PWOJÈ PLANTE KAFE

Coffee Based Cropping Systems Project

VOLUME 3: BASELINE STUDY

Redesigned Proposal Submitted to USAID

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INTER-AMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE

OFFICE IN HAITI

COFFEE REVITALIZATION PROJECT

(PWOJE PLANTE KAFE)

Report on Information Collected in Baseline Studies

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1. Introduction

In March 1990 USAID Haiti approved a five-year grant to the Inter-American Institute for Cooperation on Agriculture (IICA) for the Coffee Revitalization Project, called in Haitian Creole "Pwoje Plante Kafe" (PPK). The goal of this project is to increase coffee productivity and farmer income among coffee producers in Haiti. The project purpose is to upgrade the quality of coffee cultivation in Haiti by improving production technology and farming practices, thereby increasing the yield and consistency of the coffee product and reducing the ill effects of coffee rust. For a full description of this project and information on implementation activities, the reader is referred to the USAID Project Paper, and the letter from USAID to IICA authorizing the grant dated March 1, 1990.

In the first year of the project initial baseline studies were carried out in order to collect information on the pre-project circumstances, practices, and perceived needs of coffee growers in the project pilot zones. The following report includes a presentation of significant findings and analyses of key data obtained in the studies, as well as descriptions of study procedures and the geographic areas surveyed. Information presented in this report not only is expected to serve as a data base for measuring project impact, but is also useful to project staff in developing technology packages to improve the farming systems of Haitian coffee growers.

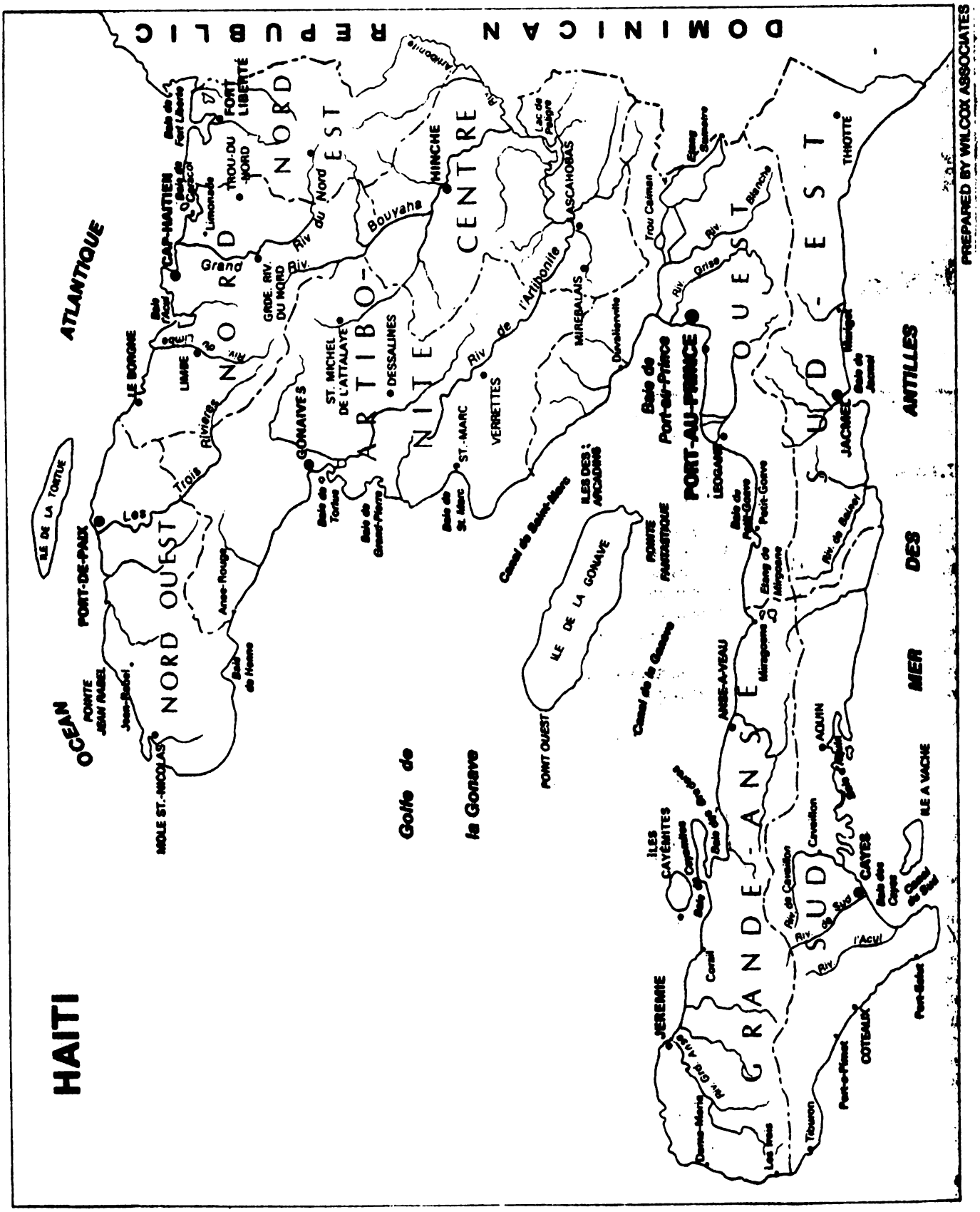
2. Geo-political Identification of Project Zones

Two regions of Haiti were selected, during the project design process, as pilot zones for intensive activity of the PPK. One is in the Department of the South-east, the other in the Department of the Grand-Anse. Figure 1, a map of the entire country, shows the location of these departments.

In the South-east, the PPK zone includes a number of localities (rural villages) in the mountains above the coastal towns of Jacmel, Cayes-Jacmel, and Marigot. Each of these towns is the center of government for the communes that bear their names. Jacmel is also the seat of government for the Southeast Department. Each commune is divided into "sections communales". A commune may have only one section, or as many as 12.

Eight sections communales in three communes have been selected for PPK activities in the South-east; two in the Marigot Commune, and two in the Cayes-Jacmel Commune, and four in the Jacmel Commune. Figure 2, a map of the Southeast Department, shows locations of current and planned PPK activities there.

In the Department of the Grand-Anse, project activities center around the Commune of Beaumont, high in the mountains in the center of Haiti's southern peninsula, near the road that links Les Cayes and Jeremie. The Beaumont Commune consists of only one section. However, project activities extend into the neighboring communes of Pestel and Corail. (See Figure 3.)

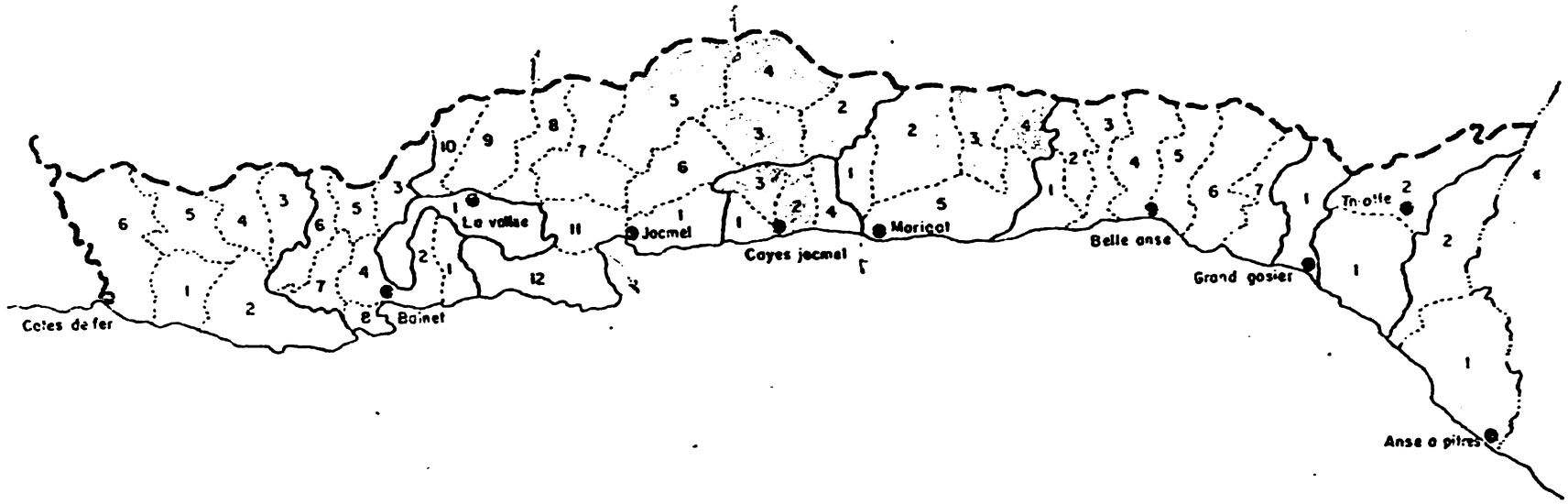


Source: HAITI Country Environmental Profile, USAID, 1986.

IDENTIFICATION DES SECTIONS RURALES *

DEPARTEMENT DU SUD-EST

SOURCE : DPESAT / CPNAP



COMMUNE DE JACMEL
1 bas cap rouge
2 fond mellon (selle)
3 cochon gros
4 la gosseline
5 marbiol
6 montagne la voute
7 grande riviere de jacmel
8 bas coq chante
9 haut coq chante
10 morne a bruler
11 levaneau
12 la montagne

COMMUNE DE MARIGOT
1 coreil soult
2 grande riviere fesle
3 macory
4 fond jean noel
5 savanne dubois

COMMUNE DE CAYES JACMEL
1 ravine normande
2 gaillard
3 haut cap rouge
4 fond mellon (michenech)

COMMUNE DE LA VALLEE
1 la vallee

COMMUNE DE BAINET
1 bresilienne
2 trou mahaut
3 haut grandou
4 bas grandou
5 bas de la croix
6 bras gauche
7 orangers
8 bas des gris gris

COMMUNE DES COTES DE FER
1 Gris_Gris
2 La Biche
3 Bras Gauche
4 Amazones
5 Boucon Bellier
6 Jamais_vu

COMMUNE DE BELLE ANSE
1 Baie d'Orange
2 Marbriol
3 Columette
4 Coreil Lamothe
5 Bel_air
6 Pichon
7 Mapou

COMMUNE DE GRD. GOSIER
1 Colline des chenes ou Bodoris

COMMUNE DE THIOTTE
1 Pot de chambre
2 Thiotte

COMMUNE DE ANSE A PITRE
1 Boucan Guillaume
2 Bois d'orme

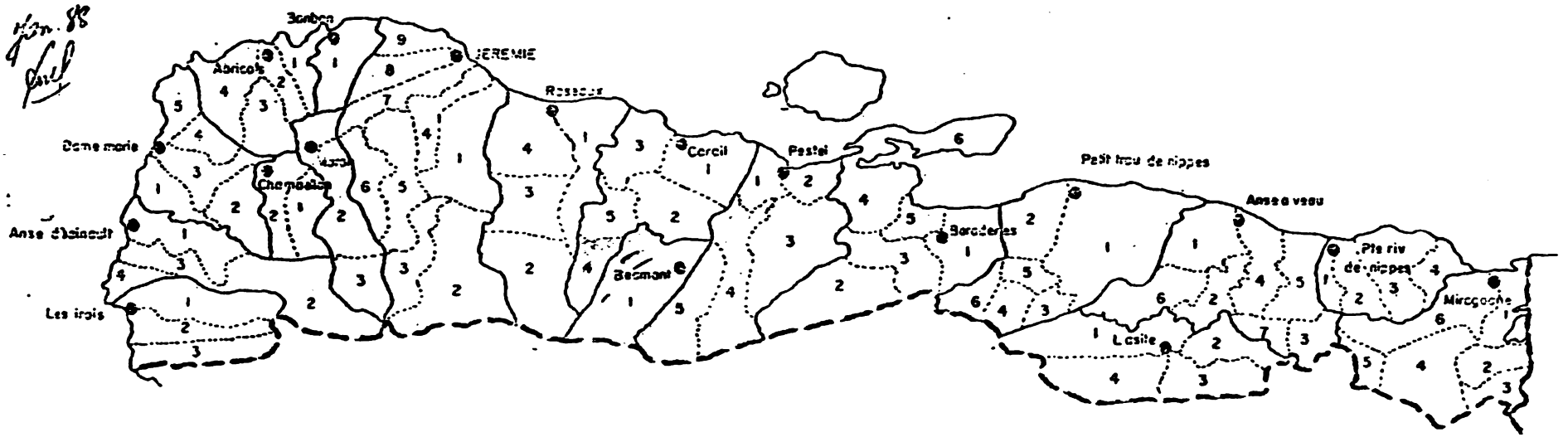
Figure 2.

* The term "Section Rurale" was changed to "Section Communale" since this map was published.

IDENTIFICATION DES SECTIONS RURALES *

DEPARTEMENT DE LA GRANDE ANSE

SOURCE : DATPE / MP



COMMUNE DE JEREMIE
1 basse voldrogue
2 haute voldrogue
3 haute guincudee
4 basse guincudee
5 revine a charles
6 iles blanches
7 morfrane (gde riviere)
8 fond rouge dehers
9 fond rouge de terback

COMMUNE DES ABRICOTS
1 anse du clerc
2 bellisiers
3 danglise
4 la saringue

COMMUNE DE BONBON
1 descmeau (bonbon)

COMMUNE DE MORON
1 cacla
2 sources chaudes
3 fossive

COMMUNE DE CHAMBELLAN
1 dejean
2 boucan

COMMUNE D'ANSE D'HAINAINAULT
1 grandolt
2 boudon
3 ilet a pierre joseph
4 mandou

COMMUNE DE DAME MARIE
1 bordelais
2 dolier
3 descmeau
4 boliverne
5 petite riviere

COMMUNE DES IROS
1 matador (lorque)
2 belair
3 carcasse

COMMUNE DE CORAIL
1 duquion
2 fond d'acque
3 compy ou non campeche
4 mouline
5 chardinnette

COMMUNE DES ROSEAUX
1 carrefour charles jacquim
2 fond cochon ou lapineau
3 grand vincent
4 les gommiers

COMMUNE DE BEAUMONT
1 beaumont

COMMUNE DE PESTEL
1 bernoçousse
2 espere
3 jean bellune (les cayemites)
4 tizio
5 duchity

COMMUNE DE MIRAGOANE
1 chalow
2 belle riviere (grande riv.)
3 dessources
4 pemelie
5 fonds des negres
6 poilcat

COMMUNE DE PTE RIV DE NIPPES
1 fonds des lianes
2 chalette
3 silleigue
4 bain

COMMUNE DE ANSE A VEAU
1 baccanois
2 berthe ou basquet
3 cocoyers duchenes
4 grande riviere
5 sud de baril
6 arnaud
7 bouzi

COMMUNE DES BARADERES
1 gerin ou mathon
2 tête d'eau
3 fond tortue
4 la plaine
5 rivière salée
6 grand boucan

COMMUNE DE PETIT TROU DE NIP.
1 raymond
2 liby
3 lieve
4 vassal
5 anse aux pins
6 poisence

COMMUNE DE L'ASILE
1 tournade
2 morisseau
3 paul
4 changeux

Figure 3.

+ The term "Section Rurale" was changed to "Section Communale" since this map was published.

Table 2.1. lists the PPK sections communales for both zones by number and name, and includes population figures (as per the 1981 census). Populations shown are not intended to represent the numbers targetted for PPK activities. In some sections, certain portions may not be included because they are not coffee growing areas, or for other reasons.

Table 2.1. PPK Zones: Communes, Communal Sections and Population

Commune	Communal Section	Population *
	Project Zone: Jacmel	
Cayes-Jacmel	2nd - Gaillard	8,394
	3rd - Haut Cap Rouge	7,716
Marigot	3rd - Macary	9,133
	4th - Fond Jn.Noel	9,072
Jacmel	2nd - Fond Melon	9,448
	3rd - Cochon Gras	7,496
	4th - La Gosseline	7,026
	5th - Marbial	3,678
	Project Zone: Beaumont	
Beaumont	1st - Beaumont	10,834
Pestel	3rd - Jean Bellevue	8,321
	4th - Tozia	8,143
	5th - Duchity	7,871
Corail	4th - Mouline	3,461

* Source: Résultats Préliminaires du Recensement Général, Institut Haitien de Statistique et d'Informatique, Sept. 1982

3. Baseline Studies - Localities and Methodology

Two types of base line studies were carried out - 1) at the community level with groups of farmers from one locality (or several small neighboring localities), and 2) at the individual farmer level. Table 3.1 shows the localities visited for each type of study, and, for farm level surveys, the number of individuals in each locality interviewed.

Thirteen community level studies were carried out in the Jacmel Zone, and 12 in the Beaumont Zone. Group meetings were led by PPK Regional Officers who had recently been assigned to each zone. Questions used in this study were designed to obtain an overview of infrastructure and services available in the area and economic information on coffee prices and local labor costs, and to elicit from participants the priority needs of the community as they perceived them. These group meetings also enabled project staff to obtain some preliminary agronomic information on altitude, soil type, major crops, and degree of erosion in each area.

A total of 197 interviews were carried out at the farm level. Individuals interviewed were chosen randomly and most were residents of the same communities where the group meetings were held. The interviewers for farm level surveys were PPK staff members from the region who are farmers themselves. They were selected for their leadership capabilities and ability to read and write. These individuals continue working with the project on a part-time basis as trainers and overseers for farmer groups in their neighborhoods. Their assignments as interviewers for

Table 3.1. Localities included in PPK base line studies

Commune/Section		Locality	Community Study	Farmer Surveys (No.)
		Project Zone: Jacmel		
Cayes-Jacmel (3rd)				
Haut Cap Rouge	1.	Desmarades	X	7
	2.	Jeanty	X	8
	3.	St. Rock	X	5
	4.	Kanyette	X	5
	5.	Vergeon	X	1
Marigot (3rd)				
Macary	6.	Moulin Goyave	X	11
	7.	Bertrand	X	8
	8.	Turette	X	7
Marigot (4th)				
Fond Jn. Noel	9.	Mahot	X	10
	10.	Platon Chapelle	X	11
	11.	Coterelle	X	12
	12.	Lolery	X	10
	13.	Terre Noir	-	1
	14.	*Grand Fond	X	-
		Totals	13	96
		Project Zone: Beaumont		
Beaumont (1st)				
Beaumont	1.	Sanette	X	9
	2.	Lacadony	X	7
	3.	Des Barrieres	X	9
	4.	Ferrace	X	7
	5.	Delincourt	X	9
	6.	*Thardieu	X	9
	7.	*Chivri	X	8
	8.	*Amiel	X	8
	9.	*Grand Bois	X	7
Pestel (4th)				
Tozia	10.	Tozia	X	10
Corail (4th)				
Mouline	11.	Belance	X	8
Roseau (2nd)				
Fond Cochon	12.	*Cartineau	X	10
		Totals	12	101

* Localities not now included in PPK activities

the baseline study were their first as part of the project. While there were a few complex questions for which they were unable to obtain uniform or adequate responses, the results obtained and presented Sections 5 of this report provide a solid base on which to measure project impact on farming practices and technology interventions.

4. Results of community level study

Community surveys included questions relating to the availability of 9 key services and institutions whose presence or existence are considered important to the success and long term sustainability of interventions in the agricultural sector, or indeed, any type of development effort.

Although localities in both zones were lacking in most services or institutions at the time of the survey, the Jacmel area did have a fair number of organized cooperatives and groupements. Table 4.1 summarizes, by PPK Zone, the information provided during community meetings on services available and institutions existing in the localities surveyed.

Participants in each of the meetings held for the community level base line surveys were asked to reach a consensus on ranking of priority needs for agricultural development of their locality. A list of 10 choices was included in the questionnaire form. All 12 of the communities in Beaumont, and 8 in Jacmel, responded by selecting five or more priorities and ranking them 1st, 2nd, 3rd, etc. (The other 5 communities in Jacmel selected their priorities but did not rank them.)

Table 4.1. Availability of socio-economic services

Type of Service/Institution	No. of Communities Where Available Beaumont	Jacmel
Cooperatives	2	10
Groupements	4	8
Credit	4	3
Technical Assistance	2 *	3
Fertilizer Sales Outlet	6	3
Seed Sales Outlet	1	2
Tool Repair Shop	1	6
Tool Sales Outlet	0	4
Schools: Public	0	2
Private	6	7

* One community mentioned assistance was available in 1988

Using the responses of communities that ranked their priorities, a weighting system was used to obtain an overall ranking for the two project zones. For each community, the 1st through the 5th priorities were weighted as follows:

1st - 5 points

2nd - 4 points

3rd - 3 points

4th - 2 points

5th - 1 point.

The results of this analysis are shown on Table 4.2. Main roads are the highest priority need in both project zones. Since transport and secondary roads are also reflections of the inaccessibility of many communities, the need for roads far outweighs other needs in the opinion of the local populations.

Table 4.2. Weighted responses for priority needs expressed during community surveys

Need	Beaumont	Jacmel	Total
Main Roads	42	40	82
Schools	36	23	59
Hospitals	19	22	41
Technical Assistance	31	-	31
Potable Water	6	13	19
Transport	6	12	18
Secondary Roads	15	-	15
Agricultural Inputs	15	-	15
Product Marketing	5	8	13
Electricity	5	-	5

While other information useful for project implementation was obtained in the community surveys, that which is most relevant for baseline purposes is presented above. Also, information obtained on coffee prices will be utilized in Section 6 of this report.

5. Results of Farm Level Study

Analysis of information provided by farmers surveyed point up some marked differences between the two zones, especially in terms of size of coffee plantations and crops grown. However, there are some equally interesting similarities - the most important, for purposes of the project and this study, being the yield farmers obtain on a per hectare basis from their coffee plantations.

5.1. Coffee yields

Figure 4 presents in graph form the yields of farmers in Beaumont and Jacmel. Further analysis of yield data shows that the median yield (1/2 of the study sample is lower, 1/2 higher) for Jacmel is 194 kg/ha and Beaumont is 176 kg/ha. The average yield per hectare in Jacmel is 257 kg and in Beaumont is 270 kg. These averages are very close to results from studies carried out in Haiti prior to the implementation of PPK. The figure used in the PPK project paper was 250 kg./ha.

These low yields can be attributed to several factors, most of which are objectively verified on the basis of the results of the base line study. For example, very few farmers have recently planted new coffee trees, and most of their stands are more than 20 years old. What new trees are within these stands are those that have sprung up from seeds falling from the trees or dropped by harvesters. (These plants are known in Haitian creole as "kafe rat".) In addition to very limited or non-existent

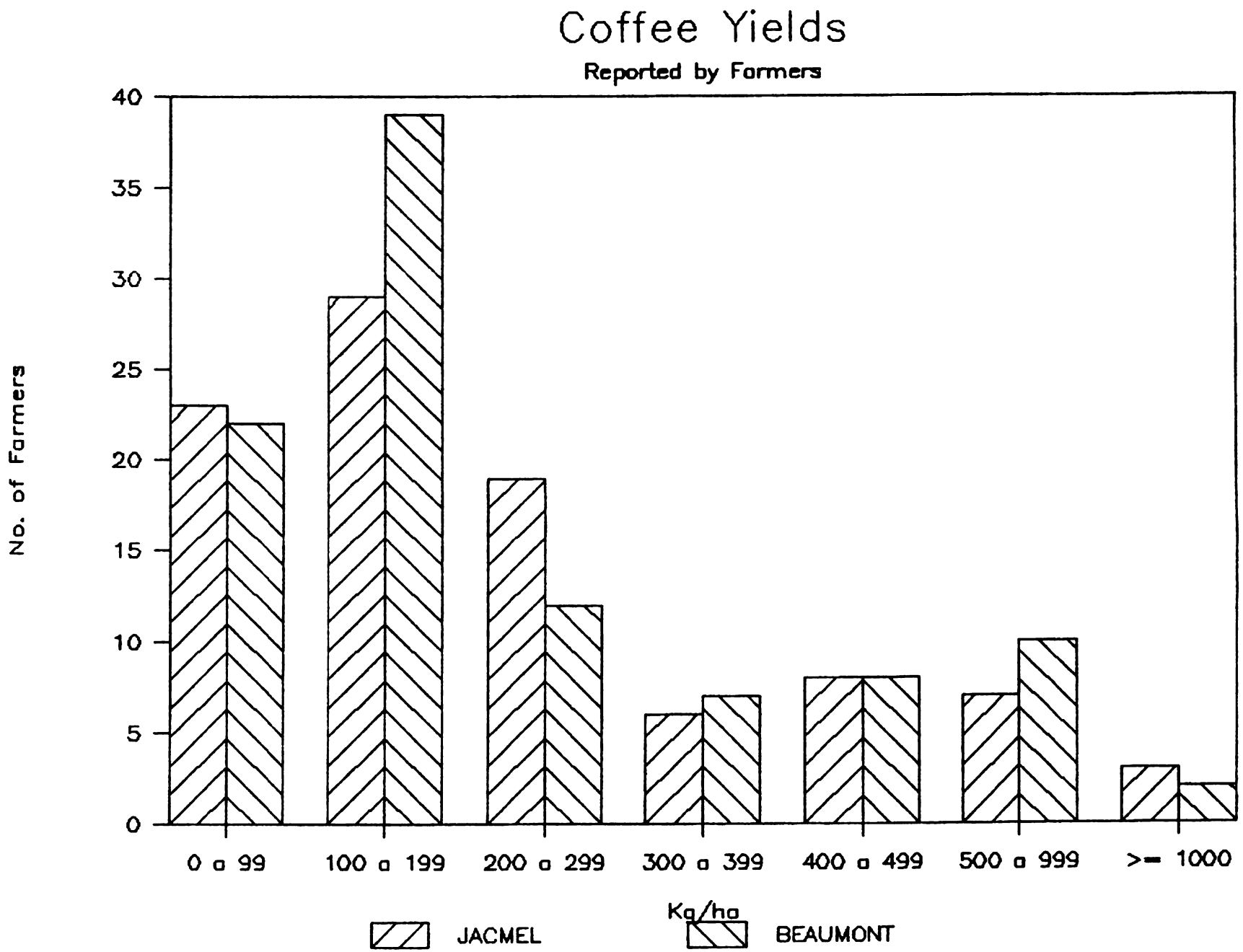

Coffee Yields
Reported by Farmers
No. of Farmers
40
35
30
25
20
15
10
5
0
0 a 99
100 a 199
200 a 299
300 a 399
400 a 499
500 a 999
>= 1000
Kg/ha
JACMEL
BEAUMONT

Figure 4.

management, the density in most plantations is very high - many farmers believe the more trees the better - no matter how close together. This same attitude extends to the lack of understanding of the higher production capability of properly pruned trees, and the amount of shade desirable.

It is not the purpose of this paper to discuss in detail these and other agronomic factors. However, findings of the survey presented in Section 5.3 below are intended to provide an objective basis for project planning and future evaluation.

5.2. Sizes of coffee plantations

Study results show that coffee plantations as well as overall farm sizes are much larger in the Beaumont zone than in Jacmel. Table 5.1 shows the sizes of coffee plantations reported by farmers in the two zones. Although the survey did not include questions concerning landholding patterns and tenure, it is the

Table 5.1. Sizes of coffee plantations (in carreaux [cx] *)

Area planted in coffee	No. of farmers reporting Beaumont	Jacmel
< .25 cx	-	40
0.25 - 0.49 cx	4	39
0.50 - 0.99 cx	18	11
1.00 - 1.99 cx	35	4
2.00 - 4.99 cx	34	1
5.00 - 9.99 cx	7	0
>= 10.00 cx	3	0

*. 1 cx = 1.29 ha

norm in Haiti for all but the smallest farmers to use more than one plot of land -- some of which they own and some rented or shareropped. Farmers are most likely to own the plot of land where they reside, and it is on this land where smaller farmers usually have all of their coffee.

As with coffee plantation sizes, total areas farmed (all crops) are much larger in Beaumont than Jacmel. Results of the survey indicate that more than 2/3 of the individuals surveyed in Beaumont farm areas totalling more than 3 carreaux. In Jacmel, 2/3 of the survey sample farm areas totalling 0.50 carreaux or less.

5.3. Indicators of technology level

5.3.1. Charactaristics and condition of coffee plantations

When asked about the ages of their coffee trees, most farmers reported that all or part of their plantations were more than 20 years old. Only 6% of the farmers in Beaumont had coffee trees 10 years old or less. Jacmel was somewhat better - there 30% of the farmers indicated that at least part of their plantations were 10 years old or less. See Table 5.2 for additional breakdowns of information provided on this subject.

Although an attempt was made to determine the density of trees in the farmers' plantations, responses provided make it difficult to analyze results. For example in the Jacmel Zone more than half

Table 5.2 Ages of coffee tree plantations

	No. of farmers Beaumont	Jacmel
Age ranges of plantations		
< 5 years old	2	5
5 to 10 years old	4	23
11 to 15 years old	13	17
16 to 20 years old	14	21
> 20 years old	89	75
Total No. of farmers responding	101	91
No. of farmers who indicated 1 age	77	73
No. who listed 2 or more ages	24	18

of the farmers indicated that coffee trees were growing at a distance of 0.5m x 0.5m. If one calculates the density/hectare from this, the result is 40,000 trees/ha, a figure deemed by agronomists to be excessively high, if not impossible. It is true, however, that "cafe rat" trees are usually left where they are, resulting in extremely dense, unmanageable plantations, and very low productivity. In the Beaumont Zone, 2/3 of the densities given ranged from 10,000 - 15,000 trees/ha. These figures are also considered quite high, considering the lack of management, and the interplanting of other trees and crops which are the norm in Haiti. Detailed analysis of the figures provided are not considered to be valid for providing baseline data on which project results can be based. Information on the ages of trees, and other survey results discussed below will be much more relevant for evaluating the success of project interventions.

The variety of coffee grown by all farmers is Arabica typica. There were only two farmers, one in each zone, who indicated that their plantations included some trees of the Caturra variety. This variety, more tolerant to the incursions of coffee rust now affecting coffee plantations, is being promoted by the PPK project.

Farmers were asked to evaluate the physiologicial condition of their coffee trees, and also to indicate any diseases noted in their plantations. Overall, farmers in the Beaumont zone had a much better opinion of the condition of their coffee trees than those in Jacmel. (See Table 5.3.) If these evaluations are correct, this could be the result of the excessive tree density as reported by Jacmel farmers.

5.3. Physiological condition of coffee trees as perceived by farmers

Condition of trees	No. of farmers reporting Beaumont	Jacmel
Good	58	21
Fair	23	12
Poor/old	15	58
Totals	96	91

Disease problems were noted by 54 farmers in Beaumont and by 88 in Jacmel. Forty-two of the Beaumont farmers named one problem and 9 named 2. In Jacmel 75 farmers named 1 problem, 11 named 2 problems and 2 farmers named 3 problems. Table 5.4 shows the different types of disease problems noted by farmers. Terms used

in responding to the survey question were more often symptoms of diseases, or problems resulting from improper management.

Table 5.4 Coffee tree diseases or symptoms of problems mentioned by farmers

Disease/symptom	No. of farmers reporting Beaumont	Jacmel
Rotten roots (Pourriture) \1	8	53
Black spots (Taches noires) \1	1	24
Grey spots (Taches grises) \1	9	-
Other spots - white, yellow, unspec. \1 (Autres taches - blanches, jaunes, non-spec.)	10	8
Coffee rust (Rouille) \2	18	1
Fruit flies (Moustique) \3	-	9
Fungus (Champignon) \1	-	5
? (Rougie)	-	3
Yellow leaves (Feuilles jaunes) \4	4	-
Insects (Insectes) \3	3	-
Necrosis (Necrose) \1	3	-
	56	103

1. Symptom of disease or problem
2. Disease
3. Pest
4. Nutritional deficiency

The fact that many more Jacmel farmers indicated disease problems correlates with farmer evaluations of the condition of their trees - especially with regard to the numbers of plantations where rotten roots were considered a problem. It is interesting to note that several farmers in Beaumont recognized that coffee rust was affecting their trees.

5.3.2. Trees and food crops grown by coffee farmers

Shade trees and inter-planting of food crops are part of the traditional and virtually universal system of coffee production in Haiti. The PPK will attempt to optimize returns to farmers from this traditional system - while introducing better management and promoting trees and crops that can enhance, or be compatible with, coffee production. The baseline surveys included questions to elicit information on species of shade trees currently grown with coffee, and food crops planted by coffee farmers. Information from farmers regarding trees in their coffee plantations is shown on Tables 5.5 and 5.6.

On average, farmers in both zones have approximately 3 different species of shade trees in their coffee plantations. Table 5.5 provides a breakdown of numbers of species farmers mentioned.

Table 5.5. Numbers of tree species grown with coffee

No. of farmers who mentioned	Beaumont	Jacmel
1 species	14	12
2 species	18	17
3 species	32	33
4 species	28	10
5 species	6	8
6 species	2	2
7 species	-	8
8 species	-	2
Number of farmers responding	100	92

As shown on Table 5.6 on the following page, the most popular tree species, grown by almost all farmers in Beaumont, and more than half in Jacmel, is the "sucrin". This leguminous tree is

one which is considered to be a very good choice. Its use is a current practice that PPK can endorse and encourage. The different tree species, and the numbers of farmers who grow them, are indicated below.

Table 5.6. Shade trees grown with coffee

Tree species	No. of farmers who grow Beaumont	Jacmel	Total
English (Local French) names*			
Swietie boonkie (Sucrin)	97	69	166
Mango (Mangue)	68	11	79
Avocado (Avocat)	63	10	73
? (Trompette)	3	53	56
Plantain (Banane)	19	25	44
Breadfruit (Veritable)	6	17	23
Grapefruit (Chadeque)	3	18	21
Banana (Figuier)	9	12	21
Cedar (Cedre)	6	10	16
Gliricidia (Cas)	-	15	15
Orange (Orange)	10	5	15
? (Cafetal)	-	13	13
? (Bois Rouge)	4	8	12
? (Mombin)	2	10	12
Palm (Palmiste)	3	6	9
Cocoa (Cacao)	-	7	7
? (Laurier)	1	5	6
Other **	15	6	21
Totals	309	300	609

* Scientific names (when known) are included in Appendix I.
** Other species mentioned by only one or two farmers

Spacing of new coffee seedlings for maximum production when mature allows for interplanting of several crops in the first year or two. As the coffee trees become larger, there are fewer crops which are appropriate for interplanting. Recommendations to PPK farmers regarding production systems for their new coffee plantations will be based on farmers current practices to the extent possible. Survey information on crops now grown by coffee farmers in the two project zones are shown on Table 5.7.

Table 5.7. Crops grown by coffee farmers

Crop	No. of farmers who grow Beaumont	Jacmel	Total
English (Local French) names*			
Beans (Haricots)	94	27	121
Corn (Mais)	93	21	114
Yam (Igname)	56	55	111
Sweet potato (Patate)	46	10	56
New Cocoyam (Malanga)	18	35	53
Chayote (Militon)	-	51	51
Plantain (Banane)	16	22	38
Cassava (Manioc)	6	5	11
? (Araroute)	-	10	10
Sugar Cane (Canne a sucre)	-	8	8
Sorghum (Sorgho)	-	8	8
Pumpkin (Giromond)	-	7	7
Cabbage (Choux)	-	6	6
New Cocoyam (Mazoubelle)	5	-	5
Pigeon Pea (Pois Congo)	2	3	

* Scientifc names (when known) are provided in Appendix II.

Based on recent conversations with the persons who carried out the farmer interviews, the large difference between the numbers of Beaumont and Jacmel farmers who reported beans and corn production can probably be explained by the fact that in Beaumont farmers reported crops grown on their farms, while in Jacmel the information was obtained on crops grown with coffee. In any case, it is evident that there is much more variety in cropping patterns in Jacmel than Beaumont.

5.3.3. New coffee plantings

In response to a general question about the origin of new coffee plants, all but one farmer indicated that the source for new trees was "kafe rat". However 11 farmers in Beaumont and 8 in Jacmel said that they also got seedlings from nurseries. Although the farmers may leave the "kafe rat" where it is, some transplant to other areas to enlarge their coffee plantations.

In response to a more specific question as to whether farmers had planted new coffee trees in the previous year, close to 1/3 of the farmers in each zone reported that they had done so. Farmers who said they had planted in the previous year were then asked about the quantities of seedlings they planted. Although some of the Jacmel farmers did not answer this question, the information provided on quantities of new coffee trees planted is shown on Table 5.8.

PPK plans to distribute between 300 and 600 seedlings annually to participating farmers, with farmers in Beaumont being eligible for larger quantities than those in Jacmel. These numbers are

similar to the numbers shown on Table 5.8 and would thus be in conformity with current practices.

Table 5.8. Coffee Seedlings planted in the previous year

No. of seedlings planted	No. of farmers planting Beaumont	Jacmel
< 100	2	3
100 to 299	14	9
300 to 599	10	3
600 to 899	2	-
900 to 1,499	-	-
>= 1,500	4	-
Total	32	16

5.3.4. Other technology indicators

5.3.4.1. Soil conservation

Soil conservation is an important component of good farming practices - and becomes increasingly important in areas where slopes are moderate to steep. Although persons surveyed were not specifically asked about the slope of their land, the PPK zones are in mountainous areas and coffee farmers would be most likely to cultivate at least some lands on slopes for which conservation measures would be highly desirable. Responses to a question about methods of soil conservation used indicated that 44 farmers in Beaumont, and only 18 in Jacmel, currently use one or more soil conservation methods. The information they provided is summarized on Table 5.9.

Table 5.9. Methods of soil conservation used

Method	No. of farmers who use Beaumont	Jacmel	Total
Reforestation (Reboisement)	38	2	40
Contour stalk/straw barriers (Rampe de paille)	4	16	20
Dry wall (Mur sec)	2	5	7
Other contour methods (Autres methodes de contour)	-	3	3
No. of farmers using			
1 method	44	13	57
2 methods	-	2	2
3 methods	-	3	3

5.3.4.2. Soil Enrichment

Survey results showed that chemical fertilizers are not used. However, the majority of farmers recognize the value of coffee parch "pay" and other by-products to increase the fertility of their soil. There were 2 questions regarding the use of soil enrichment practices. Question 1 asked farmers if they fertilized their food crops and coffee plantations. Four farmers in Jacmel and 59 in Beaumont replied yes. Those who responded yes were then asked to indicate what product(s) they used. Most of them said they use coffee parch and other organic wastes. No one indicated the use of chemical fertilizer. It appears that those responding `no' to question 1 assumed that they were being asked about chemical fertilization.

Question 2 relating to soil enrichment practices asked farmers whether they use coffee parch and other by-products as fertilizer or whether they threw them away. A much larger number of farmers

replied that they do use these by-products. A breakdown by zone of responses of farmers who replied to these questions is shown on Table 5.10.

Table 5.10. Soil enrichment practices

	Beaumont		Jacmel	
	Yes	No	Yes	No
Use fertilizer on food and coffee crops?	59	39	4	75
Use coffee pulp/wastes as fertilizer?	82	6	62	7

5.3.5. Post-harvest practices

For farmers who dry their coffee before selling it, the drying method used greatly affects the quality of the final product. Use of a cement surface is much better, although many farmers are not able to afford construction of a cement platform. Instead they dry their coffee by laying it on the ground. Because of frequent rains, the ground remains wet, the coffee takes on the odor of the soil, and often cannot be adequately dried. Analysis of responses to the survey question concerning the coffee drying method used shows that over half of the farmers in Jacmel use a cement surface, while only 20% do so in Beaumont. (See Table 5.11.)

Table. 5.11. Methods used for drying coffee

Method	No. of farmers who use Beaumont	Jacmel	Total
On cement	20	53	
On the ground	80	42	

Another question concerned storage methods for coffee. Many farmers in Jacmel did not respond to this question, which may be because they sell their coffee right after harvest. Most of the farmers who did respond indicated that they use sacks which are then placed on a platform under the eaves of their houses. A breakdown of responses from the two zones is shown on Table 5.12.

Table 5.12. Storage methods for coffee

	Beaumont	Jacmel
No. of farmers responding	99	58
Method of storage:		
Loft area in house	91	57
Sack	92	49
Straw backet	1	-
Gallon jug (plastic)	1	-

5.4. Socio-economic Indicators

5.4.1. Coffee marketing practices

Virtually all of the farmers surveyed, especially in Beaumont, sell their coffee to speculators or other intermediaries. In Jacmel some of the farmers sell to cooperatives. In analyzing survey results for Beaumont, where farmers mentioned the names of the persons to whom they sold, one sees that the market is highly fragmented. The names of 44 different intermediaries (buyers) were mentioned - and 29 of these buyers were each named only once by the farmers surveyed. No intermediary was named by more than 7 farmers. (It is not possible to know from the survey results if the situation in Jacmel is similar, as farmers there indicated the type of buyers

of their coffee but did not specify individual names.) Results of the question regarding farmer coffee sales are summarized on Table 5.13.

Table 5.13. Farmer coffee sales

Type of buyers	No. of farmers Beaumont	Jacmel
Intermediaries (speculators, voltigeurs, etc.)	114 *	84 **
Cooperatives	-	22
Buyers at local market	2	-

* Some farmers named more than one intermediary to whom they sold

** Some farmers sold to both intermediaries and cooperatives

5.4.2. Housing

An indication of economic well being can be obtained by learning about the number of rooms and type of roof of a farmer's house. Survey results show a similar variation in house size in both zones, with the average number of rooms in Beaumont being 3.3 and in Jacmel 3.5. A large majority of families in both zones have sheet metal roofs, although in Jacmel the rate is somewhat higher and exceeds 90%. Responses to questions on housing are included in Table 5.14

Table 5.14. Housing characteristics

	No. of houses having	
	Beaumont	Jacmel
No. of rooms in house		
1	2	1
2	34	22
3	16	23
4	27	24
>4	22	26
Type of roof on house		
Straw	24	7
Metal	76	88

5.4.3. Roles of household members in farm activities

Although Haitian cultural traditions assign decisions on cropping and farming practices to the head of household (usually male), women are expected to fully participate in soil tilling, planting and other farming activities. Responses to questions in this regard in the farm level survey confirms that these patterns hold for both the Jacmel and Beaumont zones. PPK interventions are not intended, nor are they expected, to affect these family practices. However, recognizing the role of women in farming activities, and incorporating women into project outreach activities, could contribute to achievement of project goals.

5.4.4. Literacy

As shown on Table 5.15 below, information from farmers regarding literacy of family members indicated the same rates for adults in both zones - 45% of the male heads of household are literate, and 14% of the wives are able to read and write. It

appears that the literacy rate for children, based on information provided by household, is slightly higher in Beaumont.

Table 5.15. Literacy

Literate Household Members	Beaumont	Jacmel
No. of heads of household	46	42
No. of wives of head of household	15	14
No. of households with 1 or more literate children	50	41

5.4.5. Radio ownership and recreational activities

While the socio-economic indicators noted above showed little difference between Jacmel and Beaumont, the response to a question regarding ownership of radios resulted in a somewhat greater variation between the two zones. (See Table 5.16.) Only 32% of the families in Jacmel who responded to this question had radios. The rate of ownership of radios in Beaumont is 50%. However, both of these figures can be considered low in terms of planned PPK radio extension activities. Further study is under way by project staff to determine radio listening practices, and to find out if access to radios may be higher than these figures might indicate (i.e. by farmers visiting neighbors who have radios when there is a program which they wish to hear).

Table 5.16. Radio ownership

No. of families who	Beaumont	Jacmel
Have a radio	45	29
Do not have a radio	44	62
Did not respond	12	2

An indicator of quality of life or general level of community development can be the availability of facilities and options for recreational and leisure time activities. Information on this aspect of rural life was not included in the individual farmer survey, but a question about it was included in the community level study. The answers obtained have been compiled and are shown on Table 5.17. In Jacmel there were 2 communites which gave no response to this question, and 2 mentioned only dominos and cards. Three communities in each zone mentioned only cockfights as their leisure time activity.

Table 5.17. Leisure time activities

Activity	No. of communities reporting Beaumont	Jacmel
Cock-fights	12	9
Party/festival (fete)	8	5
Soccer (football)	7	7
Dominos	-	3
Cards	-	3

6. Financial Returns to Farmers from Coffee Production

The goal of the PPK, as stated in the project paper, has two aspects:

1) increased coffee productivity

2) [increased] farmer income

The baseline information presented in the previous sections will enable end of project evaluators to clearly demonstrate PPK impact on 1) productivity, as well as farmer acceptance of technology interventions. It will also be possible to draw some conclusions regarding improvements in infrastructure and socio-economic well being as a result of PPK activities. The evaluation of PPK impact on 2) farmers' incomes can be done in several ways, requiring a variety of different baseline indicators. Data for only a few of these indicators are available from the baseline studies.

6.1. Financial information available from baseline studies

Community level surveys included a question about coffee prices in the previous 3 years. This information is shown on Table 6.1 on the next page. For most communities the drop in coffee prices resulting from the end of the International Coffee Agreement is clearly evident. However in two localities in the Beaumont zone (Sanette and Belance), coffee prices maintained their 1987 level. (Further investigation would be necessary to determine the reason for this.)

Table 6.1. Coffee prices in surveyed communities over a three year period

Commune/Section		Locality	Coffee Prices/lb.(in Gourdes) 1989	1988	1987
Project Zone: Jacmel					
Cayes-Jacmel (3rd)					
Haut Cap Rouge	1.	Desmarades	2.50	3.00	4.00
	2.	Jeanty	3.00	3.50	3.50
	3.	St. Rock	3.00	7.00	5.00
	4.	Kanyette	3.00	5.00	4.50
	5.	Vergeon	3.00	4.00	3.50
Marigot (3rd)					
Macary	6.	Moulin Goyave	3.00	4.50	5.00
	7.	Bertrand	3.00	4.00	5.00
	8.	Turette	3.00	4.50	5.00
Marigot (4th)					
Fond Jn. Noel	9.	Mahot	2.50	3.00	4.00
	10.	Platon Chapelle	2.50	3.00	4.00
	11.	Coterelle	3.00	4.00	4.00
	12.	Lolery	2.50	3.00	4.00
Project Zone: Beaumont					
Beaumont (1st)					
Beaumont	1.	Sanette	5.00	5.50	4.50
	2.	Lacadony	2.50	4.00	5.00
	3.	Des Barrieres	2.75	3.75	5.00
	4.	Ferrace	2.25	4.00	4.50
	5.	Delincourt	2.50	4.00	5.00
	6.	Thardieu	2.50	2.25	5.50
	7.	Chivri	2.50	2.75	4.00
	8.	Amiel	2.00	3.00	7.00
	9.	Grand Bois	2.25	3.75	4.50
Pestel (4th)					
Tozia	10.	Tozia	3.00	3.25	3.25
Corail (4th)					
Mouline	11.	Belance	5.00	5.50	5.50
Roseau (2nd)					
Fond Cochon	12.	Cartineau	3.00	4.00	5.00

Note: This list includes localities where both community level and farm level surveys were carried out.

Farmer level surveys included a question concerning quantity of coffee sold in the previous year. Responses were provided by 93 of the 96 farmers surveyed in the Jacmel zone, and by all 101 farmers in the Beaumont zone.

Based on the information on coffee sales provided by individual farmers in each locality, and the 1989 price of coffee from the community surveys, average income from coffee sales in 1989 for each locality, as well as the lowest and highest incomes have been derived and are shown on Table 6.2. The results of further analysis of these figures, to show income on a per hectare basis, are also included on Table 6.2. While it would be possible to compare these income figures with income received by coffee farmers in the last year of PPK, this would not provide a realistic and meaningful measure of project impact and goal achievement. It will also be necessary to take farmer expenses into account in order to determine net returns to farmers from their coffee production.

The farm level baseline survey form included a detailed chart on which was to be entered information on labor costs incurred by farmers for their coffee plantations in the previous year. However several of the interviewers were not able to obtain the information desired. Useful information was provided by farmers in only two communities: Kanyette in Jacmel/Cap Rouge and Amiel in Beaumont. In order to demonstrate the type of analysis needed to determine production costs, the information provided by 5 farmers in each of these two communities has been compiled in Tables 6.3 (Kanyette) and 6.4 (Amiel). The number of person days of paid labor, the daily wage rate paid, and the resulting cost for each operation related to coffee production is shown. By adding these costs, total labor costs for each coffee producer has been obtained. These costs have been deducted from gross

Table 6.2. Income from coffee sales in 1989

IN HAITIAN GOURDES

Beaumont	1989 Price Gdes/lb	Farmer Income Average	Low	High	Farmer Income in Gdes/ha Average	Low	High
Sanette	5.00	5978	1000	20000	2350	465	5168
Lacadony	2.50	1340	400	3960	631	310	1023
Des Barrieres	2.75	3046	550	8250	1217	410	3517
Ferrace	2.25	2571	675	4275	1931	698	3140
Thardieu	2.50	3433	400	12000	2133	217	9302
Chivri	2.50	2885	80	12500	1313	83	4845
Amiel	2.00	1675	400	5000	987	113	3101
Grand Bois	2.25	3954	675	9000	2886	2093	5233
Tozia	3.00	1185	750	1800	1047	465	2326
Delincourt	2.50	2678	1500	7500	849	291	1376
Belance	5.00	7175	1200	20000	5120	413	31008
Cartineau	3.00	3660	1200	6000	1265	465	4651
Jacmel *							
Cap Rouge	3.00	609	120	1800	1595	465	4651
Fonds Jn-Noel	2.50	295	0	1500	1275	0	7454
Macary	3.00	299	60	1500	657	60	1860

IN DOLLARS (5 Gourdes = $1.00)

Beaumont	1989 Price $/lb.	Farmer Income Average	Low	High	Farmer Income in $/ha Average	Low	High
Sanette	1.00	1196	200	4000	470	93	1034
Lacadony	0.50	268	80	792	126	62	205
Des Barrieres	0.55	609	110	1650	243	82	703
Ferrace	0.45	514	135	855	386	140	628
Thardieu	0.50	687	80	2400	427	43	1860
Chivri	0.50	577	16	2500	263	17	969
Amiel	0.40	335	80	1000	197	23	620
Grand Bois	0.45	791	135	1800	577	419	1047
Tozia	0.60	237	150	360	209	93	465
Delincourt	0.50	536	300	1500	170	58	275
Belance	1.00	1435	240	4000	1024	83	6202
Cartineau	0.60	732	240	1200	253	93	930
Jacmel *							
Cap Rouge	0.60	122	24	360	319	93	930
Macary	0.50	60	12	300	131	12	372
Fonds Jn-Noel	0.60	59	0	300	255	0	1491

* Data entered into the computer from Jacmel farmer surveys was identified by communal section, not locality

Table 6.3. Costs and Income for farmers in Kanyette (Jacmel, Cap Rouge)

Labor Costs

Operation	Farmer 1 No. PDs*	Farmer 1 Daily Wage	Farmer 1 Cost	Farmer 2 No. PDs*	Farmer 2 Daily Wage	Farmer 2 Cost	Farmer 3 No. PDs*	Farmer 3 Daily Wage	Farmer 3 Cost	Farmer 4 No. PDs*	Farmer 4 Daily Wage	Farmer 4 Cost	Farmer 5 No. PDs*	Farmer 5 Daily Wage	Farmer 5 Cost
Prepare land															
Plant															
Cultivate,weed															
Trim Coffee Trees															
Thin Plantation	50	7.50	375												
Trim Shade Trees															
Fertiliize															
Treat Disease															
Harvest Coffee	98	7.50	735	10	7.50	75							24	7.50	180
Dry Coffee							6	7.50	45						
Prepare (clean,etc	20	7.50	150										6	7.50	45
Bag															
Transport															
Total			1260			75			45			0			225

* PDs = Person Days

	Farmer 1	Farmer 2	Farmer 3	Farmer 4	Farmer 5
No. of Offspring who work on farm	4	6	3	4	2

Production Volume

		Farmer 1	Farmer 2	Farmer 3	Farmer 4	Farmer 5
Quantity sold	(lbs)	400	500	300	200	200
Quantity consumed	(lbs)	160	200	150	40	100
Total Production	(lbs)	560	700	450	240	300
Area of Coffee Plantation						
In Carreaux		0.75	0.35	0.35	0.20	0.40
In Ha. (1 Ha=1.29 Cx)		0.97	0.45	0.45	0.26	0.52
Production/land unit						
Lb./Cx.		747	2000	1286	1200	750
Kg./Ha.		263	705	453	423	264

Benefit/Cost Analysis

	Farmer 1 1989**			Farmer 2 1989**			Farmer 3 1989**			Farmer 4 1989**			Farmer 5 1989**		
Gross Income	Pri 1	Pri 2	Pri 3	Pri 1	Pri 2	Pri 3	Pri 1	Pri 2	Pri 3	Pri 1	Pri 2	Pri 3	Pri 1	Pri 2	Pri 3
Total	800	1200	2000	1000	1500	2500	600	900	1500	400	600	1000	400	600	1000
Per Cx.	1067	1600	2667	2857	4286	7143	1714	2571	4286	2000	3000	5000	1000	1500	2500
Per Ha.	827	1240	2067	2215	3322	5537	1329	1993	3322	1550	2326	3876	775	1163	1938
Net Income															
Total	-460	-60	740	925	1425	2425	555	855	1455	400	600	1000	175	375	775
Per Cx.	-613	-80	987	2643	4071	6929	1586	2443	4157	2000	3000	5000	438	938	1938
Per Ha.	-475	-62	765	2049	3156	5371	1229	1894	3223	1550	2326	3876	339	727	1502

Price 1 2.00 Gdes/lb.
**Price 2 3.00 Gdes/lb. (1989 Price per Community Survey)
Price 3 5.00 Gdes/lb.

All costs and income shown are in Haitian Gourdes
Official Exchange Rate: 5 Gourdes = US$1.00

Table 6.4. Costs and Income for farmers in Amiel (Beaumont)

Labor Costs

	Farmer 1			Farmer 2			Farmer 3			Farmer 4			Farmer 5		
Operation	No. PDs*	Daily Wage	Cost	No. PDs*	Daily Wage	Cost	No. PDs*	Daily Wage	Cost	No. PDs*	Daily Wage	Cost	No. PDs*	Daily Wage	Cost
Prepare land	15	5	75	20	5	100	25	5	125	10	5	50	15	5	75
Plant	12	5	60	16	2	32	14	5	70	15	5	75	13	5	65
Cultivate,weed	25	7	175	30	5	150	30	5	150	30	5	150	16	5	80
Trim Coffee Trees	12	7	84	13	5	65	14	5	70	14	5	70	12	5	60
Thin Plantation															
Trim Shade Trees															
Fertiliize															
Treat Disease															
Harvest Coffee	50	10	500	40	7	280	30	7	210	29	5	145	10	7	70
Dry Coffee	8	13	104	16	10	160				12	5	60	12	5	60
Prepare (clean,etc	15	15	225	15	7	105	20	15	300	16	5	80	18	5	90
Bag				12	7	84	10	5	50	10	4	40	12	3	36
Transport	15	20	300	20	10	200	10	20	200	10	7	70	10	8	80
Total			1523			1176			1175			740			616

* PDs = Person Days

No. of Offspring who work on farm	0	2	3	1	0
Production Volume					
Quantity sold (lbs)	400	2500	400	400	400
Quantity consumed (lbs)	162	300	100	0	100
Total Production (lbs)	562	2800	500	400	500
Area of Coffee Plantation					
In Carreaux	5.5	3.0	1.5	1.25	1.0
In Ha. (1 Ha=1.29 Cx)	7.1	3.9	1.9	1.6	1.29
Production/land unit					
Lb./Cx.	102	933	333	320	500
Kg./Ha.	36	329	117	113	176

Benefit/Cost Analysis

	1989**			1989**			1989**			1989**			1989**		
Gross Income	Pri 1	Pri 2	Pri 3	Pri 1	Pri 2	Pri 3	Pri 1	Pri 2	Pri 3	Pri 1	Pri 2	Pri 3	Pri 1	Pri 2	Pri 3
Total	800	1200	2000	5000	7500	12500	800	1200	2000	800	1200	2000	800	1200	2000
Per Cx.	145	218	364	1667	2500	4167	533	800	1333	640	960	1600	800	1200	2000
Per Ha.	113	169	282	1292	1938	3230	413	620	1034	496	744	1240	620	930	1550
Net Income															
Total	-723	-323	477	3824	6324	11324	-375	25	825	60	460	1260	184	584	1384
Per Cx.	-131	-59	87	1275	2108	3775	-250	17	550	48	368	1008	184	584	1384
Per Ha.	-102	-46	67	988	1634	2926	-194	13	426	37	285	781	143	453	1073

**Price 1 2.00 Gdes/lb. (1989 Price per Community Survey
Price 2 3.00 Gdes/lb.
Price 3 5.00 Gdes/lb.

All costs and income shown are in Haitian Gourdes
Official Exchange Rate: 5 Gourdes = US$1.00

income received by each farmer to obtain his net income. The tables also provide information on gross and net income on a per carreaux, and a per hectare, basis. These tables indicate, in addition to the wide variations in yields seen earlier, that there are large differences in the quantities of wage labor used by farmers. Rates of pay also vary considerably.

In our discussion to this point we have looked at 5 basic factors on which financial returns to coffee farmers depend:

1) Area planted in coffee
2) Productivity
3) Coffee price
4) Cost of labor
5) Amount of wage labor used

We have not taken into consideration in the discussion:

1) The value to the farmer of the coffee consumed by him and his family
2) The value of family labor for which there is no monetary outlay
3) The cost of purchased inputs for coffee production.

Of these three, information is available from the original baseline studies for only one. Quantities of coffee consumed by each household was included in the survey and the information has been included on the detailed tables for Kanyette and Amiel (6.3 and 6.4) It would be reasonable to assign the same value to coffee consumed on the farm as to that sold. However this non-cash benefit (income) has not been incorporated in the costs and income analysis primarily because there is no information

available with regard to non-cash "costs" - i.e. person days of family labor used in coffee production.

While improved farming practices recommended by PPK will entail purchased inputs in order to maximize production, current practices of the vast majority of coffee farmers do not include the use of purchased inputs on their coffee trees. Therefore, in terms of baseline farmer costs, this is not a factor.

6.2. Additional baseline information required to complete analysis of financial returns

A full analysis of the impact of PPK on farmer income will require additional baseline information on production costs and revenues - both cash and in-kind. Other studies in Haiti have shown that farmers are able to recall, in great detail, not only cash outlays for labor on each plot of land, but they can also specify the numbers of person days of family labor used over a 12 month period. While more difficult to obtain, information on cash income from crops and quantities consumed on-farm can also be obtained in circumstances where mutual trust has been established.

A supplemental baseline study is being prepared to administer to a selected sample of farmers who were surveyed in 1990, and who are also participants in PPK. Production practices in 1990 were not yet affected by PPK, so the use of these farmers will enable evaluation of project impact over the full five years of PPK. Farmers in the supplemental baseline study will be selected to

represent "typical" categories of farmers - defined on the basis of information collected previously.

While PPK has coffee as its central focus, the project design recognizes the importance to farmers of interplanting other crops with their coffee. The benefits project participants realize will accrue from increased prductivity of all crops planted within "coffee" plantations. The development, testing and extension of technology packages to enhance the productivity of the overall farming system has been and will continue to be the primary concern of PPK.

Therefore, in order to determine overall income benefits to farmers in PPK, the additional baseline information will include pre-project costs and income related to other farm activities as well as to coffee.

Increased labor and purchased inputs will be required in order to maximize increased production from coffee plantations. Planned quantification of all costs, real and in-kind, of pre-project production practices will enable end-of-project evaluators to determine the degree to which the farmer income aspect of the project goal is achieved.

APPENDIX I. English, Local French and Scientific Names for Shade Trees Grown with Coffee

Names English	Local French	Scientific
Swietie boonkie	Sucrin	Inga Vera
Mango	Mangue	Mangifera indica
Avocado	Avocat	Persea americana
?	Trompette	Cecropia peltata
Plantain	Banane	Musa sp.
Breadfruit	Veritable	Artocarpus sp.
Grapefruit	Chadeque	Citrus grandis
Banana	Figuier	Musa sp.
Cedar	Cedre	Cedrela odorata
Gliricidia	Cas	Gliricidia sepium
Orange	Orange	Citrus aurantium (sour) Citrus sinensis (sweet)
?	Cafetal	Erythrina sp.
?	Bois Rouge	G---- triobiliodes (fam. Meliaceae)
?	Mombin	Spondias mombin
Royal Palm	Palmiste	Oredoxa regial (or Roystonea sp.)
Cocoa	Cacao	Theobroma cacao
?	Laurier	Nectandra sp. ? or Ocotea sp.

APPENDIX II. English, Local French and Scientifc Names for Crops Grown in Association with Coffee

Names English	Local French	Scientific
Beans	Haricots	Phaseolus sp.
Corn	Mais	Zea mays
Yam	Igname	Dioscorea sp.
Sweet potato	Patate	Ipomoea batatas
New Cocoyam	Malanga	Xanthosoma sagittifolium
Chayote	Militon	
Plantain	Banane	Musa sp.
Cassava	Manioc	Manihot sp.
?	Araroute	
Sugar Cane	Canne a sucre	Saccharum officinarum
Sorghum	Sorgho	Sorghum vulgare
Pumpkin	Giromond	Cucurbita sp.
Cabbage	Choux	Brassica oleracea
New cocoyam	Mazoubelle	Xanthosoma sagittifolium
Pigeon Pea	Pois Congo	Cajanus cajan