time consuming. However, if the small coffee farmer in Haiti is not to be eliminated form the coffee industry, this may be the last chance.

137X

G. Areas in which to begin project activities

Identification of High Production Potential Areas

The Project Design team has on the basis of agronomic, institutional, and sociological criteria identified several areas in which the Coffee Project production component may tentatively proceed. These areas in which reconnaissance site surveys for identification of appropriate PVO groups and specific sub-target areas in which project technicians will begin working at the outset are: Baptiste, Jacmel, Thiotte, and Beaumont, all at altitudes above 800 meters. These are all areas in which the MARNDR has already in the past two years extended, or is about to extend, new high potential improved varieties.

The Definition of High Production Potential Areas

High production potential areas refer at the most basic to those areas where from an agronomic standpoint, coffee growing makes the most sense. This is explained in detail in Section A.2. above. Subsequent to a screening on purely agronomic grounds, institutional and sociological factors then come into play.

From the Design Team's standpoint then, high production potential refers to those areas in which the project feels there is a justification for investment of its technological packages among local PVO groups or sub-groups.

ANNEX C

SOCIAL AND INSTITUTIONAL ANALYSES

SOCIAL SOUNDNESS AND INSTITUTIONAL ANALYSIS

I. Organization of the Social Soundness Analysis

The Social Soundness Analysis is divided into five sections. Section II presents an overview of the rural sector from a social, cultural, and political perspective which will be of relevance to the project. It also identifies the role of coffee in Haitian farming systems. Section III presents an overview of the viability of rural cooperatives and groupements -- the lowest level grass-roots organizations the project is likely to work with. Section V analysis is made of the Coffee Cooperatives Project. In section VI a discussion of Social Equity Issues relevant to the project is presented.

II. Overview of the Rural Sector

The project will focus its production activities in the Haitian rural sector. In particular, production activities will be targeted for the zones of highest production potential (ZHPPs) in the southern peninsula and south-central region, with limited marketing activities supported throughout the country.

This section will highlight salient features of the rural sector which will be relevant to the Coffee Cooperatives Project. Aspects of social, cultural, and political life will be discussed, along with identification of characteristics of farming systems, and factors influencing social change.

A. Rural Population and Demographic Trends

Three-quarters of Haiti's population live in rural areas, with annual population growth trends projected at 2% to 2.2% (Lundahl, 1979; Ronco, 1987). This population increase has resulted from significant decreases in the death rate due to improved availability of potable water in rural areas, increased availability of food in rural areas during mortes saisons and better overall disease control. At the same time, the total fertility rate has remained at 5 births per woman. Only emigration has allowed for some offset of increasing population trends in rural areas; the increase from 1.6% to 2.3% in the difference between birth rates and death rates in 1950 and 1980 would otherwise render Haitian rural areas even more densely populated than they already are. Annual outmigration of possibly 40,000, or 0.4% of the population may actually have lowered the population growth rate to 1.75-1.5% (Segal, 1984). Yet as emigration outlets have closed over recent years, as fertility levels have been increasing, the demographic implications for Haiti given its diminishing resource base may become critical.

140X

Yet despite the apparently important function which outmigration seems to increasingly be playing inside and outside of Haiti, population in all rural areas of Haiti is still growing. It is only a part of the natural population increase which is being transferred to the cities since according to one analysis, 93% of Haitians continue to reside in their communities of birth (Ronco, 1987). Those who do leave rural communities are often the brightest children in families. Thus the classic "brain drain" model which is problematic throughout the Third World operates among the Haitian peasantry as well. Of relevance to the Coffee Project, while the rural areas are fundamentally stable in terms of population dynamics due to the levelling tendency of birth rates to death rates and outmigration, the area of Haiti which is the single most important source of migrants to Port-au-Prince over the last few decades has been the south (Ronco, Ibid.). Southern Haiti is the principal project target zone.

No doubt the dependency on remittance earnings from one or two family members working in the United States or elsewhere overseas is becoming an increasingly important phenomenon for many rural Haitians as well. The economic value of children for rural Haitians is considerable from a remittance perspective and production standpoint since capital shortages force farmers to rely on childrens' labor to attain production objectives.

B. Social Organization

1. The Peasantry

While the Haitian peasantry does not constitute a single homogenous class, the rural countryside is occupied throughout its entirety by peasant households. Each peasant household is an independent unit of production and consumption which is "grounded" to various parcels of land through either secure or insecure forms of tenure rights. The latter range from outright ownership, to undivided collective ownership among siblings of parents' plots, on down to a mini-spectrum of sharecropping and/or rental agreements for either private or state owned lands.

The primary enduring social unit of organization in rural Haiti as mentioned is the household or menaj. This group consists generally of those people that "eat out of the same pot". Most often this will refer to a nuclear family group, though often this household may consist of a patrilocal extended family of married siblings from a predominant ras (lineage) along with in-laws. These latter units may be referred to as lakou, which are composed in turn of the individual menaj including the kay (or physical houses). In different contexts and places the utilization of these terms may somewhat vary. Moreover, households are not fixed units in terms of their personnel, with residential affiliation changing with relative ease and frequency for all members of the family. As Lowenthal has noted (1987), it is small wonder that given the degree of intra-community diversity found in Haiti (and Caribbean societies in general) there has developed a proliferation of typologies and terminologies to describe household forms and family systems. These however are in reality less than adequate to describe the substance or content of what particular institutional labels impute.

In the south for example, lakou has apparently begun to lose the organizational connotations which it still confers in other regions. In the south, lakou refers primarily to the family garden around the family house (or houses) as opposed to the people living in them, though to be a met lakou is to be a "master of the household, as opposed to a met jaden who is "master of the garden". Thus the signification of all the intertwined kinship or marriage ties binding people living in a compound of adjacent kays may not necessarily be implied in this southern usage of lakou.

Yet in other regions lakou still apparently confers the sense of an extended family unit around the physical garden. The relevance of this distinction is that for these other regions, a greater sense of organizational cohesion at the extended family level may exist than in many parts of the south. Nevertheless the role which the lakou serves as the seat of ritual repository of the family's inherited spirits --the miste -- apparently remains of fundamental importance.

Throughout the country the process of unremitting sub-division of family lands (bitasyon) into minifundia has been accompanied by a corresponding orientation towards the nuclear family as the social unit most responsive to satisfaction of household subsistence needs. The tendency towards smaller and smaller minifundia had its roots in the destruction of the French plantation system during the 19th century.

In preventing the concentration of best lands from falling into the hands of an oligarchy (which would in turn have generated the creation of strong patterns of dependence of peasants and landless workers on haciendas as occured throughout Latin America), the predominance of these peasant minifundia has been suggested as being partly responsible for creating the isolation and governmental neglect with which the rural agricultural sector has come to live (Lundahl, 1979). Conversely, the importance of the individual household enterprise which this isolation and ensuant competition for scarce land resources has generated has if anything become more pronounced over time.

Peasant household needs are met through a rather ingenious combination of production and marketing strategies. The strategies generally are risk aversive, yet are flexible enough to allow for peasants to be responsive to short-term market price advantages for particular locally produced commodities. Over time the need for ingenuity has been pressed to its extreme, while harshening ecological constraints have imposed the need for near-perpetual adaptation.

Haitian peasant households are thus neither subsistence producing in the classic sense since they purchase much of what they consume, nor are they marketers of true surpluses; those households that market the most are often among the poorest. They are most dependent on market sales to satisfy internal consumption needs.

The overall peasant agricultural system has been suggested by some to be fairly stable in regard to land tenure and estate transmission over time, and thus is oriented to reproducing a "traditional way of life, maintaining 19th century patterns of paternalism and dependence on external commercial and political structures" (Smucker, 1984).

142X

2. Other Traditional Social Organizations

Other social organizations exist in rural Haiti, but are of either a predominantly occasional nature, or are the result of exogenous factors such as state intervention and/or the independent evolution of small centers around markets. These latter have evolved around important water sites and/or collection points for coffee purchase and processing, and are often coincident with administrative centers in localites. These form part of the various section rurale, which are subsumed within the commune and the arrondisement in turn.

The occasional traditional social organizations existing in the rural sector include the following:

a. atribisyon: an exchange labor group consisting of 15-30 members which meets once a week. Money earned by the group is used to purchase livestock which will be shared between members and their families during the New Year holiday period; b. eskwad: a type of labor group with a fixed membership from four to seven men or women which performs reciprocal exchanges on members fields, and whose members labor may be sold to non-group members. Rights and obligations are equal between all members, who share similar socioeconomic standing. This group has become increasingly important over time; c. sosye or metayage: sharecropping relationships of a seasonal, annual, or long-term basis; d. coumbit: a collective work group devoted to land clearing exercises prior to arrival of the rains. Coumbit were apparently established some fourty years after independence of the Haitian nation from the French. The coumbit succeeded the forced corvee work groups of the colonial period, along with the post-colonial regimes of Toussaint, Dessalines, and Christophe. e. societes de travail: groups similar to coumbit, but which may have [had] up to several hundred members, have [had] honorary dignitaries in the group who perform[ed] no labor, follow[ed] elaborate rules, and have [had] a permanence which the coumbit has not; f. eritaj: corporate descent groups tracing consanguinal links through either the male or female lines so as to provide a common orientation for members to the past, and which reinforces a lineal concept of the relation between that past -- with all its ancestors and individual gods -- to the present; g. houmfors: religious temples in which houngan priests, mambo priestesses, boko sorcerers and congregants meet to serve the lwas, the eritaj's spirits or gods which from peasants' perspective intimately affect their everyday existence; h. champwel and rara: hierarchized groups which utilize magical powers such as pwen or gad for self-protection from other groups' sorcery. The champwel are also directed by boko priests or sorcerers, and have as a mandate the protection of the interests of their members. This membership may be coincident with, or may crosscut an entire community or village. Champwel societies which may contain local dignitaries in their membership as well as peasants, thus may serve as the locus for sociopolitical struggles in the rural sector at the spiritual level. Rara groups meanwhile meet prior to Lent, are hierarchized with grades such as Emperor, President, General, Queen, Brigadier, Prefect, Soldier, Attendant, and Sentinel. Their reason for being is to demonstrate their ability to manipulate the force of magical powers to the extreme; reputed anthropophagic ceremonies and zombification ceremonies serve bolster their self-legitimation and reputation in rural areas.

These traditional organizations serve both key economic and cultural roles in the rural sector. Some such as the coumbit or societe de travail have largely disappeared. Others such as sosye or eskwads may be more or less prevalent in particular zones than previously. Where these organizations are more prevalent, this is largely a function of increased pressure on arable land resources and/or the absence of sufficient family labor to maintain or extend cultivation onto other plots as needed. The role of the religious and secret societies is normative both in a sociopolitical and cultural sense. The relevance of the cultural implications of these societies on the coffee project will be discussed in section I.B., I.D., and V.B. below.

C. Cultural Factors

Haitian peasant culture is distinctive and exercises a significant impact on the life of Haitian farmers and the particular decisions they may make. This culture is principally the product of the following: (1) disenfranchisement and slavery during the French colonial period; (2) self-expression and the development of a unique rebel identity during the marronage period preceding Haitian national independence; and the American occupation (3) the diffusion and integration throughout the rural countryside of aspects of traditional West African and Roman Catholic religious and belief systems -- with emphasis on the ancestor cult and its servicing -- into a distinctive belief and religious system generally referred to by foreigners and Haitian intellectuals (inappropriately some argue) as vodou; (4) subjugation under the rule of the first Haitian post-independence leaders leading to a polarization between a small French speaking, in general light-skinned elite, and the masses of (in general) dark-skinned Creole speaking former slaves; (5) attachment of the latter to their small plot[s] of land gained during the post-revolution land redistribution, instituted by the new regime as a political instrument to gain and hold peasants' support and to pay the army; (6) the almost total absence of subsequent participation by the rural poor in any of the elite's domains including: (7) political process, formal education, and application of western scientific concepts and methodologies to achieve self-advancement; (8) the recent period of political instability in which preliminary glimmers of peasant participation in national political process appeared through: (a) helping leverage the ouster of Jean Claude Duvalier and assisting in the subsequent string of dechoukages (political "uprootings"), and (b) widespread participation in the gwoupman (groupement in French) process which has been associated with both very "progressive" church groups and local PVO's working towards local development objectives on the one hand, and more "reactionary" groups tied to certain church groups or vodou clergy attempting to maintain the status quo on the other hand.

There are some who feel that certain fundamental sociocultural barriers present the key constraints to development of the Haitian peasant farmer, in conjunction with constraining sociopolitical institutions. The most eloquent proponents of this viewpoint work within the gwoupman framework whose most ambitious programs are modeled on the gwoupmans established by Chavannes Jean Baptiste in Hinche of the central plateau.

144X

The sociocultural barriers that the latter category of gwoupmans are working specifically to overcome stem from historical relations of inferiority to which peasants have been subjected. They maintain that the cultural concepts of fatality and "mishap causality" -- i.e. the belief that either God in the Christian sense or man/spirits in the Vodou sub-category of malevolent activities -- are responsible for reality as peasants perceive it. In this view, peasants see little room for self-realization since either their fate has been sealed by the Christian God, or else their immediate destiny is being manipulated by enemies through spirit media. Thus all forms of inequality or exploitative relations can be rationalized by the peasants as representing what is meant to be. Conversely if events take a turn for the worse, there is a reason for it, emanating ultimately from God, a human agent, and/or an individual's shortcomings. The ultimate cultural expression of suc shortcomings is zombification, in which a person is enslaved by the spirit of another, often purportedly for reasons of transgression of key societal norms.

This cultural worldview logically extends outward to rationalize a fundamental inferiority between peasants and educated city dwellers; the latter having power by means of comparative education and wealth, the former, thus, in the wrong. It also rationalizes peasant projection to the afterlife, in which the peasant will get the chance to receive his/her due rewards if duty was performed as church doctrine sets forth.

A principal "tool" which peasants have evolved meanwhile to contend with their position of inferiority vis a vis elites -- gros negres or gros chabras from the cities or rural areas -- is the lie. Peasants' sole recourse to outside domination has been to either withold or manipulate truth from those who can conversely manipulate such truths against the peasants' interests. This concerns land tenure status in particular, and of course demographic data of interest to the state apparatus for taxation or extortion purposes. While this does not seem at first glance to conform to the cultural patterns of fatalistic acceptance of god given/spirit manipulated entities indicated above, it simply says that peasants will try their best to not be submerged by those entities which at least until recently they had quietly accepted as being superior to them.

At the same time there is a significant cultural undercurrent at work in Haiti which is the product of certain socioeconomic phenomena. Most notable of these are the loss of purchasing power among both peasants and urban dwellers, the outmigration of not only the best urban Haitian minds to North America and Europe, but also the most competent peasant minds as well, coupled with an ever eroding environmental base. There is a recognition on the part of younger elements of both upper and lower classes in Haiti that the old cultural categorizations must begin to change if the country is not to be irretrievably prostrated. Thus the class influences on popular cultural concepts of what role the upper and lower classes can play in developing the country seems to be on the verge of changing at this time. These class influences and the impact they could have on the coffee project will be discussed in section VI.D. below.

An extremely important cultural factor which is directly related to the crisis in the Haitian land tenure system relates to the sociocultural institution of plasaj, or consensual union. Because children of plasaj unions have the same legal inheritance rights of children begat through maryaj, or formal marriage, the Haitian land tenure system has over time become entirely fragmented, with once substantial parcels becoming continually subdivided across generations over time (or conversely, remain indivise, as family usufruct lands).

While in an economic development sense this may appear constraining, to corporate social groups and their members, whose principal ambition may in fact be social reproduction of the membership so as to perpetuate the eritaj over time, this manner of land distribution may be quite rational.

Finally, the issue of peasant perspectives on success, envy, and power is crucial to an understanding of the leveling tendencies inherent in peasant culture and society. Peasant farmers are loathe to brag about the amount of land one owns, the amount of coffee one produces, the number of conjugal relations one has, etc., for fear of jealousy and witchcraft. This is because the object of envy is vulnerable to witchcraft or abuse through an engagement of powerful spirits of -- chanpwel or loas -- or to the purchase or creation of zombis (Smucker, Ibid; Davis, 1988). Therefore, normative peasant behavior is best characterized by complaining about one's lot. Any accumulation of prestige gained through redistribution of wealth via ostentatios social consumption is preferable to ambitious personal consumption. Wealth, in short, begets criticism for being the product of personal ambition, tied irrevocably to magical force manipulated for the wrong purposes.

We will examine the implications which these key cultural concepts could play on the Coffee Revitalization Project in subsequent sections.

D. Farming Systems

Hillside Haitian farming systems are centered around nuclear families of producers working numerous small multicropped parcels scattered up, down, and across the mornes. These are farmed by men primarily, with the exception that women are actively involved in sowing and harvesting activities. Most importantly, it is generally for women that men farm; that is, women control the product of the production process. With this product women meet both household consumption needs and manage the domestic economy in general.

Males are culturally designated to be the operators and primary decision makers on Haitian farm units. For several reasons, however, the project should make special efforts to enlist women in project implementation. First, the technical package designed for the project requires labor inputs throughout the year. Men often migrate seasonally off the farm for additional income; during the periods when men are absent, women will be responsible for providing coffee production labor.

146X

Second, women have traditionally performed some of the tasks which are essential to coffee production, such as planting, weeding and harvesting. The project implementation organizations should keep this in mind when they set up their distribution, credit and extension activities. Third, neither men nor women have traditionally done many of the tasks which will be required for the new coffee technology package. For new tasks such as nursery work, maintenance tasks like pruning and fertilizing, and storage of inputs, the project should consider hiring and training women as well as men.

In summary, the project should seek to match gender roles in the traditional situation with the ultimate recipients of extension services in order to assure that the project reaches its goal of increasing coffee production, and maintaining coffee as a key cash crop for local farmers and dependable source of foreign exchange earinging.

In many areas of the country, farmers will have either inherited or attained through purchase, loan, sharecropping, or a remunerative management arrangement, access to parcels at different elevations which permit crop diversification and corresponding risk minimization. While there is a tremendous amount of variation in farm size and characteristics of landholdings from one family farming system to another throughout the rural areas, an average farm family, if one can be defined, may have 5 or 6 parcels of land, with an average surface area per parcel of .25-.50 carreau (1 carreau =1.28ha.). Several of these parcels may contain coffee, particularly at the higher elevations and/or in the family house garden (jadin pre kay), along with an assortment of other self-regenerating and self-propogating tree species. The other parcels will be planted principally in food crops such as maize, beans, manioc, inyam, millet, etc.

Land tenure structure -- perhaps the most important variable in the farming systems -- is highly complicated by virtue of: (a) the multiplicity of claims on land that often exist on undivided family lands with or without formal title (indivise); (b) the converse extreme atomisation of family estates among family members across generations once the estates are divided, along with the severe fragmentation of individual holdings in space; (c) the dual nature of the overall land tenure structure in which a traditional extra-legal system coexists with a formal, legal, French-based notarial system that has undergone considerable localized adaptation and revision, all in the context of minimal rural government infrastructure; (d) the high proportion of short-term tenancy sharecropped estates which are becoming an increasingly important sub-category of patron-client arrangements; (e) the vibrant land options/sale market in all rural and peri-urban areas; (f) the high rate of squatting on largely unsupervised rented or protected state-owned lands; (g) the lack of a proper cadastral survey ; (h) the multiplicity of types of tenure arrangements in contiguous areas and the degree of local variation within types; (i) the fluid nature of mixed tenure configurations which change over time; (j) the increasing incidence of formalized rental agreements (fem or potek) to meet short term cash needs in lieu of outright land sale, particularly for coffee lands; (k) the not insignificant instance of managed (jeran) lands for absentee landlords; (l) the incidence of usufruct lands farmed under preinheritance grants on a quasi-sharecropping basis between parent and newly independent child.

Several different factors contribute to the prevalence of mixed tenure modes and the active land market. The most important is that Haitian peasant agriculture emphasizes risk minimization versus production maximization. Farming systems thus incorporat plots in diverse agro-ecological strata so as to minimize the effects of low yield of either food or cash crops in any given year. Given the ever-increasing marginality of soils due to nutrient depletion through overuse leading to erosion, the peasant strategy of creating an ecological balance through planting of a multiplicity of crops is quite rational. So too, the orientation to produce cash crops for market hedges against subsistence crop shortfalls in any given year makes good sense.

Nevertheless, it should be underlined that there is anything but a homogeneity of either land tenure conditions and/or farmer strategies based on those conditions (and other parameters in the farming system). Regarding farmer strategies, investment portfolios often consist of: (a) various categories of land under either rental, sharecropping, or purchased status; (b) small holdings in livestock, particularly swine; (c) investment in house construction in either the slums or city proper of Port au Prince (and larger urban centers in rural areas to a less significant extent); (d) investment in the factors of production in another business (such as masonry or artisanal industry); (e) investment in the education of one's children (through formal marriage or legally recognized through plasaj); (f) plases who in turn bring inherited land and/or their marketing businesses into the family.

The opting for a particular type of strategy -- subsistence oriented, multisectorial and upwardly mobile, etc. -- depends to a large degree upon the land resources one initially inherits, as well as the livestock resources available. The strategic role of swine in traditional farming systems as a repository of steadily accruing value, as well as a principal source of capital readily convertible to meet major expenses, has been seriously disrupted for many farmers by the eradication of swine due to the African Swine Fever Epidemic. The subsequent repopulation program has apparently redressed the problem for many farmers, though swineless farmers can no longer manipulate swine to meet expenses and other investment needs as once before.

The ability of farmers meanwhile to attain other land parcels for productive use -- through either purchase or sharecropping arrangements -- is a function of one's original land holdings, together with what one attains through the land contribution which women may bring to a domestic union. This in turn has bearing on whether in relative terms, one is a "small", "medium", or large farmer, and sets in large measure the terms of one's ability over the course of a lifetime to prosper through the increase on that original landholding through purchase of further parcels.

In an absolute sense however, the distinction between small, medium, and large is somewhat arbitrary; Haitian farmers by Latin American standards certainly are "minifundiasts" par excellence while a not totally insubstantial group of farmers may possess more than 5 hectares of land, the vast majority of peasants do not. Due to the inheritance system, most possess fewer than 2 hectares. Thus for the vast majority of Haitian peasants, one must speak in terms of relative smallness.

148X

The role which technology plays is quite crucial in this context, since the productive base which Haitians have available to work from is quite constraining. There have been relatively few technical innovations in agriculture, and the practices of the 1980's are different from those of the colonial period. Lack of erosion control technologies is one example of this. Given the level of population pressure from natural fertility increases on the one hand, coupled to a highly constraining inheritance system on the other hand -- because everyone gets something, economies of scale in farming virtually never are realised -- the need for a change from low-productivity technologies to high-productivity technologies is essential to the continued viability of the farming sector. While farmers can rationalize future coffee sales for crop advance payments at what in some instances are high credit terms, the lack of credit at interesting rates precludes investment since the ultimate profitability of the technological transition may prove negative. More importantly, the informal financial sector is not geared to extend long-term production credit period.

While it is generally said that coffee marketing is a male activity meanwhile, others claim a healthy involvement of women in this commercial marketing sphere. It clearly does not however rival womens' role in the commercialization of lesser value household agricultural production. Where women are involved in coffee, it is very often in the realm of bulking.

The role of coffee in the peasant farming system has traditionally been most substantial. The crop was introduced during the period of colonial mercantilism and was even more than cotton, cacao, tobacco, and sugar cane, the most significant export crop during the colonial period.

This importance of coffee in the peasant system is perhaps less notable for the profit which coffee brings to farmers as opposed to the short- to medium-term credit which peasant sale of coffee futures to speculators (or directly to exporters) is able to bring. This has been, and still is, an absolutely crucial feature of the peasant farming system.

More often than not, academic analysis of the patron-client relationships that develop around futures sale of coffee have focused on the potentially usurious side of the transaction as opposed to the beneficial role which the marketing advance loans provide to credit-starved farmers who must make educational, health, and morte saison subsistence expenditures from these advances. One recent study has suggested that despite numerous efforts to demonstrate the usurious side of patron-client relationships around loans for coffee purchase, no systematic data exists which support this (Lundahl, 1984).

While coffee is drunk in rural households when guests are present, its value is primarily as a cash crop which also has positive anti-erosive characteristics. Its beauty from farmers standpoint has been that it is a culture that to this point in time has been successfully intercropped with other household garden crops in the lakou and/or preferable soils of the upland mountainous slopes (te fret), without the slighest care given to the coffee trees. That is, coffee has by and large been a key cash crop and credit source for farmers, but has from an agronomic standpoint been treated almost as if it were a harvestable weed. Thus its socioeconomic significance to Haitian farmers historically has been most considerable.

E. Politics in the Sector

1. State Institutions

The laws which govern rural dwellers are codified in the 1962 Code Rural Dr. Francois Duvalier. This is an update of the 1864 Code Rural instituted under the French Colonial government. As Smucker (1984) has noted, there is a tremendous gap which exists between the laws embodied in the code and the realities of customary peasant behavior on the one hand, and the discrepancy between the goals envisaged in the code and actual rural social realities on the other.

In the Code, the section rurale is designated as the lowest rung of government jurisdiction, to be presided over by an civilian administrative council. In fact, local military authority is still the rule throughout the rural sector. The principle of "community action" and cooperative formation which the Code purports to integrate into rural life has yet to be accomplished.

The State has also attempted dirigisme in peasant agriculture through the Code by explicitly prescribing that 1/3 of peasant holdings would be devoted to food crops, 1/3 for export crops, and 1/3 for local industry. Here peasant farmers have disregarded the state's directional policies and maintained decision making vis a vis land use on the basis of their traditional agendas and personal criteria. The Code furthermore stipulates in regard to coffee cultivation that neither coffee nor fruit trees may be cultivated on slopes above 50 percent grade. Yet the state has never managed to put into place either an administrative staff nor Agricultural Extension Staff capable of supporting any of the dirigiste policies. The Code prohibits any usurious practices regarding the placement of land as collateral to secure a loan, yet this is customarily done through the traditional practice of vente a remere.

Rural Police often assume responsibilities normally falling under their mandate, as well as responsibilities attributed to the Ministry of Agriculture, Registry of Vital Statistics, tax collection agency, and the civilian sectional council. The section rurale superstructure is governed over by a Chef de section, his Adjoint, and a group of assistants (ekip). Many of these local level functionaries are able to levy secondary forms of taxation from peasants, depositing into state coffers what they will. These positions offer enormous power to those garnering them.

150X

One major change in the quality of state intervention in recent years has been the removal of the coffee export tax, which hitherto has been generally cited in most of the Haitian development literature as an enormous exploitative yoke on the peasantry. The implications of this change in the State's role in the coffee sector will be discussed in Section F. below.

Finally, the issue of "intentional chaos" as Smucker calls it is worthy of note. This calling to note is as much for the direct influence which intentional chaos has on rural Haitian peasants, as for the influence which it has had on the evolution of Haitian institutions, and their lack of sustainability in the Western sense. This chaos is characterized by "a functional confusion which allows freedom to manouver the perquisites of office to personal advantage". This latitude is based on a cultural preference for customary practice, for what is "official", versus what is legal as received from the French. This "universal respect" for the perquisite of power and the potential it has for manipulating the law and subverting it for personal ends -- through the quasi-institution of pistonaj or gran relasyon -- is used by both government functionaries and peasants so as to gain protection and/or profit.

2. Indigenous Institutions

As indicated above, there is enormous diversity in even the most basic of Haitian social institutions, including what is known formally as "the conjugal relationship". Regarding the latter, Lowenthal has clarified that unions, be they of the peasantry or the urban bourgeoisie, are never necessarily exclusive no permanently binding. "In some instances, a man may simultaneously marry, maintain a consensual union in a second household of which he is a titular head, and conduct one or more stable extra-residential affairs" (Lowenthal, 1987). The children in turn, those who most often legally have the right of inheritance bilaterally, may thus be born to a married couple, to a married man to another woman, to a couple in a consensual union, to a mother not in union to any man, etc. At the most basic level therefore, the indigenous conjugal institutional structures are extremely flexible.

The most basic traditional Haitian institution in turn is the product of the met bitasyon, the apical ancestor who represents for each ambilineal descent line, the direct link to a glorified, admittedly amorphous, pre-slavery past which set the precedent for the present way of life. This life, the eritaj of the past in both a cultural and social sense, brings together the groups of contemporary blood relatives along with the crucial subset of antecedent blood relatives traced back to the apical ancestor. These family groups have been recently deemed by Lowenthal as being the reference points for "the single most important sociosymbolic construct of Haitian culture", which are "as timeless as death itself" (Ibid.).

Co-members of any eritaj share -- hold in common -- and separate -- divide into individual units -- the most important cultural legacies including the lwa (referred to in section 2c above); their ties to the dead (lemo); the ritual knowledge necessary to invoke and fulfill these relationships; along with the material portions of landed inheritance referred to in sections above. The eritaj however, like the most basic social institution -- the conjugal unit -- is not a uniformly homogenous institution in time and space. The key membership characteristic of the institution is blood relation; distance per se to the apical blood relative being irrelevant. Thus one may be a member of several eritaj at the same time.

The next most important local institutional level would logically be the community. This community would logically consist, in a flexible manner, of the many menaj which may constitute lakou, which in turn may be more or less physically coincident with some of the residential units in any given set of eritajs.

Yet Smucker (Ibid) notes importantly that peasant society is in fact "a world at odds with itself", in so far as the "community" of peasants may be composed of fragments, segments of society which are replete with social status differentiation and antagonism based on competing ideologies and aspirations. At the level of community, egalitarian ethics collide with envy and enmity; leveling behavior confronts assertions of authority or social status, with the metaphor of crabs in a basket describing the sociocultural phenomenon at the community level -- i.e. those behind keep back the others striving to get out. While on the individual level good fortune is sought, at the community level good fortune is perceived as being transitory, contingent, and subject to obligations to both people and the lwa.

Somewhere beneath this ambiguous community level lies networks of personal ties and obligations between moun kinam, "people belonging to": your people, kinfolk, patrons, clients, neighbors and others where mutual obligations impose bonds of reciprocity. In a purist sense while these distinctions may not deserve designation as institutional status per se, in a pragmatic sense these relationships may constitute the most binding and interdependent ties that are of duration in a predictible sense in peasant society and hence may for social analytical purposes be categorized under the rubric of indigenous institutional relations. These relations serve as a counterpoint to the lack of overarching community integration, and complement in a short-term sense, the more profound and symbolically significant sense of community distinguished along blood lines which eritaj confers.

3. Militia Groups

Members of the VSN (Tonton Macoutes) a parallel service maintaining separate chains of command from the army, is more explicitly political than the police, yet is less carefully screened than the latter. The VSN solicits partisanship and loyalty to the government, and thus serves as the government's power base among the peasantry. Its means of recruitment are similar to that of the colonial corvee.

152X

Peasants in turn were apparently attracted to join it as a means of participating in a political process which might serve to advance one's personal ambitions towards wealth accumulation. Participants usually have been young, land poor peasants, who through participation in the VSN attain the right to conduct biznis -- the socially acceptable form of official corruption linked to prebendal domains of state functionaries.

The Tonton Macoutes groups, have served as a key layer of surveillance and control in rural areas. Macoutes were the omnipresent eyes and ears for the government. These Macoutes were also armed, and were hence an active force of repression of the peasantry. Pistol porting Macoutes could be found in even the most removed of rural places, and provided during the Duvalier years a source of almost surreal fascination for an outsider when juxtaposed with a rara dance on a distant spate of land such as Kay o L'eau.

With the ouster of Jean Claude Duvalier and the ensuing dechoukage (literally uprooting of a rooted plant) many Macoutes were killed or were "tempered"; given the thousands of local people who were VSN, the uprooting was clearly not across the boar nor systematic. Thus most Macoute elements still exist in the rural sector, and in some areas such as the Artibonite, in substantial number. Their role and function in the society, at large, however, is in a state of flux, many are reported to be consolidating their individual bases against erosion of their still significant local power.

F. Rural Social Change

There are numerous endogenous as well as exogenous factors which are responsible for provoking considerable social change in the rural sector. These endogenous factors include: (1)land/demographic imbalances; (2) the effects of resource base depletion on outmigration.

The key exogenous factors are: (1) commodity market price dynamics; (2) the impact of national political changes; (3) the pull of urban opportunity structures in Haiti and abroad; (4) the proliferation of church groups and their subsequent fragmentation; (5) the proliferation and impact of foreign donor aid projects.

1. Endogenous Factors

A. Land/Demographic Imbalances

In section B.1. above we described the internal dynamic provoking land fragmentation. At this time the dynamic is both a cultural and demographic; culture establishes the normative rules for all offspring to inherit bilaterally through parents of a recognized conjugal relationship. Culture also establishes the spiritual value for peasant ownership of even the most trifling plot of land.

Demographic increases meanwhile establish the growth parameters under which the fragmentation process will proceed. Land ownership is important for the role it plays as both a factor of production, as the site[s] on which the ancestors and lwa are propitiated, and as the sine qua non of personal freedom and autonomy in a society which from its very inception in the pre-revolutionary peasant adaptations of freedmen and maroons valued land ownership more than any other factor (Lowenthal, Ibid.). It is thus not surprising that no internal solutions to the land fragmentation issue exist. To quote Smucker, "use rights and inherited land tend to keep successive generations of farmers on the land, and in many families this becomes a kind of shared poverty". With the population growth rate posited at 2-2.2%, the dynamic propulsing this shared poverty intensifies.

B. Effects of Resource Base Depletion on Outmigration

In conjunction with the dynamic towards increased fragmentation of lands, resource base depletion is becoming an extraordinarily important phenomenon in the rural sector. Every year cultivation of annual food crops forces other crops and grazing lands higher up the mountain slopes and every year the steepness of the cultivated plots increases. The end result of indiscriminate tree cutting and intensification of cultivation is tremendous soil erosion, with over 6,000 ha of arable land (3%) lost each year to erosion (USAID, 1987[?]).

A further factor contributing to resource base depletion is the extent to which Haiti is susceptible to natural disasters in the form of hurricanes, floods, and drought. In the 1960s alone there were four major hurricanes -- Flora, Cleo, Inez, and Beulah. This year, particularly in the southern peninsula's upper elevations, Gilbert took its toll.

It is therefore not surprising given rural Haitians are having a harder and harder time earning their livelihoods from the land, that the latest population projections posit an increase in Haiti's urban population from 1.3 million in 1982 to 3.7 million in 2006, concurrent with a decrease in the rural population from 3.8 million in 1982 to 2.8 million in 20006.

2. Exogenous Factors

A. Commodity Market Price Dynamics

The role of commodity market prices on production/investment decisions plays an important role in rural social change. As the relative price of food crops has risen against export crops such as coffee, cacao, and cane, younger farmers in particular are forced onto ever more fragmented lands. These farmers are understandably more attracted by the short-term gains to be realized in beans, maize, or peas as opposed to export crops due to the time/price factors. This is particularly true where new investment in agriculture is required. These short-term oriented decisions in turn fuel an unremitting deterioration of the productive environment. The flip side however is that the food crops seem to tend more to cyclical glutting; excellent prices for peas one year subsequently drives everyone into them which increases the overall volume of the next crop while causing slashes in its price. Illegally imported food grains have competed significantly with domestic food crops since the farmer's price is much lower than the latter.

154X

B. National Political Changes

The considerable political flux and ensuant political dialogue which Haiti has both endured and enjoyed over the past several years has created opportunities which were virtually unimaginable during the Duvaliers' regimes. The fact that Tonton Macoutes no longer openly control the paths of rural Haiti and the streets of Port au Prince; the fact that rural and urban Haitians can and do openly talk about politics, a hitherto tabooed subject; the fact that both television and radio openly sponsor discussions on human rights and the necessary creation/evolution of participatory democratic structures; the fact that hitherto protected businessmen now talk seriously of investing in the country so that Haitians' purchasing power is not totally eroded to the point that a violent social explosion becomes inevitible; all these are crucial changes of an essentially political origin in Haiti, and are still very much in the evolving stages.

C. The Proliferation and Impact of Donor Aid Projects

There are few areas of the country in which a panoply of donors, international and national PVO's and beneficiary farmers are not either collaborating or working counter-productively on development projects. Often the interventions are either unanticipated, or else do not consider the full ramifications of antecedent of concurrent interventions of other donors and PVO's, each with their particular philosophy and development agenda.

The UNICORS zone of the Departement du Sud is a classic example. UNICORS has been receiving a fairly constant stream of development projects in the coffee and road sectors since 1975, primarily funded through the United Nations Organizations of FENU, FAO, and UNDP, with the support of World Food Program "Food For Work" rations. At the same time, they have received technical management training support for six years from the ILO (BIT), and most recently for three years from the Centre Canadien d'etudes et de Cooperation Internationale (CECI) as a follow-on to the ILO's program. Concurrent to this they are receiving technical support from the USAID funded Projet Sove Te (Watershed Management). (See section VI below for a more detailed description of this problem.)

3. The Proliferation of Church Groups

The proliferation of Church groups in recent years has been a corrollary to the proliferation of community based rural development projects. The agenda of each particular Church denomination has been of a quite different character, particularly comparing Catholic and Evangelical Protestant sects.

Protestantism in general is a movement of considerable interest because of its modernizing ideological character, underlining "rational" adult decision-making supported through literacy programs emphasizing a fundamentalist understanding of the liturgy. The Protestant approaches to conversion of Haitians constitute a serious commitment to social change. This is fairly consistent with the disparate character of Protestant missions, emphasizing the separation between church and state, with converse dependence on foreign donors for material and social support. Though they have never developed an intimate relation with the state apparatus, they have remained either supportive or neutral to it. The state thus, despite its primordial association with the Catholic Church, has welcomed the Protestant churches as sources for Western based models of social change. There may be as many as 300 protestant sects now in Haiti, based on internal schisms and ensuant fragmentation of missions.

Catholicism meanwhile has in general maintained an "uneasy symbiosis" with Haitian traditional belief systems and its lakou and eritaj based pantheons of personal deities. Thus the Catholic church has tended in recent years -- the 1940's unsuccessful campaign to eradicate vodou belief the exception -- to maintain folk religion and the social structure it is embedded in, as opposed to supplanting it. A certain toleration for the syncretic method which Haitians have used to integrate Catholic rites into the traditional lwa-based cosmology has been evidenced, particularly after the reforms of Vatican II. There has also to this day remained a strong tie between the Catholic church and state, with a former bishop of the Cap Haitien diocese noting that as recently as 1959 the church "is a branch of public service over which the state exercises its control as over all other administrations" (Msgr. Jan quoted in Smucker, ibid.).

Most recently there has been an internal rift bewteen the Haitian Catholic clergy and the Bishops; though playing a key role in the ouster of Jean Claude Duvalier, the masses now view the Bishops as opposing political reform. Thus the very positive role in instigating democratic reorientations which the church was seen as playing in the ouster of the Duvalier government, has most recently been put into question.

At the same time, the intensive internal fragmentation of Protestant sects -- according to one survey done in the Gonaives zone, among 900 families surveyed for sect allegiance 325 sects were identified, with many simply being offshoots of a mother sect (Jean Baptiste, Personal Communication) -- is seen by some as retarding the possibility for widespread social change of a significant order of magnitude. Furthermore, this process may in fact play directly and unwittingly into the hands of the least democraticly oriented elements still remaining in traditional Haitian society.

156X

III. Cooperatives

Cooperatives represent perhaps the principal institutional structure through which donors have attempted to extend systematic agricultural development interventions over the last several decades. Coiffed under the umbrella of the Conseil National des Cooperatives (CNC), the coop movement has been inspired by the potential which the Western model of participatory democracy appeared to offer for previously unstructured local organizations to realize specific development goals and purposes. The cooperative structures thus imposed upon diverse assemblages of peasants are hierarchical structures in which roles and responsibilities have been rationalized and clarified in principle, with accountability and "transparence" the sought after norm.

In practice this totally worthy objective on the part of the donor community has proven most difficult to achieve. The reasons for the relative failure include the following:

1. Cooperatives are externally imposed structures with virtually no philosophical, sociological, or organizational precedent in the Haitian experience.

2. So as to get many cooperatives off the ground, particularly in the aforementioned UNICORS zone which has received more cooperative assistance perhaps than any other zone, the World Food Program's Food For Work has become thoroughly integrated into the cooperatives' activities. A line of dependence has thus been created between the cooperatives and the food upon which all their cooperative activities function. Based on the most recent evaluation of the World Food Program and PNUD/FENU who have instituted most of development projects in the zone, not only has the food for work failed to promote achievement of the objectives for which it was given as measured by verifiable indicators but also the equitable distribution of the food has also proven to be most difficult to control. Inevitably, an accentuation of internal stratification has ensured between elites who control coooperative administrative structures and the cooperative farmer members themselves.

3. Haitian peasant farmers may perceive cooperative management irregularities as just one more form of culturally acceptable behavior falling under the general rubric of biznis -- i.e. those in bureacratic positions of administrative authority are virtually "culturally sanctioned", based on nearly nearly two centuries of experience, to manipulate the system to meet individual ends. This factor is tremendously complicating for all projects attempting to achieve efficiency and sustainability, cooperative or otherwise. As proponents of cooperatives would justifiably argue, to change this mentality will take time.

4. While these problems all hold true for individual cooperatives, they become even more amplified for unions of cooperatives, since there really is no bedrock of solidly successful cooperative experience to stand on. Organizations like the Cooperatives Cafeieres d'Haiti (CCH) have been plagued since their onset with management problems, with consequent constituent cooperative member dissatisfaction. Thus the combination of historical constraints, and cultural constraints, not to mention technical constraints, pose even more daunting problems for Unions of Cooperatives.

5. Counter-examples to the above description do in fact exist, most notably for cooperatives which were primarily self-constituted. Examples of the latter include the several Caisses Populaires of Jacmel, which have been rendering on a small scale significant lending services to principally urban and peri-urban dwellers for many years now. So too, the Vachon Coffee Cooperative of Camp Perrin has been functioning since 1961, serving a membership of over 1000 medium to large local coffee/multicrop farmers. Thus the model is by no means inapplicable across the board, nor without potential under the right circumstances.

6. There are political reasons for why cooperatives do make sense. In the current context of political transition, cooperatives are legally recognized institutions with basic rights supportable in a court of law. This is no small plus in the Haiti of the late 1980s. The cooperatives structure only becomes advantageous however to the degree that members benefit at the lowest cooperative levels.

7. The theoretical advantage which cooperatives would seem to enjoy vis a vis financial lending institutions has as yet not been realized. Cooperatives should offer the organizational viability sufficient to attract finance capital. Unfortunately, as the BCA experience of agricultural credit societies (SACs) demonstrated, to quote the DAI Evaluation of the Haiti Small Farmer Coffee Marketing Project: "credit should not be proferred to small farmers through artificially created groups. For this reason, the mature cooperatives that have participated in PCC are natural candidates for constituting the local organizational basis of the new project's production component."

The problem of reaching the stage of "maturity" necessary to properly utilize credit and other production inputs still in many instances appears elusive through the cooperative structure.

IV. Groupements

The evolution of groupements (gwoupman in Creole) has proceeded parallel to that of cooperatives, save in a far more eclectic manner. A gwoupman can be almost any assemblage of local farmer organized through the mediation of a local or international PVO. These in turn may be exclusively secular and trans-denominational in character, or may be a part of a larger denominational sect. The impetus for the gwoupman concept, and its widespread popularization, is based on the model generated by the Papaye gwoupman near Hinche. Over time however, there have been groups which have kept certain aspects of the model, while adapting it to meet their own particular group objectives.

158X

A. The gwoupman model

The premise behind the model is that Haitian society has been based on exploitative relationships between the 5% very wealthy urban class who control 50% of the country's resources, and the remaining predominantly peasant poor. The peasants at the bottom of the pecking order must become strong themselves to get access to resources since the wealthy never invest in the peasant sector. Thus "development" according to this model is seen as change enabling those at the bottom to improve their relative social and economic standing within the society (Maguire, 1984).

Operationally, gwoupman address this imbalance by investing in human resources -- providing information, skills, knowledge, and an organizational framework. Once sufficiently advanced, the next step is further investment by the group, according to its self-defined needs, to implement well identified activities. The locus of activity of groupman members is centered around the bitasyon -- the local settlement level including both kin and non-kin, often multi-denominational in composition. As the group's resources are increased through the groupman, their social and economic isolation is broken. The investment to improve the capability of the human resource base in turn will induce further investment reflows into the community. Conversely, in those situations where investment into the community is made prior to gwoupman formation, stratification disparities will be reinforced, to the detriment of the poorest community members.

The limitations on widespread dissemination of this model are obvious. Maintaining the proper contact and material support between a PVO and gwoupman is mandatory. Unfortunately this is done in an environment where no state support for such activities exists, and where output-oriented donors generally do not have sufficient time to wait for groups to develop their human resources to the point where investment reflows begin to occur. For this reason, donors have tried to "accelerate" local institutional formation through the support of cooperatives in particular.

One variation of the gwoupman model which has enjoyed initial success is the approach implemented by the USAID-funded Save the Children project at Maissade. There an initial one year period was spent in identifying and training interested pre-gwoupman members in the key responsibility concepts relevant to the success of a specific goal oriented gwoupman -- i.e. one that has an initial purposive agenda and reason for its being and which brings interested people together on this basis as opposed to coming together on the criteria of common residence in a bitasyon.

While from an institutional sustainability standpoint the classic residentially based gwoupman model is probably the most apropriate development structure if the requisite levels of technical support can be provided, the latter approach offers a nice compromise whose relevance for the coffee project will be discussed further below.

All told, the gwoupmans offer lower level structures than cooperatives, offer less probability for cooptation from powerful members than the more organizationally complex cooperatives, and on either the criteria of daily lived experience around a locale, or lived experience among a group of kinsmen or friends, offer a model which is closer to the peasant farmer experience. On the other hand, groupmans do not always offer the kind of political structures which are immutable to outside manipulation from local elites or others and are hence possibly more susceptible to outside predation. Conversely, they are less susceptible to internal manipulation by elites than cooperatives are wont to be.

V. The Social Soundness of the Proposed Coffee Project

A. A Rethinking of PID Assumptions

During the project design exercise certain key PID assumptions have been determined by the team to be sufficiently questionable to warrant a refocus of goal, purpose, and objectives from those originally identified in the main body of the Coffee Cooperatives Project PID. However much to the PID's credit, many of these findings are in fact the result of followup of issues raised in its Design Issues section.

The key conclusions from this examination of PID assumptions is that:

1. The threat of coffee leaf rust on the existing and potential coffee stands in the country is in fact more substantial than initially envisioned, and no rust resistant varieties are immediately available for widespread dissemination to small farmers. An agronomically sound strategy which mitigates against the leaf rust is therefore required. The strategy must permit sound coffee production activities to continue unabated in selected high production potential zones during the interim while rust-resistant varieties are tested and selected for subsequent widespread extension.

2. The thrust of the project should not be institutional strengthening. The institutional capacity of CCH is insufficient to coordinate a demanding production activity on the scale required as to revitalize the coffee sector. IICA is the institution more capable of performing the effort required.

Lack of CCH credibility at the local cooperative and small farmer levels precludes fruitful institution building in CCH at this time.

160X

The institutional weakness of most local and regional cooperatives, despite in some cases years of support in coffee production and marketing activities, precludes major institution building efforts directed principally for them. This is particularly the case given the threat to the coffee industry which the progression of coffee rust poses. Only the most appropriate groups of farmers, notes regardless of their label and scale of operation, should be targeted for five years of project assistance. Considering the actions which must be taken to address the spread of coffee rust in the short-term, targeting other types of farmer groups is consistent with the USAID Agricultural Sector Assessment Recommendation to not overburden coffee cooperatives "by adding to their existing efforts in the short-term" (Ronco, 1987). At this point, a pragmatic short-term approach to revitalizing the sector through emphasis on technology transfer must take precedence over a long-term institution building orientation.

3. Other local level groups -- including the broad gamut of local PVOs and gwoupmans -- should be targetted where appropriate, as opposed to cooperatives exclusively. This targeting strategy is consistent with USAID's successful Agroforestry Outreach Project.

4. The assumption that there is an unwillingness on the part of exporters to invest profits back into the sector because of marketing inefficiencies, along with the existence of a non-competitive market in general, is seen at this time to be invalid. The ASDBC coffee exporters have been identified as a participating organization with high potential for the financing of production activities in one high production potential zone at the project outset.

5. The assumption is mistaken that marketing inefficiencies are at this time more important to redress through a sustained institution building effort directed through cooperatives so as to stimulate market competition and production. Favorable current market prices are available to both cooperative and other private sector farmers from speculators and exporters. Marketing competition is now seen in the sector. Revitalizing production in the coffee sector through a production orientation must now receive priority over institution building per se if farmer incomes are to be raised and foreign exchange earnings through coffee export secured.

6. The assumption that the project could/should be targeted exclusively to "small" farmers has been examined and found to be slightly amiss. While farmers with above average, securely tenured landholdings may benefit most from the project, the fact that several attractive technological packages were designed which are adaptable for any category of farmer type and farm size, means that any farmer may adopt the packages. These farmers are by any absolute standards "small farmers" (farming 2-5 hectares on a secure basis). Relative to the farmers of Latin American and many African nations, in terms of land holdings Haitian farmers are small across 95% of the board.

7. The extension methodology must be reoriented in order to phase in project activities carefully, given the complexity of the technology transfer issues from an on-station and on-farm adaptive testing standpoint. The reorientation will not however be exclusively towards either the AOP extension methodology, which uses a gamut of local organization or towards the methodology suggested in the PID: "a concentrated, well integrated activity which does not exceed its bounds in scope and which proves that the recommended technologies are extendable". Rather, the extension orientation for the project will be a compromise between the two: it will use the same gamut of local organizations through which the AOP has successfully worked to reach the small farmer, but in the "concentrated" manner not "exceed[ing] its bounds" which the PID suggested.

8. The assumption that farmers would participate is an essential fact a precondition to achievement of the project goal. Special emphasis was therefore given to the design of "the optimum package" -- i.e. that package which from an agronomic, economic, and natural resources standpoint makes sense, and can be effectively transferred.

The optimum package has scaled down the basic package of the PID to the level where farmers can relatively easily afford to risk the investment of labor, cash purchase, or credit required. Since the package at its most basic could be used on virtually any size plot which falls within the agro-ecological guidelines, farmers could use it on any parcel they held with some tenure security.

The optimum package furthermore addresses the key feature Haitian farming systems: multicropping as a risk aversion strategy against crop failure and low market prices for any particular crop.

A. Emphasis on Support of Farmer Groups Which Have the Highest Probability of Adapting Project Technologies

Successful technology transfer has few precedents in recent Haitian agriculture. The AOP has been successful in establishing a far-reaching outreach network for the free dissemination of tree seedlings to over 100,000 peasant farm families, with an additional 30,000 "unofficial" planters. The technical package has focused on the outplanting of project seedlings versus thelong-term maintenance of seedlings. Thus the packages which have been successfully extended have been (a) cost free, save for installation labor; and (b) rustic, in the sense that the parameters for successful implantation have offered a certain degree of latitude.

The coffee project faces constraints of a much different order than the AOP for successful technology transfer. These constraints must be appreciated in turn, otherwise technology transfer will definitely not be achieved.

162X

1. PARTICIPATION CRITERIA

The prerequisites for successful technology transfer include the following criteria:

a. Participating groups, whatever their size, have farmers with experience in the coffee sector; have viable organizational structures which permit rather than constrain member participation; have the ability to contribute both labor and either cash payments or credit payments on the project's concessionary terms; have the support, if possible, of higher level local NGOs for the implantation of packages; are not particularly encumbered logistically; have capable member farmers willing to work on either a full time or part time basis (depending on the logistical considerations). Remuneration will be based on objective quantity of work, rather than gender of laborer.

b. participating groups accept the project technology transfer strategy of working closely with project extensionists during years one and two when (a) group farmers with existing non-rust resistant, high production potential coffee trees will receive support prior to the receipt of other adapted technological packages -- the 51 tree multicropped caturra or catuai variety or the larger variant minus the food crops; or (b) other farmers fitting project participation criteria without possessing any of the new improved varieties receive the first technological packages incorporating either caturra or catuai genetic material.

c. participating groups in areas where land preparation is necessary are willing to make the necessary contributions in labor, with corresponding financial support from the project or a financial institution for the balance of inputs.

d. participating groups will receive the necessary technical training in years one and two -- group workshops, station demonstrations, on-farm demonstrations, etc.

2. Implications of Criteria

Under these criteria, participation is only limited by agro-ecological and institutional criteria. Farm size or socioeconomic status per se does not exclude anyone from participating in the project. Neither does gender; what constrains female participation if anything is the traditional division of labor, which a project such as this has little means of greatly changing. What does require additional specification however is the precise role which women do play in coffee production and coffee marketing, to ascertain whether womens' participation in these activities is limited to certain precise tasks.

Another key category of project participants includes both large landholding farmers, in cooperatives or otherwise, and the coffee exporter association, known as ASDEC. Based on the analysis of current social changes in Haiti and based furthermore on the absolutely dismal downward spiralling rural poverty coupled to out-migration and degrading land resources, it is clear that traditional approaches to the resolution of Haiti's development problems have not worked to the degree desired. Many onlookers feel that if things in Haiti are to turn around, the 5% of the population owning some 50% of the country's wealth will necessarily have to begin investing in the country's revitalization. To this end, the PP Design Team agrees and has searched for ways to integrate the wealthier private sector actors into the project.

Because one of the key PID premises was that the private sector coffee exporters were unwilling to reinvest backward into the sector, the Design Team worked specifically to investigate the true potential of private sector involvement.

3. Evaluation Criteria

One function of the agro-economic surveys described in the Extension Section of the Agronomic Technical Report is to determine project impact on participants. Intial criteria of impact, which may require rethinking during implementation, are: (1) the degree of participation as measured by total number of participants and degree of democratic participation in any of the institutional structures; (2) the degree of technology transfered; (3) the potential to realize multiplier effects through the quality of the technology transfer component; and (4) the actual quality and quantity of private sector involvement in the project. With regard to the last, particular attention will need to be given to the following:

a. Amount of money ASDEC actually provides for production activities in the zone of Baptiste;

b. The number of farmers participating in production activities in the zone;

c. The amount of hectarage under cultivation and coffee produced;

d. Any changes in land tenure status/increase in land sale transactions as a result of the project supported ASDEC intervention; and

e. The terms of credit extension (though demand for this information should be secondary to the quality of the ASDEC intervention as measured by farmer participation and revitalized coffee production).

VI. Identification of Participating and Potential Farmer Organizations (PVOs or Other.)

164X

All the groups which are identified below qualif to some extent for participation in the project. They are discussed under the Institutional Analysis of the PP as well. We will identify here the issues which from a social soundness perspective are most noteworthy, and which over the course of the project must be monitored so as to avoid negative impacts.

a. Participating Groups Identified to Date

1 Vachon Cooperative/Camp Perrin

This cooperative was self-instituted, has been in existence over 25 years, and has managed to maintain up to date accounting records along with a well maintained wet coffee processing facility. The cooperative has established a direct financial linkage to the local caisse populaire in Camp Perrin, which has accorded it $15,000 in marketing and production loans.

The cooperative, described also in the Institutional Analysis appears to have been successful in large part due to the dynamic leadership of the cooperative's president, who is one of the local elite of Camp Perrin. It seems safe to assume as well, that a significant portion of the cooperative's active membership of 1050 members may be par of same local elite though it would require close field analysis to actually verify this.

From a social soundness perspective in the Haitian rural context, to be a member of a local elite has a slightly different connotation than it would in most other farming rural contexts. The absolute holdings of the coverage member of any so-called local elite actually residing in rural areas is very modest relative to elites in other countries. In fact, many of the elite -- if they are to be deemed such principally by virtue of the size and quality of their land portfolios -- would be considered to be poor farmers in most other rural contexts.

For this reason, the analysis considers support for a cooperative like Vachon, which likely is dominated by a core of local elite, to not represent a problem so long as the cooperative can demonstrate that the inputs and technical assistance it receives from the coffee project will in fact be distributed equitably across the cooperative's membership. This will require strong supervision from the project's Local Organization/Institution Building Unit, as well as the Extension Unit.

The analysis contends furthermore that in general, per the criteria established in Section B1 above, the crucial social soundness variables to be considered at this point in the coffee sector are group viability and technical capacity. Without these two prerequisites in place, coffee technology transfer can not be accomplished. The technology transfer issues are simply so daunting in the context of years of failed extension of technologies in general and coffee technologies in particular, that the most socially sound approach at this point must be to devote efforts towards groups which offer the best chances of succeeding. Further down the line, once technologies have been transferred to a sufficient nucleus of farmers, the combination of demonstration and multiplier effects should come into play which will permit a more equitable approach to less advantaged groups -- the landless farmersand those with no securely tenured land, women-headed households etc. For the time being however, it is worth the effort to work with the most capable and interested groups.

Vachon Cooperative, based on all said above, appears to offer an adequate opportunity base for the transfer of improved coffee technologies. They are aware of the gamut of new improved varieties; they have prior experience through the PPC project of fertilization, pruning, and marketing advance credit. On the other hand, they are very picky about what they do and do not like about coffee varieties, with caturras not being very high on their list of preferred varieties. Thus in their particular case, so as to make the technology transfer successful, a very convincing case for the new, improved varieties will need to be made by the project's Extension Unit.

The one notable drawback of Vachon Cooperative is that the majority of its coffee holdings do not fall in the 700 meter and above zone. Clearly once the technical team is in place, it must weigh the agronomic and social recommendations for participation which the respective PP analyses are providing, to decide the final criteria for participation.

1.2 CECOOPASE Cooperatives

Some CECOOPASE cooperatives appear to have a promising organizational base, and/or meet the agronomic criteria established for the target zones. The principal drawback of the CECOOPASE cooperatives, or groups of farmers within those cooperatives who may be able to receive financing through the Jacmel Union des caisses populaires (see below), is that they are on the verge of receiving major project support from SOCODEVI, financed by ACDI, the Canadian government. The ACDI project document although it was not yet finalized as of January 1989, established goals of cooperative institution building, economic farmer income generation, and improving women's economic and participatory status, within the cooperatives.

Specifically in regard to coffee, the ACDI project plans an intervention which covers all aspects of the production/commercialisation process. Of interest though, no mention of the potential CCH role was made in the document.

In terms of social soundness, it is recommended that the USAID funded coffee project not intervene in the CECOOPASE zone unless: (a) a clear division of responsibility between SOCODEVI and IICA can be established regarding zones of intervention and policies of intervention for credit, technology transfer etc.; or (b) complementarity is established bewteen the two projects -- SOCODEVI would underwrite all the training/institution building activities while IICA would take care of the technology transfer program for coffee. Here a key consideration is who would finance the technician/formateurs which will be crucial for realizing extension objectives, as noted in the Extension section of the Technical Analysis.

3 PRODECA/CAPP COOPERATIVES of Thiotte

PRODECA/CAPP presents from a social soundness perspective an enormously interesting test case as to whether in fact local elites can serve as positive forces for development in Haiti.

The case of PRODECA/CAPP is quite different from Vachon in that PRODECA truly represents an elite cooperative in the strictest sense of the term in Haiti -- land holdings of 5-10 hectares for most members; several part-time, absentee members; several "arriviste" members - i.e. former poor farmers who have made it and have purchased 3-5 hectares.

166X

These purchased hectares, may sell for as high as $5,000/ha in Thiotte because they have mature, high yielding coffee trees). The President of the Cooperative is the dynamic daughter of one of the oldest and most successful coffee growers in Haiti, Mr Perez Bayard. Mr Bayard learned proper agronomic techniques to grow coffee on his small plot in Thiotte beginning some forty years ago when he arrived as the local purchasing agent for the Madsen export house. Many PRODECA members have spent considerable time in North America, both studying and working, and consider themselves to be "intellectuals". While they come from rural areas, most have not been truly peasant farmers.

CAPP meanwhile is a recently formed cooperative under the aegis of a respected local minister. Its interest to be associated with PRODECA appears to lie in PRODECA's promise to serve as an "engine of development" and quasi-extension service for CAPP. Despite the fact that PRODECA too is newly formed, CAPP sees that PRODECA has already succeeded in purchasing fertilizers in Miami, and has submitted proposal/dossiers to SOFHIDES and AID for support in obtaining financing improved coffee technologies.

The point of fusion for CAPP and PRODECA is CAPP's President/Minister, who is the responsible member of PRODECA in the name of CAPP. The linkage is recent and dependent on a sole personality; however, if properly supported, the PRODECA/CAPP association could prove essential to development in the zone. Therefore the PP Design team suggests that the Mennonite Economic Development Associates (MEDA) provide the technical assistance needed to solidify CAPP/PRODECA activities under the project.

As the USAID 1987 Agricultural Sector Assessment notes, MEDA has enjoyed success in organizing cocoa cooperatives in both the north and southwest. MEDA's experience, coupled with its commitment towards assisting the cooperatives it supports to realize "transparency" in their operations, and democratic participation among their membership, make it a particularly appropriate organization to technically assist coffee cooperative activities in Thiotte. MEDA assistance will two pronged: (1) proper administration of the advance credit line for production activities CAPP/PRODECA will receive from SOFIHDES or another financial institution; and (2) assistance to permit CAPP/PRODECA to achieve the marketing autonomy for direct coffee export to North America. MEDA's experience with cocoa exports to Hershey's in Pennsylvania should be a blueprint for PRODECA/CAPP.

4. ASDEC Supported Farmer Groups in Baptiste (and potentially Beaumont)

One of the most controversial aspects of the coffee project is the participation of ASDEC as a financier of coffee production, its potential as a "competitor" with other project participants.

ANNEX D

ECONOMIC AND FINANCIAL ANALYSES

The source of controversy over whether AID should enlist ASDEC involvement in the project lies in the fact that ASDEC has never previously demonstrated a sincere interest to reinvest any of its coffee profits into the coffee sector. Thus ASDEC's operation has appeared to be essentially predatory and self-interested, as opposed to collaborative and equitable. As an Association of coffee exporters, ASDEC is characterized as a loosely organized, monopsonistic coterie of, at best self interested businessmen or, at worst, exploitative sharks who have made their millions -- and many in the group have indeed made considerable millions -- on the blood, sweat, and tears of poor Haitian coffee farmers. The Association is perceived to be nothing more than "a weekly luncheon club" or "a private boys' club", at which tactics to perpetuate the continued suppression of Haitian coffee farmers is the Association's bill of fare.

Normally in a Social Soundness Analysis one must ritualistically bemoan the ever widening chasm between the haves and have nots in a society and in the project area. The case for bemoaning can be made for Haiti and for the coffee project: Haitian farmers are doubtlessly, on the basis of all available economic and qualitative indicators, becoming relatively poorer in relation most other segments of Haitian society, save perhaps for rural outmigrants newly arrived to Port au Prince.

More germane to a Social Soundness Analysis however evaluation of whether participation by an actor or set of actors in a project can have either positive or negative impacts on other actors (or participants), and if so, in what ways? If the determination is that one participant could impact others negatively, -- can the project mitigate the potential negative impacts?

In regard to ASDEC and the Baptiste coffee farmers, it must be stated unqualifiedly that any venture of collaboration such as that proposed has its definite risks. But these risks in no way set ASDEC & Baptiste particularly apart from any of the other zones of intervention in the project area. Coffee, just like any other of the world's glutted commodities, is inherently a risky investment whether produced by USAID assisted farmers in Beaumont, or CECOOPASE organized and supported farmers in Jacmel. The questions to ask are whether there is a greater risk in the case of ASDEC and the farmers of Baptiste than in the other project zones of intervention; (2) are there any convertly, greater potential gains to be realized through support of the proposed exploratory exercises (3) What are the implications of <u>not</u> supporting the ASDEC in Baptiste for both the coffee sector and in a larger sense, the country as a whole? (4) Why ASDEC suddenly become interested in investing in the coffee sector? (5) Would ASDEC extend credit at usurious rates?

To begin with the question (4) there is a convergence of factors at this time which may rationalize at least a tentative investment in the countryside by ASDEC members. These include the following:

169X

a. The Haitian peasantry and growing masses of urban dwellers -- including the small "middle class" of professionals and bureaucrats together with the masses of urban proletariat - are increasingly losing their purchasing power. Fewer manufactured goods are being sold; fewer services are being demanded. There is a general feeling among private sector business people that something must be done to stimulate the economy to revive diminishing purchasing power.

b. The political situation is such that two opposing tendencies in the private sector are manifesting themselves: (a) capital continues to flee to the country and find haven in North American or European investments; (b) private businessmen realize that, in a period of downwardly spiralling economy and rising political tensions, their privileged position will become jeopardized. To mitigate against this, they are prepared to at least attempt some formula to reverse these troubling trends.

c. The government may enact an investment tax credit to allow private sector investments in productive agricultural activities to be deducted directly from gross profits. Any investment losses in coffee would thereby be covered.

d. ASDEC members may recognize that playing a more active role in stimulating the rural sector, may boost their own personal stock with outside observers' through direct investment in coffee production.

e. Linked to No. 4, ASDEC wants to attain the status of "Reconnu d'Utilite Publique", to be officially recognized as an association which renders service, as opposed to one perceived as extractors of peasant surplus and value added profits.

f. At this point Haitian farmers can not be forced to participate in ventures that are not in their interest. For most Haitian coffee producers, their relations with coffee speculators and/or more direct linkages with the ASDEC export houses themselves, are more interesting than the linkages they have with CCH. CCH is unable to match the morte saison credit which ASDEC-financed speculators are able to loan farmers for ritual and consumption needs. Also with the recent elimination of the coffee export tax, ASDEC members consistently offer farmers as high or higher prices for their coffee than CCH. The greatest discrepancy in recent pricing was for higher quality cafe leaves where the Madsen house offered Dondon area cooperatives 6.4 gourdes versus CCH's 4.25. Neither CCH member cooperatives or individual non-CCH-affiliated farmers have registered animosity to the current functioning of the coffee marketing purchasing network. The fact that ASDEC offers good prices for coffee suggests that they can be trusted to make good potential investments to revitalize production with peasant farmers in the Baptiste zone.

g. Finally, ASDEC members may now be willing to invest in revitalizing the coffee sector even if the internal rate of return on investment from the sale of coffee is very low. This is because, we hypothesize, ASDEC is more interested in obtaining the dollars from coffee sales than in gaining to the profits from coffee sales. Dollars can be converted into high mark-up commodities such as cars or refrigerators, to be sold to the Haitian upper classes. Ironically, if our hypothesis is correct, ASDEC is now actually willing to pay an excellent price for peasant farmer coffee (especially considering the often times poor quality of the coffee) not from altruism nor from the quest for profits on coffee sales but rather, because of the future value which coffee dollars represent.

h. Finally, ASDEC must also fulfill its delivery contracts to thus to maintain its percentages ... the Haitian coffee export quota. The quota risks being atrophied further unless production rebounds are realized in the short-term. Losses will diminish the coffee dollars whose benefits are described in g. above.

Based on the convergence of factors noted above, ASDEC should be encouraged to invest in coffee production activities as part of this project. Just because they never have not invested before is no reason to exclude them from investing now under the project umbrella.

To return to the other questions posed about ASDEC is the possibility of their maintaining potentially usurious money lending relations with peasant farmers reasonable? To begin with, there simply are no other rural credit institutions that the majority of peasant farmers in Baptiste can now turn to, save the ASDEC-financed speculateurs secondly, as Lundahl argues (1984):

"The usury argument is an old one. The problem with it is that nobody (including Girault) has been able to support it with any systematic data. That interest rates are high is not per se evidence of usury or exploitation. Unfortunately, so far, no direct investigations of the informal credit markets in rural Haiti have been carried out. What indirect evidence there is (Lundahl 1979:Ch.11), however, does not seem to indicate monopoly profits from lending. The number of potential lenders is fairly large, and the lender category is not to be found only among speculateurs. Furthermore a difference must be made between high- and low-risk loans. The rate of interest is likely to vary substantially between the two. It can easily be demonstrated, for example, that paying the equivalent of 125% on a yearly basis is equivalent to taking a one-month consumption loan by selling and repurchasing an asset which yields 5% per year with transaction costs both for selling and repurchasing at 5% (Lundahl, 1979:516- 18). We know far too little about how informal lending takes place in rural areas, but I strongly suspect that the picture is much more complex than what the mere identification of high interest rates with usury would lead us to believe." In answer to the other questions posed at the beginning of this discussion of the Social Soundness of including ASDEC as a participant; the following should be noted:

171X

a. The only input that ASDEC would be receiving from the project is technical assistance to the farmers whom it selects to finance. The assistance will include nursery establishment, training of technicians, selected and paid by ASDEC, to transfer coffee plants and the accompanying technology to participant farmer fields, and provision of requisite inputs on a cash sale basis from the project to ASDEC.

b. The PP Design Team has debated the necessity meanwhile of providing a financial institution like SOFIHDES (in the event they commit themselves to involvement) a guaranty loan for loans they provide to ASDEC. Given the shortage of credit fund monies, and the financial position and strategic position of ASDEC, we have concluded that a guaranty loan to SOFIHDES would be inappropriate. ASDEC has the ability to meet its debt in the event of loan default.

c. The key input from USAID's standpoint therefore is technical assistance. Since it will only provide inputs to ASDEC on a sale basis, and since the project extension unit will be working directly with the ultimate beneficiaries of the ASDEC financed action -- the Baptiste farmers -- it is difficult to see the potential source of impropriety.

d. Since the Design Team had not otherwise identified the Baptiste area as a targeted zone of intervention, if ASDEC is not involved in Baptiste, then the numbers of project beneficiaries will possibly be reduced. If, in addition, working in the Jacmel area turns out to be unfeasible due to incompatibility of the SOCODEVI intervention, project benefits will be severely deminished.

e. Some feel, that, if Haiti is to realize a significant economic turnaround, the private sector must play a major role. We can not imagine, based on all the convergent factors noted above, a more propitious opportunity for involving the private sector in agricultural investment presenting itself than the present one.

f. ASDEC has stated that one reason they have not invested in coffee production activities in the sector is that there has been no credible technical assistance service in country, unlike the 1930s when J.G. White was present. Thus one is safe to assume that if USAID does not collaborate with ASDEC in supporting production activities in Baptiste, ASDEC is unlikely to do so on their own. It is hard to see how the farmers of Baptiste would benefit from that course of action.

g. ASDEC has stated their willingness to finance production activities in the Beaumont zone as well. If after a mid-term evaluation it is determined that ASDEC participation has in fact proven beneficial, consideration could be given to a further expanded ASDEC's role to Beaumont.

h. In terms of sustainability, if ASDEC's pilot activities are supported and show benefits the future potential for ASDEC investments in high production potential areas will correspondingly increase. The key here again is to assure that the necessary levels of extension support are provided to allow for transfer of the technologies.

i. ASDEC believes it has a "better" way to reach coffee farmers than any other executing agency can -- particularly compared to cooperatives or local PVOs. They feel that healthy competition can and should be fostered to determine whose approach will prove most successful over the long-term. While all the project agencies will utilize the same extension support, there will be room for interestiong comparisons, particularly in regard to the financial aspects of new production activities.

5. Selected CECI supported gwoupmans in the UNICORS zone

In the PID, project activities were planned for the UNICORS zone through the regional cooperative structure. Over the course of the PP design, it became apparent that the donors which have supported UNICORS for the longest -- FENU, UNDP, WFP/PAM, FAO, ILO, and most recently CECI -- have become increasingly disenchanted with the social soundness of operating project activities through the regional cooperative structure so as to reach small farmers. Yet projects targeted for a lower level of organizational complexity in the zone do offer promise and are worthy of support.

The role which Food For Work has come to play in the zone can not be underestimated; UNICORS farmers now work with difficulty on cooperative owned plantations without the Food For Work incentive. Their dependence on Food For Work clearly renders problematic any new projects oriented towards cooperative activities in the zone. At the same time, individual farmers in the zone are constantly attempting to adapt new food production and soil conservation techniques to maintain some equilibrium where ecological degradation is accelerating and endangering their production base.

Where the aforementioned donors and implementing agencies, have injected Food For Work into the zone, have resulted no corresponding production increases. A considerable proportion of the Food For Work entering UNICORS since 1975 was earmarked for coffee production projects. One of the reasons for adding Food For Work at the higher altitudes where the cooperative had purchased 1055 hectares of land, was a minimum of available labor was available within 1-2 hours walking from the coffee fields. For this reason, hired labor was paid in food so that improved coffee technologies could be transferred through the Regional Cooperative.

According to various available reports, for a variety of technical and institutional reasons, and despite considerable technical assistance, UNICORS has transferred technologies only with the utmost difficulty. Apparently somewhere between 47 and 115 of the 1055 hectares purchased for cooperative coffee lands are at present yielding moderately satisfactorily.

Reasons for the poor results reported are:

a. lack of appreciation of nursery work from siting, to choosing sacks, to transplanting;

b. lack of knowledge of coffee pests and possible treatments;

c. totally inappropriate fertilisation of the new improved caturra varieties, which depend on correct ferilisation doses;

173X

d. poor financial management and overvalorisation of man/day Food For Work rations;

c. lack of supervision by UNICORS' administrative council of community plantation activities, save regarding the distribution of Food For Work.

The UNICORS zone is in fact a high production potential zone. CECI has orientated on its work towards much smaller gwoupmans, feeling that the possibility for transferring technologies and achieving rural development objectives will be higher with the small groupman than through activities at the regional cooperative level.

Is it feasibile for CECI to support activities which are geared towards the fringes of UNICORS' participants versus the center? The project staff should consider all the antecedent complications noted, plus to the ongoing AID-financed Projet Sove Te with UNICORS, which focuses on technology transfer of contour planting, alley cropping, etc., to decide how a rational intervention in this high potential zone should be made.

For example, if linkages to CECI-supported gwoupmans can be established, some of the approximately 450 farmers from the gwoupmans could benefit from the coffee project. CECI groupmans could serve as an interesting comparison to the centralized approach to coffee technology transfer already attempted unsuccessfully through the regional UNICORS structure.

Further CECI might collaborate in the formation of a number of gwoupmans in the higher production potential zones in the UNICORS area, to be targeted specifically as beneficiaries for coffee technology transfer interventions. Successfully transfering improved, adaptable coffee technologies to CECI-supported pilot gwoupmans will allow for the subsequent transfer of technologies to a much broader spectrum of UNICORS zone farmers who do truly need assistance.

6. Beaumont Cooperatives

As indicated in the description of activities in the ASDEC zone of Baptiste, if the mid-term evaluation shows sufficient progress at Baptiste, a further project collaboration with ASDEC in the Beaumont zone, should be encouraged.

For the time being in years 1 & 2. The technical assistance agency should attempt to identify no more than three smaller sized coffee cooperatives in the Beaumont zone which have received marketing advance loans from CCH and have responsibly repaid their loans. The relative social and institutional soundness of these cooperatives -- or PVO supported gwoupman in the zone subsumed within or adjacent to these cooperatives -- should be identified prior to committing project resources to technology transfer, and particularly credit fund activities.

One major problem with the Beaumont zone which in some ways counterbalances the zone's production potential is that most of the cooperatives formed there are perceived by outsiders as "speculator cooperatives". That is coffee speculators formed the cooperatives in order to obtain financing through CCH. Speculators have in turn used the cooperatives to reinforce their position by using resources from CCH to meet their personal objectives. In short, the intervention of CCH in many of these cooperatives has allowed the speculator elites to play both ends against the middle -- since CCH has not taken legal means to seize cooperative accounts receivable, these cooperatives have been able to obtain CCH loans and subsequently turn around and sell coffee to non CCH buyers, traditional pocketing the profits above what CCH would pay to the cooperatives' members. Thus institutional transparency has if anything become even more opaque through the CCH intervention in the zone; the project technical assistance agency should carefully considered the history of Beaumont cooperatives prior to any interventions in the zone during years 1 & 2.

7. Union des Caisses Populaires de Jacmel Affiliated Farmer Groups

The Union des Caisses Populaires de Jacmel through assistance from the ILO and a CNC guaranty fund has begun to address the liquidity problems of the CECOOPASE cooperatives and the affiliated caisses populaires associated to the CECOOPASE zone. In particular, for bottleneck periods when educational and holiday needs coincide, the Union des Caisses Populaires with the backup of the $400,000 CNC guaranty fund, is lending money for production loans to both cooperatives as well as individual farmers. While the Institutional Analysis examines the role which caisses populaires can play more fully, for small scale loans these caisses may offer the most potentially socially sound basis upon which sustainable linkages between small farmer groups and local financial institutions may be made. If the project technical assistance agency determines that there exists no institutional conflict between SOCODEVI and the Coffee Project for work on coffee in the CECOOPASE zone, providing guaranty funds to the caisses populaires and/or small sums of capital carefully phased in for production activities may be a sound approach, particularly for small local PVOs structurally simpler than cooperatives.

VII. Final Social Equity Considerations

The PP design has identified technology transfer as the primary constraint to increased coffee production in Haiti. The project design has therefore focused on the development of technological packages which can be adapted by peasants with any size, land holding, necessing very modest financing, particularly for the multi-foodcrop modular package.

These packages are designed to maximize coffee production potential, soil conservation needs, and food cropping realities of Haitian farming systems. The packages are also designed within available labor resources at the small farmer level. The project will offer farmers alternative coffee technologies with higher value than traditional foodcrop technologies. Because coffee is a perennial crop which holds soil and moisture on sloping fields, the project's technology transfer activities will have important natural resource management implications at the small farmer level if extended of course food cropping will continue but it will be part of a package with aspects which promote improved soil conservation and natural resource management.

175X

As coffee hectarage under cultivation in any sub-project approaches a commercially significant scale of operations -- five well managed hectares or more -- the demand for hired labor increases particularly in the higher, rockier, more topographically demanding high-production-potential elevations. The project will not however provide credit for labor. Therefore, larger farm enterprises such as PRODECA/CAPP for example, will require financing labor from a Haitian financial institution such as SOFIHDES. PRODECA/CAPP's in particular, faces extreme competition for labor with the Dominican Republic sugar cane industry. Available field labor has become a scarce and costly factor of production in Thiotte.

Thus the project may provide a greater proportion of its credit resources to smaller farm enterprises. The larger farmer operations, which can receive commercial credit will however realize substantial production increases. At even conservative yield and world market pricing projections, their projection will provide most interesting IRR's (see Financial Analysis at Farm Level). Furthermore, successful technology transfer will provide local wage labor employment in these larger operations. If successful, they will offer an important alternative to the land-poor laborers who now migrate seasonally and/or permanently to Port-au-Prince.

Since coffee multicrop technological packages have been developed which minimize risk, and which can be adapted in lakou gardens if shade conditions are correct, all efforts have been made to allow small farmers to participate on either a cash buy-in or credit basis.

ASDEC's participation in the project will allow farmers in the Baptiste zone to participate in the project where otherwise they would not have. If ASDEC's participation proves fruitful, the socioeconomic opportunities for coffee farmers nationwide will improve; and wealthy coffee exporters will have begun to invest backwards in production activities a more for which critics have been clamoring for decades. Such backward investment would represent an equitable shift in financial burdens; for generations coffee farmers have been heavily taxed relative to coffee marketers. However, circumstances have changed in recent years due to a convergence of factors. The current circumstances described in Section VI above permit farmers to receive a more equitable price for their coffee production than before. Furthermore it is no longer a necessity to allocate scarce project resources to coffee marketing activities, so that the project can focus on the key constraint to increasing coffee farmer income at this time -- production technology transfer.

In summary, the thrust of the project is to develop a successful technology transfer program which will allow a sufficient nucleus of farmers to adopt technologies so that they can eventually serve as larger scale adopter/demonstrators to other farmers. To this end, the project will work with the most appropriate groups of farmers -- be they cooperatives, eskwads, lakous, bitasyons, or the most basic menaj -- and will emphasize the extension and training aspects required to transfer the technologies. Since the project will work with the most effective groups, based on criteria established herein regardless of their scale of operation, social soundness will be evaluated by the success of the technology transfer process under the wing of the Extension Unit. This approach is considered appropriate given the dimensions of the coffee rust problem coupled to the already significant production constraints facing coffee farmers and the sector at large. Making technology transfer work, versus simply working with X number of small farmers, is therefore considered to be a socially sound project goal.

ANNEX D. ECONOMIC AND FINANCIAL ANALYSES

Table of Contents

1. Application of Recommended Inputs and Resulting Yields
2. Input and Labor Costs
3. Reduced Inputs and Resulting Yields
4. Seedling Production and Distribution
5. Coffee Prices
6. Single Farm Analyses
7. Farmer Options and Access to Credit
8. Overall Project Analysis

Tables

1. Recommended Annual Level of Inputs for One-Tenth of a Hectare Replanted in Improved Coffee Variety
2. Costs of Recommended Inputs and Labor Per One-Tenth Hectare
3. Participating Farmers, Trees Distributed and Hectares Planted

4a. Optimal Level Inputs - Single Farm Analysis
4b. - Labor Inputs in Person Days and Cost Equivalent
4c. - Fertilizer/Fungicide Inputs and Costs

5a. Mid Level Inputs - Single Farm Analysis
5b. - Labor Inputs in Person Days and Cost Equivalent

6a. Low level inputs - Single Farm Analysis
6b. - Labor Inputs in Person Days and Cost Equivalent

7a. Overall Project - Costs of Inputs/Hectare at Projected Level of Use
7b. - Fertilizer Rate of Use and Cost
7c. - Fungicide Rate of Use and Cost
7d. - Production Costs for Commodities and Labor by Year of Planting and Project Year
7e. - Total Production Costs by Year and Incremental Farm Costs

8. Coffee Production, Income Generated and Incremental Benefits
9. Fifteen Year Overall Participants' Cost Benefit Stream
10. Fifteen Year Overall Cost Benefit Stream Including USAID Inputs

Figure

1. Net Returns to Coffee Farmers Over a Six Year Period

1. Application of Recommended Inputs and Resulting Yields

The recommended inputs and management discussed in the Agronomic Analysis are considered to be a preliminary best estimate of how improved coffee production can be applied in the Haitian context. This sample "technology package" is considered to be applicable to a wide variety of farm sizes. Table 1 summarizes the level of inputs suggested and labor estimates for a coffee plot 1/10 of a hectare in size.

By using all of the recommended inputs and a planting density of 300 trees per 1/10 ha, farmers are expected to obtain a yield of 200 kg of coffee per 1/10 hectare (2,000 kg/ha) from mature trees. While this coffee yield greatly exceeds the estimated average now obtained on existing traditional Haitian coffee plantations, it should be noted that small farmer coffee yields in other countries, with inputs similar to those recommended, are known to surpass 3,000 kg/ha. Thus yields of 2,000 kg/ha are considered realistic for those farmers who fully adopt all of the recommended inputs. The analysis which follows assumes, however, a wide range of adoption levels for participating farmers and concomitant lower yields.

The results of this analysis will show substantial benefits for a large majority of project participants, even if yields on existing stands are not afflicted with coffee rust. The likelihood of coffee rust incursion and yield drops of more than 50% on old stands will make participation in the project (i.e adoption of improved production methods) the only viable alternative for farmers who wish to continue to produce coffee.

In addition to the inputs and management needed specifically for the production of improved coffee varieties, the "technology package" incorporates the interplanting of fruit trees and plantains. In the first year or two after seedlings are planted, legume or other annual crops are also suggested. However, the analyses in this paper are based on inputs and returns only for coffee. The other crops are not included in order to focus on the component of the small farmers' production with which the Coffee Revitalization Project is concerned. Also, data on current production for crops interplanted with coffee is sparse or non-existent, which would render comparisons with returns under the project extremely speculative.

2. Input and Labor Costs

Based on the rates of application from Table 1, the costs for commodities and labor, at 1989 prices, have been calculated for a 1/10 of a hectare plot planted with new, improved coffee seedlings. The results of these calculations are shown on Table 2, Costs of Recommended Inputs and Labor Per 1/10 Hectare. A glance at this table quickly reveals that costs for labor far outweigh purchased inputs, even at the very low Haitian rural wage rate of $1.50/day.

Farmers with several able bodied (otherwise unemployed) household members will be in a better position to undertake the planting and proper care of new coffee plantations, since the investment of family labor will not

178X

require cash outlays. It will be important for extension and training staff to recognize the necessity of reaching all household members. If each familiy member understands the potential benefits of improved coffee production, the possibility of achieving optimum yields will be increased.

As production levels increase, harvesting and processing costs increase proportionately. By the third year after planting, harvesting and processing represent over one-half of the labor costs. Although farmers may not wish to sell their coffee immediately after harvest, if cash payment is needed for harvest related labor, quick sale can provide the money required.

3. Application of Inputs at Reduced Levels and Resulting Yields

Every effort will be made to impart to farmers the importance of using all the recommended inputs so they will gain optimum yields and returns from participation in the project. It is recognized, however, that various factors could prevent a farmer's full participation at recommended levels, especially in years following the planting year.

In order to prepare a realistic analysis of project results, some assumptions have been made concerning the degree to which participants will adopt project recommendations. For the pilot zones it is assumed that 20% of the individuals involved in the project will be model farmers who will follow all recommendations. These farmers can expect to obtain optimum yields of 2,000 kg/ha. from mature coffee trees. 60% of participants (mid-level input farmers) are expected to apply, on average, half of the recommended amounts of fertilizer and 70% of plant care, and achieve yields averaging 800 kg/ha. The remaining 20% of participating farmers (low-level input farmers) will apply, on average, only 20% of the recommended amounts of fertilizer, 40% of the recommended amounts of fungicides and plant care and obtain yields of 500 kg/ha. In the national outreach areas, where promotion and follow-up depend on other agencies' inputs, a more conservative projection for technology adoption has been made. In these areas adoption rates used for the analysis are: 10% of participants will be model farmers, 40 % mid-level input farmers and 50% low-level input farmers.

4. Seedling Production and Distribution

Based on the schedule for project implementation and nursery production capacity, distribution of seedlings in the pilot zones is projected as follows: Participating farmers will receive 300 seedlings in their first year of participation; 60% of these farmers will return the following year for another 300 seedlings; and 60% of them will return again for 300 seedlings. (See Table 3, Participating Farmers, Trees Distributed and Hectares Planted.) Thus the maximum number of trees a farmer in the pilot zones will receive is considered to be 900. In the national outreach component, outside the pilot zones, requesting organizations will receive materials to produce 500 seedlings per participating farmer. These figures, preliminary estimates, have been adopted for purposes of this analysis. However, wide variability is expected in farmer participation levels in both the pilot and outreach areas.

5. Coffee Prices

Following the expiration of the International Coffee Agreement, coffee prices on the international market dropped precipitously in the summer of 1989. Local prices to farmers at the time this analysis is being prepared (December 1989) range from $.80 - .90/kg, whereas in 1988, farmers were selling coffee at $1.98/kg. If the current low price holds, Haitian farmers would have little reason to continue growing coffee, with or without the project. However even at $.90/kg the model farmer would increase his net income from coffee by 200%. Farmers who use considerably less than optimum inputs would not be able to cover their costs, even when new plantations have matured.

It is considered highly unlikely that prices will remain at this level for very long. It would be reasonable to predict a return to former coffee prices within a year or two. However most of the examples used in this analysis are based on a coffee price to farmers of $1.40/kg - which is 70% of the former level.

6. Single Farm Analysis

An analysis has been carried out to show how a small farmer with .3 ha. in coffee, could replant his holdings over a three year period with improved, rust tolerant varieties of coffee seedlings. (See Tables 4a, 4b, and 4c.) In Year 1 this plan, using optimal inputs, is considered to be feasible for all but the poorest farmers, even without credit. In Year 2, some farmers may need to obtain credit to maintain full inputs and plant another .1 ha with improved varieties. If coffee rust has not yet reached the zone where our sample farmer lives, he would have the option of maintaining recommended inputs on his first .1 ha plantation, but delaying replanting the second .1 ha. Harvest results during year 2 and after would provide margins that would enable him to continue his new plantations in the next two years without resorting to credit.

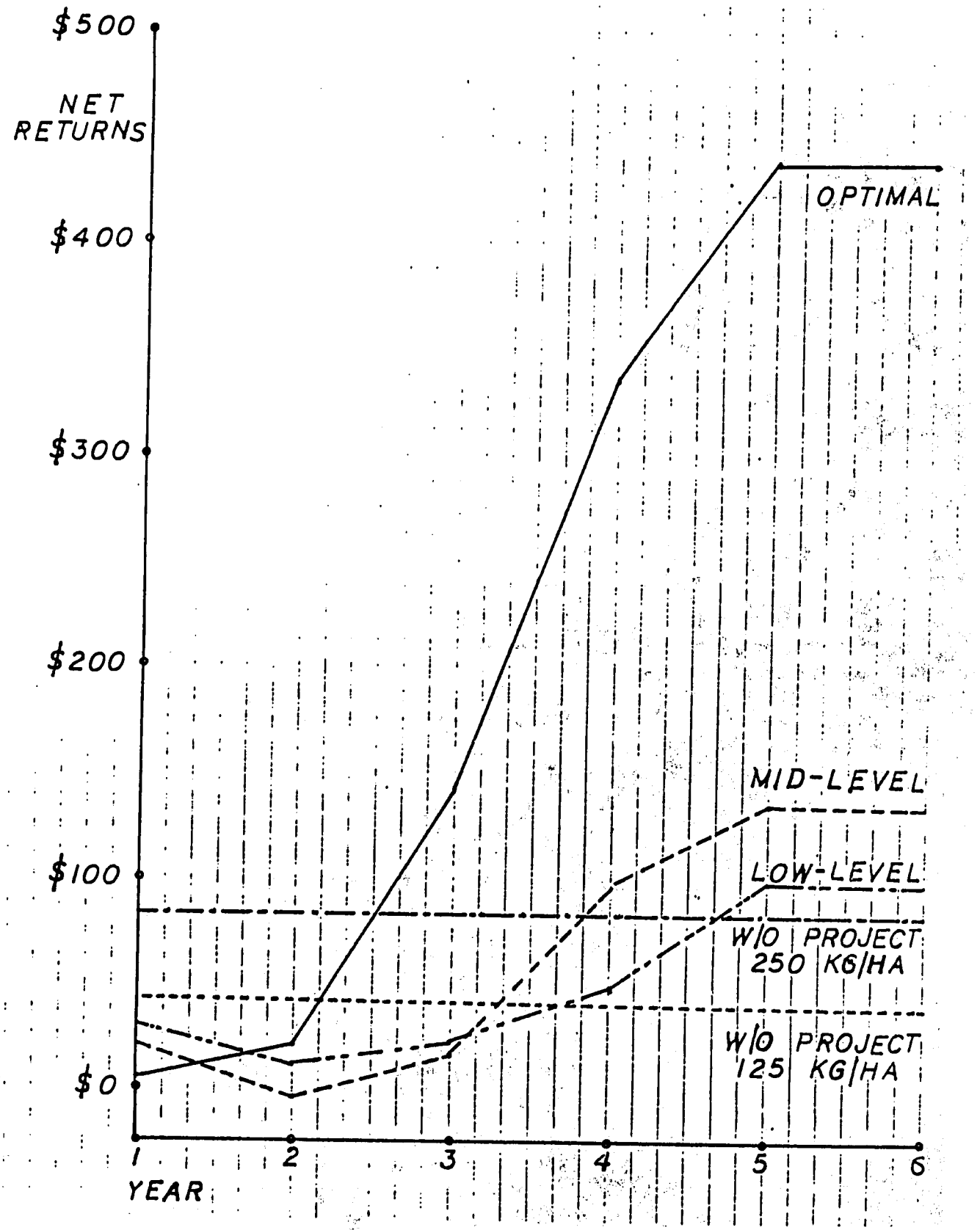
Following initial investments, the financial returns to this model farmer, who applies all the recommended inputs and achieves optimum yields, are very favorable. Even most other farmers, who apply less than the recommended inputs, stand to benefit from participation in the project. (See Tables 5a, 5b, 6a and 6b for anlayses of results for mid-level and low-level input farmers.)

Figure 1, a graph, shows the net returns (income) for the three composite farmers (optimal, mid-level and low level inputs) in Years 1 - 6 of project participation. The expenses and revenues used to derive the net incomes are drawn from Tables 4a, 5a and 6a.

Figure 1. also shows two examples of income projections for farmers who do not participate in the project. One of these projections is based on the current yield estimate of 250 kg/ha from old coffee stands under traditional management. The other projection is based on reduced yields of 125 kg./ha. resulting from the effects of coffee rust. If (or more likely when) the effects of coffee rust are felt in the south of Haiti, yields can be expected to fall drastically. In some areas of Haiti, three years after initial infestation, coffee has reduced yields by as much as 70%.

180X

Figure 1. Net Returns to Coffee Farmers Over a Six Year Period



Coffee Price: $1.40/kg

7. Farmer Options and Access to Credit

An individual farmer who wishes to increase his returns from coffee production through full participation in the project must be financially able to cover the costs of the first two years of inputs, when returns to the new plantations do not cover costs.

The sample participation schedule used in the illustration above is for a small famer who plants .1 ha each year for three years. This example is suggested with the expectation that most farmers would be able to cover the first year of inputs on this scale without resorting to credit. Continued participation at the rate of new plantations programmed may require a limited use of credit in Year 2. The following strategy, on the part of the farmer and the project, could enable this credit through existing Caisses Populaires (Savings Associations/Credit Unions) which are especially active in the Jacmel area.

At the present time, the Caisses Populaires provide credit to members who have savings on deposit. Credit is normally limited to double the amount of savings, and is provided only to individuals with a guarantor or collatoral.

The small farmer who expects to need credit in a year's time, for his second new coffee plantation of .1 ha., could join the Caisse Populaire and deposit $2.50/month for 12 months, giving him savings of $30.00. His purchased inputs (based on Table 4.) would be expected to cost $61.65 in Year 2. By obtaining credit for $60.00 from the Caisse Populaire, he could afford to purchase these inputs, and, assuming his family labor pool is sufficient, he could maintain his level of participation at 100%, and obtain maximum benefits from his new plantations.

Even without direct action by the project in the credit sector, this strategy on the part of a farmer may enable him to participate fully in the project. However, some involvement by the project could augment the availability of this type of credit Such involvment might include promotional or educational efforts among farmers, and the provision of loan or guaranty funds, which would enable Caisses Populaires to expand their currently limited loan portfolios.

The Caisses Populaires, which by and large have very good loan repayment records, operate under the control of their members, and their approach to extending credit is a cautious one. Many of them are small, with very limited capital. Any relationship of the project with the Caisses Populaires, or other credit facilities which operate in rural areas, should be planned with sensitivity to the need for these organizations to maintain their autonomy and remain in the control of their members.

Larger farmers, with more extensive land holdings and financial assets, may be eligible for credit through commercial facilities. Although some of these farmers might be in a position to initially plant new coffee seedlings without access to credit, the need for credit will increase in Year 2 because of low returns in the 1st year after new seedlings are planted. Through farmer organizations such as cooperatives, and the possibility of project supported guaranty funds in the commercial credit sector, the medium to larger farmer could also have improved access to credit that would enable him to obtain maximum returns from his new coffee plantations.

182X

8. Overall Project Analysis

The purpose of this analysis is to focus on what farmers can expect to gain from planting and proper maintenance of improved coffee plants. The financial analysis for farmer participants, and the economic analysis which also incorporates USAID inputs, take into account costs and benefits only for direct participants in the project. There are several aspects of the project which have not been quantified or taken into consideration in these analyses such as: Long term benefits from research activities; benefits to non-participants through radio extension services and demonstration effects; as well as benefits which accrue to participant farmers from crops interplanted in their new coffee plantations.

Cost benefit analyses for the overall project, and internal rate(s) of return (IRR) are based on weighted averages for inputs and yields derived from the farm level analysis and the schedule for farmer training and seedling distribution in the project implementation schedule. The following list includes the weighted averages, costs for inputs, and yield levels used for the analysis:

Weighted averages for overall project:

Fertilizer use	51% of optimum amount
Fungicide use/Labor for plant care	68% of optimum amount
Yields for project participants	47% of optimal yield or 938 kg/ha

Input costs:

Fertilizer	$0.50/kg
Fungicide	$5.00/kg
Backpack sprayer rental	$0.40/day
Labor	$1.50/day

Yield without project 125 kg/ha

Table 3 indicates the schedule of implementation in terms of farmer participants, trees (seedlings) distributed and hectares planted for each project year.

Tables 7a through 7e show how production costs used in the analysis have been calculated.

Table 8 shows coffee production levels for each year and income generated. The coffee sale price used for this table is $1.40/kg.

Table 9 shows the incremental benefits to farmers (total revenues under the project less foregone revenues from old coffee plantations), and incremental costs for farmers (total costs incurred under the project less the costs that would have been incurred on old coffee plantations) over a 15 year period beginning with Year 1 of the project. Fifteen years is the normal period of full production for coffee trees.

Not included in the cash flows in these calculations are loans and interest payments made by farmers who borrow in order to improve their coffee holdings. Even though the project intends to make some provisions to enable qualified farmers to gain access to credit, implementation schedules and strategies to be promoted for small farmers will be designed to minimize the need for credit. The inclusion of credit would defer farmer costs from earlier years, when values are at or close to current levels, to later years, when discounting reduces them. If interest rates are lower than the internal of return, then the farmer would still benefit from the project, even if he borrows funds to cover some of his costs.

In developing the financial analysis no consideration is made for incentive packages such as were discussed in the project paper. Thus the analysis assumes that all on farm costs will be borne by the farmer. If incentive packages are adopted, these costs would be transferred to the project and the net benefits to farmers would increase, but the overall economic analysis would remain the same.

It should also be noted that a substantial portion of labor costs can be considered as over valued in these calculations. As mentioned in the single farm analysis, many labor inputs will be provided by family members who are otherwise unemployed, and for whom marginal labor costs can be considered close to zero. To the extent that this occurs, cash outlays for labor would be reduced, increasing farmer's net revenues.

Because the coffee price is considered subject to considerable variation, IRR's have been calculated based on several possible coffee prices. Two versions of the cost benefit stream are provided: One of them based on all farm level benefits and costs (Table 9) with a coffee price of $1.40/kg; the other encompassing the cost of USAID inputs as well (Table 10) with a coffee price of $1.80. Some other IRR's, based on coffee prices ranging from $1.40 up to the former price of $1.98/kg, are shown below.

	Coffee Prices per kg.			
	$1.40	$1.60	$1.80	$1.98
Farmers IRR	17%	38%	150%	150%
Overall Project IRR	-14%	-5%	1%	5%

The IRR's based on all farmer costs and returns are favorable, indeed extremely so, if coffee prices approach their former level, as is considered likely. IRR's for the overall project including USAID inputs are positive at price levels of $1.80/kg and above and negative at lower coffee prices. However, the conservative assumptions made in preparing this analysis, the focus on direct participant farmers only, and the fact that no attempt was made to quantify and include indirect benefits or those resulting from the research component of the project, reduce the significance of the Overall Project IRR. The return to farmers is a far more relevant indicator and should be the overriding consideration in the decision to implement the project.

Experience gained in the pilot and outreach zones will permit replication in other prime coffee growing areas at much lower cost than in this project. Thus the results of this investment should be of great importance for the future development of the Haitian coffee sector.

184X

Table 1. Recommended Annual Level of Inputs for One-Tenth of a Hectare Replanted in Improved Coffee Variety

Commodities:

	Fertilizer	Fungicide
First Year Plantation	45 kg	.15 kg
Second Year Plantation	69 kg	.3 kg
Third Year and after	78 kg	.45 kg
Rental of backpack -	3 days (for fungicide applic.)	

Labor:

Cultivation/Land.Prep
First Year Plantation: 3.5 person days Second Year and after .5 person days

ForlstYrPlanting
Dig holes 150holes/dayor 2 pers.days/1/10 ha
Fertil.,transplant 75 trees/day or 4 pers.days/1/10 ha

Fertilizer Application (each year) 2 days, 3 times/yr or 6 person days
Fungicide Application (each year) 1 day, 3 times/yr or 3 person days
Weeding (each year) 3 days, 4 times/yr or 12 person days

Manure/Compost Prep. (each year) .8 person days
Harvest and Process - Labor requirement based on yield

For 1/10 ha	1stYr	2ndYr	3rdYr & after
Yield in kg.	10	100	200
Harvest 8 kg/day	1.2 p.d.	12.5 p.d.	25 p.d.
Process 15/kg/day	.7 p.d.	6.7 p.d.	13.3 p.d.

Pruning Begin year 4, every 4 years: 1.5 pers.days

Table 2. Costs of Recommended Inputs and Labor per 1/10 Hectare

Commodities	1stYrPl	2ndYrPl	3rdYrPl	4thYrPl	5thYr+Pl
Fertilizer	$22.50	$34.50	$39.00	$39.00	$39.00
Fungicide	$0.75	$1.50	$2.25	$2.25	$2.25
Backpack Rental	$1.20	$1.20	$1.20	$1.20	$1.20
Total Commodities	$24.45	$37.20	$42.45	$42.45	$42.45
Labor Costs					
Cultivation/LandPrep	$5.25	$0.75	$0.75	$0.75	$0.75
Dig holes	$3.00	$0.00	$0.00	$0.00	$0.00
Transplant/fertilize	$6.00	$0.00	$0.00	$0.00	$0.00
Fertilizer applications	$9.00	$9.00	$9.00	$9.00	$9.00
Fungicide applications	$4.50	$4.50	$4.50	$4.50	$4.50
Weeding *	$9.00	$13.50	$18.00	$18.00	$18.00
Prepare Manure/Compost	$1.20	$1.20	$1.20	$1.20	$1.20
Harvest	$1.88	$18.75	$37.50	$37.50	$37.50
Process	$1.00	$10.00	$20.00	$20.00	$20.00
Pruning	$0.60	$0.60	$0.60	$0.60	$0.60
Total Labor Costs	$41.43	$58.30	$91.55	$91.55	$91.55

Commodity Prices:

Fertilizer:	$0.50 /kg.
Fungicide:	$5.00 /kg.
Backpack Rental	$0.40 /day

Price of Labor:

$1.50 per person day

* Agronomic analysis recommends intercropping of other crops in Years 1 and 2 of new plantations. Thus weeding costs for coffee have been reduced by 50% and 25% in Years 1 and 2 respectively.

** Pruning costs, $2.30 every four years, have been prorated.

186X

Table 3. Participating Farmers, Trees Distributed and Hectares Planted

(for each project year in Pilot and National Outreach Zones)

	Numbers of Farmers\a			Numbers of Trees		No.New Ha.	Replacement	Total
Year 1	New	Returning	Total	Ave/Frmr\b	NewPltgs	Planted\c	Trees\d	Trees
Pilot Zones	800	0	800	300	240,000	80	0	240,000
Nat'l Outreach	200	0	200	500	100,000	33	0	100,000
Year 2								
Pilot Zones	1,400	480	1,880	300	564,000	188	24,000	588,000
Nat'l Outreach	460	0	460	500	230,000	77	0	230,000
Year 3								
Pilot Zones	2,000	1,128	3,128	300	938,400	313	80,400	1,018,800
Nat'l Outreach	460	0	460	500	230,000	77	0	230,000
Year 4								
Pilot Zones	2,000	1,704	3,704	300	1,111,200	370	150,240	1,261,440
Nat'l Outreach	460	0	460	500	230,000	77	0	230,000
Year 5								
Pilot Zones	2,000	1,920	3,920	300	1,176,000	392	204,960	1,380,960
Nat'l Outreach	460	0	460	500	230,000	77	0	230,000
Totals								
Pilot Zones	8,200				4,029,600	1,343	459,600	4,489,200
Nat'l Outreach	2,040				1,020,000	340	0	1,020,000
Grand Totals	10,240				5,049,600	1,683	459,600	5,509,200

Notes/Assumptions:

a. 60% of farmers will return for additional trees in 2nd year of participation, and 60% of these returnees will return for trees in 3rd year of participation (Pilot Zones)

b. Tree Distributions:

300 : Average number of trees/farmer, Pilot Zones

500 : Average number of trees/farmer, Outreach areas

c. Planting density: 3,000 trees/hectare

d. Replacement rate: 10% replacement for seedlings lost at farm level for total hectarage planted in 2 previous years. (Pilot Zones)

Table 4a. Small Farmer Analysis, Optimal Level Adoption Rate
(For a coffee plot .3 ha, planting .1 ha per year in improved trees)

	Number of Improved Variety Trees				$ Input Costs			Total	LaborCost	Total	Total	Net	Net Profit	Without Project Total	Total	Net
	New	2nd Yr.	3rdYr.+	Total	Fert.	Fungicide	RentBkpk	$ Costs	Equival	Cost	Revenues	Profit	w/o labor	Cost	Revenues	Profit
Year 1	300.0			300.0	$22.50	$0.75	$1.20	$24.45	$55.20	$79.65	$84.00	$4.35	$59.55	$21.56	$105.00	$83.44
Year 2	300.0	300.0		600.0	$57.00	$2.25	$2.40	$61.65	$105.71	$167.36	$189.00	$21.64	$127.35	$21.56	$105.00	$83.44
Year 3	300.0	300.0	300.0	900.0	$96.00	$4.50	$3.60	$104.10	$189.48	$293.58	$434.00	$140.43	$329.90	$21.56	$105.00	$83.44
Year 4		300.0	600.0	900.0	$112.50	$6.00	$3.60	$122.10	$241.85	$363.95	$700.00	$336.05	$577.90	$21.56	$105.00	$83.44
Year 5			900.0	900.0	$117.00	$6.75	$3.60	$127.35	$275.10	$402.45	$840.00	$437.55	$712.65	$21.56	$105.00	$83.44
Yr.6 and+			900.0	900.0	$117.00	$6.75	$3.60	$127.35	$275.10	$402.45	$840.00	$437.55	$712.65	$21.56	$105.00	$83.44

Rate of application:
Fertilizer 100% of optimal rate
Fungicide 100% of optimal rate

Backpack sprayer for fungicide application
Rental cost $0.40 /day
No. days required
Year 1 3.0 days
Year 2 6.0 days
Year 3& + 9.0 days

Coffee Harvest (in kg.) and Income

	Year 1		Year 2		Year 3		Year 4		Year 5 & after	
	Harvest	Income	Harvest	Income	Harvest	Income	Harvest	Income	Harvest	Income
Year 1 Plant (.1 ha)	10.0		100.0		200.0		200.0		200.0	
Year 2 Plant (.1 ha)			10.0		100.0		200.0		200.0	
Year 3 Plant (.1 ha)					10.0		100.0		200.0	
Old Plantation	50.0		25.0		0.0		0.0		0.0	
Totals	60.0	$84.00	135.0	$189.00	310.0	$434.00	500.0	$700.00	600.0	$840.00
Coffee Price/kg.	$1.40									

188X

Table 4b. Labor Inputs in Person Days and Cost Equivalent
Optimal Level Inputs (For a coffee plot .3 ha, planting .1 ha per year in improved trees)

Daily Labor Cost $1.50

	Year 1 Person days Pl'tedYr1	CostEq.	Year 2 Person days Pl'tedYr1	Pl'tedYr2	Yr2Total	CostEq.	Year 3 Person days Pl'tedYr1	Pl'tedYr2	Pl'tedYr3	Yr3Total	Cost Equiva.
Land Prep/Cultivation	3.5	$5.25	0.5	3.5	4.0	$6.00	0.5	0.5	3.5	4.5	$6.75
Planting											
Dig holes-150/day	2.0	$3.00		2.0	2.0	$3.00			2.0	2.0	$3.00
Fert,transpl-75/day	4.0	$6.00		4.0	4.0	$6.00			4.0	4.0	$6.00
Fertilizer Applic.	6.0	$9.00	6.0	6.0	12.0	$18.00	6.0	6.0	6.0	18.0	$27.00
Fungicide Applic.	3.0	$4.50	3.0	3.0	6.0	$9.00	3.0	3.0	3.0	9.0	$13.50
Weeding *	6.0	$9.00	9.0	6.0	15.0	$22.50	12.0	9.0	6.0	27.0	$40.50
Man/Compst Prep-8days	0.8	$1.20	0.8	0.8	1.6	$2.40	0.8	0.8	0.8	2.4	$3.60
Harvest 8 kg/day **	7.5	$11.25	15.6	1.3	16.9	$25.31	25.0	12.5	1.3	38.8	$58.13
Process 15 kg/day **	4.0	$6.00	8.3	0.7	9.0	$13.50	13.3	6.7	0.7	20.7	$31.00
Totals	36.8	$55.20	43.3	27.2	70.5	$105.71	60.6	38.5	27.2	126.3	$189.48

* Agronomic analysis calls for interplanting other crops in first and second year of new plantations. Thus part of the suggested weeding level is considered to be for other crops in these years:
In year of Planting: 50% for other crops
In second year: 25% for other crops

** In year 1 and 2, Pl'ted Yr 1 includes harvest/processing of remainder of old plantation

	Year 4 Person days Pl'tedYr1	Pl'tedYr2	Pl'tedYr3	Yr4Total	Cost Equival	Year 5 Person days Pl'tedYr1	Pl'tedYr2	Pl'tedYr3	Yr5Total	Cost Equival
Cultivation	0.5	0.5	0.5	1.5	$2.25	0.5	0.5	0.5	1.5	$2.25
Fertilizer Applic.	6.0	6.0	6.0	18.0	$27.00	6.0	6.0	6.0	18.0	$27.00
Fungicide Applic.	3.0	3.0	3.0	9.0	$13.50	3.0	3.0	3.0	9.0	$13.50
Weeding *	12.0	12.0	9.0	33.0	$49.50	12.0	12.0	12.0	36.0	$54.00
Manure/compost Prep.	0.8	0.8	0.8	2.4	$3.60	0.8	0.8	0.8	2.4	$3.60
Harvest 8 kg/day	25.0	25.0	12.5	62.5	$93.75	25.0	25.0	25.0	75.0	$112.50
Processing 15 kg/day	13.3	13.3	6.7	33.3	$50.00	13.3	13.3	13.3	40.0	$60.00
Pruning	1.5			1.5	$2.25		1.5		1.5	$2.25
									0.0	
Totals	62.1	60.6	38.5	161.2	$241.85	60.6	62.1	60.6	183.4	$275.10

Table 4c. Fertilizer/Fungicide Inputs and Costs for Optimum Yield

For 1 hectare (3,000 trees) and 1/10 hectare (300 trees)

FERTILIZER		Cost/kg.	$0.50	
	No. of Trees			
Year 1	3,000	300	3,000Tr	300 Tr
Yr1 Plant	450.0	45.0	$225.00	$22.50
Year 2				
Yr1 Plant	690.0	69.0		
Yr2 Plant	450.0	45.0		
Total	1140.0	114.0	$570.00	$57.00
Year 3				
Yr1 Plant	780.0	78.0		
Yr2 Plant	690.0	69.0		
Yr3 Plant	450.0	45.0		
Total	1920.0	192.0	$960.00	$96.00
Year 4				
Yr1 Plant	780.0	78.0		
Yr2 Plant	780.0	78.0		
Yr3 Plant	690.0	69.0		
Total	2250.0	225.0	$1,125.00	$112.50
Year 5 and up				
Yr1 Plant	780.0	78.0		
Yr2 Plant	780.0	78.0		
Yr3 Plant	780.0	78.0		
Total	2340.0	234.0	$1,170.00	$117.00

FUNGICIDE		Cost/kg.	$5.00	
	No. of Trees			
Year 1	3,000	300	3,000Tr	300 Tr
Yr1 Plant	1.5	0.15	$7.50	$0.75
Year 2				
Yr1 Plant	3.0	0.3		
Yr2 Plant	1.5	0.15		
Total	4.5	0.5	$22.50	$2.25
Year 3				
Yr1 Plant	4.5	0.45		
Yr2 Plant	3.0	0.3		
Yr3 Plant	1.5	0.15		
Total	9.0	0.9	$45.00	$4.50
Year 4				
Yr1 Plant	4.5	0.45		
Yr2 Plant	4.5	0.45		
Yr3 Plant	3.0	0.3		
Total	12.0	1.2	$60.00	$6.00
Year 5 and up				
Yr1 Plant	4.5	0.45		
Yr2 Plant	4.5	0.45		
Yr3 Plant	4.5	0.45		
Total	13.5	1.4	$67.50	$6.75

Table 5a. Single Farm Analysis, Mid-level Adoption Rates
(For a coffee plot .3 ha. planting .1 ha per year in improved trees)

	Number of Improved Variety Trees				$ Input Costs			Total	LaborCost	Total	Total	Net	Net Profit	Without Project Total	Total	Net
	New	2nd Yr.	3rdYr.+	Total	Fert.	Fungicide	RentBkpk	$ Costs	Equival	Cost	Revenues	Profit	w/o labor	Cost	Revenues	Profit
Year 1	300.0			300.0	$11.25	$0.53	$0.59	$12.36	$44.93	$57.29	$75.60	$18.31	$63.24	$21.56	$105.00	$83.44
Year 2	300.0	300.0		600.0	$28.50	$1.58	$1.18	$31.25	$68.29	$99.54	$96.60	($2.94)	$65.35	$21.56	$105.00	$83.44
Year 3	300.0	300.0	300.0	900.0	$48.00	$3.15	$1.76	$52.91	$106.30	$159.21	$173.60	$14.39	$120.69	$21.56	$105.00	$83.44
Year 4		300.0	600.0	900.0	$56.25	$4.20	$1.76	$62.21	$123.20	$185.41	$280.00	$91.59	$217.79	$21.56	$105.00	$83.44
Year 5			900.0	900.0	$58.50	$4.73	$1.76	$64.99	$137.85	$202.84	$336.00	$133.16	$271.01	$21.56	$105.00	$83.44
Yr.6 and+			900.0	900.0	$58.50	$4.73	$1.76	$64.99	$137.85	$202.84	$336.00	$133.16	$271.01	$21.56	$105.00	$83.44

Rate of application:
Fertilizer 50%
Fungicide 70%

Backpack sprayer for fungicide application
Rental cost $0.40 /day
No. days required
Year 1 2.1 days
Year 2 4.2 days
Year 3& + 6.3 days

Coffee Harvest (in kg.) and Income

	Year 1		Year 2		Year 3		Year 4		Year 5 & after	
	Harvest	Income	Harvest	Income	Harvest	Income	Harvest	Income	Harvest	Income
Year 1 Plant (.1 ha)	4.0		40.0		80.0		80.0		80.0	
Year 2 Plant (.1 ha)			4.0		40.0		80.0		80.0	
Year 3 Plant (.1 ha)					4.0		40.0		80.0	
Old Plantation	50.0		25.0		0.0		0.0		0.0	
Totals	54.0	$75.60	69.0	$96.60	124.0	$173.60	200.0	$280.00	240.0	$336.00

Coffee Price/kg. $1.40

Yields from new plantations Mid-level Adoption Rates
(per 1/10 hectare) 4 kg. - 1st Year Planted
40 kg. - 2nd Year Planted
80 kg. - 3rd Year and after
Optimum yield from full inputs: 200 kg. 1/10 ha.
Yield for this level of inputs: 40% of optimum yield

Yield from old Planta 25 kg. (per 1/10 ha.)

Table 5b. Labor Inputs in Person Days and Cost Equivalent, Mid-level Adoption Rates

Daily Labor Cost $1.50

	Year 1 Persondays Pl'tedYr1	CostEq.	Year 2 Person days Pl'tedYr1	Pl'tedYr2	Yr2Total	CostEq.	Year 3 Person days Pl'tedYr1	Pl'tedYr2	Pl'tedYr3	Yr3Total	Cost Equiva.
Land Prep/Cultivation	3.5	$5.25	0.5	3.5	4.0	$6.00	0.5	0.5	3.5	4.5	$6.75
Planting											
Dig holes-150/day	2.0	$3.00		2.0	2.0	$3.00			2.0	2.0	$3.00
Fert,transpl-75/day	4.0	$6.00		4.0	4.0	$6.00			4.0	4.0	$6.00
Fertilizer Applic.	3.0	$4.50	3.0	3.0	6.0	$9.00	3.0	3.0	3.0	9.0	$13.50
Fungicide Applic.	2.1	$3.15	2.1	2.1	4.2	$6.30	2.1	2.1	2.1	6.3	$9.45
Weeding *	4.2	$6.30	6.3	4.2	10.5	$15.75	8.4	6.3	4.2	18.9	$28.35
Man/Compst Prep-8days	0.8	$1.20	0.8	0.8	1.6	$2.40	0.8	0.8	0.8	2.4	$3.60
Harvest 8 kg/day **	6.8	$10.13	8.1	0.5	8.6	$12.94	10.0	5.0	0.5	15.5	$23.25
Process 15 kg/day **	3.6	$5.40	4.3	0.3	4.6	$6.90	5.3	2.7	0.3	8.3	$12.40
Totals	30.0	$44.93	25.2	20.4	45.5	$68.29	30.1	20.4	20.4	70.9	$106.30

* Agronomic analysis calls for interplanting other crops in first and second year of new plantations. Thus part of the suggested weeding level is considered to be for other crops in these years:

In year of Planting: 50% for other crops
In second year: 25% for other crops

** In year 1 and 2, Pl'ted Yr 1 includes harvest/processing of remainder of old plantation

	Year 4 Person days Pl'tedYr1	Pl'tedYr2	Pl'tedYr3	Yr4Total	Cost Equival	Year 5 Person days Pl'tedYr1	Pl'tedYr2	Pl'tedYr3	Yr5Total	Cost Equival
Cultivation	0.5	0.5	0.5	1.5	$2.25	0.5	0.5	0.5	1.5	$2.25
Fertilizer Applic.	3.0	3.0	3.0	9.0	$13.50	3.0	3.0	3.0	9.0	$13.50
Fungicide Applic.	2.1	2.1	2.1	6.3	$9.45	2.1	2.1	2.1	6.3	$9.45
Weeding *	8.4	8.4	6.3	23.1	$34.65	8.4	8.4	8.4	25.2	$37.80
Manure/compost Prep.	0.8	0.8	0.8	2.4	$3.60	0.8	0.8	0.8	2.4	$3.60
Harvest 8 kg/day	10.0	10.0	5.0	25.0	$37.50	10.0	10.0	10.0	30.0	$45.00
Processing 15 kg/day	5.3	5.3	2.7	13.3	$20.00	5.3	5.3	5.3	16.0	$24.00
Pruning	1.5			1.5	$2.25		1.5		1.5	$2.25
Totals	31.6	30.1	20.4	82.1	$123.20	30.1	31.6	30.1	91.9	$137.85

192X

Table 6a. Single Farm Analysis, Low-level Adoption Rates
(For a coffee plot .3 ha, planting .1 ha per year in improved trees)

	Number of Improved Variety Trees				$ Input Costs									Without Project		
	New	2nd Yr.	3rdYr.+	Total	Fert.	Fungicide	RentBkpk	Total $ Costs	LaborCost Equival	Total Cost	Total Revenues	Net Profit	Net Profit w/o labor	Total Cost	Total Revenues	Net Profit
Year 1	300.0			300.0	$4.50	$0.30	$0.19	$4.99	$37.74	$42.74	$73.50	$30.76	$68.51	$21.56	$105.00	$83.44
Year 2	300.0	300.0		600.0	$11.40	$0.90	$0.38	$12.68	$48.69	$61.38	$73.50	$12.12	$60.82	$21.56	$105.00	$83.44
Year 3	300.0	300.0	300.0	900.0	$19.20	$1.80	$0.58	$21.58	$68.63	$90.21	$108.50	$18.29	$86.92	$21.56	$105.00	$83.44
Year 4		300.0	600.0	900.0	$22.50	$2.40	$0.58	$25.48	$74.64	$100.11	$175.00	$74.89	$119.52	$21.56	$105.00	$83.44
Year 5			900.0	900.0	$23.40	$2.70	$0.58	$26.68	$83.63	$110.30	$210.00	$99.70	$183.32	$21.56	$105.00	$83.44
Yr.6 and+			900.0	900.0	$23.40	$2.70	$0.58	$26.68	$83.63	$110.30	$210.00	$99.70	$183.32	$21.56	$105.00	$83.44

Rate of application:
Fertilizer 20%
Fungicide 40%

Backpack sprayer for fungicide application
Rental Cost $0.40 /day
No. days required
Year 1 1.2
Year 2 2.4
Year 3& + 3.6

Coffee Harvest (in kg.) and Income

	Year 1		Year 2		Year 3		Year 4		Year 5 & after	
	Harvest	Income	Harvest	Income	Harvest	Income	Harvest	Income	Harvest	Income
Year 1 Plant (.1 ha)	2.5		25.0		50.0		50.0		50.0	
Year 2 Plant (.1 ha)			2.5		25.0		50.0		50.0	
Year 3 Plant (.1 ha)					2.5		25.0		50.0	
Old Plantation	50.0		25.0		0.0		0.0		0.0	
Totals	52.5	$73.50	52.5	$73.50	77.5	$108.50	125.0	$175.00	150.0	$210.00

Coffee Price/kg. $1.40

Yields from new plantations (per 1/10 hectare) Low Level Adoption Rate
3 kg. - 1st Year Planted
25 kg. - 2nd Year Planted
50 kg. - 3rd Year and after

Optimum yield from full inputs: 200 kg. 1/10 ha.
Yield for this level of inputs: 25% of optimum yield

Yield from old Planta 25 kg. (per 1/10 ha.)

Table 6b. Labor Inputs in Person Days and Cost Equivalent, Low Level Adoption Rates

Daily Labor Cost $1.50

	Year 1 Persondays Pl'tedYr1	CostEq.	Year 2 Person days Pl'tedYr1	Pl'tedYr2	Yr2Total	CostEq.	Year 3 Person days Pl'tedYr1	Pl'tedYr2	Pl'tedYr3	Yr3Total	Cost Equiva.
Land Prep/Cultivation	3.5	$5.25	0.5	3.5	4.0	$6.00	0.5	0.5	3.5	4.5	$6.75
Planting											
Dig holes-150/day	2.0	$3.00		2.0	2.0	$3.00			2.0	2.0	$3.00
Fert,transpl-75/day	4.0	$6.00		4.0	4.0	$6.00			4.0	4.0	$6.00
Fertilizer Applic.	1.2	$1.80	1.2	1.2	2.4	$3.60	1.2	1.2	1.2	3.6	$5.40
Fungicide Applic.	1.2	$1.80	1.2	1.2	2.4	$3.60	1.2	1.2	1.2	3.6	$5.40
Weeding *	2.4	$3.60	3.6	2.4	6.0	$9.00	4.8	3.6	2.4	10.8	$16.20
Man/Compst Prep-8days	0.8	$1.20	0.8	0.8	1.6	$2.40	0.8	0.8	0.8	2.4	$3.60
Harvest 8 kg/day **	6.6	$9.84	6.3	0.3	6.6	$9.84	6.3	3.1	0.3	9.7	$14.53
Process 15 kg/day **	3.5	$5.25	3.3	0.2	3.5	$5.25	3.3	1.7	0.2	5.2	$7.75
Totals	25.2	$37.74	16.9	15.6	32.5	$48.69	18.1	12.1	15.6	45.8	$68.63

Agronomic analysis calls for interplanting other crops in first and second year of new plantations. Thus part of the suggested weeding level is considered to be for other crops in these years:

In year of Planting: 50% for other crops
In second year: 25% for other crops

** In year 1 and 2, Pl'ted Yr 1 includes harvest/processing of remainder of old plantation

	Year 4 Person days Pl'tedYr1	Pl'tedYr2	Pl'tedYr3	Yr4Total	Cost Equival	Year 5 Person days Pl'tedYr1	Pl'tedYr2	Pl'tedYr3	Yr5Total	Cost Equival
Cultivation	0.5	0.5	0.5	1.5	$2.25	0.5	0.5	0.5	1.5	$2.25
Fertilizer Applic.	1.2	1.2	1.2	3.6	$5.40	1.2	1.2	1.2	3.6	$5.40
Fungicide Applic.	1.2	1.2	1.2	3.6	$5.40	1.2	1.2	1.2	3.6	$5.40
Weeding *	4.8	4.8	3.6	13.2	$19.80	4.8	4.8	4.8	14.4	$21.60
Manure/compost Prep.	0.8	0.8	0.8	2.4	$3.60	0.8	0.8	0.8	2.4	$3.60
Harvest 8 kg/day	6.3	6.3	3.1	15.6	$23.44	6.3	6.3	6.3	18.8	$28.13
Processing 15 kg/day	3.3	3.3	1.7	8.3	$12.50	3.3	3.3	3.3	10.0	$15.00
Pruning	1.5			1.5	$2.25		1.5		1.5	$2.25
Totals	19.6	18.1	12.1	49.8	$74.64	18.1	19.6	18.1	55.8	$83.63

1947

Table 7a. Overall Project - Cost of Inputs per Hectare at Projected Level of Use

(On average/ha basis)

Commodities	1stYrPlt.	2ndYrPlt.	3rdYrPlt.	4thYrPlt.	5thYr+Pl	Application Percent
Fertilizer	$115	$177	$200	$200	$200	51%
Fungicide	$5	$10	$15	$15	$15	68%
Backpack Rental	$8	$8	$8	$8	$8	68%
	$128	$195	$223	$223	$223	
Labor Costs						
Cultivation/LandPrep	$53	$8	$8	$8	$8	100%
Dig holes	$30	$0	$0	$0	$0	100%
Transplant/fertilize	$60	$0	$0	$0	$0	100%
Fertilizer applications	$46	$46	$46	$46	$46	51%
Fungicide applications	$30	$30	$30	$30	$30	68%
Weeding	$61	$91	$122	$122	$122	68%
Prepare Manure/Compost	$8	$8	$8	$8	$8	68%
Harvest	$19	$188	$375	$375	$375	100%
Process	$10	$100	$200	$200	$200	100%
Pruning	$4	$4	$4	$4	$4	68%
	$321	$475	$793	$793	$793	

Projected Level of Use of Inputs:

- Fertilizer — 51% of recommended level (weighted average)
- Fungicide, labor for plant care — 68% of recommended level (weighted average)
- Planting, harvest — 100%

Table 7b. Overall Project - Fertilizer Rate of Use and Cost

	No. Hectares Improved Trees				No. Kgs. of Fertilizer Applied\a				Fertilizer
	NewPltgs	2ndYrPlt	3rdYr+Plt	Total	NewPltg	2ndYrPl	3rdYr+Pl	Total	Cost\b
Year 1									
Pilot Zones	80	0	0	80	18,432	0	0	18,432	$9,216
Nat'l Outreach	33	0	0	33	7,680	0	0	7,680	$3,840
Year 2									
Pilot Zones	188	80	0	268	43,315	28,262	0	71,578	$35,789
Nat'l Outreach	77	33	0	110	17,664	11,776	0	29,440	$14,720
Year 3									
Pilot Zones	313	188	80	581	72,069	66,417	31,949	170,435	$85,217
Nat'l Outreach	77	77	33	187	17,664	27,085	13,312	58,061	$29,030
Year 4									
Pilot Zones	370	313	268	951	85,340	110,506	107,028	302,875	$151,437
Nat'l Outreach	77	77	110	263	17,664	27,085	43,930	88,678	$44,339
Year 5									
Pilot Zones	392	370	581	1,343	90,317	130,855	231,948	453,120	$226,560
Nat'l Outreach	77	77	187	340	17,664	27,085	74,547	119,296	$59,648
Totals									
Pilot Zones	1,343								
Nat'l Outreach	340								
Grand Totals	1,683							1,200,298	$600,149

Notes/Assumptions:

a. Optimum fertilizer use in kg/ha (based on Agronomic Analysis)

1stYrPl	2ndYrPl	3rdYr+pl
450	690	780

Estimated actual use of fertilizer

18% of farmers will use 100% of optimum amount
56% of farmers will use 50% (average) of optimum amount
26% of farmers will use 20% (average) of optimum
Weighted Average: 51% of optimum amount

b. Fertilizer Cost
$0.50 /kg

1986

Table 7c. Overall Project - Fungicide Rate of Use and Cost

	No. Hectares Improved Trees				No. Kgs. of Fungicide Applied\a				Fungicide
	New Pltgs	No.2nd Yr	No.3rdYr+	Total	New Pltgs	2ndYrPltg	3rdYrPltg+	Total	Cost\b
Year 1									
Pilot Zones	80	0	0	80	81	0	0	81	$406
Nat'l Outreach	33	0	0	33	34	0	0	34	$169
Year 2									
Pilot Zones	188	80	0	268	191	162	0	353	$1,764
Nat'l Outreach	77	33	0	110	78	68	0	145	$727
Year 3									
Pilot Zones	313	188	80	581	317	381	243	942	$4,709
Nat'l Outreach	77	77	33	187	78	155	101	335	$1,673
Year 4									
Pilot Zones	370	313	268	951	376	634	815	1,825	$9,126
Nat'l Outreach	77	77	110	263	78	155	335	568	$2,839
Year 5									
Pilot Zones	392	370	581	1,3[illegible]	397	751	1,767	2,915	$14,577
Nat'l Outreach	77	77	187	340	78	155	568	801	$4,005
Totals									
Pilot Zones	1,343								30,582
Nat'l Outreach	340								9,413
Grand Totals	1,683							7,999	$39,996

Notes/Assumptions:

a. Recommended fungicide use in kg/ha

1stYrPl	2ndYrPl	3rdYr+Pl
1.5	3.0	4.5

Estimated Actual use of fungicides

18% of farmers will use 100% of recommended amount
56% of farmers will use 70% (average) of recommended amount
26% of farmers will use 40% (average) of recommended amount
Weighted Average 68% of recommended amount

b. Fungicide cost/kg.: $5.00

c. Backpack rental: $0.40 /day

Table 7d. Overall Project - Production Costs For Commodities and Labor by Year of Planting and Project Year

	1stYrPlt Commod.	Labor	2ndYrPlt Commod.	Labor	3rdYrPlt Commod.	Labor	4thYr+Plt Commod.	Labor	5thYr+Plt Commod.	Labor
Year 1										
Pilot Zones	$10,271	$25,661	$0	$0	$0	$0	$0	$0	$0	$0
Nat'l Outreach	$4,279	$10,692	$0	$0	$0	$0	$0	$0	$0	$0
Year 2										
Pilot Zones	$24,136	$60,303	$15,591	$37,994	$0	$0	$0	$0	$0	$0
Nat'l Outreach	$9,843	$24,591	$6,496	$15,831	$0	$0	$0	$0	$0	$0
Year 3										
Pilot Zones	$40,158	$100,333	$36,640	$89,286	$17,840	$63,428	$0	$0	$0	$0
Nat'l Outreach	$9,843	$24,591	$14,942	$36,411	$7,433	$26,428	$0	$0	$0	$0
Year 4										
Pilot Zones	$47,553	$118,809	$60,962	$148,557	$41,924	$149,055	$17,840	$63,428	$0	$0
Nat'l Outreach	$9,843	$24,591	$14,942	$36,411	$17,097	$60,785	$7,433	$26,428	$0	$0
Year 5										
Pilot Zones	$50,326	$125,737	$72,188	$175,913	$69,755	$248,003	$41,924	$149,055	$17,840	$63,428
Nat'l Outreach	$9,843	$24,591	$14,942	$36,411	$17,097	$60,785	$17,097	$60,785	$7,433	$26,428
Year 6										
Pilot Zones	$0	$0	$76,398	$186,172	$82,600	$293,671	$69,755	$248,003	$59,765	$212,483
Nat'l Outreach	$0	$0	$14,942	$36,411	$17,097	$60,785	$17,097	$60,785	$24,530	$87,213
Year 7										
Pilot Zones	$0	$0	$0	$0	$87,417	$310,796	$82,600	$293,671	$129,520	$460,486
Nat'l Outreach	$0	$0	$0	$0	$17,097	$60,785	$17,097	$60,785	$41,627	$147,998
Year 8										
Pilot Zones	$0	$0	$0	$0	$0	$0	$87,417	$310,796	$212,120	$754,157
Nat'l Outreach	$0	$0	$0	$0	$0	$0	$17,097	$60,785	$58,724	$208,783
Year 9 +										
Pilot Zones	$0	$0	$0	$0	$0	$0	$0	$0	$299,536	$1,064,953
Nat'l Outreach	$0	$0	$0	$0	$0	$0	$0	$0	$75,821	$269,568

1983

Table 7e. Overall Project - Total Production Costs by Project Year and Incremental Farm Costs

	Total Production Costs			Without Project Production Costs	Incremental Farm Costs	
	Commod.	Labor	Overall		By Zone	By Year
Year 1						
Pilot Zones	$10,271	$25,661	$35,931	$2,875	$33,056	$46,830
Nat'l Outreach	$4,279	$10,692	$14,971	$1,198	$13,773	
Year 2						
Pilot Zones	$39,727	$98,297	$138,024	$9,631	$128,393	$181,201
Nat'l Outreach	$16,339	$40,422	$56,761	$3,953	$52,808	
Year 3						
Pilot Zones	$94,638	$253,047	$347,685	$20,873	$326,813	$439,753
Nat'l Outreach	$32,218	$87,431	$119,649	$6,708	$112,940	
Year 4						
Pilot Zones	$168,279	$479,850	$648,129	$34,184	$613,945	$802,012
Nat'l Outreach	$49,315	$148,216	$197,530	$9,464	$188,067	
Year 5						
Pilot Zones	$252,033	$762,137	$1,014,170	$48,271	$965,899	$1,229,092
Nat'l Outreach	$66,411	$209,001	$275,412	$12,219	$263,194	
Year 6						
Pilot Zones	$288,517	$940,329	$1,228,846	$48,271	$1,180,575	$1,487,216
Nat'l Outreach	$73,666	$245,194	$318,860	$12,219	$306,641	
Year 7						
Pilot Zones	$299,536	$1,064,953	$1,364,490	$48,271	$1,316,218	$1,649,389
Nat'l Outreach	$75,821	$269,568	$345,389	$12,219	$333,170	
Year 8						
Pilot Zones	$299,536	$1,064,953	$1,364,490	$48,271	$1,316,218	$1,649,389
Nat'l Outreach	$75,821	$269,568	$345,389	$12,219	$333,170	
Year 9 +						
Pilot Zones	$299,536	$1,064,953	$1,364,490	$48,271	$1,316,218	$1,649,389
Nat'l Outreach	$75,821	$269,568	$345,389	$12,219	$333,170	

Table 8. Coffee Production, Income Generated and Incremental Benefits

	Kgs. Coffee Harvested (From impr.plant.)\a				Revenues \b		Incremental Benefit	
	1stYrPlt	2ndYrPlt	3rdYr+Plt	Total	FromImpPlta	Foregone\c	By Zone	By Year
Year 1								
Pilot Zones	3,752	0	0	3,752	$5,253	$14,000	(8,747)	(12,392)
Nat'l Outreach	1,563	0	0	1,563	$2,189	$5,833	(3,645)	
Year 2								
Pilot Zones	8,817	37,520	0	46,337	$64,872	$46,900	17,972	25,643
Nat'l Outreach	3,596	15,633	0	19,229	$26,921	$19,250	7,671	
Year 3								
Pilot Zones	14,670	88,172	75,040	177,882	$249,035	$101,640	147,395	213,875
Nat'l Outreach	3,596	35,957	31,267	70,819	$99,147	$32,667	66,480	
Year 4								
Pilot Zones	17,372	146,703	251,384	415,459	$581,643	$166,460	415,183	568,921
Nat'l Outreach	3,596	35,957	103,180	142,732	$199,825	$46,083	153,742	
Year 5								
Pilot Zones	18,385	173,718	544,790	736,893	$1,031,650	$235,060	796,590	1,037,594
Nat'l Outreach	3,596	35,957	175,093	214,646	$300,504	$59,500	241,004	
Year 6								
Pilot Zones	0	183,848	892,226	1,076,074	$1,506,503	$235,060	1,271,443	1,608,092
Nat'l Outreach	0	35,957	247,007	282,963	$396,149	$59,500	336,649	
Year 7 +								
Pilot Zones	0	0	1,259,922	1,259,922	$1,763,890	$235,060	1,528,830	1,915,818
Nat'l Outreach	0	0	318,920	318,920	$446,488	$59,500	386,988	

NOTES/ASSUMPTIONS: For National plus pilot zones

a. Estimated yields/ha for mature plantations (Three years and older)

18%of farmers will obtain	2000 kg./hectare	100%of optimum yield
56%of farmers will obtain	800 kg./hectare	40%
26%of farmers will obtain	500 kg./hectare	25%

Weighted average yield/ha.: 47% of full yield
or 938 kg/ha.

Estimated yields prior to maturity
New Plantations 5% of mature yield
2nd Year Planta. 50% of mature yield

b. Coffee sale price $1.40 /kilogram

c. Estimated yield without proj. 125 kg/ha

200X

Table 9. Fifteen Year Overall Participants Cost Benefit Stream

At a coffee price of $1.40 /kg

	Project year 1	2	3	4	5	6	7	8	9-15
Incremental Benefit	($12,392)	$25,643	$213,875	$568,924	$1,037,594	$1,608,092	$1,915,818	$1,915,818	$1,915,818
Incremental Farm Costs	$46,830	$181,201	$439,753	$802,012	$1,229,092	$1,487,216	$1,649,389	$1,649,389	$1,649,389
Net Benefit	($59,221)	($155,558)	($225,878)	($233,088)	($191,498)	$120,876	$266,430	$266,430	$266,430

IRR 16.73%

Table 10. Fifteen Year Overall Cost Benefit Stream Including USAID Inputs

At a coffee price of $1.80 /kg

	Project year 1	2	3	4	5	6	7	8	9-15
Inflow Incremental Benefit	($15,932)	$32,969	$274,982	$731,474	$1,334,049	$2,067,546	$2,463,195	$2,463,195	$2,463,195
Outflow Incremental Farm Costs	$46,830	$181,201	$439,753	$802,012	$1,229,092	$1,487,216	$1,649,389	$1,649,389	$1,649,389
Project Donor Costs									
Salaries and Allowances	$510,000	$602,000	$729,000	$866,000	$1,092,000				
Equipment	$218,000	$30,000	$10,000	$2,000	$0				
Commodities Supplies	$49,000	$112,000	$186,000	$226,000	$247,000				
Travel/Perdiem	$48,000	$48,000	$48,000	$48,000	$51,000				
Training	$108,000	$91,000	$108,000	$87,000	$65,000				
Vehicle Oper/Maint	$90,000	$90,000	$90,000	$90,000	$90,000				
Administ. Costs	$77,000	$86,000	$74,000	$74,000	$78,000				
Subtotal	$1,100,000	$1,059,000	$1,245,000	$1,393,000	$1,623,000				
IICA Overhead	$134,000	$132,000	$161,000	$188,000	$226,000				
USAID Inputs *	$1,234,000	$1,191,000	$1,406,000	$1,581,000	$1,849,000				
Total Outflow	$1,280,830	$1,372,201	$1,845,753	$2,383,012	$3,078,092	$1,487,216	$1,649,389	$1,649,389	$1,649,389
Net Benefit	($1,296,762)	($1,339,232)	($1,570,771)	($1,651,538)	($1,744,043)	$580,330	$813,806	$813,806	$813,806

Total Donor Budget * 7,261,000 (Years 1-5)

* Without Inflation, does not include membership fees, audit and evaluation or contingency.

ANNEX E

ENVIRONMENTAL ASSESSMENT

Environmental Assessment
of the
Haiti Coffee Revitalization Project

by

Jeffrey J. Brokaw
Office of Environment, Energy, and Science
A.I.D. Latin America and Caribbean Bureau

and by

CHEMONICS

Table of Contents

Page

List of Acronyms and Abbreviations.....iv

1.0 Summary and Recommendations.....1

2.0 Purpose and Scope of Environmental Assessment.....2
- 2.1 Purpose.....2
- 2.2 Scope.....2

3.0 Project Description.....4
- 3.1 Background.....4
- 3.2 Project Goals.....5
- 3.3 Beneficiaries.....6
- 3.4 Affected Environment.....7

4.0 Project's Relationship to Other Programs.....8
- 4.1 Background.....8
- 4.2 Current Related USAID/Haiti Projects.....9
- 4.3 Previous USAID/Haiti Involvement in the Coffee Sector.....10
- 4.4 ROCAP's Regional Coffee Pest Project.....11

5.0 Institutional Analysis.....11
- 5.1 Changes in Institutional Participation.....11
- 5.2 IICA's Technical Capacity and Experience.....12
- 5.3 Local PVO's.....13

6.0 Pesticide Use Assessment.....14
- 6.1 Basis for Selection of Requested Pesticides.....14
- 6.2 Registration Status of Requested Pesticides.....14
- 6.3 Acute and Long Term Toxicological Hazards.....17
- 6.4 Uses of Requested Pesticides and Warnings in Application of Pesticides.....19
  - I. Fungicides.....20
  - II. Insecticides.....21
  - III. Herbicides.....22
- 6.5 Compatibility with Target and Non-Target Ecosystems.....22
- 6.6 Use of Pesticides Not Requested in this EA.....23
- 6.7 Proposed Methods of Application, and the Availability and Use of Protective Clothing.....23
- 6.8 Effectiveness of Proposed Pesticides.....23

205X

Page

6.9 Availability and Effectivieness of other Control Mehtods besides Pesticides.....24
6.10 The Ability of the Government of Haiti and IICA/HCR to Monitor and Regulate the Distribution, Use, Storage, and Disposal of Pesticides.....24
I. Government of Haiti
II. IICA/HCR
6.11 Conditions Under Which Pesticides are to be Used.....25
6.12 Pesticide Use in the Context of Integrated Pest Management.....27
6.13 Pests and Diseases of Coffee in Haiti and Their Recommended IPM Management.....28
I. Diseases and Pests.....28
II. Control of Diseases.....29
III. Control of Insect Pests.....31
IV. Rodents, Weeds, and Nematodes.....32
V. Disease and Pest Control in Nurseries.....32
6.14 Project Organization and Training as they Relate to Pesticide Use.....34

7.0 Alternatives, Including the Proposed Action.....35
7.1 Alternative I -- No Action.....35
7.2 Alternative II -- The Haiti Coffee Revitalization Project.....35

8.0 Environmental Consequences of Project Interventions.....35
8.1 Soil Erosion.....36
8.2 Fertilizers.....36
8.3 Deforestation and Biodiversity.....37

List of Contacts.....38

206

LIST OF ACRONYMS AND ABBREVIATIONS

AOP	Agroforestry Outreach Project
BCA	Banque Credit Agricole
CCH	National Association of Coffee Cooperatives
DA	Development Assistance
EA	Environmental Assessment
EOP	End of Project
EPA	Environmental Protection Agency
FAO	Food and Agricultural Organization of the United Nations
GOH	Government of Haiti
HCR	Haiti Coffee Revitalization Project
IICA	Inter-American Institute for Cooperation in Agriculture
IPM	Integrated Pest Management
LAC	Bureau for Latin America and the Caribbean
LD50	Lethal Dose of a pesticide required to kill 50% of test organisms
LRD	Local Resources Development Project
MARNDR	Ministry of Argiculture, Natural Resources, and Rural Development
NGO	Nongovernment Organization
NPA	National Program for Agroforestry
PADF	Pan American Development Foundation
PID	Project Identification Document
PCC	Small Farmer Marketing Project
PP	Project Paper
PPC	Small Farmer Improvement Project
PVO	Private Voluntary Organization
ROCAP	Regional Office for Central America and Panama
RPAR	Rebuttable Presumption Against Registration
SMC	Secondary Multiplication Centers
TWMP	Targeted Watershed Management Project
UNAPEL	Union Nationale des Associations pour la Promotion d Elevage
USAID	United States Agency for International Development
ZHPPs	Zones of Highest Production Potential

1.0 SUMMARY and RECOMMENDATIONS

Coffee has traditionally been a major source of foreign exchange for Haiti, and an important cash crop for the country's peasant farmers. But, coffee rust (*Hemileia vastatrix* Berk. Br.), a serious disease of coffee, has recently spread to the country. Almost all of Haiti's coffee is the *typica* variety, which is the most susceptible to rust. If steps are not taken to introduce resistant coffee varieties, and the cultivation practices they require, coffee will be eliminated as a crop of Haiti within a few years. The Haiti Coffee Revitalization Project is designed to introduce resistant varieties and their required cultivation practices to the peasant farmers of the country.

This Environmental Assessment (EA) examined the potential environmental consequences of the project's proposed activities. The use of pesticides on the project presents the greatest environmental concern, and is what this EA focuses on. Also considered are the project's potential effects on soil erosion, land-use, biodiversity, tropical forests, and pollution caused by the use of fertilizers.

Based on the review of project activities conducted during the EA, the following recommendations and conclusions are made.

* Pesticides: Pesticides will only be used in the context of the Integrated Pest Management System to be developed by the project. If pesticides are required, only those listed in Table 6-1 will be permitted. These pesticides are recommended as relatively safe, if used according to label instructions. Their transportation, storage, application, and disposal will take place under the extension network to be developed by the project. Pesticides will only be handled by project personnel and the extension agents trained by the project.

* Fertilizers: The use of fertilizers in the project does not present a significant environmental problem. The project's extension agents will be trained in the proper use of fertilizers to minimize what dangers exist.

Biodiversity and Tropical Deforestation: The project will be active in already highly disturbed areas, therefore, threats to biodiversity or forests are not likely.

Soil Erosion: By promoting a perennial crop, the project is likely to have a positive effect in reducing potential soil erosion. Because of this, the project is predicted to have an overall positive environmental effect. The project will also introduce soil erosion prevention techniques to farmers

Though beyond the scope of this project, the loss of coffee in areas where the project will not be active may result in increased erosion, a problem that needs to be addressed.

2.0 PURPOSE and SCOPE of ENVIRONMENTAL ASSESSMENT

2.1 Purpose of the Environmental Assessment

The Initial Environmental Examination (LAC-IEE 88-43) for the USAID/Haiti financed Coffee Revitalization Project (HCR; originally named the Coffee Cooperative Development Project) determined that an Environmental Assessment (EA) should be done. This determination was made because the project involves the use of pesticides and fertilizers, and also changes in coffee cultivation techniques that might affect soil erosion and deforestation.

EAs are prepared in accordance with the Environmental Procedures of 22 CFR Part 216. They deal with the identification, measurement, interpretation, and communication of a project's potential positive and negative effects on the natural and human environment. They are conducted to ensure that environmental considerations are factored into the A.I.D decision-making process. For this EA due consideration has also been given to A.I.D. s recent Policy Paper on Environment and Natural Resources (April 1988).

2.2 Scope of Environmental Assessment

This EA's Statement of Work requested a review and evaluation of existing environmental and ecological issues pertaining to Haiti in general, and to coffee production in particular. It also instructed the contractor to visit the regions where the Coffee Revitalization Project will be implemented, and to work

in coordination with the other members of the Project Design Team to:

1. Identify and define the significant environmental issues pertaining to the implementation of the Coffee Revitalization Project, especially the uses of pesticides, fertilizers, and new agricultural practices.

2. Identify the nature and magnitude of current pest problems, especially coffee rust, rats, and insects such as the Cercospora coffeicola, Acheta assimilis, and Saissetia spp. Determine and evaluate current pest management Practices. Propose the best non-chemical pest management practices.

3. Provide a list of pesticides to be used in the project if chemical control is necessary. Determine their acceptable use, and procurement procedures with respect to their EPA registration status. Identify acute and long term toxicological hazards associated with the use of the proposed pesticides, their efficacy, residual effects, and compatibility with target and non-target ecosystems, especially water sources and soils.

4. Determine the ability of Cooperatives Cafeires d Haiti (CCH) to properly regulate, handle, and control the distribution, storage, use, and disposal of the proposed pesticides, if chemical control is recommended.

5. Propose specific recommendations on training needs for Project personnel in pesticide and fertilizer uses, and assess the extent to which the proposed pesticide use is part of an Integrated Pest Management program.

6. Explore the land use implication of the project, with special attention being given to the environmental impact of coffee cultivation in terms of hillside agriculture, erosion, and deforestation.

7. Identify and propose alternatives which would avoid or minimize adverse effects or enhance the quality of the environment, so that the expected benefits from the project can be weighed against any adverse impacts upon the human environment, or any irreversible or irretrievable commitment of resources

210 X

3.0 PROJECT DESCRIPTION

3.1 Background

Coffee has long occupied a prominent role in Haitian agriculture. It was introduced around 1725 in the country's northern part, and by the eve of the French Revolution supplied 60% of the world's coffee. After Haitian independence coffee became the leading export crop, remaining so until recently. Progressively, though, the southern and central regions - the project's target zones -- have overshadowed the traditional northern growing areas in importance.

Almost all coffee in Haiti is grown as part of a multicrop system by poor farmers with small land holdings. Most holdings are 0.7 - 1.5 hectares with only a few exceeding 5 hectares. Coffee has traditionally been a source of cash and credit of particular importance for small farmers during annual times of food shortages.

Haiti's coffee sector has been in decline since 1950. An average of 25,750 metric tons was exported in the 1950's, 19,200 metric tons in 1980, and as low as 12,000 metric tons is projected for 1988. In-field coffee production levels have also fallen dramatically, with 250 Kg/hectare the current average. Farmers in response to declining yields have reduced the hectarage under coffee cultivation in favor of non-credit-securing commodities such as corn, peas, or beans.

This Project's principal assumption is that the current decline in coffee production is primarily due to Haiti's inefficient coffee production technology. The country's stands are old, overshaded, and physiologically exhausted. Haiti has also failed to switch from *Coffea arabic* var. *typica* to improved varieties that provide much higher yields, but require different and more intensive cultivation practices, practices that are unfamiliar to Haitian coffee growers.

The introduction of modern varieties and cultivation techniques has become even more urgent with the rapid spread in Haiti of coffee rust (*Hemileia vastatrix* Berk. & Br.). Unfortunately for Haiti, *typica* is the most rust susceptible of the coffee varieties. Coffee rust is a fungus that first appears as a slight chlorosis on a leaf's upper side. Eventually the lower surface becomes encrusted with masses of spores forming bright orange pustules. One pustule is enough to cause a leaf's premature abscission. Infestation of the rust can cause total defoliation, drastically reducing yield. Repeated defoliation kills the tree. Worldwide, coffee rust is the industry's most serious pest. When unchecked it has eliminated coffee from some countries.

The rust was first identified in Haiti in the North. It had probably been there for several years, but was only identified in March 1988. Now it is spread throughout much of the North and is rumored to be in the South. It is predicted that within a few years rust will be throughout the country, and if not counteracted will eliminate coffee as a product of Haiti.

Resistant varieties of coffee are the best means of controlling rust. Over the last few years Haiti's Ministry of Agriculture, Natural Resources, and Rural Development (MARNDR) has, through a PL 480 funded program, produced in nurseries 8 million seedlings of var. caturra. This variety is rust tolerant and with the proper inputs can be economically grown in Haiti.

Rust resistant varieties have been developed for other countries, but no variety is resistant to all the races of rust. Resistance is also conditional upon local ecology and cultivation practices. Maximizing resistance and productivity depends on developing technological packages that combine the most resistant variety with cultivation practices that are both suitable to the local ecology and farming practices. The cultivation elements of a technological package include soil preparation, spacing of trees, pruning, amount of shade, fertilization, all of which comprise an integrated pest management system which may at times also require the use of pesticides.

3.2 Project Goals

Given the progressive decline in the country's coffee production along with the severe deterioration of the entire agricultural sector, assistance to the improvement of coffee production can make an important contribution to Haiti's economy.

The project will develop and transfer coffee technologies that combine coffee varieties with cultivation practices that will maximize resistance to rust and increase productivity in the context of the multicropping system of Haiti's small farmers. The project will last three and half years. Cost to A.I.D. will be $4,400,000 in DA funding. An additional 18,760,000 gourdes ($3,752,000) in Title III local currency will be provided for in-kind services and materials, and for cash credits. Project activities will take place in the Zones of Highest Production Potential (ZHPPs) in the Southern Peninsula and South-Central Haiti. The transfer of the technological packages will be done through the most qualified farmer organizations in these areas.

212X

The most promising rust resistant coffee varieties now available in Latin America and elsewhere will be tested and adapted to Haitian conditions under this project. Concomitantly, the project will produce and distribute existing rust tolerant varieties which can be grown economically under appropriate management. Futhermore, a network of local individuals from farmer organizations will be established. These individuals will be trained by the project and serve as the "formateurs" that will transfer the developed technological packages, including the rust resistant varieties, directly to the farmers.

Purpose-level achievements of the project directly relevant to the EA are:

(1) Distribution of 12 million rust resistant/tolerant seedlings (or equivalent in seeds) and extension of improved adapted technological packages to qualified farmer organizations in the ZHPPs by EOP.

(2) Productivity per hectare increased from 250 kg/ha to over 2000 kg/ha three years after EOP, with commensurate income increases for coffee producers.

(3) 3600 hectares of improved coffee varieties outplanted and under proper management by EOP.

(4) A minimum of 275 extension agents and technicians, and 11,500 farmers participating directly in project activities and benefiting from project-developed technologies and support services by EOP.

(5) An average of $4,000 metric tons of coffee produced annually when project trees are at full production.

(6) A minimum of 2,000 hectares of multicropped farm land incorporating appropriate soil conservation techniques by EOP.

(7) Significant capacity strengthening of local organizations and participating institutions in the ZHPPs to channel production inputs to farmers.

3.3 BENEFICIARIES

The direct beneficiaries of the project by EOP will be an estimated 11,500 coffee farmers planting an equivalent total area

of 3,600 hectares. This will result in an annual production of 60,000 60-kg sacks of coffee worth approximately $9.0 million three years after EOP.

3.4 Affected Environment

The general topography of Haiti, particularly in zones where coffee is grown, is characterized by a rugged terrain with mountains as high as 2,684 meters. The gradation from low to high altitudes produce different ecological zones, each with its own climate, flora, and fauna.

Based on temperature and humidity, the optimal zone for growing C. arabica is located in the wet forest of the sub-tropics [Holdridge]. In other words C. arabica ideally requires tropical-climate temperatures with contrasting seasons. Yearly average temperatures should range between 18-25° C, with an absolute minimum of not less than 13° C, and the maximum not exceeding 30° C. Because of these temperature requirements, the latitude at which arabica coffee is best grown is between 25° N and 25° S of the equator. The range of annual rainfall required lies between 1500 and 2250 mm per year with a relative dry period of 2-3 months. The relative humidity is less important, but is thought to be ideal between 70 and 95%. For this reason the altitude above sea level for growing high quality arabica coffee in Haiti probably lies between 700 and 1200 meters. Soil structure, texture, and topography for the cultivation of coffee should allow free drainage (ideally porous) but a reasonable water retention (organic material).

The Project team has determined that the zones of highest potential production exist in the South and South-Central regions of the country. This is due partly to these regions having the climate and soil most closely matching that ideal for coffee, and partly to the presence in these regions of the farmers most interested in coffee production.

The areas in which the Coffee Project will operate include:

Thiotte

Jacmel

214X

Beaumont

Baptiste

Camp Perrin

Tiburon-Port Salut zone

These areas occupy a similar altitudinal zone which can be designated as Subtropical Wet Forest and Subtropical Rain Forest. Soils are composed of igneous metamorphic rock and limestone, the latter being highly subject to erosion.

The selected areas for the coffee project are, at present, planted in a rudimentary fashion with coffee, fruit trees, bananas, and cacao intermingled with vegetables such as yams, casava, peas, and beans. It is thus the area's small multicrop farms that are the environments directly affected by the project.

Precipitation varies in accordance with altitude and location. In the regions of Jacmel and Cavaillon, rainfall is rather uniform and averages 1,350 mm to 1,550 mm annually. In the area of Baptiste it averages 2,512 mm per year. In the mountainous areas in which the project will be active, convectional rainfall is common. The heavy downpours that result can cause rapid runoff and extensive erosion.

4.0 Project's Relationship to Other Programs

4.1 Background

HCR advances USAID/Haiti's agricultural and resource management strategy, the focus of which is the development and dissemination of more productive but also sustainable technologies for Haiti's peasant hillside farmers. The relentless depletion of soil and water resources under traditional annual cropping regimes is the single most important constraint to sustainable, increased agricultural production in Haiti. Negative downstream impacts are also considerable. The improved production systems promoted by the Mission are based on the increased integration of perennial crops of various kinds -- including trees, shrubs, and grasses -- into existing peasant multicrop system. Appropriate perennial vegetation, properly deployed on mountainside plots, helps maintain soil fertility, minimizes soil erosion, assures maximum infiltration of rainfall, and generally preserves the upper watersheds, thereby protecting downstream areas from destruction by excessive runoff

and siltation. On-site benefits of perennial crops on soil and water conservation also increase yields of intercropped annual food and cash crops.

The HCR's goal of developing and disseminating a technological package that promotes rust resistant coffee as a part of the multicropping system of small farmers, can be an important element in the mission's goal of enhancing farm income while promoting soil and water conservation.

4.2 Current Related USAID/Haiti Projects

Besides HCR, USAID/Haiti is implementing four other projects that play integral roles in advancing its agricultural objectives. HCR could benefit greatly from the information, methods, and network of PVO's developed by these projects. These projects are: (1) the National Program for Agroforestry (NPA) which is nationwide; (2) Local Resource Development I (LRD I) at Maissade in the Central Plateau; (3) LRD II at Legen near Arachaie; and (4) the Targeted Watershed Management Project (TWMP) in and around Les Cayes.

NPA's goal is to maximize the productive potential of Haitian hillside agricultural land and to reduce the ongoing degradation of the country's natural resource base by introducing soil-conserving and fertility-enhancing perennial crops and cropping patterns into traditional Haitian peasant farming systems. The project will build upon the soon-to-be-completed Agroforestry Outreach Project (AOP, #521-0122) which was successful in generating peasant interest in appropriate land-use practices, in disseminating plant materials, and in developing an extension service.

LRD I's goal is to reduce environmental degradation on the hillsides of a local commune. It employs some of the nursery technology developed through the AOP, but focuses on participatory approaches to soil conservation and technology transfer. This project is viewed by many as one of the most successful natural resource projects because of, first, its ability to motivate farmers to implement soil conservation and protection based on land capability; and second, its establishment of a comprehensive demonstration site, illustrating many of the farm practices employed by local farmers. LRD II provides nursery materials, seed, germplasm, and training, but relies on local labor and use of private farmlands to implement soil conservation and tree planting. Many the techniques used in LRD II were adapted from AOP. Unless additional funding is found, both LRD I and II will end during 1989.

216X

TWMP addresses broad issues of watershed management in several of the Southern Peninsula's major catchment basins.

A regular exchange of information and coordination when possible between HCR and these four projects should be established. Many of the techniques developed by these projects for motivating farmers, improving soil fertility, reducing soil erosion, and disseminating technological packages could be adapted with great benefit to HCR.

4.3 Previous USAID/Haiti Involvement in the Coffee Sector

USAID has been involved in both coffee production and marketing activities in Haiti since the 1950's when the Point Four Program was established. Since the mid-1970's USAID has supported the Small Farmer Improvement Project (PPC), the Small Farmer Marketing Project (PCC), the Strengthening Coffee Cooperatives II project, and a PL480 program for propagation of improved rust tolerant varieties distributed over the last two years by the MARNDR.

The overall objective of both the PPC and PCC was to increase small farmer income. From 1974-1981 PPC attempted to achieve this objective through increasing smallholder coffee production. The Project was evaluated as not having fully realized its objectives, although some temporary increases in production were recorded among farmers who availed themselves of the project's subsidized in-kind (fertilizer) and cash (for labor) group credit program run through the Banque Credit Agricole (BCA). Construction of coffee buying centers and coffee access roads were also part of the activity. At the time, however, the failure to increase production was attributed to inferior market prices paid to farmers through the oligopsonistic marketing structure.

As a result of this experience, USAID initiated a marketing project (PCC) in 1977 to develop a network of coffee cooperatives and build a coffee processing facility. The PCC was considered successful at strengthening the cooperative movement, as the number of cooperatives marketing coffee doubled over the life of the project. The cooperatives succeeded in offering prices through 1983 that, with patronage refunds and quality bonuses included, were 8-26% higher than those offered by speculators. These gains in fact were evaluated (DAI, 1984) as occurring not because of cooperatives taking advantage of alleged speculator inefficiencies (such as collusion, price-fixing, and exorbitant profits) as envisioned in the project design, but rather because cooperatives realized

economies of scale which permitted the payment of quality bonuses and patronage refunds to farmers.

Marketing and institutional development constraints faced by cooperatives are being addressed through the Strengthening Coffee Cooperatives II Project, which began in 1985.

More recently the local currency funding provided by USAID to MARNDR has been responsible for the propagation of 8 million coffee plants, and the distribution of 6 million of these plants. Most of these plants were distributed in the ZHPPs targeted by the project.

HCR will build upon the past successes and lessons learned from these coffee projects. In particular the local coffee cooperatives have the potential for being centers through which HCR extension services can operate.

4.4 ROCAP's Regional Coffee Pest Control Project

Of particular relevance to HCR is the Regional Coffee Pest Control Project 596-0090) funded by ROCAP. The project works with regional and national level institutions to develop and disseminate an integrated system to combat rust and other coffee pests in Central America. Research focuses on: (1) the development and reproduction of resistant varieties of coffee plants; (2) the biological properties of rust; (3) properties of the coffee-berry borer and methods of control; (4) the use and control/registration of pesticides; (5) analysis of residues; and (6) the development/adaptation of appropriate technologies for small farmer production of coffee. Additional activities include training of technicians from both regional and national level institutions, the expansion of a data bank containing information relevant to coffee production, and technical and logistical support. A principal implementing agent of the project is the Inter-American Institute for Cooperation in Agriculture (IICA), which is the principal implementing agent for HCR.

5.0 INSTITUTIONAL ANALYSIS

5.1 Changes in Institutional Participation

The PID which led to this Project Paper proposed that CCH and its member cooperatives be the primary project focus, stating that "the purpose of this project is to strengthen the institutional capability of the National Association of Coffee Cooperatives (CCH) and affiliated cooperatives to provide

expanded coffee production and marketing services to their member farmers. "The PID also called for the PP team to examine the ability of CCH to carry out project activities.

When the PP team became aware of the extent of the danger coffee leaf rust posed to the future of Haiti's coffee production, it recommended, and it has been agreed, that the focus of the project be shifted to the introduction and dissemination of rust resistant plant materials and improved production technologies. A review of CCH was done with the new focus of the project in mind. The team concluded that because CCH's role is in marketing rather than production, it would not be appropriate for CCH to implement the revised project. Because the project is now proposed as a production activity, local cooperatives and cooperative unions choosing to be involved in the project can be more effectively served by IICA, because of its technical expertise, being the implementing agent.

5.2 IICA's Technical Capacity and Experience

IICA is an international agricultural research organization based in San Jose, Costa Rica, with a permanent office located in Port au Prince. It is in a unique position to implement this Project. As an international public organization, IICA/Haiti is closely linked to IICA operations throughout Latin America and the Caribbean, and can draw on the organization's many years of experience in agricultural research and development in these areas.

IICA's experience with coffee includes a broad spectrum of coffee research. It was instrumental in the establishment of the regional coffee organization known as PROMACAFE and is one of the principal agents in the ROCAP funded Regional Coffee Pest Control Project (596-0090) begun in June 1981 and continuing through FY 90. The project is designed to develop an integrated pest management system to combat coffee rust and other pests, particularly as they affect small farmers. For a number of years, IICA has also operated a coffee research farm in Costa Rica where it has experimented with ways to control coffee leaf rust and the development of rust resistant varieties. This program has been instrumental in the development of the most resistant varieties currently available.

IICA/Haiti will be able to draw on the expertise available at the coffee research facility, as well as make use of the plant materials being developed there. In addition, through its IICA organizational relationships, IICA/Haiti will be able to draw on the broader resources of the international scientific community.

IICA's direct experience in Haiti and work with local PVOs will also be of significant benefit to the project. Its swine repopulation project (AID/LAC Project Number 521-0170) has given it a strong knowledge of Haiti's rural areas and a wide range of contacts with local organizations and farmers throughout the country. The field extension and farmer training components of that activity will be directly relevant to the extension tasks IICA will have under the coffee project. During the implementation of the swine repopulation project, IICA was instrumental in the development of a network of local non-governmental associations organized specifically for pig and feed distribution. This network was later organized into a larger entity known as the Union Nationale des Associations pour la Promotion d Elevage (UNAPEL). The organization had 62 charter member groups representing 80,000 farm families. The local organizations that make up UNAPEL operated the swine project's 440 Secondary Multiplication Centers (SMCs). UNAPEL's member organizations have an established track record of direct involvement with the peasant population. They are involved not only with swine multiplication, but in many other aspects of rural community development, including the construction of schools and clinics and the provision of health services. The project leadership will explore the potential for the involvement of some of the UNAPEL member organizations in project activities.

The swine repopulation project also enabled IICA to establish strong relationships with MARNDR, and international donor organizations working in Haiti, all of which will be valuable for project implementation. IICA has also received formal authorization from MARNDR to work directly with Haitian PVOs.

5.3 Local PVO's

The PP team devoted much time and effort to identifying PVOs and cooperatives with sufficiently strong links to the target population and sufficient motivation to participate in the project. Because the success of the project will depend, to a large extent, on the ability of the IICA team to transfer project inputs and technology to large numbers of coffee farmers, the strength of these local organizations is essential.

The team concluded that there is a sufficient number of organizations that have both a strong enough willingness and ability to participate in the project. Many of the small local PVOs, in addition to those in UNAPEL, have already had successful experience working with project implementation, such as those affiliated with the AID-funded Agroforestry Outreach Project implemented by the Pan American Development Foundation (PADF) and CARE.

220X

6.0 Pesticide Use Assessment

6.1 Basis for Selection of Requested Pesticides

It is A.I.D.'s policy that Integrated Pest Management (IPM) be the means of addressing pest problems. Consequently, compatibility with IPM was a criterion used in selecting the requested pesticides.

It is also A.I.D. policy not to provide small farmers with highly toxic pesticides that are restricted on the basis of human hazard. All pesticides requested here are registered by the Environmental Protection Agency (EPA) for "general use" and are judged to be adequately effective while minimally toxic to humans and the environment.

A list of the pesticides requested and technical information about them is presented in table 6-1.

6.2 Registration Status of Requested Pesticides

All of the requested pesticides are registered by the EPA for general use. "Restricted use" pesticides present potentially very high toxicity and/or environmental hazard. They are available for purchase and use only by applicators certified by law. In contrast, a "general use" pesticide is available for purchase and use by the general public.

Though all requested pesticides are registered for general use by EPA, some have been issued a so-called "Rebuttable Presumption Against Registration" (RPAR). The RPAR process is designed to be a "Special Review" to gather information and stimulate public debate about a pesticide being scrutinized because of adverse effects on human health or the environment. If at the end of this process the risks are found to outweigh the benefits, the pesticide may be cancelled (banned) or greatly restricted in the US. The project managers should remain informed about the status of RPAR pesticides and discontinue the use of any that are canceled or placed in the restricted category.

Some of the requested pesticides do not have residue tolerances for coffee established by the EPA. Therefore the use of these pesticides will be circumscribed to immature trees, and trees without fruits.

TABLE 6-1 -- Technical Information on Pesticides Requested for Use in HCR

Name	Use	Tolerance	USEPA Registration	Signal Word	EPA Toxicity Class	LD 50 Oral	LD 50 Dermal
Cupric Chloride-Copper Oxychloride	F	E	G	C	III	1000	
Cuprous oxide-copper sandoz	F	E	G	C	III	1000	8000
Cupric Hydroxide-Copper Oxychloride	F	E	G	C	III	1000	
Chlorothalonil (Bravo)*	F	T	G	W	II	10000**	10000**
Tri-Miltox	F	NT	G	C	III	4100	
Ferric Dimethyl-Dithio-Carbamate (Ferbam)	F	NT	G	C	III	17000	
Mancozeb	F	NT	G	C	III	11200	15000
Benomyl-Benlate	F	NT	G	C	III	10000	10000
Thiramis	F	NT	G	C	III	780	
Triadimefon	F	NT	G	W-C	II-III	1020-1855	5000
Propiconazole (Tilt)	F	NT	G			1517	4000
Benomyl	F	NT	G	C	IV	10000	10000

222X

Table 6-1 (cont)

Name	Use	Toler-ance	USEPA Regis-tration	Signal Word	EPA Toxicity Class	LD 50 Oral	LD 50 Dermal
Sevin	I	NT	G	C	III	500	2000
Diazinon	I	T	G	C	III	3-400	3600
Captan	I	NT	G	C	IV	9000	
Malathion	I	NT	G	C	III	1375	4100
Carbofuran (Furadan)***	I	T	G	W	II	11	10200
Dalapon	H	T	G	W	II	970	
Napropamide	H	T	G	C	II	500-5000	
Isopropyl-amine gly-phosate (Roundup)	H	T	G	W	II	4300	7940
Oxyfluorfen (Goal)	H	T	G	W	II	5000	10000

I - Insecticide
F - Fungicide
H - Herbicide
E - exempt
T - EPA tolerance established
NT - no EPA tolerance established (should only be used on immature trees and trees without developing fruits)

G - General Use
RPAR - Rebuttable Presumption Against Registration

C - caution
W - warning

* There are many restricted formulations of Chlorothalonil. Care should be taken not to procure these.
** Greater than these amounts.
*** Granular formulations of Carbofuran are not restricted, but all concentrates, suspensions, and wettable powders 40% and greater are. Furadan granules in a 10% or less formulation are proposed for use in HCR.

6.3 Acute and Long Term Toxicological Hazards

The EPA assigns pesticides to one of four toxicity categories depending on their relative LD50, and effects on eyes and skin. The LD50 value is the amount of the chemical necessary to kill 50 percent of the test animal population, usually laboratory rats. It is expressed in the weight of the pesticide per unit body weight, usually mg/kg, when swallowed (oral), absorbed through the skin (dermal), or inhaled. The latter value, "inhalation toxicity", is expressed in parts per million per unit volume of air. It is only occasionally used in reporting relative toxicity.

Pesticides with the lowest LD50 value are potentially the most toxic to humans. Ingestion of just a few drops to a teaspoon of a pesticide with an oral LD50 value of less than 50 might be sufficient to kill an adult person. An adult would probably have to consume 16 tablespoons to 1/2 kilogram or more of a pesticide with an oral LD50 of 5,000 before dying. However, the pesticide's formulation, percentage active ingredient, and other factors determine its actual hazard level.

The EPA also assigns "signal words" to pesticides. These words have been assigned by levels of toxicity and appear on the labels of EPA registered pesticides. Table 6-2 summarizes U.S. toxicity categories and precautionary statements by such categories. Toxicity category, LD50 values, and signal words assigned to each pesticide requested for use are given in Table 6-1. Specific information about the use and warnings associated with each pesticide are given in Section 6.4.

All of the pesticides recommended for use on this project are registered for "general use" in the U.S. Most have also been assigned to toxicity category III and the signal word "caution". This means that they are judged not to present an unacceptably high short- or long-term health risk to a user that understands and follows all label instructions, including the required interval before re-entry into a treated area.

If the pesticides are applied by a well-trained applicator, according to label specifications, no hazards are envisioned. In this project no highly toxic chemicals are being recommended. Therefore, it is unlikely that a person will get seriously contaminated. All pesticides, however, if misused are potentially hazardous to humans and the environment, and should be treated with caution. Also, accidents do occur. Thus, the applicators' training must make them fully aware of the dangers and the actions to be taken in the event of a mishap.

Table 6-2 -- Toxicity Categories of Proposed Pesticides by Hazard Indicator

Indicator	I	II	III	IV
Oral LD50 (mg/kg)	50 or less	50-500	500-5,000	5,000 or more
Inhalation LD50 (mg/l)	.2 or less	.2-2	2.0-20	20 or more
Dermal LD50 (mg/kg)	200 or less	200-2,000	2,000-20,000	20,000 or more
Eye Effects	Corrosive; corneal opacity not reversible within 7 days	Corneal opacity reversible within 7 days; irritation persisting for 7 days	No corneal opacity; irritation reversible within 7 days	No irritation
Skin Effects	Corrosive	Severe irritation at 72 hours	Moderate irritation at 72 hours	Mild irritation at 72 hours
EPA Signal	"DANGER"	"WARNING"	"CAUTION"	"CAUTION"

The word "Poison" and also a picture of skull and crossbones appear on the labels of EPA-registered, Category I pesticides.

Source: 40 CFR Ch. 1 (7-1-86 Edition), 162.10 Labeling Requirements.

The most toxic pesticides are the organophosphates and the carbamates, which are cholinesterase inhibitors. The project management must have on hand the antidotes and medication required for this type of chemical.

The copper fungicides offered for this project are not very toxic and problems are not expected. They are possible skin irritants, but washing with soap and water is sufficient treatment. If ingested, these fungicides irritate the digestive tract causing diarrhea.

The proposed dithiocarbamates and thiocarbamate insecticides are of low toxicity. Contact with skin may produce irritation. Thoroughly washing the contaminated area is adequate treatment. Fungicides of this type are Mancozeb, Thiram, Ferbam, and Tri-Miltox. Any eye irritation should be treated by flushing with water.

The new systemic fungicides have no antidote. First aid consists of washing the contaminated area with plenty of water. The insecticide Furadan is highly toxic in the liquid form, but in this project will be applied only in granular form in a 10% or less formulation with a shaker. So the danger of contamination is low. After application, however, a thorough washing and cleaning is mandatory.

The issue of residues on coffee must be considered. There is an increasing sensitivity in the U.S. to pesticide residues on crops. Coffee beans are in danger of being turned back if residues exceed a pesticides's tolerance level or if the residues are of a pesticide for which tolerances for coffee have have not been set. For those pesticides with tolerance levels, cut-off dates for application should be strictly adhered to. Pesticides without established tolerances should only be used on immature trees and trees without fruit. The copper compounds are exempt from tolerance requirements and, therefore, do not present a residue problem unless they contain lead. However, copper for these compounds is frequently gotten from old scrap water pipes that may have lead solder. Care should therefore be taken in acquiring copper fungicides low in lead. In cases of coffee being intercropped with food crops, the extension agent should see that proper precautions are observed to assure not contaminating these crops.

6.4 Uses of Requested Pesticides and Warnings in Application

Warnings and application instructions on the labels of all pesticides must be strictly followed.

I. Fungicides:

a. Cupric chloride-copper oxychloride -- A protective fungicide currently in wide use among coffee growers in other countries to control several fungal diseases affecting coffee. It is toxic to mammals. It is also corrosive to iron and galvanized metal, thus copper or plastic sprayers are required for its application. Its phytotoxic effects on copper susceptible plants require that care be exercised in its application.

b. Cuprous oxide-copper sandoz -- A widely used fungicide for the control of tropical fruit and leaf diseases of horticultural crops. It is the favored fungicide among coffee growers.

c. Cupric hydroxide-copper oxychloride -- A protective fungicide with low mammalian toxicity. However, it is corrosive to sprayers and other containers made of iron or galvanized iron.

d. Tri-Miltox -- A mixture of three copper salts (copper oxychloride, copper sulphate and copper carbonate) plus mancozeb. This is the preferable fungicide to use in the nurseries because it is not toxic to young coffee plants. Although it is widely used in Central America, it is under EPA special review for oncogenic and thyroid teratogenic risk.

* Copper compounds are toxic to fish. Therefore they should not be applied near water, and the depositing of any wastes near water must be avoided. Also cooper compounds high in lead should not be used.

e. Chlorothalonil (Bravo) -- A broak spectrum agricultural fungicide. Causes eye irritation, Wear goggles or face shield when handling. Toxic to fish and aquatic invertebrates.

f. Ferric Dimethyldithiocarbamate-Ferbam -- A widely used, low toxicity fungicide that provides protection against a broad spectrum of fungus diseases. It must be stored away from flammable products.

g. Mancozeb -- A low toxicity fungicide that is also used for seed treatment. At present, mancozeb is under special review by the EPA. Instructions must be followed exactly for safe use.

h. Benomyl-Benlate -- A systemic fungicide with low toxicity used for the control of a wide range of fungal diseases. In this project, it will be used only in the seed beds and will be applied with knapsak sprayers. The EPA has cancelled all aerial applications of Benomyl.

i. Thiramis -- A low toxicity product used for seed treatment. As it is an irritant to the skin and eyes, protective measures must be taken while handling. Goggles, dust mask, and gloves are essential for the applicator. The use of alcohol before, during, and immediately after use is to be avoided.

j. Triadimefon-Bayleton -- A new low toxicity systemic fungicide, used primarily to combat rust diseases including coffee rust. Since this is more toxic than the copper products, its use will be restricted to control in the event of serious outbreaks, or in the event that resistance develops to copper products. There is no specific antidote.

k. Propiconazole Tilt -- A new systemic fungicide, not yet in general use, that is effective in controlling many coffee diseases. If mancozeb, benomyl, or any of the other fungicides is not affective, Tilt is a possibility.

II. Insecticides

a. Sevin -- A broad spectrum carbamate used on almost all crops. It is toxic to honeybees, so application near honeybee colonies should be avoided. Recommended intervals between last treatment and harvest should be observed to avoid contamination by residues.

b. Malathion -- A broad spectrum organophosphate with a broad range of application. It is one of the safest organophosphate insecticides.

c. Diazinon -- Widely used and considered of low toxicity. Ducks are susceptible to it, so applicaiton near streams, rivers, or other lacustrine or riparian environments should be avoided. Because of residual effects, the recommended intervals between treatment and harvest must be observed.

228X

d. Carbofuran-Furadan -- A carbamate. Liquid formulations are restricted by the EPA due to high dermal toxicity. Granular formulations are permitted for general use if direct body contact is avoided. Appropriate shakers for application must be used. Granular formulations of 10% or less are proposed for use on HCR. Furadan is effectvie for the control of soil insects and nematodes and can be used as a substitute for the highly toxic insecticides, Mocap and Thimet. Is poisonous to birds, so granuals should be covered with soil.

III. Herbicides

Mechanical control, not herbicides, is currently the recommended means of controlling weeds. If herbicides in some situations are necessary, the following do have tolerances for coffee set by the EPA.

a. Dalapon -- For perennial and annual grasses. Often used as preplant treatment to control established perennial grasses in crop land.

b. Napropamide -- Used to control several grasses and broadleaf weeds in coffee stands.

c. Isopropylamine glyphosphate (roundup) -- Controls many annual and perennial grasses and broadleaf weeds plus many tree and woody brush species.

d. Oxyfluorfen (goal) -- Selective pre and post-directed control of a wide spectrum of annual broadleaf weeds and grasses.

6.5 Compatibility with Target and Non-target Ecosystems

The pesticides listed above for use in HCR are generally non-persistent and, if used correctly and according to their labels, should present no unusual hazards to the target or natural ecosystems. Applying higher dosages, shrinking intervals between applications, spraying during windy conditions, storing or disposing carelessly, or rinsing equipment and/or containers in rivers would have harmful effects. The damage, however, would be limited because the

chemicals selected have very little phytotoxic effect, and are only slightly toxic to wildlife. Some of the possible effects pertaining to specific pesticides were discussed in Section 6.4

Most insecticides are toxic to some natural enemies and bees, especially if applied at high rates. Thus, natural enemies and bees residing in treated fields would likely decrease. Further, the threat of buildup of genetically resistant strains of insect pests, plant diseases, weeds, nematodes always exists.

Some problems are unavoidable when pesticides are used. Minimal adverse effects result only when pesticides are used as part of an IPM program, and when users are educated to the hazards and proper use of the materials. In cases where pest control is necessary, the project will emphasize pesticide use in the context of IPM, and through special training on these subjects, foster a rational use of the materials.

6.6 Use of Pesticides Not Requested in this EA

Preparation of an EA amendment and review by the LAC Bureau Environmental Officer is required before pesticides not listed in Table 6-1 may be used in HCR.

6.7 Proposed Methods of Application, and the Availability and Use of Protective Clothing.

If pesticides are used, the project would utilize hydraulic backpack sprayers for liquid formulations, and the appropriate shakers for granular and powder formulations. Protective clothing that will be needed includes: gloves, boots, masks, long-sleeved shirts, long pants, goggles, and hats. The project will assure that the appropriate application and safety equipment is available and used by applicators.

6.8 Effectiveness of Proposed Pesticides

Pesticides selected for use on this project were recommended by pest management experts and have been found effective against the target pests either in Haiti or under similar environmental conditions.

6.9 Availability and Effectiveness of other Control Methods besides Pesticides

The best means for avoiding the hazards associated with pesticide use is a well designed and fully implemented IPM program. In most cases non-chemical means are also the most effective way of controlling insect pests. Consequently, pesticides will only be used in the context of the IPM system that the project will develop. PROMACAFE studies indicate that cultural techniques such as proper fertilizing, shading, pruning, and spacing in combination with the right resistant variety, provided adequate control of coffee rust, the main threat to coffee trees. The use of fungicides by small farmers is not recommended nor needed when the proper IPM system is employed (personal comment of Cecilia Galvez, PROMACAFE phytopathologist). Experts disagree about this, though, and for non-resistant varieties chemical control may be necessary.

6.10 The Ability of the Government of Haiti and IICA/HCR to Monitor and Regulate the Distribution, Use, Storage, and Disposal of Pesticides

I. Government of Haiti (GOH)

There is no evident regulation or orderly control of coffee pests by any government or private agencies in Haiti. Also no government documentation on pesticide regulations could be found. There were some indications, however, that the GOH was about to issue pesticide regulations. In the absence of any regulations or enforcement, anyone can purchase and use pesticides according to their own judgment or in accordance with instructions from the manufacturers. Currently, what use of insecticides there is, does not meet either FAO or United States EPA regulations on toxicity, environmental pollution, storage, or disposal.

Pesticide regulation and control is the responsibility of the Ministry of Agriculture and, in theory, farmers should be able to get guidance and assistance from the agronomists on the Ministry staff. In practice, however, the staff is ill-equipped to deal with these extension activities due to lack of training and needed equipment such as vehicles for transportation.

A wide array of pesticides are sold in the country by private companies. Those recommended by the Ministry of Agriculture for coffee pests are: Azodrin 40 and 60, Malathion 57, Diazinon, Dipterex 80%, Chlordane, Furadan, Aldrin, Disyston, Thimet, Decis, Actellic, Captan, Dithane M-45, Lead Arsenate, Terrachlor W.P., Terrachlor G. 25%, Organo Mercury, Gerbam, Cupravit,

Bourdeaux mixture, Zinc phosphate, and Warfarin for rodent control. Many of these, however, are not permitted for use under HCR.

II. IICA/HCR

The problems HCR faces in assuring the proper use of pesticides are much greater than that for a project such as AOP. In AOP pesticide use is restricted to nurseries where storage, disposal, training, and use is centralized and can be relatively easily monitored. In contrast, if pesticides are required in HCR, they may have to be applied to outplanted trees on the holdings of the 7,200 farmers that are estimated to participate in the project.

If pesticides were made available for the participating farmers to apply themselves, it is unrealistic to expect any assurance that the chemicals would be used properly. An appreciation for the toxic effects of pesticides, and a motivation to transport, store, use, and dispose of properly, along with extensive training not just in pesticide use but IPM, are required. With few exceptions, Haitian farmers have no knowledge of the prevalent pests and no understanding of the use of pesticides. Also the cost of masks, gloves, sprayers, and other safety equipment is beyond the means of the project's target farmers.

Given these constraints, the project will create through local NGOs its own extension service to assure: (1) that the IPM system developed by the Project is fully employed to minimize the need for pesticides, and (2) that if pesticides are required they are used in an environmentally sound manner.

Given IICA's experience in Haiti working with local NGOs and small farmers in the Swine Repopulation Project, and IICA's principal role with PROMACAFE in developing for transfer to small farmers the technological package required by the new resistant coffee varieties (see Section 5: Institutional Analysis) -- IICA is well qualified for developing the extension network that will ensuring the safe and appropriate use of pesticides in HCR.

6.11 Conditions Under Which Pesticides are to be Used

Pesticides will only be used in the context of an IPM system. The application of pesticides would occur on the holdings of small farmers. If HCR develops nurseries for propagating seedlings of resistant coffee varieties pesticides may also be needed there.

232X

Working with local organizations, centers will be established where pesticides can be safely stored and disposed of. The project will also hire and train the most qualified individuals to be the local agents "formateurs" for the extension network that the project will develop. These individuals will be trained in IPM and the proper use of pesticides. These individuals will be key in transferring the IPM system to farmers, and they will apply pesticides to tree on farms or in nurseries, if pesticides are needed. A more detailed description of the training, extension network, and monitoring, to be developed by the project is provided in Section 6.14

If pesticides are required the following minimum mitigating steps will be taken by the project:

1. Only pesticides registered by the EPA for "general use" and approved in this EA (Table 6-1) will be used;

2. Manufacturers instructions for application will be followed, including the use of protective clothing (ie. gloves, boots, masks, long-sleeved shirts, long pants, goggles, hats, etc.) when called for;

3. All pesticides will be stored in locked storage depots, and according to manufacturers instructions. Pesticides will be stored in original containers, liquids will be stored away from solids, storage facilities will be away from water, food, and the living quarters of people, and no more than the amount needed in one growing season will be sent to a local storage depot;

4. Containers and excess pesticides will be disposed of properly. In particular containers will be destroyed so that they cannot be reused for other purposes, pesticides will be dispensed from the storage depot only in the amounts adequate to do a job so that misuse and improper disposal of excess is avoided;

5. Individuals responsible for transporting, storing, applying, and disposing of pesticides will be adequately trained. Training will include manuals, workshops, and in field exercises. Training will also include steps to be taken in the case of accidents;

6. Periodic spot checks will be made to see if pesticides are being handled properly. Corrective actions will be taken. With extreme infractions, persons responsible will be fired or local NGOs dropped from the project; and

7. For the mitigations, the project will develop a standardized protocol that will be followed at all project sites.

To help assure that the proper procedures will be developed and followed in the project, the estimated costs for training, monitoring, and securing storage depots will be made line items in the Project's budget.

6.12 Pesticide Use in the Context of Integrated Pest Management

Reliance on pesticides alone is expensive and rarely gives lasting control. Pests often become physiologically or behaviorally resistant to extensively used pesticides. Such resistant pest strains have serious consequences to both farmers and the general public.

Experience worldwide has shown that the best way to avoid pest resistance and to increase and sustain agricultural production is to employ a variety of control tactics, including biological (predator, parasite, and pathogenic natural enemies), genetic, physical, and only if necessary chemical. IPM is this multi-tactic, balanced approach.

This project will develop an IPM system adapted to the coffee pests, ecology, and farming practices in Haiti.

At a minimum the Project in developing an IPM system will focus on:

1. Determining the pests of coffee and their natural enemies in the zones of project intervention;

2. Field test coffee varieties and cultivation techniques that in combination provide the greatest resistance and productivity;

3. Maximize the use of mechanical and cultural controls to the extent that available labor allows to be cost effective;

4. Test effectiveness of different pesticides so they can be targeted and not over used;

5. Monitor pesticide resistance throughout the project;

6. Estimate through field tests the pest infestation threshold below which the use of pesticides is not economical;

7. Train personnel as extension agents to disseminate the IPM system to farmers; and

8. Devise a monitoring scheme to determine if IPM is being disseminated and employed properly.

To assure that adequate testing, and in particular training and follow-up monitoring takes place, the estimated costs of these activities will be made individual line items in the Project's budget.

Of great assistance in this effort will be the findings of PROMACAFE which for several years has been developing an IPM system for coffee pests, and in particular coffee rust, in Central America. Project managers will assure that the findings of PROMACAFE will be adapted to HCR when appropriate.

6.13 Pest and Diseases of Coffee in Haiti and their Recommend IPM Management

I. Diseases and Pests

Field observations and information obtained from two well-informed Haitian plant protection specialists, Mr. Jean Paul Samedy and Julio Barthelemy of MARNDR, identified a number of pests and diseases that affect coffee trees in the project's zones of intervention. These include:

Diseases:

- Rust
- Brown Eye Spot (Cercospora)
- Leaf Spot
- Leaf Rot
- Leaf Burn
- Pink Disease
- Root Rot
- Stem Rot
- Fumagina

Insects:

- Aphids
- Leaf Miner
- Mealy Bugs
- Scale Insects
- Cutworms
- Root insects
- Stem Borers

Nematodes

Rodents

Weeds

Following is a brief description and recommendations for control of the above listed diseases and pests. Fortunately only a few are often of economic importance. Pesticides without established EPA tolerances for coffee are recommended for use only on immature trees and trees without fruits

II. Control of Diseases

-- a. Coffee rust, Hemileia Vastatrix Berk. & Berk.

Coffee Rust is the most devastating coffee disease in the World. This disease was described in section 3.1.

Control -- The best control is the introduction of rust resistant coffee varieties, and proper management, including weeding and the proper applications of fertilizers, for young and vigorous plants are less susceptible. Rust thrives under low light intensities, a relative humidity between 80 and 100, and temperatures between 19° and 25° C Regulating shade and draining wet spots in the stands is, therefore, a rust control measure.

Improving overall cultural practices, reducing shade, weeding, and fertilizing should become standard practice for well kept typica and rust tolerant caturra or catuai stands, as well as for the rust resistant varieties when they are introduced. For typica and for the rust tolerant varieties chemical control of rust maybe necessary. The use of chemicals in marginal plantings of typica, however, does not warrant the effort and expense.

The immediate strategy in chemical control should focus on making the coffee stands accessible for passage through with a knapsack sprayer because sprays must be applied to the lower side of the leaves.

All stands should constantly be monitored for the presence of rust in the following manner. Divide every hectare of coffee into 8 imaginary lines of 100 meters each. Sample 3 leaves from the middle third and lower third of every tree at 10 meter intervals. A minimum of 480 leaves should be collected from which a percentage of infestation should be calculated.

Preventive sprays with copper compounds may be advisable at infestation rates of below 15 to 20%, depending on conditions such as the infestation of rust in areas close by. Above 15 to 20 % infestation, systemic fungicides may be used advantageously. Specific schedules for the application of fungicides have to be designed for the local ecological conditions.

-- b. Chasparria, Cercospora coffeicola Berk. & Cooke

This disease causes small brown spots, 5 to 12 mm in diameter on both sides of the leaves. In advanced stages the spots turn reddish brown, have a whiteish-grey center, and are surrounded with a yellow circle. The disease also attacks the fruits, reducing quality and yield.

Control -- Regulating shade, fertilizing, and weeding are the first control measures. If required, three applications of copper fungicide compounds, each a month apart at the beginning of the rainy season, should be applied.

-- c. American leaf spot, Mycena citricolor Berk. & Curt. Sacc.

This disease thrives in shady humid conditions and cause lesions on the leaves and fruits. The lesions are round and at first dark brown. Later they turn pale grey. The border of the lesions are well defined and are 3 to 6 mm in diameter. During the rainy season filaments emerge and can be seen with the naked eye. The disease cause abscission of leaves and fruits.

Control -- Control begins with reducing shade, draining wet areas, and fertilizing. Copper applications as described for the control of Chasparria are recommended.

-- d. Root Rot, Rosellinea bunodes Berk. & Br. Sacc.

This disease is found in many of Haiti's coffee areas. It kills the trees and therefore is of real concern. Trees three to four years old are most susceptible. The leaves wilt and a black crust and a substantial amount of mycelium builds up on the tree's base. Plants thus infected will die within a few weeks.

Control -- The diseased tree should be removed and burned. Do not plant in the same hole. Around the affected area, including several healthy trees, a ditch 30cm wide and 60cm deep must be dug and the bottom lined with a layer of lime.

-- e. Fumagina

This fungus grows on the honeydew secretions of Homoptera, in particular Coccus viridis, and Saissetia hemisphaerica.

Control -- Follow recommended control of Homoptera given below.

-- f. Other diseases and their control include: (1) Leaf Rot, Corticium koleroga v. Hoehnel, cut and burn infested stems and branches in place; (2) Phoma (leaf burn), Phyllosticta coffeicola Speg., apply fertilizer; (3) Pink Disease, Corticium salmonicolor, cut infested branches and pull out heavily infested trees, burning both in situ; do not plant coffee in same spot; (4) Stem Rot, Rhizoctonia solani Kuhn, pull out plant and burn in situ, do not plant coffee in same spot; if infection is in seed bed, rotate and do not plant in same area.

III Control of Insect Pests

Few pests present an economic threat to coffee production in Haiti. If insecticides are required, they should be specifically targeted and not overused, so as to protect natural enemies which are frequently the best controls.

-- a. Coffee leaf miner, Liucoptera coffeella Guer.

Usually the leaf minor is a more serious problem at elevations below 800 meters, but can be damaging up to 1300 meters. To the untrained eye it is difficult to see the adults unless there is a massive infestation. With a little training, however, they can be easily detected. The brown spots of irregular shape found on any part of the leaf are quite distinguishable from necrosis caused by fungi.

Control -- Increased shade reduces this pest's numbers. A random sample of 100 leaves should be collected, taking two leaves per tree, and checked for the presence of live larvae. With the presence of 40 to 50 larvae per 100 leaves, a chemical control is recommended. Below that level no insecticide should be applied. Apply Malathion 50% or Diazinon 60%, plus 0.1% of a spreader sticker, such as Trithon or Citowet. With heavy infestations the treatment should be repeated 30 days later.

238X

-- b. Homoptera: Scales Aphids, and Mealy Bugs

The maintenance of natural enemies is the best control for these pests. If pesticides are necessary the treatment is similar to that for leaf miners, but a mineral oil at not more than 2% should be added.

-- c. Other potential insect pests and their recommended control are: (1) Cut Worms, Agrotis spp. -- In seed beds pick up and kill by hand. (2) Stem Borers -- Cut infested branches and burn. (3) Root Insects-grubs, Phyllophaga spp. -- For seedbeds only, plow soil in the dry season and leave exposed for two weeks.

IV. Rodents, Weeds, and Nematodes

-- a. Rodents

Control -- Do not control until species identification is made, damage assessed and the population density has been established. No rodent treatments will be initiated by the project until that time due to the danger of affecting some of the endangered small mammal species such as Solendon paradoxus and others.

-- b. Weeds-- Grasses and broadleaf Plants

Control -- Weeds, which are mainly tropical broadleaf plants and grasses, do not constitute a serious problem for the project. Mechanical means such as cutting and uprooting are recommended for control. If herbicides are required, excellent ones with established tolerances are given in Table 6-1, and in Section 6.4 (III).

-- c. Nematodes (Genera Meloidogyne, Pratylenchus, and Xiphinema)

Control -- Only a problem in seed beds: rotate area.

V. Disease and Pest Control in Nurseries

A. Diseases - The project may establish nurseries for propagating rust resistant varieties for outplanting. To prevent disease infestation in the nursery, fungicide applications should be initiated immediately. Of particular importance is a leaf spot caused by Cercospora coffeicola Berk & Cooke, and Anthracnose, caused by Colletotrichum coffeanum

Noak. At the first signs of yellowing at the edges of the leaves and appearance of spots cause by Cercospora, the plants should not only be sprayed with a fungicide, but also with fertilizers. This disease is very closely related to malnutrition, and fungicide alone will not do the job.

At elevations above 1,000 meters, "Derrite", caused by Phyloosticta coffeicola, or Phoma costarricense (particularly where the young leaves have been damaged by wind or insects) may be a serious problem. "Derrite" should only be treated when warranted. Treatment may have to be repeated at three weekly intervals, and sometimes more frequently with alternate applications of copper, namcozeb and ferbam, or preferably with trimiltox forte, which is of extremely low toxicity and well tolerated by the young coffee. This product, in fact, stimulates the growth of coffee, possibly because of its high iron content. This is particularly useful in Haiti where most soils have a high pH, and iron deficiency. Difolatan (Captafol), effective against "Derrite" must not be used. It was voluntarily canceled because of oncogenetic effects.

B. Pests -- If the potting soil is carefully chosen, no major pests, nor the presence of nematodes are anticipated. At an early stage cut worms such as Feltia sp. or Agrostis sp. may cause problems and should be controlled. These larvae, however, can be destroyed by hand and no insecticide application is recommended. For other insects, particularly scales, Malathion 50% may be used at the rate of 0.23%, or 99 cc per gallon. Should nematodes become serious, a soil treatment with Furadan of not more than 10% may have to be used. This would at the same time help to control sucking insects such as scales.

C. Fertilization -- Coffee seedlings must be periodically fertilized throughout their development. Foliar fertilizing, which is the fertilization technique most used by Haitian farmers, is not sufficient. Soil applications must be made.

D. Weeds -- Handweeding is recommended for control. If necessary herbicides such as goal can facilitate weed control in nurseries.

240X

6.14 Project Organization and Training as they Relate to Pesticide use

The project will be directed from IICA/Haiti headquarters in Port au Prince. The Haiti IICA representative will have overall responsibility for the implementation of the project, but the senior technical member of the Project staff will serve as the Project Coordinator. Because IPM establishes the context defining sound pesticide use, the project coordinator should have extensive understanding and field experience with the latest IPM technology for coffee. This person should also have field experience implementing IPM programs and programs for the safe use of pesticides on small farms.

The project is also planning on hiring eight trained field extension officers, who will receive additional specialized training to address the project's pesticide-use concerns. Under the direction of the extension officers, an eventual network of up to 180 formateurs drawn from the local farm organizations will be trained to work directly with local organizations and individual farmers. Thus, the formateurs will be the interface between the project's own extension staff and the coffee farmers.

The formateurs will be selected from the local organizations and will be the most receptive and responsible individuals that the project can find. They will receive seminar and workshop training in which general project goals and purposes will be clarified. Specific task training will also be given. These will be coupled to field-level workshops in which all IPM techniques will be demonstrated, with appropriate testing done to determine what each formateur has learned. Periodically, refresher workshops and testing will be done to enhance the formateurs' performance.

The formateurs will also be expected to adopt the IPM package on their own plots, not only to be good examples for other farmers, but also as a means by which staff extension officers can monitor the formateurs' skills and practices.

Special attention in training will be placed on the proper and safe transportation, use, and disposal of pesticides, meeting all the criteria for pesticide use set forth in Section 6.11 of this EA. It will be the formateurs, not individual farmers, that will apply pesticides, if they are required.

IICA will arrange for the procurement, storage, and dispensing of pesticides and safety equipment so that the conditions set forth in Section 6.11 are met. This will include a monitoring scheme that will assure strict compliance.

7.0 Alternatives, Including the Proposed Action

Definition and comparison of project alternatives provides the basis for the Environmentla Assessment. We develop here two alternatives, the "No Action" alternative, which provides a benchmark against which to evaluate the proposed project, and Alternative II, the HCR project as proposed.

7.1 Alternative I -- No Action

If steps are not taken to counteract the spread of rust, it is predicted that coffee will be eliminated as a significant crop in Haiti. This has occurred in other countries. It is likely to occur in Haiti, because almost all of Haiti's coffee plants are typica, the most rust-susceptible coffee variety. With the elimination of coffee, farmers might shift to other perennial crops, such as fruit trees and cacao. There is evidence, though, that much of the land currently in coffee stands would be used for annual crops such as corn or beans, or for bananas. A shift to bananas and annual crops would result in the removal of shade trees now part of coffee cultivation. Shade tree removal can currently be observed in Haiti where this shift is taking place.

7.2 Alternative II -- The Haiti Coffee Revitalization Project

The PID, PP, and Section 2 of this EA describe this alternative, which is the preferred option. HCR proposes to introduce rust-resistant varieties of coffee to Haiti along with developing and spreading the technological package, including changes in cultivation, the use of fertilizers, and possibly the use of pesticides that are a part of improved coffee production. The differences in cultivation include weeding, reduction in shade, and closer spacing of coffee trees than is the case for typica. Also, typica is now grown in Haiti with little use of fertilizers or pesticides.

8.0 Environmental Consequences of Project Interventions

In this section the predicted environmental consequences of Alternative I and II are compared to evaluate the environmental soundness of the project. Topics considered include soil erosion, the use of fertilizers, deforestation, and impacts on biodiversity. The use of pesticides was addressed in Section 6.

8.1 Soil Erosion

Taking no action is predicted to increase soil erosion because of the elimination of the perennial coffee trees and the associated shade trees. The coffee and shade trees' leaves provide year around protection from rain directly hitting the soil. Their root systems also hold soil, increase the depth of surface water penetration, and the soil's water storage capacity, all of which reduce run-off and erosion. Annual crops overall are inferior to perennials in all of these soil conservation qualities. Both the short- and long-term predicted effects of Alternative I are increased soil erosion, contributing to the decline of long-term productivity of the environment.

By promoting a perennial crop, the HCR project is superior to "No Action" in conserving soil. The high population density in improved coffee production provides excellent soil protection. However, the reduced shade and increased weeding practiced with the new production techniques are factors that may increase soil erosion in contrast to current coffee cultivation practices in Haiti. To address this the project will introduce practices that promote soil conservation.

Trees which are too big and not appropriate as shade trees must be eliminated, not by cutting them down in one stroke, but through girdling. This will kill them slowly, thus avoiding unnecessary exposure of the soil. Also, on slopes retention walls, hedgerows, etc. can be effective in retaining soil. Most importantly, though, the HCR project should take full advantage of the substantial experience and methods developed in the AOP, LRD, and TWMP projects. These projects have been highly successful in developing and promoting soil and water conservation methods appropriate to Haitian Multi-crop farming systems. Many of these projects' methods could be successfully adapted to HCR.

If the proper techniques are employed, the HCR project will have a positive effect in helping to address the serious soil and water conservation crisis facing Haiti.

8.2 Fertilizers

No improved coffee production can be conceived without the use of fertilizer to maximize production and resistance to coffee rust. Alternative II will, therefore, increase the use of fertilizers. Nitrogen, phosphorus and potassium are the main chemical fertilizers to be used in the project. Excessive use of these fertilizers can result in their entering streams and rivers. The explosive growth of both freshwater and marine

plants can result, causing serious envionmental problems. If used properly, however, these fertilizers present little threat to the environment. The project will, therefore, make sure that the project's extension agents are trained in the proper use of fertilizers.

The use of organic fertilizers and soil conditioners can reduce the need for chemical fertilizers. The Haitian coffee farmer is conscious of the need but lacks training in the use of compost or other organic matter to help his crops. Coffee pulp or other organic waste material can be converted to compost and used to enrich the organic content of soils. Incorporation of organic matter into soil facilitates the interchange of nutrients. At the same time it will change the structure of the soil, aerate it, improve water retention, enhancing soil-conservation. Such biological fertilizer will not eliminate the need for chemical fertilizer, but it will reduce the quantities required while helping to restore the soil.

If the use of organic fertilizers and soil conditioners are encouraged by HCR, the project will have a positive effect on the long-term productivity of the environment.

8.3 Deforestation and Biodiversity

Haiti is extensively deforested, with less than 5% of the country remaining in forest. Deforestation, other forms of habitat destruction, and the introduction of exotic species are the principle threats to Haiti's biodiversity.

The HCR does not propose introducing exotic species, and the project will take place in already intensively disturbed and cultivated areas. Therefore, it is not predicted that the project will contribute to either deforestation, or the loss of biodiversity.

By maintaining some shade trees and reducing soil erosion, it is predicted that the project will have a relatively positive effect on forests and biodiversity, compared to the no-action alternative.

LIST of CONTACTS

John Wilson	USAID/Washington
Larry Harms	USAID/Haiti
Ronal Ruybal	USAID/Haiti
Marc-Eddy Martin	USAID/Haiti
Michelet Fontaine	USAID/Haiti
Will Roche	CCH
Reginald Murphy	CCH
James Talbot	Environmental Resources Management
John Jenkins	PADF
Pierre David Nicolas	Ecole Moyenne L'Agriculture de Dondon
Gullaume Saint Jean	Dondon Coffee Cooperative

ANNEX F

PROJECT EVOLUTION SINCE THE PID

Summary of Project Evolution Since the PID

Original PID Assumptions and Modifications

During the course of project design, the team determined that key assumptions in the 1987 Coffee Production and Marketing PID were sufficiently questionable to warrant a refocus of goal, purpose, and objectives from those originally identified in the PID. Many of these findings are the result of follow-up of issues raised in the Design Issues section of the PID. The issues fall under the following headings: Technical Issues, Institutional Issues, Beneficiary Issues, Marketing Issues.

The Project Paper was initially prepared by a team from Chemonics, Inc. in late 1988, with a shift away from the PID's emphasis on marketing and assistance to cooperatives, based on the recognition that the rust problem must be addressed directly through new technology and cultivation practices. The draft PP was substantially revised by the USAID/H ADO in the spring of 1989 after the fall in world coffee prices and finalized by the ADO with assistance from an contract design oficer and economist in the fall of 1989.

This annex serves to explain the design evolution between the PID and the final Project Paper and the reasons for the new directions taken in the PP towards improved coffee technology aimed at better yields and protection against rust disease.

A. Technical Issues

The threat of coffee leaf rust on the existing and potential coffee stands in the country is in fact more substantial than initially envisioned, and no totally rust resistant varieties are immediately available for widespread dissemination to farmers. An agronomically sound strategy which mitigates the problem of leaf rust is therefore required. This strategy must allow for coffee production activities to continue utilizing improved rust tolerant varieties combined with other technical improvements. This strategy will therefore optimize farmers' transition to technologies which will not only maintain but increase production in the presence of coffee rust.

The need carefully to phase in and target project activities was not sufficiently emphasized in the PID. This requirement arises from the lack of successful precedents in the transfer of coffee technologies in Haiti. It also arises from the incursion of coffee rust in northern Haiti which poses a serious threat to the most productive coffee areas.

Thus an on-farm adaptive testing program of rust resistant varieties is required in the project. Concurrent with this, an adaptive testing program of the <u>entire</u> technological package of inputs to be extended to

247X

farmers, with its several variants for different scales of operation, must proceed. Refinement of the technological package based on feedback from farmers acquiring the improved rust tolerant variety packages will be crucial. Only in this way will the preconditions for revitalization of the coffee sector be established.

B. Institutional Issues

The institutional capacity of CCH is insufficient to coordinate a demanding production activity on the large scale required to revitalize the coffee sector. The Inter-American Institute for Cooperation on Agricultural (IICA) is a much more appropriate institution to assume this effort. Not burdening CCH with the project coordination role will permit it to provide its members with the marketing services currently expected of it on a consistent basis.

The institutional weakness of most local and regional cooperatives, despite their having provided years of support in some cases to coffee production and marketing, precludes channeling production support only through them. The threat posed by coffee rust suggests that other appropriate groups of farmers, regardless of their label and scale of operation, should be targeted under this five year project. This policy is consistent with the USAID Agricultural Sector Assessment Recommendation not to overburden coffee cooperatives "by adding to their existing efforts in the short-term".

At this point, a pragmatic short-term approach, emphasizing technology transfer to selected farmers operating through appropriate local organizations in the project zones, must take precedence over a long-term institution building orientation. Participating organizations will be selected on the basis of their prior experience in coffee production, and on their ability to undertake the necessary investments in labor and input credit to assure that the technologies are properly adapted to local farming systems. These organizations will require support to develop the rudimentary management systems required to extend and properly transfer the technological package to farmers, and to assume the responsibility for collecting payments and repaying credit provided to finance the technology transfer. In opening up participation to organizations of any size of label, including the smallest pre-cooperatives and local PVOs, the targeting strategy is consistent with that of USAID's successful AGroforestry Outreach Project (AOP) and the swine Repopulation Project.

C. Beneficiary Issues

The assumption that the project could/should be targeted exclusively to cooperatives has been examined and revised. Only 25 percent of coffee farmers are served by cooperatives. Therefore, additional mechanisms must be developed to channel inputs and extension to target farmers. In addition to cooperatives, the following groups have been identified as effective means for the project to reach the maximum number of beneficiaries: (a) local grass roots organizations; (b) Haitian PVOs supporting local organizations; and (c) private sector groups such as the coffee exporter organization, ASDEC.

248

It is expected that farmers will choose to adopt the coffee package provided through the project on their owned and otherwise tenure-secured land, because they must be assured that the benefits of the new, more intensive coffee technology, which are not going to arrive in the short-term, must be assured to them in the long-term. Farmers who have more tenure-secured land tend to have more land holdings compared to the poorest Haitian peasants. For this reason, there is a concern that the project will benefit more those who are already better off. However, the technical package designed is considered adaptable for any category of farmer type and farm size. Furthermore, relative to farmers of Latin America and many African nations, those Haitian farmers who farm 2-5 hectares on a secure basis are still very much "small" farmers.
The role which risk plays in beneficiary farmers' decision-making processes vis à vis adoption of improved technologies was not emphasized in the PID. A technological package which appropriately addresses the role of risk in constraining technology transfer to project beneficiaries is a key aspect of this project. To ensure farmer participation, special emphasis is accorded in the PP to identification of "the optimum package", one that balances agronomic, economic, and natural resources factors, and that, from a socioeconomic standpoint, offers the potential to be transferred.

A second aspect of mitigating risk is to fine-tune this optimum package of inputs and cultural techniques for transfer onto beneficiaries' fields. Finetuning will involve a combination of (1) selecting the most promising rust resistant varieties based on station and field tests to replace the predominant Arabica Typica variety; and (b) monitoring the acceptance of the recommended technical package to determine modifications needed to facilitate technology transfer.

Monitoring beneficiary acceptance of the package will identify whether package design has in fact incorporated features which minimize beneficiaries' perceived risks of technology adoption, allowing for subsequent package modification if needed. Results from this process will serve as the foundation for launching the full-fledged revitalization program.

Males are culturally designed to be the operators and primary decision makers on Haitian farm units. For several reasons, however, the project should make special efforts to enlist women in project implementation. First, the technical package designed for the project requires labor inputs throughout the year. Men often migrate seasonally off the farm for additional income. During the periods when men are absent, women will be responsible for providing coffee production labor.

Second, women have traditionally performed many of the tasks which are essential to coffee production, such as planting, weeding and harvesting. The project implementation organizations should keep this in mind when setting up distribution, credit and extension activities. Third, neither men nor women have traditionally done many of the tasks which will be required for the new coffee technology package. For new tasks such as nursery work, maintenance tasks like pruning and fertilizing, and storage of inputs, the project should consider hiring and training women as well as men.

249X

In summary, the project should seek to match gender roles in the traditional situation with the ultimate recipients of extension services in order to assure that the project reaches its goal of increasing coffee production, and maintaining coffee as a key cash crop for local farmers and dependable source of foreign exchange earinging.

D. Marketing Issues

The assumption of unwillingness on the part of exporters to invest in the coffee sector is seen as questionable over the longer run. The ASDEC coffee exporters had declared their willingness to participate in financing revitalization activities in a geographically distinct zone, given a reasonable market price and provided the project offers sufficient technical expertise and inputs to warrant their investment. Although current prices are insufficient to attract their interest and ASDEC is not formally involved in the project as finally presented, it should not be assumed that exporters will remain unwilling to reinvest into the coffee sector, that their attitude could change at such time as the market price is deemed to be reasonable.

The PID assumption that Haiti's coffee marketing inefficiencies can be effectively redressed through a sustained institution-building effort directed through cooperatives and aimed at stimulating production and exports, has been determined to be invalid. Until the steep fall in the world market price of coffee in the summer of 1989 following the abandonment of the International Coffee Agreement, favorable market prices were available to both cooperative and other private sector farmers from speculators and exporters. A return to a level at least 70% of the 1988 price during the project is one of the assumptions in the PP's economic analysis. This would restore marketing competition to the coffee sector. Current marketing issues related to exports concern questions of quality and quality control as much as price competition. Revitalizing production in the coffee sector through a production orientation characterized by improved technologies, must now receive priority, as opposed to institution-building or marketing, per se, if farmer incomes are to increase and foreign exchange earnings through coffee exports maintained.

ANNEX G

STATUTORY CHECKLISTS

5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable to: (A) FAA funds generally; (B)(1) Development Assistance funds only; or (B)(2) the Economic Support Fund only.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FY 1989 Appropriations Act Sec. 578(b). Has the President certified to the Congress that the government of the recipient country is failing to take adequate measures to prevent narcotic drugs or other controlled substances which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States Government personnel or their dependents or from entering the United States unlawfully? NO

2. FAA Sec. 481(h); FY 1989 Appropriations Act Sec. 578; 1988 Drug Act Secs. 4405-07. (These provisions apply to assistance of any kind provided by grant, sale, loan, lease, credit, guaranty, or insurance, except assistance from the Child Survival Fund or relating to international narcotics control, disaster and refugee relief, narcotics education and awareness, or the provision of food or medicine.) If the recipient is a "major illicit drug producing country" (defined as a country producing during a fiscal year at least five metric tons of opium or 500 metric tons of coca or marijuana) or a "major drug-transit country" (defined as a country that is a significant direct source of illicit drugs significantly affecting the United States, through which such drugs are transported, or through which significant sums of drug-related profits are

Recipient is not defined as either a ''major illicit drug producing'' or a ''major drug-transit country''

laundered with the knowledge or complicity of the government): (a) Does the country have in place a bilateral narcotics agreement with the United States, or a multilateral narcotics agreement? and (b) Has the President in the March 1 International Narcotics Control Strategy Report (INSCR) determined and certified to the Congress (without Congressional enactment, within 45 days of continuous session, of a resolution disapproving such a certification), or has the President determined and certified to the Congress on any other date (with enactment by Congress of a resolution approving such certification), that (1) during the previous year the country has cooperated fully with the United States or taken adequate steps on its own to satisfy the goals agreed to in a bilateral narcotics agreement with the United States or in a multilateral agreement, to prevent illicit drugs produced or processed in or transported through such country from being transported into the United States, to prevent and punish drug profit laundering in the country, and to prevent and punish bribery and other forms of public corruption which facilitate production or shipment of illicit drugs or discourage prosecution of such acts, or that (2) the vital national interests of the United States require the provision of such assistance?

3. 1986 Drug Act Sec. 2013; 1988 Drug Act Sec. 4404. (This section applies to the same categories of assistance subject to the restrictions in FAA Sec. 481(h), above.) If recipient country is a "major illicit drug producing country" or "major drug-transit country" (as defined for the purpose of FAA Sec 481(h)), has the President submitted a report to Congress listing such country as one (a) which, as a matter of government policy, encourages or facilitates the production or distribution of illicit drugs; (b) in which any senior official of the N/A

government engages in, encourages, or facilitates the production or distribution of illegal drugs; (c) in which any member of a U.S. Government agency has suffered or been threatened with violence inflicted by or with the complicity of any government officer; or (d) which fails to provide reasonable cooperation to lawful activities of U.S. drug enforcement agents, unless the President has provided the required certification to Congress pertaining to U.S. national interests and the drug control and criminal prosecution efforts of that country?

4. FAA Sec. 620(c). If assistance is to a government, is the government indebted to any U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies, (b) the debt is not denied or contested by such government, or (c) the indebtedness arises under an unconditional guaranty of payment given by such government or controlled entity? N/A

5. FAA Sec. 620(e)(1). If assistance is to a government, has it (including any government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? N/A

6. FAA Secs. 620(a), 620(f), 620D; FY 1989 Appropriations Act Secs. 512, 550, 592. Is recipient country a Communist country? If so, has the President determined that assistance to the country is vital to the security of the United States, that the recipient country is not controlled by the international Communist conspiracy, and that such assistance will further promote the independence of the recipient country from international communism? Will assistance be provided NO

254X

either directly or indirectly to Angola, Cambodia, Cuba, Iraq, Libya, Vietnam, South Yemen, Iran or Syria? Will assistance be provided to Afghanistan without a certification, or will assistance be provided inside Afghanistan through the Soviet-controlled government of Afghanistan?

7. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, damage or destruction by mob action of U.S. property? NO

8. FAA Sec. 620(l). Has the country failed to enter into an investment guaranty agreement with OPIC? NO

9. FAA Sec. 620(o); Fishermen's Protective Act of 1967 (as amended) Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing vessel because of fishing activities in international waters? NO
(b) If so, has any deduction required by the Fishermen's Protective Act been made? N/A

10. FAA Sec. 620(q); FY 1989 Appropriations Act Sec. 518. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any loan to the country under the FAA? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the FY 1989 Appropriations Act appropriates funds? NO

11. FAA Sec. 620(s). If contemplated assistance is development loan or to come from Economic Support Fund, has the Administrator taken into account the percentage of the country's budget and amount of the country's foreign exchange or other resources spent on military equipment? (Reference may be made to the annual "Taking Into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of N/A

Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

12. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have relations been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? NO

13. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget? (Reference may be made to the "Taking into Consideration" memo.) Haiti is not in arrears

14. FAA Sec. 620A. Has the President determined that the recipient country grants sanctuary from prosecution to any individual or group which has committed an act of international terrorism or otherwise supports international terrorism? NO

15. FY 1989 Appropriations Act Sec. 568. Has the country been placed on the list provided for in Section 6(j) of the Export Administration Act of 1979 (currently Libya, Iran, South Yemen, Syria, Cuba, or North Korea)? NO

16. ISDCA of 1985 Sec. 552(b). Has the Secretary of State determined that the country is a high terrorist threat country after the Secretary of Transportation has determined, pursuant to section 1115(e)(2) of the Federal Aviation Act of 1958, that an airport in the country does not maintain and administer effective security measures? NO

256X

17. FAA Sec. 666(b). Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA? NO

18. FAA Secs. 669, 670. Has the country, after August 3, 1977, delivered to any other country or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards, and without special certification by the President? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.) NO

19. FAA Sec. 670. If the country is a non-nuclear weapon state, has it, on or after August 8, 1985, exported (or attempted to export) illegally from the United States any material, equipment, or technology which would contribute significantly to the ability of a country to manufacture a nuclear explosive device? NO

20. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. on Sept. 25 and 28, 1981, and did it fail to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the "Taking into Consideration" memo.) N/A

21. FY 1989 Appropriations Act Sec. 527. Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States? NO

22. FY 1989 Appropriations Act Sec. 513. Has the duly elected Head of Government of the country been deposed by military coup or decree? If assistance has been terminated, has the President notified Congress that a democratically elected government has taken office prior to the resumption of assistance?

Current Head of Government was not duly elected

23. FY 1989 Appropriations Act Sec. 540. Does the recipient country fully cooperate with the international refugee assistance organizations, the United States, and other governments in facilitating lasting solutions to refugee situations, including resettlement without respect to race, sex, religion, or national origin?

YES

258X

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria

FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? NO

FY 1989 Appropriations Act Sec. 536. Has the President certified that use of DA funds by this country would violate any of the prohibitions against use of funds to pay for the performance of abortions as a method of family planning, to motivate or coerce any person to practice abortions, to pay for the performance of involuntary sterilization as a method of family planning, to coerce or provide any financial incentive to any person to undergo sterilizations, to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning? NO

2. Economic Support Fund Country Criteria

FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the President found that the country made such significant improvement in its human rights record that furnishing such assistance is in the U.S. national interest? N/A

FY 1989 Appropriations Act Sec. 578(d). Has this country met its drug eradication targets or otherwise taken significant steps to halt illicit drug production or trafficking? N/A

5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A includes criteria applicable to all projects. Part B applies to projects funded from specific sources only: B(1) applies to all projects funded with Development Assistance; B(2) applies to projects funded with Development Assistance loans; and B(3) applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 1989 Appropriations Act Sec. 523; FAA Sec. 634A. If money is sought to obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified to Congress, has Congress been properly notified? YES

2. FAA Sec. 611(a)(1). Prior to an obligation in excess of $500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? YES

3. FAA Sec. 611(a)(2). If legislative action is required within recipient country, what is the basis for a reasonable expectation that such action will be completed in time to permit orderly accomplishment of the purpose of the assistance? N/A

4. FAA Sec. 611(b); FY 1989 Appropriations Act Sec. 501. If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for guidelines.)	N/A
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and total U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively?	N/A
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.	NO
7. FAA Sec. 601(a). Information and conclusions on whether projects will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	(a), (b) & (d): N (c) Cooperatives, credit unions, S&L are not targeted under the project (e) Agriculture i served through the introduction of coffee technology and modern cultivation practices.
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	NA

9. FAA Secs. 612(b), 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

PL 480 Title II local currency wil finance a portion of project costs. Implementing NGOs will make in-kind contributions.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

NO

11. FY 1989 Appropriations Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?

NO

12. FY 1989 Appropriations Act Sec. 549. Will the assistance (except for programs in Caribbean Basin Initiative countries under U.S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel?

NO

13. FAA Sec. 119(g)(4)-(6) & (10). Will the assistance (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other

(a) YES
(b) YES

262X

wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection; or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas?

(c) NO

(d) NO

14. FAA Sec. 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (either dollars or local currency generated therefrom)?

N/A

15. FY 1989 Appropriations Act. If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government?

YES

16. FY 1989 Appropriations Act Sec. 538. If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I.D., and is the PVO registered with A.I.D.?

YES

17. FY 1989 Appropriations Act Sec. 514. If funds are being obligated under an appropriation account to which they were not appropriated, has prior approval of the Appropriations Committees of Congress been obtained?

N/A

18. State Authorization Sec. 139 (as interpreted by conference report). Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A.I.D. LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision).

N/A

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FY 1989 Appropriations Act Sec. 548 (as interpreted by conference report for original enactment). If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities (a) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U.S. exporters of a similar agricultural commodity; or (b) in support of research that is intended primarily to benefit U.S. producers?

NO

NO

b. FAA Secs. 102(b), 111, 113, 281(a). Describe extent to which activity will (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life, and otherwise encourage democratic private and local governmental

Project emphasizes labor-intensive production methods and use of appropriate technology in rural areas. TA and Training in coffee technology and cultivation practices, along with provision of inputs will help increase coffee production and farmer income in poor areas of South Haiti. Women will benefit on a equal basis as men. Project is being implemented through a public international organization and local NGOs. Cooperatives are not specifically targeted, and regional co-operation is not an objective.

264X

institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries.

c.	FAA Secs. 103, 103A, 104, 105, 106, 120-21; FY 1989 Appropriations Act (Development Fund for Africa). Does the project fit the criteria for the source of funds (functional account) being used?	YES
d.	FAA Sec. 107. Is emphasis placed on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small busiresses, and small incomes of the poor)?	YES
e.	FAA Secs. 110, 124( ). Will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?	Haiti is an RLDC and this is not a bilatera project with. the GOH.
f.	FAA Sec. 128(b). If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority?	YES

g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

This is a grassroots project helping small farmers help themselves. It includes practical training in coffee technology and cultivation practices.

h. FY 1989 Appropriations Act Sec. 536. Are any of the funds to be used for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions?

NO

Are any of the funds to be used to pay for the performance of involuntary sterilization as a method of family planning or to coerce or provide any financial incentive to any person to undergo sterilizations?

NO

Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning?

NO

i. FY 1989 Appropriations Act. Is the assistance being made available to any organization or program which has been determined to support or participate in the management of a program of coercive abortion or involuntary sterilization?

NO

If assistance is from the population functional account, are any of the funds to be made available to voluntary family planning projects which do not offer, either directly or through referral to or information about access to, a broad range of family planning methods and services?

N/A

266X

FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	YES
FY 1989 Appropriations Act. What portion of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, colleges and universities having a student body in which more than 40 percent of the students are Hispanic Americans, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)?	NONE. Project wil be implemented by the Inter-American Institute for Cooperation in Agriculture (IICA), a public international organization.
FAA Sec. 118(c). Does the assistance comply with the environmental procedures set forth in A.I.D. Regulation 16? Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent feasible: (a) stress the importance of conserving and sustainably managing forest resources; (b) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas; (c) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (d) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices; (e) help conserve forests which have not yet been degraded by helping to increase	Yes. Proper coffee cultivation practices are the essence of this project. a) YES b) YES c) YES d) YES e) YES

production on lands already cleared or degraded; (f) conserve forested watersheds and rehabilitate those which have been deforested; (g) support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (h) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation; (i) conserve biological diversity in forest areas by supporting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation, and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas; (j) seek to increase the awareness of U.S. government agencies and other donors of the immediate and long-term value of tropical forests; and (k)/utilize the resources and abilities of all relevant U.S. government agencies?

f) YES

g) YES

h) YES

i) YES

k) YES

m. FAA Sec. 118(c)(13). If the assistance will support a program or project significantly affecting tropical forests (including projects involving the planting of exotic plant species), will the program or project (a) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land, and (b)/take full account of the environmental impacts of the proposed activities on biological diversity?

N/A

268X

n. FAA Sec. 118(c)(14). Will assistance be used for (a) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; or (b) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas?

a) NO

b) NO

o. FAA Sec. 118(c)(15). Will assistance be used for (a) activities which would result in the conversion of forest lands to the rearing of livestock; (b) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undegraded forest lands; (c) the colonization of forest lands; or (d) the construction of dams or other water control structures which flood relatively undegraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development?

a) NO

b) NO

c) NO

d) NO

p. FY 1989 Appropriations Act. If assistance will come from the Sub-Saharan Africa DA account, is it (a) to be used to help the poor majority in Sub-Saharan Africa through a process of long-term development and economic growth that is equitable, participatory, environmentally sustainable, and self-reliant; (b) being provided in accordance with the policies contained in section 102 of the FAA;

N/A

(c) being provided, when conistent with the objectives of such assistance, through African, United States and other PVOs that have demonstrated effectiveness in the promotion of local grassroots activities on behalf of long-term development in Sub-Saharan Africa; (d) being used to help overcome shorter-term constraints to long-term development, to promote reform of sectoral economic policies, to support the critical sector priorities of agricultural production and natural resources, health, voluntary family planning services, education, and income generating opportunities, to bring about appropriate sectoral restructuring of the Sub-Saharan African economies, to support reform in public administration and finances and to establish a favorable environment for individual enterprise and self-sustaining development, and to take into account, in assisted policy reforms, the need to protect vulnerable groups; (e) being used to increase agricultural production in ways that protect and restore the natural resource base, especially food production, to maintain and improve basic transportation and communication networks, to maintain and restore the renewable natural resource base in ways that increase agricultural production, to improve health conditions with special emphasis on meeting the health needs of mothers and children, including the establishment of self-sustaining primary health care systems that give priority to preventive care, to provide increased access to voluntary family planning services, to improve basic literacy and mathematics especially to those outside the formal educational system and to improve primary education, and to develop income-generating opportunities for the unemployed and underemployed in urban and rural areas?

270X

q. FY 1989 Appropriations Act Sec. 515. If deob/reob authority is sought to be exercised in the provision of DA assistance, are the funds being obligated for the same general purpose, and for countries within the same general region as originally obligated, and have the Appropriations Committees of both Houses of Congress been properly notified? N/A

2. Development Assistance Project Criteria (Loans Only)

a. F[illegible] Sec. 122(b). Information and c[illegible]clusion on capacity of the country t[illegible] repay the loan at a reasonable rate of interest. N/A

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20 percent of the enterprise's annual production during the life of the loan, or has the requirement to enter into such an agreement been waived by the President because of a national security interest? N/A

c. FAA Sec. 122(b). Does the activity give reasonable promise of assisting long-range plans and programs designed to develop economic resources and increase productive capacities? N/A

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA?	N/A
b. FAA Sec. 531(e). Will this assistance be used for military or paramilitary purposes?	N/A
c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?	N/A

272 X

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. PROCUREMENT

1. FAA Sec. 602(a). Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed? — YES

2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or determined under delegation from him? — YES

3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? — YES

4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If non-U.S. procurement of agricultural commodity or product thereof is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U.S.) — N/A

5. FAA Sec. 604(g). Will construction or engineering services be procured from firms of advanced developing countries which are otherwise eligible under Code 941 and which have attained a competitive capability in international markets in one of these areas? (Exception for those countries which receive direct economic assistance under the FAA and permit United States firms to compete for construction or engineering services financed from assistance programs of these countries.) — NO

6. FAA Sec. 603. Is the shipping excluded from compliance with the requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent such vessels are available at fair and reasonable rates? — NO

7. FAA Sec. 621(a). If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? Will the facilities and resources of other Federal agencies be utilized, when they are particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs? — Technical assistance will be provided principally by ITCA, a public internation organization under a Grant Agreement.

8. International Air Transportation Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? — YES

9. FY 1989 Appropriations Act Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? — YES

10. FY 1989 Appropriations Act Sec. 524. If assistance is for consulting service through procurement contract pursuant to 5 U.S.C. 3109, are contract expenditures a matter of public record and available for public inspection (unless otherwise provided by law or Executive order)? YES

B. CONSTRUCTION

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used? N/A

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? N/A

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the CP), or does assistance have the express approval of Congress? N/A

C. OTHER RESTRICTIONS

1. FAA Sec. 122(b). If development loan repayable in dollars, is interest rate at least 2 percent per annum during a grace period which is not to exceed ten years, and at least 3 percent per annum thereafter? N/A

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? N/A

3. FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? YES

4. Will arrangements preclude use of financing:

   a. FAA Sec. 104(f); FY 1989 Appropriations Act Secs. 525, 536. (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilizations as a means of family planning; or (4) to lobby for abortion? N/A

   b. FAA Sec. 483. To make reimbursements, in the form of cash payments, to persons whose illicit drug crops are eradicated? YES

   c. FAA Sec. 620(g). To compensate owners for expropriated or nationalized property, except to compensate foreign nationals in accordance with a land reform program certified by the President? YES

   d. FAA Sec. 660. To provide training, advice, or any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? YES

   e. FAA Sec. 662. For CIA activities? YES

276X

f. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained? YES

g. FY 1989 Appropriations Act Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for prior or current military personnel? YES

h. FY 1989 Appropriations Act Sec. 505. To pay U.N. assessments, arrearages or dues? YES

i. FY 1989 Appropriations Act Sec. 506. To carry out provisions of FAA section 209(d) (transfer of FAA funds to multilateral organizations for lending)? YES

j. FY 1989 Appropriations Act Sec. 510. To finance the export of nuclear equipment, fuel, or technology? YES

k. FY 1989 Appropriations Act Sec. 511. For the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? YES

l. FY 1989 Appropriations Act Sec. 516; State Authorization Sec. 109. To be used for publicity or propaganda purposes designed to support or defeat legislation pending before Congress, to influence in any way the outcome of a political election in the United States, or for any publicity or propaganda purposes not authorized by Congress? YES

5. FY 1989 Appropriations Act Sec. 584. Will any A.I.D. contract and solicitation, and subcontract entered into under such contract, include a clause requiring that U.S. marine insurance companies have a fair opportunity to bid for marine insurance when such insurance is necessary or appropriate? YES