caribbean
food
crops society

Eighteen
Annual Meeting
August 22 to 28th 1982
Dover Convention Centre
BARBADOS

Vol. XVIII

ECONOMICS OF FOOD SECURITY IN HAITIAN SMALL FARM PRODUCTION SYSTEMS

A. Bellande[1/]

INTRODUCTION

The main objective of the majority of Haitian small farmers is to secure a continuous flow of products for family consumption and sale throughout the year. Planting in various ecosystems, is in this perspective a risk minimization strategy which farmers have elaborated a response to irregular rainfall patterns, storage problems and low levels of cash income.

By cultivating several ecological "stories" on a mountainside, each presenting specific soil, temperature and rainfall characteristics, farmers have the possibility of growing a wider range of species and varieties, and can spread out planting and harvesting operations. This enables them to spread out risk, reduce the length of storage of products and limit their dependance on the market for their food supply.

The case study presented here is part of a study of three farms which involved day by day farm data collection of work schedules, sales and purchases for each farm and weekly observations on the type of food consumed by the family.

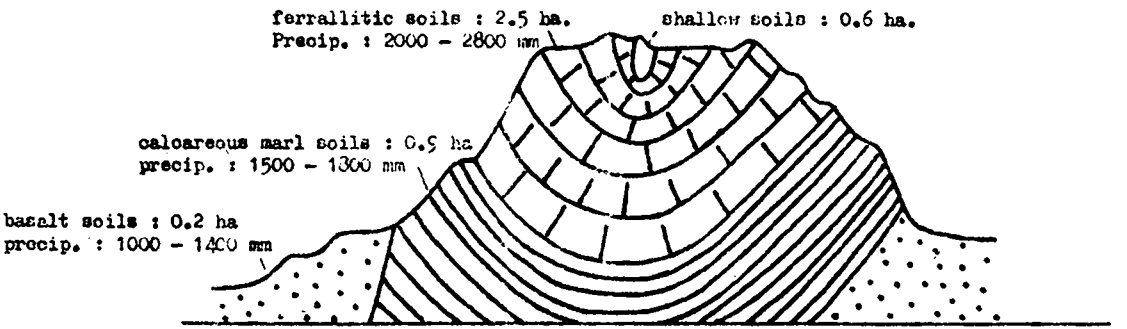
DISCUSSION

The farm analyzed covers 4.2 hectares of land, divided into 13 parcels located in three ecological zones on the northern slope of the Rochelois Plateau in southern Haiti.

Six parcels totalizing 2.5 hectares are located between 700 and 950 metres above sea level, on infertile ferrallitic soils, in an area where annual rainfall varies between 2,000 and 2,800 mm. Two other parcels located on steep slopes in the same area cover 0.6 hectares on shallow, stony soils developed from calcareous parent material. Four parcels totalizing 0.9 hectare are located between 350 and 450 metres above sea level in an area of more fertile calcareous marl soils where annual rainfall varies between 1,500 and 1,800 mm. One parcel is situated at an altitude of 200 metres on a basaltic soil, annual rainfall in that area varying between 1,100 and 1,400 mm (Figure 1).

1/ Agricultural Economics and Statistics Division, Ministry of Agriculture (Haiti), Madian-Salagnac Research Center.

FIGURE 1 . LOCATI . OF FARM'S PARCELS



The farmhouse itself is located at 700 metres above sea level. The household is composed of two adults and five children between the ages of two and thirteen. The number of mouths to be fed per hectare is 1.7.

The farm's crop calendar is as described in Figure 2.

January - February

A crop association of yams (Dioscorea cayenensis Link), Black and Red beans (Phaseolus vulgaris L.), Corn (Zea mays L.), Cassava (Manihot utilisima Pohl), Pigeon peas (Cajanus indicus Spreng), and Sweet potato (Ipomoea batatas LAM), is planted in an area of ferrallitic soil surrounding the farmhouse (1800 m^2) where organic matter content, usually between 2 and 3% in these ferrallitic soils, reaches 5% due to transfers of crop residues from other gardens as well as the manure from pigs fed around the home.

Corn, pigeon peas and black beans are planted on calcareous marl soils at an altitude of 400 metres. Sorghum is added here in May after beans have been harvested and the corn has been weeded.

March

Corn and pigeon peas are planted on ferrallitic soils at 700 metres above sea level. Sorghum is planted in May, three months before the corn harvest.

April

Corn and pigeon peas are planted on basalt soils at an altitude of 200 meters. Sorghum is introduced into this crop association in June.

June - July

A crop association consisting of sweet potato, black and red beans and pigeon peas is planted on ferrallitic soils between 700 and 950 metres above sea level.

August

Sweet potato is planted as a sole crop on ferrallitic soils.

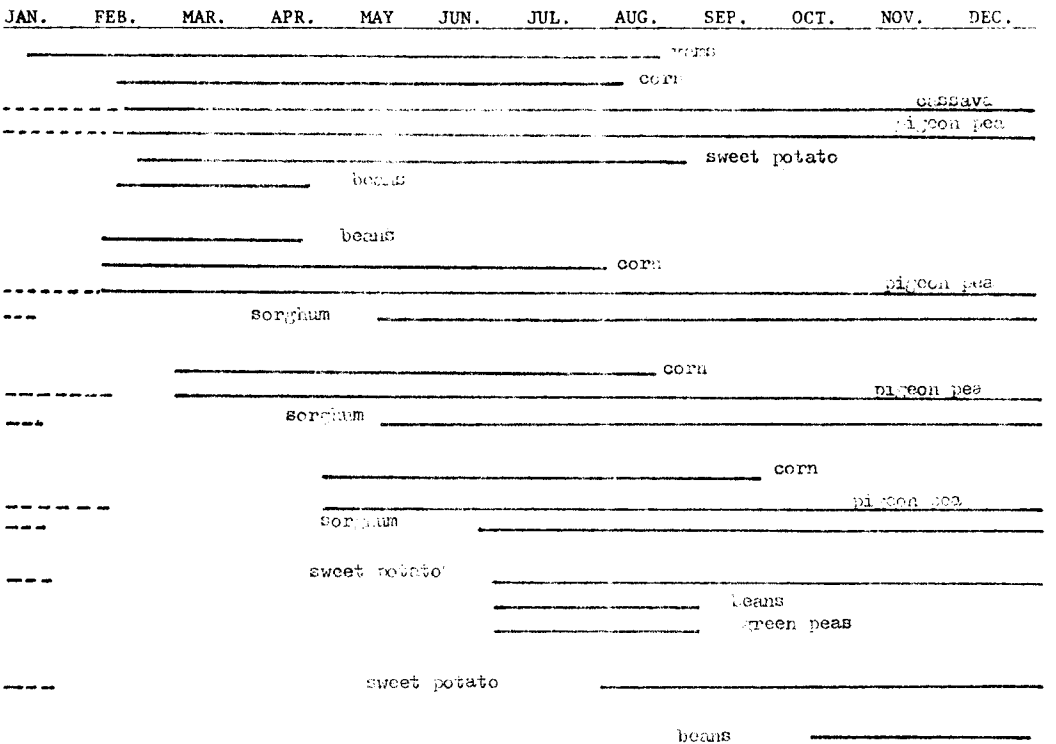
October

Black and red beans are planted as sole crops on the shallow stony soils between 700 and 800 metres above sea level. Beans are cultivated on these well drained soils in October because of high rainfall during the first month of growth.

November - December

Sweet potato is planted with green peas on ferrallitic soils. Corn is planted in February of the following year after green peas have been harvested.

FIGURE 2. CROP CALENDAR



Corn varieties grown here have a 5 1/2 to 6 month cycle, sorghum has a 6 to 8 month cycle and sweet potato varieties have a 4 1/2 to 6 month cycle.

As for perennial crops, breadfruit grown in the calcareous marl soils are in production between the months of May and January, small areas of bananas planted around the farmhouse are in production mainly between August and December (bananas in areas of calcareous marl soils mature earlier). Avocados cultivated at lower altitudes start producing fruit in June; at higher altitudes fruits are available from September to November. A few citrus trees (orange and grapefruit) are grown around the farmhouse: they produce fruit between the months of October and February. Mangoes planted in low altitude areas are in production mainly during the months of May and June. Total area in perennial crops: 1600 m^2. Most of the breadfruit, mangoes and bananas are grown between 200 and 500 meters above sea level.

The consumption calendar that proceeds from the succession of planting dates and the combination of long and short cycle species is presented in Table 1. The main crops consumed by the family are:

In October and November: fruit (breadfruit, avocados, bananas, citrus) corn and yams.

In December and January: sweet potatoes harvested in fields planted in June and July. Important quantities of breadfruit are also consumed.

In February: sorghum, harvested in mid-January.

In March: cassava.

In April: tubers, yams (D. alata) and taro, planted under tree cover in the calcareous marl soils. The earlier maturing varieties of sweet potato planted in December are harvested for consumption.

In May: breadfruit and mangoes from the low altitude areas.

In June and July: late maturing varieties of sweet potatoes planted on ferrallitic soils in December and also breadfruit.

In August and September: breadfruit and corn planted between February and April.

Breadfruit grown on calcareous marl soils, and sweet potato grown on ferrallitic soils at higher altitude are thus the main elements of the family's diet. One or the other, or both, figure in its consumption calendar during 11 months of the year. Sorghum, grown in the low altitude areas plays an important role as a "bridge" in February, at a time when sweet potatoes planted in July have been consumed and breadfruit is not available. Shade tolerant varieties of yam and taro, grown under tree cover on calcareous marl soils, have the same function in March and April.

TABLE 1. CALENDAR OF CROPS PRODUCED AND CONSUMED BY THE FARM FAMILY

MONTH	OCT		NOV		DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP	
15 DAY PERIOD	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Breadfruit	X	X	X	X	*	*	*	*							X	*	X	X	X	X	*	*	X	X
Banana	X	X	X	X	X	X															X	X	X	X
Yams	X	X	X	X	X	X					X	X	X											
Sweet potato			X	*	*	*	*	*	*	X			X		X	X	*	*	*	X				
Citrus	X	X	*		*	X	X	X																
Pigeon pea						X	X																	
Beans	X	X					X																	
Green peas									X															
Sorghum									*	*														
Cassava									X		*	X												
Taro											X	X	X											
Mangoes															*	X								
Corn	X	X													X	X	X				X	X	*	*

* regular consumption

X occasional consumption

This farm was thus able to reduce its purchases of basic cereals and fruits to about 120 kgs. of cereals (corn and sorghum) and 50 kgs. of breadfruit for a total value of 105 gourdes (1 Gde = $0.20 U.S.), representing only 6% of total yearly purchases (Table 2).

During the same period, the farm sold 350 kgs. of yams, 100 kgs. of corn, about 100 kgs. each of sweet potato, breadfruit and bananas and 25 kgs. of beans for a total value of about 800 gourdes. The cropping calendar here again makes it possible to spread out sales over the year so as to provide small amounts of cash periodically (Table 3). In this way also, the storage period does not exceed three months for all crops except corn which can be stored as long as nine months.

CONCLUSION

Risk minimization and food security are primary considerations in crop production strategies developed by this type of farmer. This implies that research should be oriented towards technology that satisfies these objectives. Criteria such as resistance to diseases and drought, length of cycle and storage characteristics should be taken into account when designing new technology for this category of farmers.

TABLE 2: FARM PURCHASES OF CEREALS AND FRUIT (IN GOURDES)

	9/23 10/24	11/10 11/26	11/30 12/20	1/6 2/8	2/16 2/29	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOT
Corn	7.20	1.80		6.50									15.50
Sorghum				10.55	8.20	27.25	2.80	8.50	16.10	6.80		2.20	82.40
Rice									0.80		4.40	2.00	7.20
Breadfruit	0.50	0.90						2.85	1.90	0.60			6.75
Dasheen						1.40							1.40
Plantain								0.30	0.50				0.80
Avocado	0.10												0.10
Mangoes								1.60	1.35	0.65			3.60
TOTAL	7.80	2.70	0.00	17.05	8.20	28.65	2.80	13.25	20.65	8.05	4.40	4.20	117.75

TABLE 3: CROPS SOLD BY THE FARM (IN GOURDES)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	TOT
Beans	13.40	48	1.85				12			15			9[illegible]
Yams	32.70		138	7								63.70	[illegible]6.4[illegible]
Bananas	39.20	2.85				4	4	5.60		6	29	20.70	109.[illegible]
Coffee	4.50	[illegible]											[illegible]3.50
Citrus				0.80	2.20								[illegible].00
Sw.Potato				4.50					27.90	15.85			[illegible]8.25
Green peas					11.45								11.45
Cassava					1.40								1.40
Corn						3.50		138	15.40	4			[illegible]80.90
Breadfruit												20	20
TOTAL	89.80	59.85	139.85	12.30	14.05	7.50	16.00	161.60	43.30	40.85	29.00	109.20	723.30