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9. ABSTRACT
The objectives of this study are: to assist the Haitian Ministry of Agriculture in conducting background research in agricultural marketing, to make recommendations on the marketing of agricultural commodities, and to provide input to the marketing section of USAID/Haiti's Agricultural Assessment. The consumption-production characteristics of Haiti reflect relatively high changing population densities and small dispersed production units, with generally poor access to regional and urban marketing centers. The input markets are unorganized but farmers must rely on purchased inputs. Marketing infra-structure suffers from a lack of investment. The agricultural marketing system in Haiti is characterized by these and other problems not uncommon to developing countries. The report begins with a brief discussion of the role of marketing and a description of Haitian consumption. Discussions are also included on the marketing channels for domestically produced and consumed agricultural commodities, the marketing channels of major export crops, and the marketing of agricultural inputs. The unique marketing characteristics of the major commodities are highlighted and the various problems and inefficiencies identified. Market interdependencies, storage needs and other price dimensions of market performance are considered. Constraints and issues of overall importance to market performance and marketing policy are explored. These include: transportation, weights and measures, grades and standards, information needs, concessional food grain imports, and a description of donor programs in the marketing area. The report concludes with a discussion of additional programs and research needs.

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AN ECONOMIC EVALUATION OF THE HAITIAN AGRICULTURAL MARKETING SYSTEM

by

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TABLE OF CONTENTS

I Introduction 1

II Background 2
Consumption Characteristics 4
Production - Market Characteristics 7

III Marketing Channels for Domestically Produced and Consumed Agricultural Commodities 13
Food Grain Marketing 13
Farm Level Food Grain Marketing Activities 13
Wholesale-Retail Food Grain Markeing Channels 20
Marketing of Vegetable Crops 26
Livestock Meat Marketing 34
Marketing of Fruits 41
Cotton Marketing 50

IV Marketing Channels of Major Export Crops 56
Coffee Marketing 57
Background 57
Marketing Channels 62
Sisal Marketing 73
Background 73
Marketing Channels 76
Marketing of Other Export Crops 81

V Agricultural Input Markets 85

VI Price Dimensions of Market Performance 90
Seasonal Price Variation - Storage Needs 91
Price Relationships Over Space and Form 100

VII Transportation 112

VIII Weights and Measures, Grades and Standards 123

IX Dispersed Production 126

X Information Needs 130
Private Sector Information Needs 132
Public Sector Information Needs 135

XI Food Grain Imports 138

TABLE OF CONTENTS cont.

XII Major Foreign Assistance Programs in the Marketing Area ... 143

XIII Summary, Recommendations 157
Donor Project-Program Considerations 162
Roads, Transport Facilities and Infrastructures 162
Storage Facilities 163
Processing and Retail Marketing Facilities 163
Input Marketing Facilities and Infrastructure 164
Human Resources 165
Programs to Strengthen Haitian Policy 166
Making, Monitoring and Policy Management Activities 166
Other Approaches to Improved Market Performances 168
Supportive Studies 170
Commodity Demand-Supply (price analysis) 170
Farm Level Input Demand 171
Inter-regional Competition and Spatial Location Studies 172
Sector Analysis 173

Appendix A 175

Appendix B 189

References 198

LIST OF TABLES

Table		Page
I	Population and Income Aggregated, Haiti	5
II	Estimated Area, Production and Yield per Hectare for Principal Crops, Haiti, 1973	8
III	Public Markets Surveyed by Region and Type, 1975	11
IV	Simple Average Monthly Prices and Percent Differences by Farm Level, Wholesale and Retail Market for Six Selected Products, 1971-74.	24
V	Estimates of National Production of Major Vegetable Crops, 1971-1973	27
VI	Quantities (lbs.) of Vegetables Transported From the Kenscoff Region to Port-au-Prince During Two Days, 1974	29
VII	Percentage of Retail-Consumer Price Accruable to Producer, Madam Sara and Retailer by Type of Vegetable, 1975	31
VIII	Characteristics of Public Markets in Haiti, 1975	33
IX	Selected Livestock on Hand and Slaughter, Haiti, 1950, 1970-1973	35
X	Marketing Margins as a Percent of Unit Retail Price For Selected Fruits Sold Fresh for Domestic Consumption, Haiti, June, 1975	45
XI	Selected Export Crops	48
XII	Imports of Cotton and Cotton By-Products (1970-71 to 1973-74)	51
XIII	Exports of Cotton and Cotton By-Products	54
XIV	Size Distribution of Coffee Holdings in Hectares	60
XV	Number of Coffee Speculators and Volume of Coffee Sold by District in 1972-1973	66

LIST OF TABLES cont.

Table		Page
XVI	Coffee Exporters and Volume of Exports, 1972-73	69
XVII	Average Costs and Taxes of Coffee Growers, Speculators, and Exporters per 60 kg Sack, 1975-76	70
XVIII	Sisal Plantations and Area Cultivated	74
XIX	Average Annual Production Estimates of Sisal	77
XX	Use of Sisal as a Percentage of Local Production	80
XXI	Imports of Chemical and Biological Inputs, 1972-1974	86
XXII	Percent of Input Purchases by Type of Transaction	87
XXIII	Estimates of Marketing Margins for Fertilizer by Type of Distributor as a Percentage of the Cost of 100 lbs. of Chemical Fertilizer	88
XXIV	Average Monthly Prices in Gourdes per Marmite for Six Selected Products in Regional, Urban and Semi-Rural Markets, 1971-74	100
XXV	Average Monthly Prices of Selected Products by Geographic Department or Region, 1971-74 (Gourdes)	102
XXVI	Correlation of Spatial Commodity Prices by Month Port-au-Prince With Other Select Urban Markets, 1975	103
XXVII	Vertical Monthly Price Relationships for Selected Commodities Between Semi-rural and Port-au-Prince Urban Market, Haiti, 1975	107
XXVIII	Corn/Grain and Corn/Ground Price Interdependence in Selected Urban Markets, Haiti, 1975	110
XXIX	Haitian Markets and Qualitative Condition of Roads	113
XXX	Principal Coastal Shipping Ports, 1975	116
XXXI	Operating Cost ($) Per Km, by Type of Vehicle and Road	120
XXXII	Rates of Return to Road Constribution Projects in Northern Haiti	120
XXXIII	Food Grain Imports in Metric Tons, 1972-1977	139
XXXIV	Summary of the Major Factors Inhibiting Market Performance	161

LIST OF FIGURES

Figure		Page
I	Spatial Disbribution of Haitian Markets	12
II	Bean Marketing Channels at the Farm Level	15
III	Rice Marketing Channels at the Farm Level	18
IV	Food Grain Marketing Channels Between Regional and Urban Markets	21
V	Principal Vegetable Producing Areas, Haiti	27
VI	Marketing Channels for Livestock	37
VII	Principal Zones de Production de Certain Fruits	42
VIII	Fruit Marketing Channels	47
IX	Cotton Marketing Channels	53
X	Spatial Distribution of Coffee Production and Marketing, Haiti, 1972-1973	58
XI	Coffee Marketing Channels	64
XII	Coffee Prices Received by Farmers, Marketing Costs and Taxes, By Month, Haiti, 1970-74	72
XIII	Major Sisal Marketing Channels	78
XIV	Spatial Distribution of Cocoa Production in Haiti, 1975-1976	83
XV	Average Monthly Price (Gds) for Millet, Port-au-Prince Haiti	92
XVI	Average Monthly Price (Gds) for Rice, Port-au-Prince Haiti	93
XVII	Average Monthly Price (Gds) for Bananas, Port-au-Prince, Haiti	94
XVIII	Average Monthly Price (Gds) for Corn, Port-au-Prince Haiti	95
XIX	Average Monthly Price (Gds) for Beans, Port-au-Prince Haiti	96

LIST OF FIGURES cont.

Figure		Page
XX	Impacts on Farm Level Prices from Lower Spatial Costs	114
XXI	Effects of Food Grain Price Changes on Production-Consumption Levels of Farm Households Commercializing Preferred Food Grains	142
XXII	Effects of Food Grain Price Changes on Production-Consumption Levels of Farm Households Commercializing Less Preferred Food Grains	144

LIST OF APPENDIX TABLES

Table		Page
AI	Production of Selected Agricultural Commodities, Haiti, 1970-1976	176
AII	Selected Exports, Haiti, 1970-1976	178
AIII	Annual Market Prices (Gourdes per Marmite) for Rice, Beans, Corn, Millet and Bananas, Port-au-Prince Haiti, 1968-75	179
AIV	Average Monthly Market Prices (Gourdes per Marmite) for Rice, Beans, Corn, Millet and Bananas, Port-au-Prince, Haiti, 1968-72	180
AV	Urban Market Price (Gds) for Selected Products, Haiti, March, April, May, June, 1977	181
AVI	Monthly Price, Selected Markets, Haiti, 1975	184

LIST OF APPENDIX FIGURES

Figure		Page
BI	Household Indifference Map Between Preferred (Y) and Less Preferred (X) Food Grain Crops	190
BII	Production Frontier	191
BIII	Farm Household Production-Consumption Levels: No Marketing Costs	192
BIV	Farm Household Production-Consumption Levels With Marketing Costs	193
BV	Farm Household Production-Consumption Levels With High Marketing Costs	195
BVI	Effect of Relative Price Changes on Farm Household Production-Consumption Levels	196

LIST OF ACRONYMS

ASDEC	Associations des Exportateurs de Cafe
ASDEM	Association of Mango Exporters
CIDA	Canadian International Development Agency
CTCIF	Compangie des Tabacs Comme Il Faut
DARNDR	Department of Agriculture, Natural Resrouces and Rural Development
FAO	Food and Agriculture Organization
HACHO	Haitian-American Community Help Organization
HAMPCO	Haitian-American Meat Provisions Company
IBRD	International Bank for Reconstruction and Development
IDAI	Institute for Development of Agriculture and Industry
IDB	International Development Bank
IFDC	International Fertilizer Development Center
IHPCADE	Institute for the Promotion of Coffee and Export Products
IHS	Institut Haitien de Statistique
IICA	Inter-American Institute of Agricultural Sciences
OAS	Organization of American States
ODVA	Organisme de Developpement de la Vallee de l'Artibonite
SENACA	Service Nationale de Commercialisation Agricole
UNDP	United Nations Development Program
USAID	United States Agency for International Development

I. INTRODUCTION

The general objectives of this study are: (a) to assist the Haitian Ministry of Agriculture in conducting background research in agricultural marketing, (b) to make recommendations on the marketing of agricultural commodities and (c) to provide input to the marketing section of USAID/Haiti's Agricultural Assessment. This research is based on secondary sources of information, interviews with ministry and agency officials, and officials of other bilateral and multilateral aide agencies and organizations stationed in Port-au-Prince.

The report is organized as follows. A brief discussion of the role of marketing and a description of Haitian consumption, production and market characteristics are presented first in order to set Haitian agricultural marketing activities into context. The next three sections focus on: the marketing channels for domestically produced and consumed agricultural commodities, the marketing channels of major export crops, and the marketing of agricultural inputs. These sections describe and highlight the unique marketing characteristics of the major commodities, pointing out various problems and inefficiencies. Then, market interdependencies, storage needs and other price dimensions of market performance are considered. The remaining sections focus on constraints and issues of overall importance to market performance and marketing policy. These include: transportation, weights and measures, grades and standards, information needs, concessional food grain imports, and a description of donor programs in the marketing area. A discussion of additional programs and research needs concludes the paper.

II. BACKGROUND

Marketing is frequently defined as a process which coordinates the exchange of resources, goods and services over time, space and form. The unit value of the resource, good or service exchanged should reflect its marginal cost of supply to the seller and its marginal value to the buyer. If this process is inefficient or costly, scarce resources will tend to be misallocated and the marketing process becomes a constraint to economic growth.

Previous research focussing on the importance of marketing in developing countries has generally found that when growth in product demand and supply is relatively slow, the marketing process is relatively efficient in transferring price information and incentives between consumers and producers (34). However, in situations characterized by rapid progress in production technology and/or rapid expansion in product market demand, (because of increased incomes, population pressure, growth in urban areas, etc.) traditional marketing systems do not have the capacity to efficiently respond to the needs placed on them. Under such conditions, the inelastic supply of marketing services are found to represent a serious constraint on the response of agricultural producers to new production and market opportunities.

In contrast to product markets, which have had a long history of evolution in developing countries, the input markets are unorganized and often nonexistent. Input markets are found to be unorganized or nonexistent because farmers historically undertook to provide their own

seeds for planting and maintained soil fertility by compost, manure and crop rotation. In order to increase production, however, farmers are expected to rely on purchased inputs, such as fertilizers, chemicals, new seeds and equipment. Yet, traditional product marketing systems cannot be easily modified and encouraged to handle these modern inputs so that they are available at the time, place and in the form to be of most benefit to the farmer. Furthermore, marketing infrastructure in developing countries frequently suffers from a lack of investment because it is not profitable for the individual buyer or seller to invest in marketing activities whose unit costs to the individual are high and whose gains are lost to others; examples include docks, roads and information systems. It will become clear below that the agricultural marketing system in Haiti is characterized by these and other problems not uncommon to developing countries. Hopefully, an understanding of the nature of these problems in Haiti will yield a means of resolving them.

Consumption Characteristics

While other chapters in this series focus on the level and distribution of income, population, employment, etc., it is nevertheless, useful to briefly review in an aggregate manner those consumption, production, market and foreign trade characteristics which are important for putting the Haitian marketing process into perspective. The consumption-production characteristics of Haiti reflect relatively high changing population densities and small dispersed production units, with generally poor access to regional and urban marketing centers.

The Haitian census of 1971 calculated the total population to be 4,314,628, with a net population annual growth rate of about 1.6 percent based on the 1950 census. Changes in the spatial distribution of population is toward the major urban population areas. Approximately 88 percent of the population resided in rural areas in 1951. This percentage dropped to 80 percent in 1971 (Table I). While income levels and distribution estimates are notoriously approximative at best, in the case of Haiti they, nevertheless, suggest that a large percentage of the population are indeed poor. For 1970, IBRD estimates (36) that about 87 percent of the <u>employed</u> population had income levels below $240 per year, with about 58 percent of employed urban workers and 92 percent of employed rural workers earning less than $240 per year. Ministry of Agriculture estimates of disposable income for 1975 are $385 for urban residents and $96 for rural residents. Although the 1970 and 1975 income estimates are not directly comparable, they nevertheless suggest that incomes are increasing, yet remain among the lowest in the western hemisphere.

TABLE I

POPULATION AND INCOME AGGREGATES, HAITI

	Population[a/] Distribution		Active[a/] Population Reporting Income Less Than $240/Yr.	(In US$)[a/] Per Capita Disposable Income Nominal		Income[b/] Spent On Food
	1950	1971	1970	1970	1975	1970
	Percent		Percent			Percent
URBAN	12	20	58	90	385	43
RURAL	88	80	92	55	96	54
NATIONAL	100	100	87	63	162	50

Source: a/ Clarence Zuvekas

b/ Current Economic Position and Prospects of Haiti, IBRD, Vol. II., 1976.

Data on dietary characteristics suggest that the Haitian diet is composed primarily of the cereals corn, sorghum, rice and wheat, with daily caloric intake estimates ranging from 1,105 to 2,450 calories. The majority of estimates, however, fall into the 1500 calorie per day range (10). In a recent socio-economic survey (45), 79 percent of those interviewed reported consuming cereals each day, 4 percent reported consuming leafy vegetables and legumes each day, while only 1 percent reported consuming meat and 12 percent reported other foods. Per capita consumption estimates are provided by FAO (29) and, as in the case of the above mentioned estimates, are only approximative at best. These estimates, in Kg per capita per year are: corn, 29.0 Kg; sorghum, 19.0 Kg; wheat, 6.0 Kg; rice, 9.0 Kg; beef and veal, 2.7 Kg; chicken, .7 Kg; and other meats, 4.6 Kg.

These population, income and dietary characteristics have important implications to the marketing system. First, they suggest that spatial shifts in population toward urban areas, along with increases in income in these areas, are likely causing an increase in the volume of goods and services that traditional marketing channels must direct toward these areas. Second, the low absolute level of income suggests that goods, rather than services, such as processing and packaging, dominate marketing channels. Third, low per capita income levels with a large portion of income spent on food (Table I) also suggest that food price decreases and/or income increases will likely bring substantial percentage increases in demands for goods and services supplied through the marketing system.

Production - Market Characteristics

The value of total agricultural production is estimated by the IBRD (36) to represent about 45% of Haiti's GDP in 1975 and, for the periods 1971-75 has experienced a growth rate of about 1.2 percent.

Only about 30 percent (1,306,547 ha) of the total land area in Haiti is suitable for cultivation, of which approximately 5.4 percent are alluvial plains and suitable for irrigation. However, only about 46 percent of the area in alluvial plains is irrigated. Relative to other Latin American countries, land holdings appear to be more evenly distributed, although the extent of state land holdings is conjectural (10, 59). While census data on land under cultivation and land distribution is biased in favor of small holdings, (58), estimates of land holdings based on this data suggest that about 90 percent of the farmers occupy over 62 percent of the arable land and that the largest land holding in this category is about 2.3 ha.

The estimated area planted to the various crops appears in Table II for 1973. Area estimates are not available for other years and no regional estimates are available. Various estimates of yearly production of agricultural products appear in Appendix Table AI for the years 1970-76. Various estimates of the yearly exports of agricultural products appear in Appendix Table AII for the years 1970-76. As implied by the above mentioned dietary characteristics of the Haitian population, the major food crops produced are cereals, where corn and rice together account for about 70 percent of the value of cereals produced in 1973 (Table II). The value of agricultural crops produced for export

TABLE II

ESTIMATED AREA, PRODUCTION AND YIELD PER HECTARE

FOR PRINCIPAL CROPS, HAITI, 1973[a]

CROPS	AREA Ha	AREA Percent of Total	PRODUCTION T.M.	VALUE Millions of U.S. $
Millet	219,368	19.0	215,200	7.6
Beans	82,384	7.0	42,840	12.8
Corn	238,850	20.0	252,000	24.7
Bananas	86,550	7.0	191,000	14.3
Rice	39,000	3.0	82,620	18.5
Vegetables	2,114	0.1	-	-
Potatoes	230		1,400	
Onions	450		2,244	
Cabbage	1,042		6,345	
Lettuce	100		312	
Eggplant	94		936	
Tomato	198		2,965	
Coffee	132,800	11.0	33,290	22.6
Cocoa	10,220	0.9	3,300	1.7
Sugar Cane	82,600	7.0	4,900,000	12.0
Coconut	-	2.0	-	-
Cotton	22,328	2.0	5,396	1.0
Others	253,786	21.0	-	-

Source: Plan Quinquennal du Secteur Agriculture, 1976-1981, DARNDR, Port-au-Prince, Haiti, IBRD.

[a] See Appendix Table AI for volume estimates of the production of selected agricultural commodities 1970-76.

(dominated by coffee, sugar isal) amounted to approximately 38 percent of the crops produced for domestic consumption. Traditional production methods are universally employed with little or no use of purchased chemical and biological inputs.

The above mentioned agricultural production characteristics have three important implications to the marketing process. First, dispersed production and small producing units generally require complicated input and product sale and assembly systems which tend to be labor intensive, and to function effectively, require substantial information flows because of the large number of decision makers involved. Second, agricultural production systems composed of a large number of producers invariably result in a wide variation in the quality of the products produced and sold. Third, the production of both domestic and export crops often requires a dual marketing system, one based on traditional channels, the other based on more modern or direct marketing channels; the first of which may face efficiency problems and the second may face problems of imperfect competition. A brief description of Haitian markets, the "connecting link" between consumers and producers, concludes this section.

There are two basic categories of markets in Haiti: public markets and internal markets. Prior to September, 1974, all goods sold in public markets were taxed. This encouraged more "private" sales between producers and middlemen, among middlemen, and between final consumers and suppliers, which gave rise to internal markets. The

before and after tax effects on marketing is unknown, although an increase in the level of activities in public markets is reported to have occurred (30).

Information on the nature and characteristics of Haitian public markets is available in several regional (28,33, 57) and one national study (48). The national study occurred after the public market tax was abolished and is based on an intensive survey covering 70 percent of Haitian public markets. All of these markets are locations, cities, villages and small towns where transactions occur. The markets surveyed, by type, are reported in Table III.

Regional markets are classified as those markets where the majority of sales are between producers and intermediaries. These markets can be found in intermediate sized cities, such as Croix-des-Bouquets and Pont l'Estere. These markets are generally found on the major routes, but not necessarily in the vicinity of the larger urban markets. They serve the function of assembling points for goods obtained in semi-rural markets. Semi-rural markets are, of course, markets found in rural areas where, according to La Gra, et.al., transactions are almost exclusively between local producers and consumers. Figure I provides an impression of the spatial distribution of these markets. Within this context, the Haitian agricultural marketing system can now be presented in more detail.

TABLE III

PUBLIC MARKETS SURVEYED

BY REGION AND TYPE, 1975

	North-west	North	Artibonite	West	South	Total
Number	37	82	69	206	125	519
Type						
Regional	6	5	10	19	19	59
Semi-rural	29	75	57	163	102	426
Urban	2	2	2	24	4	34

Source: LaGra, Guy Fanfan and Wesner, Charleston, Les Marches Publics d'Haiti, IICA, Document 31, 1975

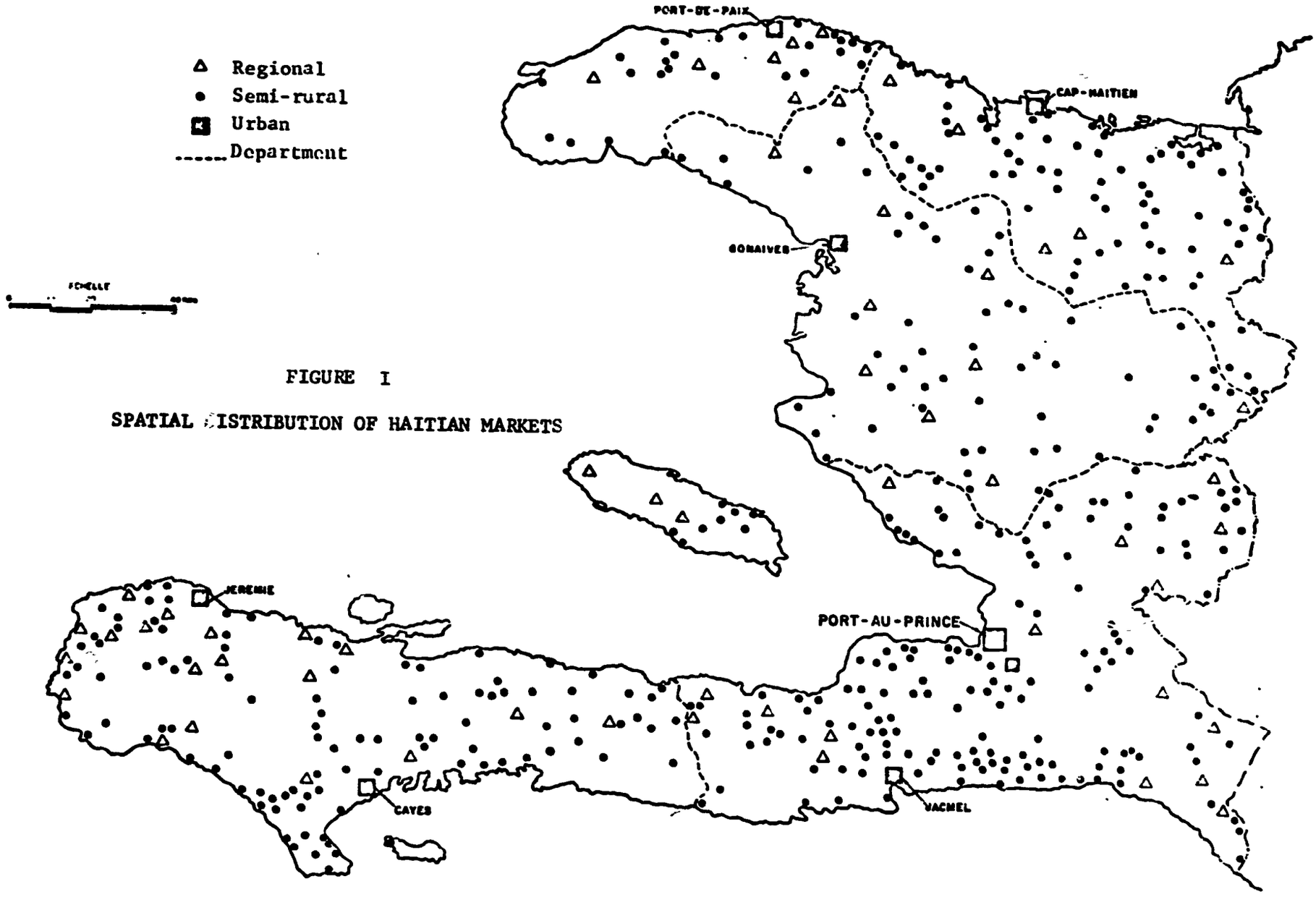


FIGURE I

SPATIAL DISTRIBUTION OF HAITIAN MARKETS

III. MARKETING CHANNELS FOR DOMESTICALLY PRODUCED AND CONSUMED AGRICULTURAL COMMODITIES

Food Grain Marketing

The marketing of the major food grains, beans, rice, corn and millet, will be considered in this section. Those production, harvesting and product perishability characteristics that have important implications to producer marketing decisions and activities are discussed first. Then, the sale of the grains of the farm level is discussed in general and as it relates to the four major food grains in particular. Next, the activity of middlemen and their importance in the system are presented. The section is concluded with a description of the various retail markets and their role on influencing marketing activity.

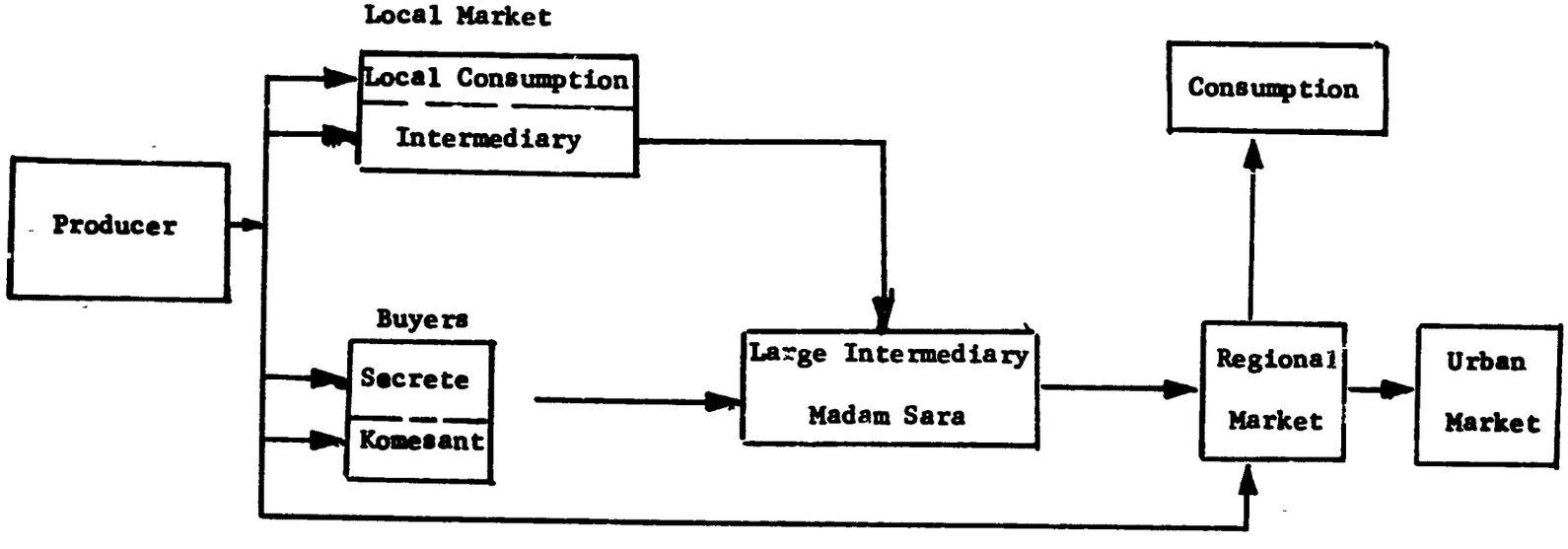
Farm Level Food Grain Marketing Activities: The major area of rice production is the Artibonite. Rice is harvested nearly continuously throughout the year and is seldom stored for more than six months (27). Among the four crops in this group, rice is the easiest to store with the least likelihood of loss from pests and damage from humidity. Rice is milled by hand after sun drying. Head rice and broken kernels are consumed by the household, while rice bran is generally used for animal feed. Each of the other three grain crops is produced and harvested seasonally (harvest occurring during the period of December - late February) which gives rise to storage and seasonal price variation (11).

Indigenous storage methods for corn and sorghum heads are bundles of husk-protected ears suspended by wires, ropes or poles attached to or supported by trees. Portable storage bags made of palm leaves, baskets and, less frequently, 55 gallon drums, are used to store grains in the family living quarters (11). Millet is frequently stored up to 10 months (31), while the storage periods for corn and beans are approximately 6 months and 7 months, respectively. Rats cause the most damage to all grains. except beans (due to its short storage life), which are more susceptible to damage from mildew and insects (11). Beans are the riskiest of the four crops to grow because of their sensitivity to drought, salinity, wind and storage problems. Nevertheless, beans are considered by farmers to be a major and cash crop (35).

The marketing of beans at the farm level was studied in considerable detail by C. Murray and M. Alvarez (52) in the Cul-de-Sac plain. The marketing activity in this area is reported to be typical of food grain marketing activity in other areas of the country (30). As depicted in Figure II, the typical producer has three possible classes of buyers for his beans: local consumers, regional markets and local buyers. In rare cases, he is reported to sell directly to local consumers in the semi-rural markets. This channel is generally not preferred because newly harvested supplies tend to saturate local demand, thereby depressing local prices. His second alternative is to sell to intermediaries in regional markets. In this case, the farmers wife generally transports the beans to the regional markets and arranges for the sale. The third

FIGURE II

BEAN MARKETING CHANNELS AT THE FARM LEVEL



alternative is to request the services of a local buyer. There are two types of local buyers, both of which will come to his home to collect the beans. The first type of local buyers, referred to as komesant, either purchases beans with his own capital or takes the beans on consignment from the farmer. The komesant generally markets the beans in regional markets or sells directly to the second type of local buyer. The second type of local buyer is referred to as secrete. The secrete is an assistant to another intermediary, is advanced capital by them and performs the function of assembling supplies. The literature on Haitian markets refer to these other intermediaries as "Madam Sara" (51). The Madam Sara intermediary specializes in the wholesale-retail portion of the marketing channel. Before discussing her role in the marketing process, attention is focussed on the farm level marketing of the other food grains.

The komesant is, generally speaking, a "free lance" buyer-seller. In some cases he performs the role of arbitrage between the farmer and other intermediaries, while in other cases he simply earns a fee for fiding a buyer willing to offer a competitive price. In stature or position he is socially ranked below the secrete.

The secrete is a specialized purchaser and assembler of food grains at the farm level whose service to the marketing process and importance to the Madam Sara lies in his knowledge of local production and supply conditions. While data on the volume of sales entering each of the three

major market channels at the farm level are not available, Murray and Alvarez (52) and others (17, 30) report that more than half the beans the producer sells are to these two types of buyers.

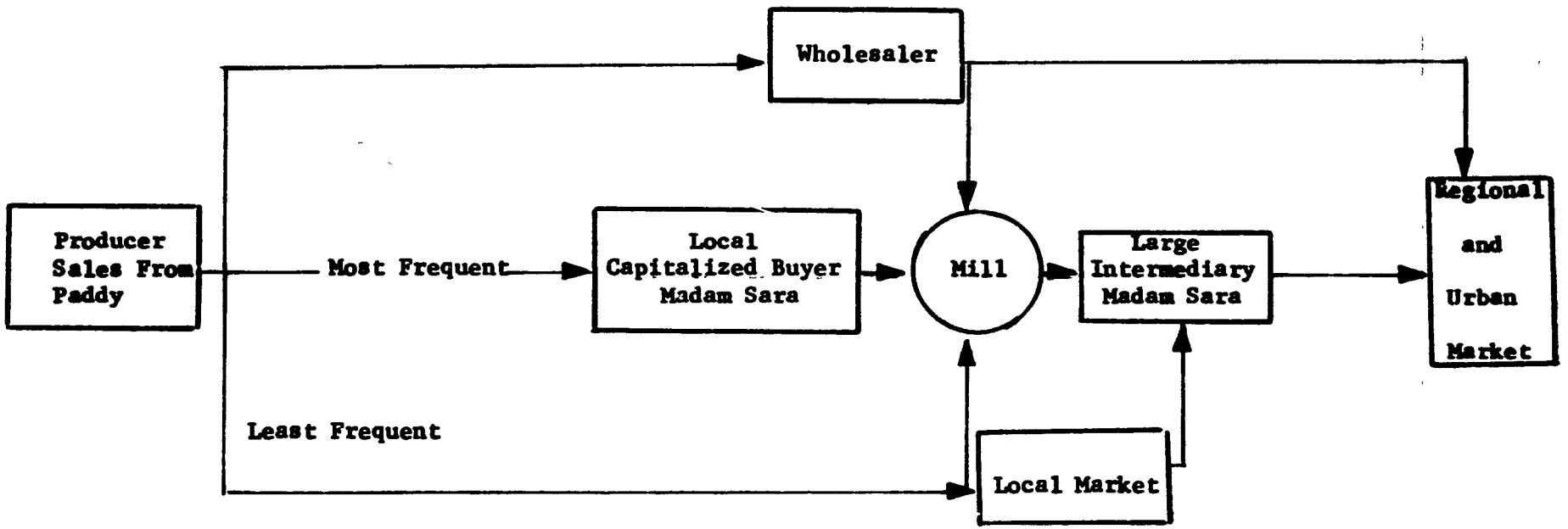
Marketing arrangements for rice at the farm level represent the other extreme in marketing the four major food grains. The buyers of rice are different agents than the secrete and in many ways resemble either the komesant or the less capitalized and mobile versions of the Madam Sara intermediary. Consequently, Locher (50) refers to these intermediaries as the local Madam Sara. The alternative ways of marketing rice at the farm level are depicted in Figure III.

The most frequent form of sale is where the local Madam Sara, upon inspecting the paddy, buys the rice while it is still in the paddy, but near the point of harvest. This local Madam Sara also harvests the rice. The next most frequent form of sale is directly to a wholesaler. In this case, the rice is generally harvested by the farmer. The wholesaler is frequently a local rice mill owner and operator. In the case of the Artibonite, he is occasionally a wholesaler from relatively near-by Port-au-Prince and deals in larger volumes.

As in the case of beans, competition among buyers at the farm level is reported to be intense (30). The local Madam Sara is reportedly able to compete favorably with the wholesaler, not only because she is willing to harvest the rice, but also because she accepts risk on her estimate of yields, provides the farmer with cash sooner than can the wholesaler and, if competition becomes intense, she bids on the rice earlier in the growing season. Given these two competitive alternatives,

FIGURE III

RICE MARKETING CHANNELS AT THE FARM LEVEL



farmers infrequently harvest their own commercial (i.e., beyond household consumption needs) rice or directly incur the milling, transportation and other marketing costs.

A possible "bottle neck" in the farm level marketing system could be the number and capacity of mills (29). Unfortunately, no data exists on mill numbers and capacity. Based on conversations with SENACA officials, rice milling costs, (i.e., costs for hulling the rice), are in the vicinity of 5-6 cents per marmite (about 5.5 pounds) with no apparent constraints on milling capacity.

No studies focussing exclusively on the farm level marketing channels for corn and millet in Haiti exist. Remarks by Girault, et. al. (30) and Sorenson and Chung ((53) indicate that corn and millet marketing at the farm level resembles both that of beans and rice, except that the grain is not typically purchased from the farmer until after it is harvested. They also indicate that competition for corn and millet at the farm level is intensive. It appears that in the case of corn and millet, the local Madam Sara faces more intensive competition from the wholesaler than in the case of rice. In the next section wholesale-retail food grain marketing channels are discussed.

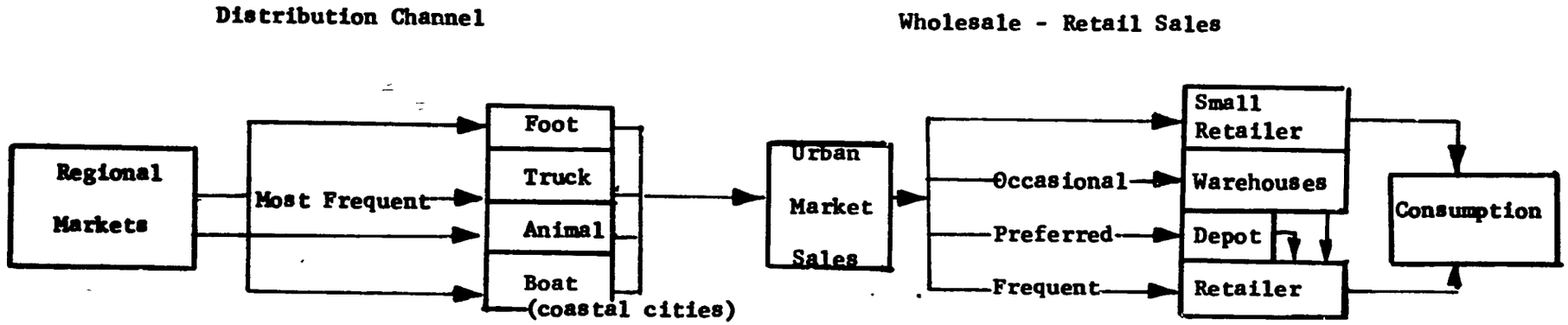
Wholesale-Retail Food Grain Marketing Channels: In this section, the market channels for food grains are traced through to the urban markets and final consumption, Figure IV. The movement of food grains between the regional public and internal markets to the urban markets tends, at this point, to converge, i.e., the channels are not product specific as they are in the case of the channels between producer and intermediary. The key agent in this channel is the female intermediary, referred to above as Madam Sara. The typical Madam Sara operates on about $200 to $500 of capital and often transports in the neighborhood of 1,000-1,600 pounds of produce between regional and urban markets, and to a lesser extent among regional markets (30). By focussing on her activities, the important features (transportation, risk bearing, price discovery, information flows, etc.) of the channel can be presented.

Evidence (18,47) indicates that between the regional and urban markets the majority of intermediaries transport food grains by truck. This requires the establishment of relationships with truck owners. Transportation costs are reported to range between 4-6 percent of the value of food grains carried, depending on the route, distance and the type of food grain transported. In the case of Port-au-Prince, Duplan and La Gra (47) report that 83 percent of <u>all</u> agricultural products arrived by foot or animal and 14.09 percent arrived by boat.

The Madam Sara intermediaries are reported to generally specialize on a single route and grain. Her strategy appears to be based on the establishment of a series of close marketing relationships with regular customers and to develop a thorough knowledge of the marketing activities

FIGURE IV

FOOD GRAIN MARKETING CHANNELS BETWEEN REGIONAL AND URBAN MARKETS



and alternatives associated with the route. Although the typical Madam Sara is reported to specialize in a single product, she is known to diversify in times of scarcity to include other products. Also, she frequently makes "back hauls" of non-agricultural products to the area markets from which she obtains her product supplies.

There are three basic types of dealers in the urban market who purchase from the Madam Sara intermediary (Figure IV). These are (a) warehouse owners who sell to other retailers or directly to consumers, (b) retailers who sell only to consumers and (c) small street traders who sell to consumers and other retailers. Although no volume estimates are available, it appears that the Madam Sara prefers the depot, a storage facility where, for a fee, she can store her product for a short period (1-3 days) and sleep there if necessary (30).

At the moment of her arrival, the Madam Sara is reported to frequent the retail markets in the area to ascertain the retail price of her product, aware that she needs this information in order to negotiate a good price with the buyer of her product. The preference for the depot storage is allegedly to allow her time to seek the best possible price, or frequently, to wait for favorable price changes in the market (57). On other occasions, she may sell directly to a warehouse owner who then sells to a retail outlet. However, the majority of sales appear to be either to retailers via the depot or directly to retailers.

The price risk faced by the Madam Sara intermediary in this arbitrage activity is apparently substantial, since the period required from the time her buyers, the secrete, assemble the grain and she returns from the urban market can expand to a period of three to four days. Murray and Alverez (52) report that occasionally, when the Madam Sara arrives at the retail market, she finds the retail price to be less than the price she paid for the product.

Estimates of the marketing margins for food grains have not been made. However, in the case of the bean study, the authors report that based on their observation the gross margin between producer and final consumer for beans was in the neighborhood of about 25%, with the Madam Sara earning a return of about 10 percent. While the evidence, largely descriptive, suggests that there is a great deal of competition in these labor intensive marketing channels, no quantitative estimates of the margin are available.

Table IV reports the simple (unweighted) average monthly prices for the four basic food grains in regional, semi-rural and urban public markets over a period 1971-74. Considerable caution should be exercised in interpreting the price differences in these markets as marketing margins because of possible spaital demand shifts, storage and spatial product transfers. Because of these factors, the price difference reported in Table IV biases the magnitude of the marketing margin downward. Nevertheless, the price differences are generally higher in the urban (retail) than in the regional (wholesale) market

TABLE IV

SIMPLE AVERAGE MONTHLY PRICES AND PERCENT DIFFERENCES

BY FARM LEVEL, WHOLESALE AND RETAIL MARKET

FOR SIX SELECTED PRODUCTS, 1971-74

	TYPE OF MARKET				
Product	Regional Dollars	Percent Difference Regional-Urban	Urban Dollars	Percent Difference Semi-rural Urban	Semi-rural Dollars
Rice	1.254	- 2	1.226	4	1.182
Millet grain	.319	12	.359	15	.312
Millet ground	.392	9	.428	- 6	.456
Corn grain	.332	3	.343	-13	.392
Corn ground	.412	5	.434	11	.392
Red Beans	.888	1	.900	2	.880

Source: Johnson and LaGra

(with the exception of rice). Comparisons between the rural and farm level market prices, however, appear to be meaningless. In any case, the wholesale-retail comparison seems to support contentions that the food grain marketing channels are reasonably efficient. Price relationships between urban and farm level markets are described in more detail in Section VI.

Marketing of Vegetable Crops

The marketing of vegetables is made difficult by their perishability. In countries where swift transportation, refrigerated trucks, warehouses or vegetable processing facilities in the vegetable growing area are non-existent, the spatial marketing area for these perishable crops is limited by the extent of urban markets. The addition of seasonality in production further complicates the profitable production of the more perishable vegetables, since they must be marketed soon after harvest when the market tends to be well supplied, causing depressed prices within an already limited spatial market area. Or, from another perspective, the development of improved and efficient marketing channels and market infrastructure tends to increase the profitability of vegetable crop production, encourages multiple cropping, encourages the production of otherwise more perishable vegetables, and increases the spatial dimension of the market area.

Sources of information which focus on the marketing of vegetable crops in Haiti is limited to Dorville (12), Lambrechts (49) and to a lesser extent, Mintz (57). Cabbage, onions and potatoes account for over 80 percent of total area planted to vegetable crops (Table V). The principal vegetable production areas appear in Figure V. The most important areas of production are Kenscoff and the valley of the Artibonite, both in close proximity to major urban markets. Production tends to be seasonal in the valley areas (October - February), while multiple cropping is common in the mountains. According to Dorville

TABLE V

ESTIMATES OF NATIONAL PRODUCTION

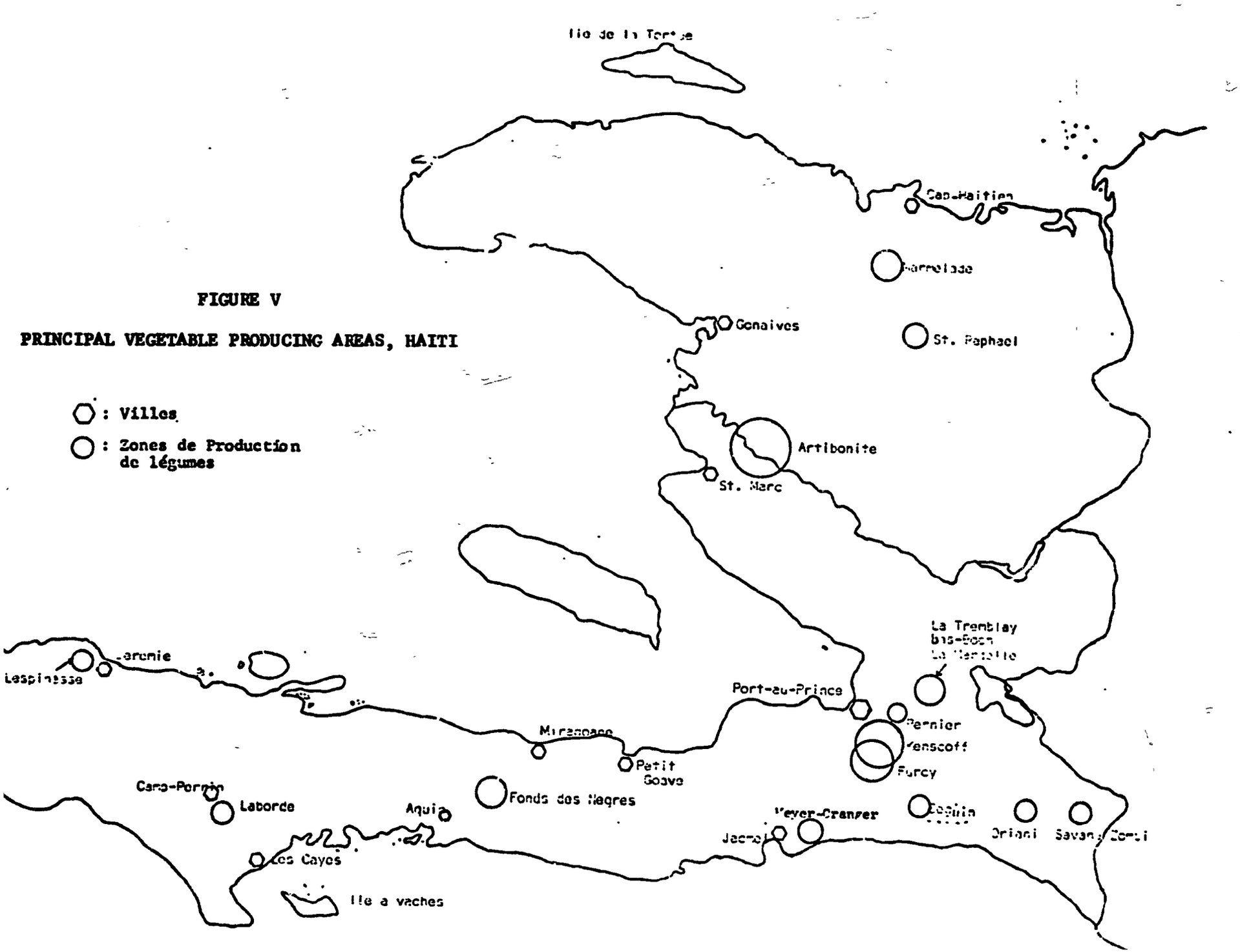
OF MAJOR VEGETABLE CROPS, 1971-1973

Product	1971		1972		1973	
	Ha. Area	M.T. Production	Ha. Area	M.T. Production	Ha. Area	M.T. Production
Potato	230	1.400	230	1,400	340	1,400
Onion	440	2,200	440	2,200	450	2,244
Cabbage	1,000	6,000	1,020	6,240	1,042	9,344
Lettuce	100	300	120	306	104	312
Eggplant	90	900	91	918	94	936
Tomato	190	2,850	194	2,907	198	2,965

Source: Dorville

FIGURE V

PRINCIPAL VEGETABLE PRODUCING AREAS, HAITI



the major factor limiting production in the mountainous region of Kenscoff are inclinations in the range of 30° or more due to errosion and the need to build terraces.

The far majority of vegetables are, naturally, consumed fresh. The exception being tomatoes, where a plant located at Port Sonde (Artibonite) processes a small percentage of the tomatoes into tomato paste. The plant operates about 5.5 months per year. Estimates of total annual per capita consumption of legumes are 43 Kg. (3). However, these estimates must be viewed with caution since they are based on production estimates and no account is taken of differences in urban-rural consumption levels.

The marketing channels for vegetable crops are, generally speaking, less complex than the marketing channels for food grains. A major percentage of the vegetables are marketed by the members of the producers family and sold directly to retailers. Smaller percentages are sold through local Madam Saras. With perhaps the exception of potatoes and dried onions, no effort on the part of producers or middlemen is made to store vegetable crops. Distances shipped are short, with little transshipment through regional markets, Figure V . Also, the close proximity to urban markets and small volumes marketed tends to "shorten" the marketing channels, which enables the producer's wife and other family members to undertake marketing activities.

Based on a study by Duplan and La Gra (18,47) some insights into transportation modes for vegetable crops can be obtained (Table VI).

TABLE VI

QUANTITIES (lbs.) OF VEGETABLES TRANSPORTED FROM THE KENSCOFF REGION TO PORT-AU-PRINCE DURING TWO DAYS, 1974

Product	Large Truck	Medium Sized Truck	Small Truck	By Boat	Animal	Total
Potatoes	5,573	8,645	10,040	5,137		29,395
Tomatoes	120	6,960	2,785	1,945	120	11,930
Cabbage	2,047	11,580	12,167	3,048	36	28,878
Other	26,967	80,462	68,005	45,448	3,842	234,324
Total	34,707	96,647	92,997	56,178	3,998	284,527

Source: Duplan and La Gra, 1975.

The major quantity, 79 percent, of the vegetables arrived by truck, while 21 percent arrived by foot and animal. However, as pointed out by Duplan and La Gra, these data include produce that arrived by trucks which also carry passengers. That is, a family member carrying vegetables to market, upon reaching a major road, will travel the remaining distance by truck. While the importance of the Madam Sara is believed to be less in vegetable marketing activities than in the case of food grains, her activities have not been studied to the extent that they have in the latter.

Dorville attempted to obtain some insight into the marketing margin for vegetable crops marketed by non-family members. Based on a small sample of producers in the Kinscoff area, he obtained farm level prices, the price obtained by the Madam Sara, and price obtained by the retailer of the producers' vegetables. From these data, he determined the percentage of the final (retail-consumer) unit price accruable to the producer, Madam Sara and retailer (Table VII). Caution must be exercised in the interpretation of these data in terms of economic efficiency, however, since no estimates of costs for transport, spoilage, etc., are included. Nevertheless, a margin between the farm level and wholesale level in the range of 20-30 percent of the retail price does not appear excessive when viewed in light of the margin, a bit lower, obtained for cereals (see previous section) which are less costly and perishable to transport.

TABLE VII

PERCENTAGE OF RETAIL-CONSUMER PRICE ACCRUABLE

TO PRODUCER, MADAM SARA AND RETAILER

BY TYPE OF VEGETABLE, 1975

Product	Producer	Madam Sara	Retailer
Potato	60	25	15
Cabbage	60	30	10
Carrots	75	20	5
Onions	75	20	5

Source: Dorville, 1975

Vegetable marketing inefficiencies may exist at the retail level. These inefficiencies may arise because of spoilage in the retail market. However, there is no "solid" evidence to indicate that this is the case. From La Gra, Fanfan and Charleston's study of Haitian public markets (48), a large percentage of the markets were found to be uncovered (Table VIII). This suggests that perishable products may suffer exposure to the sun and deteriorate more rapidly. Discussions with IICA and SENACA officials and casual observation supported this possibility. The 5 to 15 percent retail margins (Table VII) tend to further support this view in light of the simple retail structures (Table VIII).

TABLE VIII

CHARACTERISTICS OF PUBLIC MARKETS IN HAITI, 1975

Type of Structure	North West	North	Arti-bonate	West	South
Enclosed	2	3	1	5	0
Partially Covered	2	2	4	7	3
Fixed Walls	4	34	15	98	45
Mobile Walls	6	4	16	18	19
Street Vendors	23	39	33	78	58
TOTAL	37	82	69	206	125

Source: La Gra, et. al.

Livestock Meat Marketing

Beef and veal are more commonly consumed in the Haitian diet than is poultry. However, the typical diet is deficient by about 25% in protein consumption requirements (2). Given these low levels of consumption, the demand for meat can be expected to increase sharply as income increases. Among the agricultural products produced, the Haitian livestock (cattle, sheep, goats, swine, poultry) subsector is perhaps the least developed. The largest Haitian cattle producing areas are in the Northern plains, the Seguin Plateau, the Central Plateau, the Cayes plain and the Cul-de-Sac plain.

Livestock numbers reported in the Haitian census for 1950 and 1971, and numbers slaughtered, appear in Table IX. Cattle and goats appear to have declined slightly between 1950 and 1971, while sheep have approximately doubled in number. Haitian farmers typically raise one to three head of cattle in addition to a few goats, pigs and chickens. No fencing or quarters are generally available for the animals; instead they forage for available feed, frequently from ropes attached to trees and stakes. Breeds of cattle (Creole) and hogs (Cochon Planche) have evolved over time into disease resistent strains, but otherwise are of poor quality with low productivity. Malnutrition and undernutrition are generally seen in all species (32). Furthermore, there are frequently too many males.

As in many countries, livestock appears to serve the purpose of a "savings bank" to the typical Haitian producer, and is traded depending on a farmers need for liquidity. For instance, Murray and

TABLE IX

SELECTED LIVESTOCK ON HAND AND SLAUGHTER

HAITI, 1950, 1970-1973

	Number On Hand 1950	Number On Hand 1971[a/]	Number Slaughtered[b/] 1970	1971	1972	1973
Goats	890,056	842,602	18,003	19,115	13,923	15,440
Sheep	51,783	105,503	381	405	99	110
Swine	1,136,057	1,140,643	40,188	42,760	23,370	25,917
Poultry	3,758,519	4,164,120				
Cattle	669,272	636,737				
Cows			7,882	8,386	5,353	5,936
Bulls			26,955	28,680	18,660	20,694

a/ IHS (1955; 1975b)

b/ Guide Economic de la Republic d'Haiti, IHS.

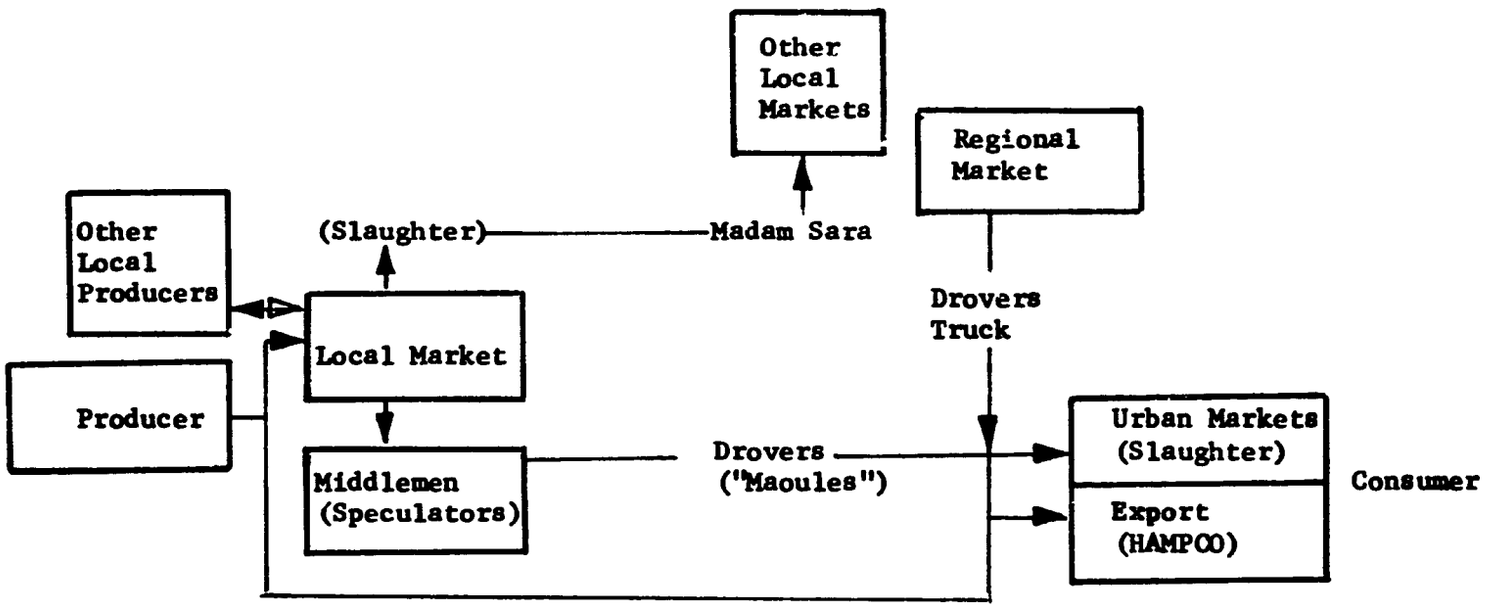
Alvarez (52) found that when a Madam Sara is forced to withdraw from commerce, the most common reason being the birth of a child, the capital she used for trading is invested in livestock. Upon re-entering commerce, the animals are sold to retrieve her operating capital.

A diagramic description of the major marketing channels for cattle, sheep and goats is provided in Figure VI. This diagram is based on discussions with Ministry of Agriculture officials, the JWK International Corporation study (43), and several regional studies (6, 19, 46). It should be emphasized that no study of Haitian livestock marketing channels per se is known to exist. Typically, farms appear to choose one of four farm level marketing alternatives. The producer can choose to sell the animal in his local market, slaughter the animal and sell the meat, sell to middlemen, or sell directly to urban markets. The majority of cattle sold in local markets are sold to middlemen (speculators) and less frequently to local farmers and local butchers.

The animals purchased by local butchers often exceed their needs for local sales. Since cold storage facilities are not available, a local Madam Sara will often purchase the excess supplies and transport the meat to other nearby local markets. Speculators arbitrage regional markets. Animals are generally transported on hoof to urban markets and are slaughtered at the site. The number of animals purchased by the speculator typically ranges from two to ten. The trip to market generally lasts from 5-6 days (30).

FIGURE VI

MARKETING CHANNELS FOR LIVESTOCK



Direct sales by producers are less frequently made in urban markets and slaughter houses. Occasionally, producers in the vicinity of urban markets will contact and sell directly to owners of restaurants and hotels. In the case of poultry, not depicted in the diagram, sales in excess of local consumption are sold to the Madam Sara. The Madam Sara transports from 3 to 15 dozen birds through regional and urban markets in a manner presumably similar to food grains. Chickens are sold live to either retailers or directly to consumers.

The transportation of animals on hoof is reportedly because of the poor roads and/or lack of roads in many rural mountainous areas. In areas accessable by good roads, the transportation cost is about 1-2¢ per kilometer per head. It is reported by the JWK study (43) that the construction of a newly surfaced road from Estere to Port-au-Prince practically eliminated drovers from this route. Given the weight loss occuring when animals are transported on hoof instead of truck, road improvement may have resulted in lower marketing costs.

Since no scale facilities exist (with the exception of HAMPCO's facilities) prices are based on the buyers experience and judgement of an animal's overall quality and, in the case of slaughter, meat yield. Slaughtering facilities are not automated. They process any animal offered without regard for age or sex, although age and sex affect price premiums and discounts.

A study of Cap Haitian retail markets reveals some details of the slaughtering and sale of meat (57). This study found that slaughter occured under unsanitary conditions with only a few enclosures for live animals awaiting slaughter. Meat scraps, tripe and heads are sold at the place of slaughter. The remainder of the meat is quartered and purchased by retailers, generally for sale in another nearby market under more favorable conditions. In this market, the quartered meat is often hung from the hock. Customer sales are in terms of a morsel at a time from the quarter, or from a stack of morsels cut and placed on the retailer's counter. No apparent attention is given to classification by weight or quality.

Most of the meat sold in Haiti, as in the case of the Cap Haitian market study, is fresh and unpackaged. The stocks of fresh meat are subjected to flies and constant consumer handling. With the exception of the larger tourist hotels, very little meat is refrigerated, although some meat is cured by drying. In this case, the meat is dried by placing it in the sun, untreated to protect it against decay.

The Haitian American Meat Company (HAMPCO) accounts for the majority of Haitian meat exports. HAMPCO was awarded monopoly rights on all meat slaughtering in the Port-au-Prince zone. The company reportedly exports an average of about 5,500 Kg of meat per day to the United States and the Carribian Islands.

From a marketing standpoint, i.e., considering the transportation difficulties and lack of infrastructure associated with meat marketing, poultry appears to be a better alternative source of animal protein than either beef, pork, sheep or goats. Since poultry is nearly always sold live to the final consumer, it avoids hygiene problems and poses no serious storage problem. However, cattle appear to play an important role as a "savings bank". Their relationship to Haitian agriculture is thus complex.

Marketing of Fruits

A large array of fruits are produced in Haiti, the most important of which are mangoes, bananas, oranges, avocados and coconuts. Mangoes are important from a nutritional standpoint as they are a major source of vitamin A. Mangoes grow naturally throughout Haiti. However, mangoes grown in the plains are generally of better quality than those grown in the mountains. The most preferred variety of mangoes, and the only variety grown commercially by a few growers, is the Frances variety, which is grown in the Cul-de-Sac area and in the vicinity of Gros Morne (Figure VII).

The major varieties of bananas are Musa Paradislaca and Musa Cavendishi. Bananas are grown on most of the plains and in the mountains where erosion is not too severe. The major banana producing area is in the vicinity of Port-de-Paix and Arcahaie.

Coconuts grow naturally on most of the coastal areas of Haiti and, as is pointed out below, they are a major source of a large array of by-products. There are two basic varieties of coconuts, an indigenous variety and an imported variety. The height of the indigenous variety ranges from 70-80 feet and requires about 7-8 years before it bears fruit. The imported variety ranges from 5-10 feet and bears fruit within three to four years.

Estimates of fruit production are rather meaningless since only a portion of the fruits grown are actually harvested and commercialized. However, estimates of mango production are in the range of 94,000 metric tons. Only bananas and coconuts are non-seasonal. Mangoes, (harvested

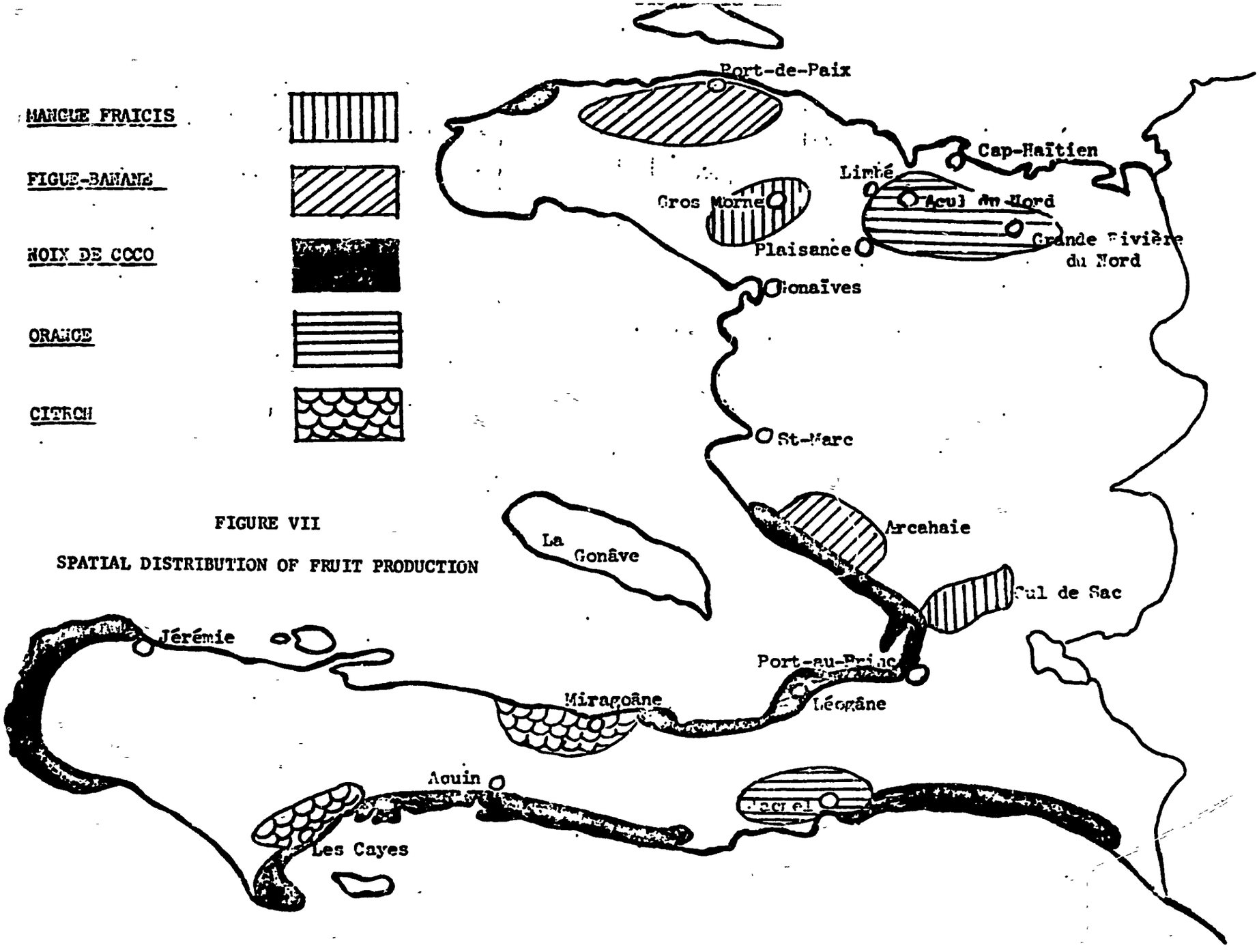


FIGURE VII

SPATIAL DISTRIBUTION OF FRUIT PRODUCTION

from April to September) and avocados are seldom found on the market out of season. Mangoes and the other major fruits are consumed fresh. Dorville (13) reports that a significant percentage of the mangoes and avocados that are not marketed are instead fed to the grower's hogs and goats.

The majority of Haitian fruits are marketed for domestic consumption, and a small percentage are exported. The majority of domestically marketed fruits, 80% (Dorville), are sold directly to the consumer in the locality where they are grown (Figure VII). In fruit deficit areas, such as the larger urban markets in Port-au-Prince and Cap Haitian, the Madam Sara once again becomes an important intermediary arbitraging spatial markets.

The Madam Sara is reported to specialize in the high volume seasonal fruits such as mangoes and avocados. She is known to employ assemblers (secrete) as in the case of food grains. However, she apparently faces competition from truckers who are sought out by growers and who are willing to pay a slightly higher price for reasons which are discussed below.

Packaging and transportation modes, as in the case of vegetables, tend to bruise and damage a large portion of the fruit. This is especially true for mangoes, oranges, avocados and lemons. For those growers who are not in the proximity of roads, fruits are transported by pack animals to the local and regional markets packed in straw sacks. This manner of transportation is also used when the fruit is purchased directly from the grower by the secrete. The fruit is then transported

by truck to the urban markets where a large percentage arrives in damaged and bruised condition (50). Truckers frequently become middlemen in this market also. They tend to select the better quality fruit, occasionally buying from the secrete, but more frequently from growers in the vicinity of the regional market. The truckers tend to use better packaging methods so that the fruit arrives at the urban market in generally better condition than the fruit assembled by the Madam Sara. The undamaged fruit carries a price premium in urban markets because of longer shelf life and consumer preference. Dorville (12) indicates, for instance, that in the case of oranges the value increases by as much as 40 percent. Consequently, as alluded to above, the trucker is often willing to offer higher prices to growers than is the Madam Sara.

The transportation of bananas and coconuts are an exception to the above transportation characteristics for fresh fruit. The transportation of bananas is government regulated. Consequently, bananas are picked green and suffer less damage from packaging and transportation activity. Coconuts, of course, are not easily damaged in transit. The majority of coconuts are transported to regional or urban markets by boat, primarily because of the lack of roads in many coastal areas.

Dorville estimated the marketing margin for fresh fruit in the Croix-des-Bouquets market. The estimate is based on a sample size of 104 and, because of quality and size differences of the fruit, it is only a rough approximation. His estimates appear in Table X. Again, it should be pointed out that these margins do not necessarily provide any information on economic efficiency since the costs of packaging,

TABLE X

MARKETING MARGINS AS A PERCENT OF UNIT RETAIL PRICE

FOR SELECTED FRUITS SOLD FRESH FOR DOMESTIC CONSUMPTION

HAITI, JUNE 1975

	Madam Sara	Retailer	Producer
Coconut	10	20	70
Oranges	25	35	40
Avocados	--	70	30
Mangoes (Francis)	28	38	34
Mangoes	35	48	17
Bananas	20	20	60

Source: Dorville

transportation, spoilage losses, etc., are unknown. The higher margins for mangoes Frances and avocados are explained by the greater distance shipped to reach this market. The low retail margin for bananas and coconuts is reportedly due to their longer shelf life characteristics.

All Haitian mangoes are exported by ASDEM, the Association of Mango Exporters, an association of about 17 exporters. This association exports about 300,000 dozen (1.5%) of the mango Frances to specialty markets in the United States by air freight. The mangoes exported are of superior quality to those marketed locally. However, the major volume of exports is accounted for by the 17 member growers of the association ASDEM. Exporters also purchase from local truckers (Figure VIII) and less frequently from the Madam Sara herself (42).

Of all the fruits, coconuts result in the largest variety of by-products. Coconut hull by-products include matting for mattresses, rugs, and brooms. Other uses are flower pots, buttons, etc. The wood of the coconut tree is also used for furniture and wood carvings.

The processing of fresh fruit is primarily to meet local demands for jams and a variety of other uses. Only one functioning plant exists for processing mangoes, and it only functions during the season when fruits are abundant.

The processing of citrus for the essential oils vitevert and lime is done in a single IDAI plant at Gonaive. Of all the export crops, these essential oil crops are the only products for which foreign exchange (receipts) have consistently and sharply (Table XI) increased

FIGURE VIII

FRUIT MARKETING CHANNELS

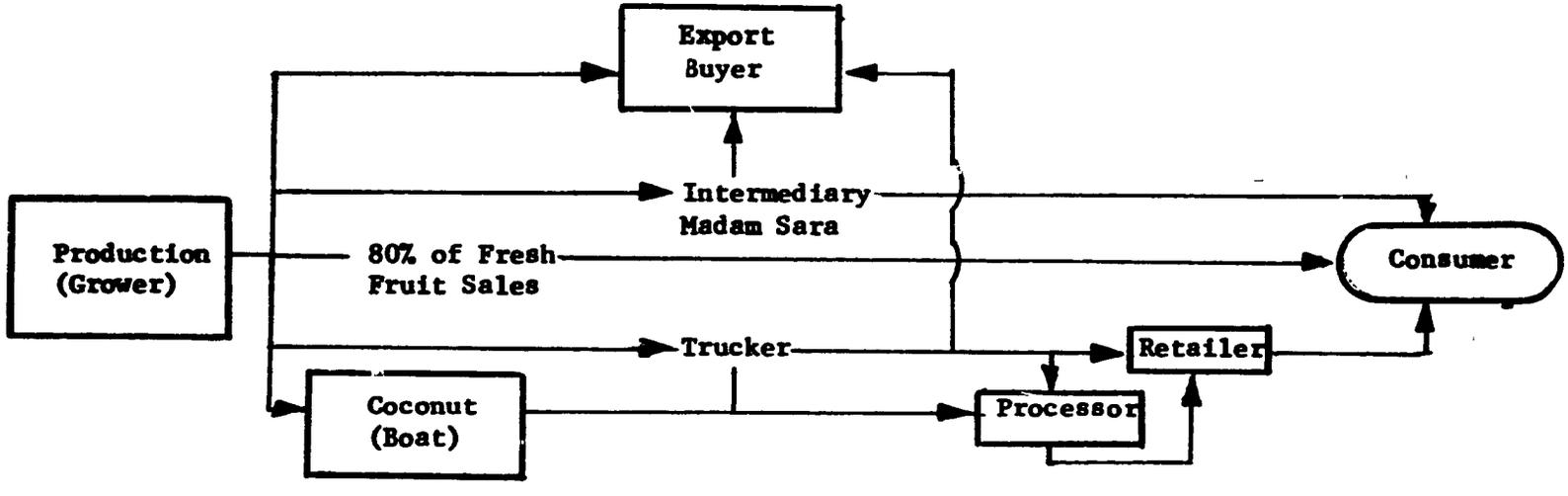


TABLE XI
SELECTED EXPORT CROPS[a]

Products	1972 Volume T.M.	1972 Value 000 ¢	1972 Percent	1973 Volume T.M.	1973 Value 000 ¢	1973 Percent	1974 Volume T.M.	1974 Value 000 ¢	1974 Percent
Coffee	18.636	78.568	37,14	19.420	103.072	40,18	18.768	119.858	33.73
Essential Oils	316	16.581	7,84	333	18.489	7.21	394	32.610	9.18
Sugar	20.685	17.024	8,05	13.715	13.152	5,13	8.038	7.660	2,15
Beef	1.367	5.310	2,51	1.140	6.732	2,62	1.058	5.930	1,67
Sisal	4.026	2.671	1,26	6.474	6.146	2,39	12.220	23.170	6,52
Molasses	23.789	2.194	1,04	21.082	3.457	1,35	20.808	5.537	1,56

Source: Plan Quinquennal du Secteur Agriculture, 1976-1981, DARNDR, Port-au-Prince, Haiti, IBRD.

[a] See Appendix Table AII for volume estimates of other exported crops for the years 1970-76.

in recent years. This is not a result of increases in production. Rather, the explanation lies in the near doubling of world market prices of vitevert and lime. These markets might continue to be favorable because world demand for soft drinks and toiletries (the essential users of these oils) should continue to grow. Clearly, the modernization of existing plants is a prerequisite to the expansion of these exports.

Cotton Marketing

Domestic cotton consumption in Haiti is estimated at about 3,000 metric tons. The Haitian textile industry absorbs the largest percentage of cotton production (21), but has remained stagnant during the last decade. This lack of growth is related to the unprofitability (at farm level prices) of Haitian cotton production and to the inability to import cotton, thereby making use of abundant low cost Haitian labor.

Cotton production declined sharply between 1920 and 1950, and since has gradually declined to about 3,150 M.T's. during the last several years (Appendix Table AI). The level of agricultural technology employed in cotton production is the same as the technology employed in the production of food grains and other crops (41) with small size holdings (1-2 ha) dominating the land tenure profile. In addition, cotton production is ravaged by insects, especially the boll weevil.

Prior to 1947, cotton was cultivated exclusively for export, which in 1937 accounted for about 17 percent of Haiti's total exports (41). The first major Haitian textile factory was constructed in 1947 (FITICOSA). A second factory was constructed in 1966 (NESDAM), at which time the Institute for Agricultural Industrial Development (IDAI) was assigned the task of promoting cotton production. IDAI established a cotton spinning mill in Gonaive in 1966 and was granted a buying monopoly. Since about 1966, cotton imports have been required to meet local demand (Table XII).

TABLE XII

IMPORTS OF COTTON AND COTTON BY-PRODUCTS

(1970-71 to 1973-74)

	1970-1971		1971-1972		1972-1973		1973-1974	
	Weight (T.M.)	Value (Dollars)	Weight (T.M.)	Value (Dollars)	Weight (T.M.)	Value (Dollars)	Weight (T.M.)	Value (Dollars)
Cotton	810.6	432,326.40	456.5	236,151.80	312.3	201,458.60	53.4	31,968.60
Cotton Thread	128.3	315,784.80	85.3	235,959.60	140.9	371,529.20	280.9	526,025.40
Cotton Material	3,203.9	4,305,157.40	2,621.9	3,239,018.00	2,373.4	2,951,224.20	2,075.0	2,722,421.00
Vegetable Oil[1/]	9,811.6	3,214,679.60	12,416.0	3,944,942.80	8,030.5	2,769,001.40	5,952.7	5,302,128.40

Source: Directory of External Trade of Haiti, 1970-71; 1971-72; 1972-73; 1973-74, Ministry of Finance.

[1/] Vegetable oil (cotton, soya-bean, olive, coconut, palm)

Cotton is purchased by one of IDAI's four major buying stations located at Gonaive, Mirebalais, Jacmel and Miragoane, where the grower is paid about 14 cents per pound, depending on quality. The Ca Soleil cotton facility at Gonaive processes the cotton assembled by the buying stations (Figure IX). This facility consists of a spinning mill, gin and an edible oil refining factory (21).

The yarn produced is sold to textile factories and craft industries, while the cotton seed oil is sold to cooking oil refineries. Cotton meal is sold back to the agricultural sector for animal feed. The textile industry produces mostly denim, the majority of which is exported to the Caribbean Islands. The denim tends to be of heavier weight than that preferred by Haitians. Other manufactured material includes cotton cloth (3.5 million yards in 1973-74), most of which was exported to the United States (Table XIII).

Both imported and indiginous varieties of cotton are used by weavers in the handicraft trade. These are the only major industries which buy, via middlemen, cotton from producers (not shown on diagram). However, the volume of cotton sold is believed to be quite small (41). The handicraft industries manufacture rugs, napkins, etc., some of which is exported, the remainder consumed locally and sold to tourists.

There is some evidence which suggests that the price paid for cotton at the farm level is lower than what the world market price for cotton suggests it should be. The world price for imported cotton fiber is about 65-70 cents per pound, depending on quality. The yield of Haitian

FIGURE IX

COTTON MARKETING CHANNELS

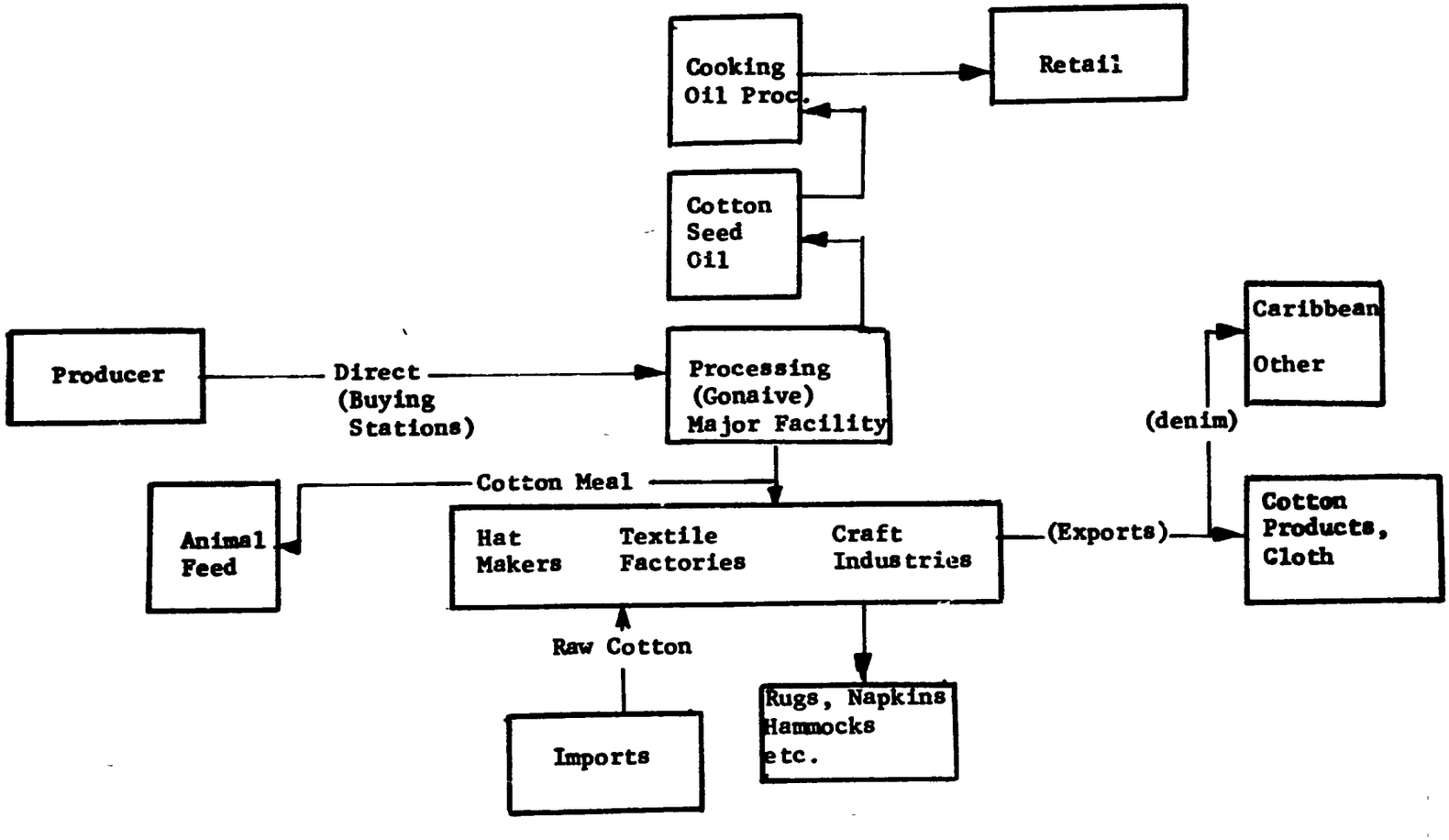


TABLE XIII

EXPORTS OF COTTON AND COTTON BY-PRODUCTS

	1970-1971		1971-1972		1972-1973		1973-1974	
	Weight (M.T.)	Value (Dollars)	Weight (M.T.)	Value (Dollars)	Weight (M.T.)	Value (Dollars)	Weight (M.T.)	Value (Dollars)
Cotton							59.9	178,586.00
Cotton Items			29.4	43,536.20	288.8	102,638.20	29.8	89,350.40
Cotton Thread					48.3	56,945.00	53.2	80,856.00
Cotton Material	46.5	56,778.00	12.3	47,980.40	78.0	212,340.80	460.7	1,398,111.00

Source: Yearbook of External Trade of Haiti, 1970-71, 1971-72, 1972-73, 1973-74, Customs Administration, Ministry of Finance.

cotton fiber from seed cotton production can be estimated by dividing reported cotton fiber production by reported cotton seed production. Performing these calculations for a series of years results in an estimate of .32 pounds of fiber per pound of seed cotton. In other words, 3.125 pounds of seed cotton are required to produce 1 pound of cotton fiber. Based on this yield estimate, IDAI pays the farmer 43.75 cents for every one pound of cotton fiber produced (43.75¢ = 3.125 X 14¢). Ignoring the revenue earned by IDAI from the sale of other cotton by-products (oil, cotton meal), domestic cotton fiber is at least 21.25 cents cheaper (65¢ - 43.75¢) than imported cotton fiber. Thus, IDAI is purchasing seed cotton for 14¢ per pound when, based on world market prices, it should be paying 20.8¢ per pound ($20.8¢ = \frac{65¢}{3.125 \text{ lbs.}} = 14¢ + \frac{21.25¢}{3.125 \text{ lbs.}}$. While this "analysis" (arithmetic) is rough, it does seem to suggest that more attention might be given to studying farm level cotton prices.

IV. MARKETING CHANNELS OF MAJOR EXPORT CROPS

This section focusses on the marketing system for those agricultural products that are important agricultural exports. Generally speaking, the marketing system for these products are of a dual nature, i.e, one system for internal consumption and another system for meeting the needs of export markets. As pointed out in Section II, the major agricultural export crops are, in order of value of exports, coffee, sugar, essential oils (vitevert and lime) and sisal. These exports (1975) account for $36.24 million, over 90 percent, of total agricultural exports. While other agricultural exports, such as fruits, cotton and cocoa may have good export potential, they historically have accounted for a small dollar volume of total exports (36).

It should also be pointed out that at the farm level, export crops compete with the production of food grains and other food crops essential for subsistence. Thus, the fluctuation in volume of exports is not only related to export prices, but also to the underlying farm level food needs and market demands for domestic food crops. If urban market demands for food crops continue to increase, then resources at the farm level will likely be allocated to the production of food crops, making (citrus paribus) increases in export crops more difficult to achieve.

Coffee Marketing

Coffee is undoubtedly the most important single commodity, providing income for a large segment of the Haitian population and as a provider of foreign exchange. Estimates of total coffee production refer to the quantity of coffee harvested, not the quantity of beans grown. Appendix Table AI provides estimates of coffee harvested and Appendix Table AII provides estimates of the quantity of coffee exported.

Background: The annual rate of growth in coffee production since 1971 has averaged, depending on the data series used, about 1.6 percent. However, the difference between production and exports suggests that domestic consumption of coffee has increased at a slightly higher rate. In 1971, coffee consumption was approximately 35 percent of total coffee production. The percentage of coffee consumed since 1971 has increased steadily, reaching about 49 percent of coffee production in 1975. Yet, coffee accounted for 20 percent of the total value of merchandise exports in 1975.

Figure X provides an impression of the spatial distribution of coffee production, whose total area estimate is 132,800 Ha (36) or approximately 16 percent of all cultivated land area. Approximately 35 percent of total coffee production takes place in the north, Cap Haitian and Port-de-Paix, while about 25 percent is produced in the Departement Du Sud (Figure X). Estimates of the number of people employed in coffee production vary, but most appear to fall in the 1.5 million to 2 million range, or in the vicinity of 33 to 43 percent of the country's total population (55).

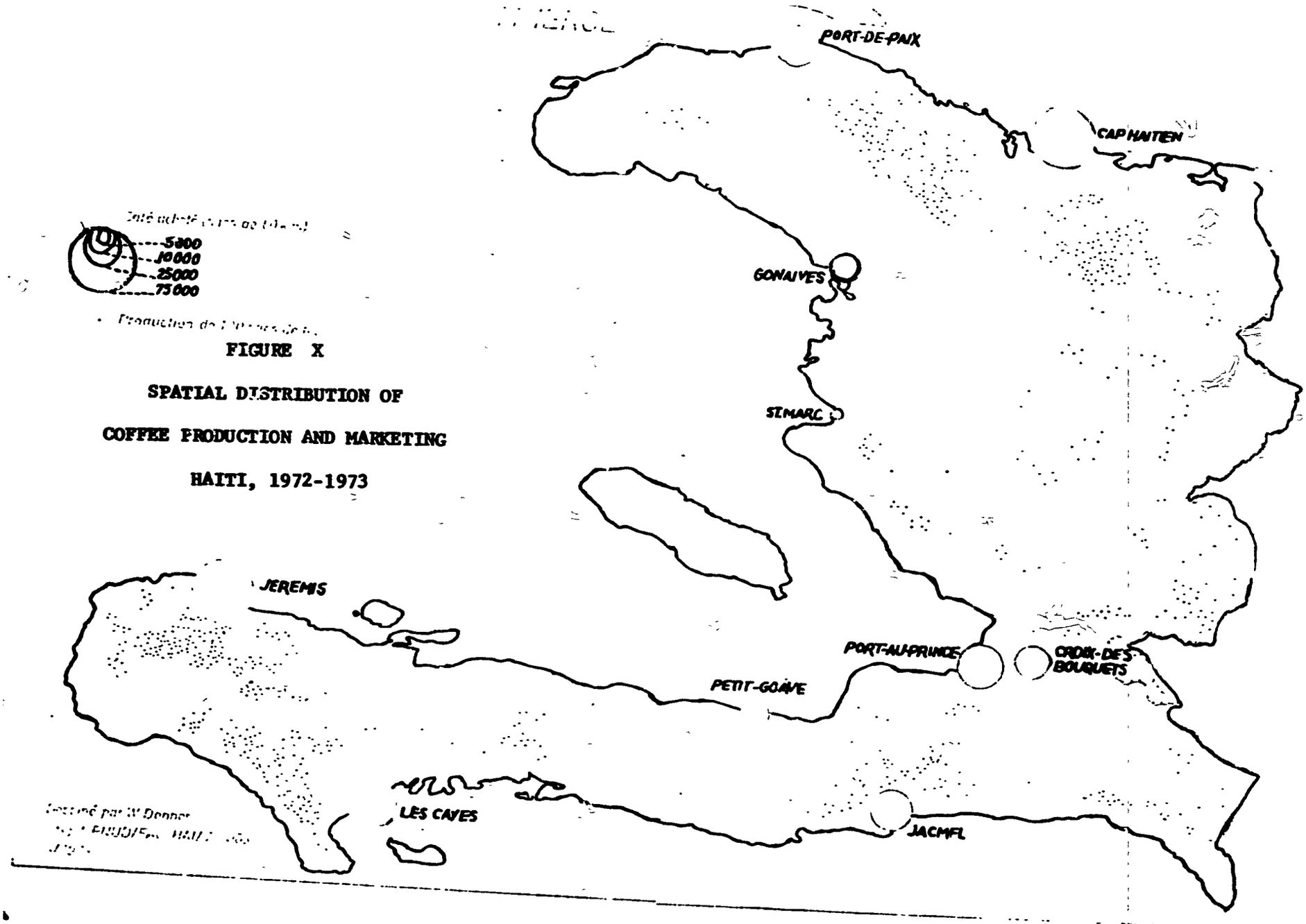


FIGURE X

SPATIAL DISTRIBUTION OF

COFFEE PRODUCTION AND MARKETING

HAITI, 1972-1973

Farm size, enterprise mix and the level of technology employed in coffee production provide important insights into the marketing process because this is the context within which producer marketing decisions are made. The size of holdings are small (Table XIV). The majority (30.6 percent) of farms range from 1.3 to 2.6 hectares, while more than 88 percent of all farms are less than 6 hectares. Only one large coffee producing farm exists, with a total area in the neighborhood of 155 ha. While coffee may be the major enterprise for most of the producers, composing Table XIV, it is seldom their only enterprise. The other crops cultivated with coffee, and frequently among the coffee trees, are the major food grains discussed above (corn, millet, beans) and vegetables. Coffee trees are also intercropped with bananas. The coffee trees tend to be too densely grown (overcrowding), too shaded and old (40).

The lethargic nature of Haitian coffee production is related to several factors. The average age of Haitian coffee trees exceeds thirty years and many are over fifty years old. Cherry yields tend to decrease after about twenty-five years, and approach very low levels on trees exceeding fifty years of age. Haitian farmers (of which about 80-90 percent are illiterate) seldom use chemical and biological inputs (3% reported using these inputs). They tend to follow soil preparation practices that either cause erosion (thereby exposing tree roots), or allow weeds to grow among the trees, thereby wasting soil nutrients already in scarce supply. Farmers also tend to harvest cherries in a

TABLE XIV

SIZE DISTRIBUTION OF COFFEE HOLDINGS IN HECTARES

Size Category	No. of Farms	Percent Of Farms	Cumulative Percent
0 - .7	57,600	15.0	15.0
0.7-1.3	74,496	19.4	34.4
1.3-2.6	117,504	30.6	65.0
2.6-6.0	91,776	23.9	88.9
> 6.0	42,624	11.1	100.0
TOTAL	384,000		

Source: IHPCADE, National Coffee Plan, Haiti, 1969-1976.

manner resulting in broken tree stems, which are the stems that would otherwise provide blossoms for the next year's crop. Furthermore, based on 1974-75 data, the farm level price for a 60 kg sack of coffee is about $27 (depending on quality and type of beans). Finally, coffee cherries ripen from the months of September through January, depending on altitude, which coincides with a major portion of the food grain production and harvesting season (30). With the increasing demands for food grains reflected in "free" or competitive markets, the tendency for farmers is, at the margin, to emphasize food grain production rather than coffee production, since coffee production returns have not kept pace with the returns to other crops. Together, the above "mix" of factors have, perhaps not surprisingly, resulted in yields of only 230-270 kg of coffeecherries per hectare, compared to production levels of 800-1000 kg per hectare in other countries.

The Institute for the Promotion of Coffee and Export Products (IHPCADE) is the major government office assigned the responsibility for coffee regulation and promotion. The Institute for the Promotion of Coffee and Export Products was created in 1968 and integrated into the Department of Agricultural, Natural Resources and Rural Development (DARNDR) as a special unit of the ministry. The Director General of IHPCADE reports to the Minister of Agriculture. The Director General also reports to the national planning council, which controls IHPCADE's budget. The services provided by IHPCADE include:

a) Coffee promotion service which carries out studies and research on production and provides data on agricultural prices and other aggregates;

b) Approves and regulates export sales, regulates and issues export licenses;

c) An evaluation service which carries out the evaluation of projects and programs; and

d) Extension services and supplies BCA's chemical and biological inputs associated with small farmer credit programs.

Given this background, the characteristics of coffee marketing are discussed in the next section.

Marketing Channels: The major and most recent source of information on coffee marketing in Haiti is a recent USAID supported study (40) which is in part based on farm level surveys conducted over the period November 1975 to January 1976 in the major coffee producing areas. Other studies are (30), (20), (38), (36), (54), and a series of short papers by Eugene (24). Other sources of information were obtained in interviews with the Institute for the Promotion of Coffee and Export Products (IHPCADE) and UMTAD. The discussion of marketing channels draws heavily from JWK International (40) unless otherwise indicated.

The flow of dry and washed coffee from producers to the domestic market and export market is depicted in Figure XI. The producer faces essentially four different agents in selling his coffee; an unlicensed speculator, a licensed speculator, consumers in his local market area, and the local coffee washing factory. The producers choice becomes somewhat futher complicated because only cherries are sold to the washing factory, while coffee beans are sold to speculators.[1/] Before discussing the role of the speculators, it is worthwhile to consider the farm level relationship between coffee processed by the "dry" process and coffee processed by the "wet" process.

The majority of coffee sold by farmers, 88-92% (40), is coffee prepared by the dry process. This process is performed by the producer and involves drying the coffee cherries in the sun, pounding the dried pulp off the bean and then redrying the beans in the sun. The problem with this process is that unless the beans are dried on some non-earthen surface, they absorb various tastes and must be sold at a discount. Reportedly, the most serious factor affecting quality is the removal of the bean pulp before the beans have adequately dried. The wet process involves transporting the freshly picked cherries (within 18-24 hours of picking) to the washing factory.

The speculator is frequently a small coffee grower who purchases natural coffee from growers and resells it to exporters. This

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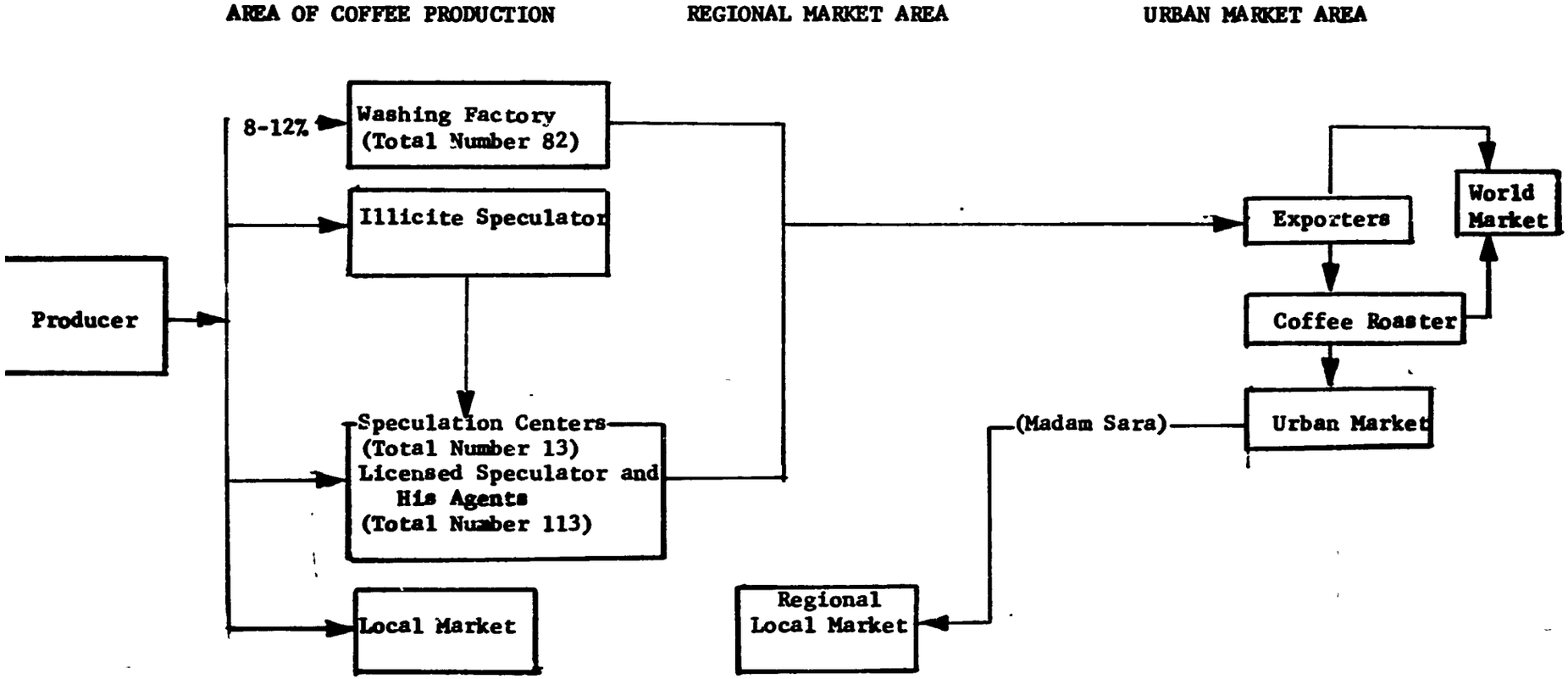
1/ The term speculator is used in the literature on Haitian coffee marketing, although "broker" more adequately reflects the speculator's activity.

FIGURE XI

COFFEE MARKETING CHANNELS



speculator is licensed and operates from speculation centers. The number of speculators, centers, and volume of coffee purchased appears in Table XV. The license obligates the speculator to provide a dry surface for coffee beans, a scale for weighing coffee and a warehouse in which dried coffee can be stored. The processing functions performed by the speculator are: redrying wet beans, bagging, and shipping to exporters. Illicite speculators buy coffee from producers at their home and resell the beans to the speculators. Reportedly, the illicite speculator specializes in inferior beans, pays lower prices and, in addition to performing a transportation service, alledgedly advances producers loans that they would not be able to obtain from other sources (40).

Coffee washing facilities account for about 8 (40) to 12 (48) percent of the total coffee produced. The majority of washing factories are owned by exporters (IHPCADE). The remaining washing factories tend to be owned by coffee cooperatives. As denoted on the diagram, the washing factories (including the co-ops) sell to the exporters. These factories perform the following functions: sorting, mechanical depulping, fermentation (18-24 hours), drying, removal of seed coat, and shipment to exporter. Recently IHPCADE permitted co-ops to buy from non-members. This has increased the competition between speculators and the co-ops for the farmer's beans.

The licensed speculator, reportedly, operates on a margin of about 2¢, i.e., they pay the farmer about 2¢ per sack below the price paid

TABLE XV

NUMBER OF COFFEE SPECULATORS

AND VOLUME OF COFFEE SOLD BY DISTRICT IN 1972-1973

Districts	Speculation Centers	Speculators		Coffee Purchase
		Number	Average per Center	No. 60 kg. Sacks
Port-au-Prince	11	88	8	30,292
Crx. des Bouquets	17	51	3	19,028
Cap Haitian	20	125	6	74,752
Port de Paix	4	59	14	26,952
Gonaives	4	29	7	11,619
Saint Marc	4	7	2	3,187
Jacmel	6	77	12	30,995
Petit Goave	13	93	7	14,755
Jeremie	21	216	10	63,351
Cayes	13	85	5	43,737
Total	113	830	7	318,068

Source: IHPCADE, Commercial Division, Internal Commercial Section

the speculator by the exporter (40). Exporters offer the co-op washing factories (their competition in the coffee washing process) the same price for coffee as received by speculators, even though the washing process produces higher and more uniform quality coffee. However, to encourage the growth of cooperatives, their export taxes are decreased by $4 per 60 kg. sack of dry coffee beans.

The reasons advanced (20) for a small percentage (8-12%) of washed coffee are:

(1) Lack of roads: necessity of freshly picked beans arriving at washing factory in less than 24 hours; wet cherries are heavier and bulkier to carry on mountain paths, reducing the assembling radius to 5-10 km from a plant site.

(2) Source of savings: producers process their own coffee, store it and then sell it as the need for cash arises.

(3) Speculators: they are not permitted to buy and sell wet coffee and discourage producers by refusing to grant them future loans or buying their coffee.

(4) Prices: lack of sufficient price differentail at the producers level.

Coffee exporters number about 28, all operating in the major port cities (Table XVI). Haitian coffee exporters also sell coffee to domestic roasters. Cafe Ribo, the largest roaster, produces 100,000 to 125,000 pounds per year, which is sold on the local market. Allegedly due to "excessive" price competition, exporters formed an association--Association des Exportateurs de Cafe (ASDEC)--to guide pricing. However, JWK International indicates that the 28 exporters are too many for price fixing and that competition between them for a share of the market remains intense. Discussions with DARNDR officials, however, suggest that some price fixing activities occur, but seem to be of short duration. The nature of competition between exporters takes the form of financing a group of speculators to compete for coffee supplies at the farm level. The speculators are often advanced modest sums of capital by exporters and are encouraged to buy in areas where other exporters seem to be at a disadvantage. Speculators are allegedly known to sell to rival exporters (30).

Marketing margins between FOB export price and the farm level price have been averaging, exclusive of taxes, about 23.5 percent of the export price during the last four years. Table XVII provides a detailed accounting of the average costs and taxes at each level in the marketing channel for 8 exporting firms. Average profits to exporters was approximately $8.73 per sack in 1975-76, or about 11.5 percent of the 1976 FOB price of $75.62 per 60 kg. sack. Farmers received about 46% of the FOB price. The remainder is accruable to taxes (25%), exporter costs (15%) and to speculator services (2.5%).

TABLE XVI

COFFEE EXPORTERS AND VOLUME OF EXPORTS, 1972-73

(In 60 kg sacks)

Company	Rank	No. of Sacks	
Usine a Manteque	1	54,197	
Wiener et Co.	2	45,738	53.56%
Madsen et Co.	3	38,873	
Jacques A. Dufort	4	20,743	
Kersaint et Co.	5	16,900	
Jacques Novella	6	16,093	20.18%
Leon Baptiste	7	15,508	
Vital et Succs.	8	11,607	
Berne et Co.	9	9,525	
Copexim	10	8,655	
Raymond Nazon	11	9,385	
Blanchet et fils	12	8,325	
Jacomin	13	7,350	
Otto Schutt	14	6,950	
Boucard et Co.	15	6,396	
Leon St. Remy	16	6,270	
Duverneau Export	17	4,350	26.26%
Bennet Export	18	3,500	
Edouard Cadet	19	3,210	
Eyssalenn	20	1,175	
Adolf Schumberg	21	925	
Cooperative Cocva	22	792	
Genimpex	23	750	
Luc Paultre	24	656	
Max Vieux	25	583	
Lespinasse Jean	26	250	
Cooperative Esperance	27	91	
Emile Domond	28	65	

Source: IHPCADE - Promotion Service, Statistics and Price Section.

TABLE XVII

AVERAGE COSTS AND TAXES OF COFFEE GROWERS, SPECULATORS, AND EXPORTERS PER 60 kg SACK, 1975-76

(U.S. Dollars)

Marketing Margin	Averages
FOB Price	75.62
Price to Speculator	37.08
Price to Farmer	34.61
Gross Speculator Profit (2-3)	2.47
Taxes	18.90
Exporter Costs	11.45
Humidity Weight Loss (-)	3.90
Triage Loss (-)	3.74
Sale of Triage (+)	2.36
Sack Including Loss (-)	1.31
Transport Cost (-)	1.62
Processing Cost (-)	3.33
Gross Exporter Profit	8.73

Source: JWK International Corporation, Agricultural Policy Studies In Haiti: Coffee, Damien, Haiti, DARNDR, Sept., 1976.

Export price (FOB), taxes and prices received by farmers are charted by months for the period 1970-71 to 1973-74 (Figure XII). The results from regressing the monthly farm level price (denoted Y) on the FOB price (denoted X) for the years 1970-74 yields:

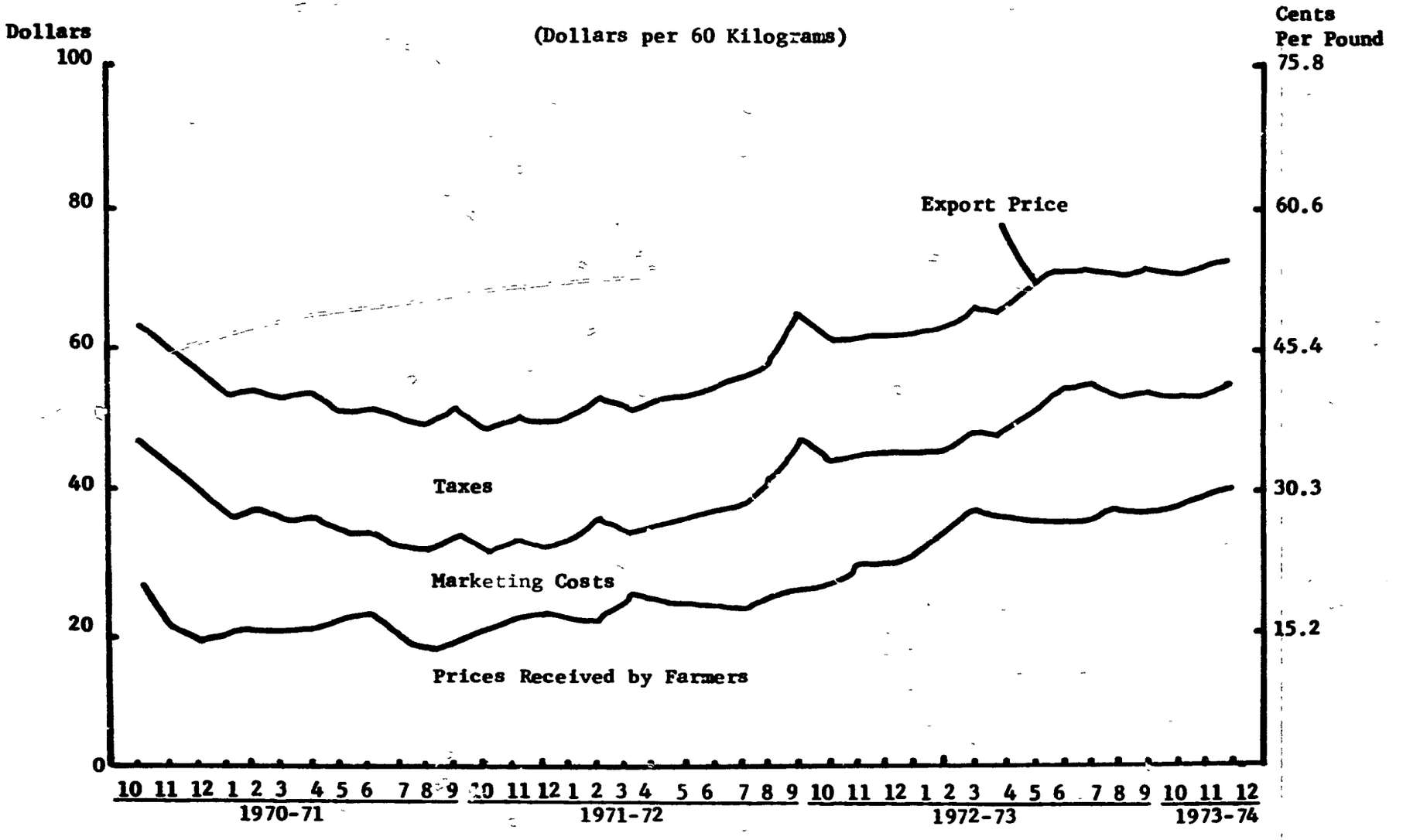
$$Y = -22.3 + .941X; \; R^2 = .994$$

Standard Error = (.0447)

Thus, as can be seen from the chart and as verified by the percent of variation in farm level price, explained by changes in the FOB price (99.4%), farm level prices follow the general trend in export prices. This suggests that exporters do, in fact, pass changes in export prices back to the farm level. Therefore, <u>if</u> imperfect competition exists, it is perhaps in terms of exporters agreeing to an absolute and constant faction of the FOB price. However, local monopoly power may exist. In any case, it is reasonable to conclude that at least no conclusive evidence can be found to suggest that exporters are effective in colluding to control farm level market prices.

FIGURE XII

COFFEE PRICES RECEIVED BY FARMERS, MARKETING COSTS AND TAXES, BY MONTH, HAITI, 1970-74



Source: USAID Capital Assistance Paper - Small Farmer Improvement Loan, Haiti (Draft), P. 35.

Sisal Marketing

Commercial exportation of sisal started in 1920 with the establishment of the Crooks and Dauphin plantation companies. Sisal production was further encouraged by World War II and the Korean Wars. Sisal production peaked in 1958 at about 40,000 tons (41) and declined during the 1960's, and then dropped to 10,000 tons in 1975 (Table AI). Exports of sisal have also steadily declined over the last five years for three major reasons (26). Firstly, synthetics have made inroads into the sisal string market. Increasing petroleum prices have affected this trend somewhat, but substitution continues to occur. Secondly, the increased demand for food crops have also contributed to declining sisal production.

While sisal grown naturally in most parts of Haiti, commercial production is found in the Bainet-Miragoane-Aquin triangle in the West Department, the North-East zone in the vicinity of Montrouse, Dualvierville, Source Matelas, Manegue and Ile de la Gonave in the West Department.

Background: In order to provide a context within which the marketing of sisal occurs, it is worthwhile to briefly discuss sisal production characteristics. Sisal production is characterized by the duality of large plantations and small producers, which tends to result in a dual marketing system. Fatton (26) estimates that the total commercialized hectarage of sisal production is about 16,850

hectares with the six remaining plantation farms accounting for about 7,920 hectares. These larger producers (Table XVIII) employ, as expected, capital intensive techniques of production and tend to be vertically integrated through to sisal exportation. The Dauphin plantation

TABLE XVIII

SISAL PLANTATIONS AND AREA CULTIVATED

Port Dauphin	6,000
NABASA	600
Sajous and Co.	500
Gerard Theard	400
Raymond Nazon	300
Jean Duvegneoud	120

Source: IHPCADE

dominates the exports of Haitian sisal. It is purported to be the largest sisal plantation in the world and for the last ten years has accounted for over 80 percent of Haitian sisal exports.

Since 1970, however, the Dauphin plantation has been under considerable economic pressures from declining sisal prices. In 1970 the plantation closed and reopened in 1972 when a livestock project was initiated. Rising sisal prices spurred by petroleum price increases encouraged new planting of sisal. The plantings matured in time for the 1975 decline in sisal prices, forcing the plantation to temporarily close in 1976.

Sisal production by small producers is characterized by the same level of production technology used in the other farm enterprises discussed thus far. Virtually no chemical or biological inputs are used. Sisal is seldom the major farm enterprise (26), yet over half of Haitian sisal production comes from these small producers. Sisal can be harvested in three years after planting and, depending on harvesting techniques, a plant can be harvested over a period of about seven years (26). The sisal plant can be harvested anytime during the year or continuously through the year. The quality of the sisal harvested and the longevity of the sisal plant depends on selecting sisal leaves at the correct time and not over or under cutting the leaves from the plant. Frequently, when sisal prices rise the plant is over-harvested, which decreases its longevity and decreases the quality of the sisal harvest because of the younger, less mature leaves being harvested. When sisal prices are low, leaves are allowed to "over mature," decreasing the development of younger leaves and, when harvested, again decreasing quality (44). Anglode (2) indicates that small producers generally over and under harvest depending on price movements. For this reason, most of the output they produce results in lower quality sisal which remains in the country, while sisal grown on plattations tends to be exported.

Upon harvesting the leaves, they must be processed to remove leaf pulp and expose the fibrus material. Small producers perform this process by hand using a toothed metal blade (44). This procedure,

however, results in low quality fiber because the pulp not removed adheres to and stains the fibers. Nevertheless, over half of the fiber produced is initially processed in this manner (Table XIX).

Marketing Channels: The Institute for the Promotion of Coffee and Export Products (IHPCADE) regulates sisal marketing and exports. Consequently, sisal marketing channels are similar to those for coffee. The important aspects of these channels are depicted in Figure XIII and are based to a large degree on the work of Fatton (26). The agents in the system are again the licensed and unlicensed speculators, while the intermediate sources of derived demand are fiber processing factories, small scale industries and export markets.

The small producer can sell his sisal to the plantations or to the speculator or his agent who accumulates 200-300 pounds of fiber. The agent then sells to the speculator who amasses four-five tons (44). This is the process by which the sisal is collected from the small scale, spatially dispersed producers. The speculator has essentially four alternative markets for the sisal he has accumulated (Figure XIII). He can sell it to factories, the most important of which makes bailer twine and rope, to brushing centers, to the plantations, or to the small crafts industry. The brushing centers are required to remove the fermented pulp from the fiber.

The illicit speculator does not have the storage and weighing facilities required of the licensed speculator. As in the case of coffee, he attracts sales by granting short-term loans which would

TABLE XIX

AVERAGE ANNUAL PRODUCTION ESTIMATES OF SISAL[1/]

Origin	Mechanically Processed In Factories (M.T.)	Manually Processed by Peasants (M.T.)
Port Dauphin	5,000	
NABASA	300	
Sajous & Co.	300	
Gerard Theard	500	
Ile de la Gonave		2,500 - 3,000[2/]
Plateau Central, Caracol Jean Rabel		750 - 1,000[2/]
Triangle Bainet, Miragoane, Aquin		5,500 - 6,500[2/]
Total	6,000	8.750 -10,500

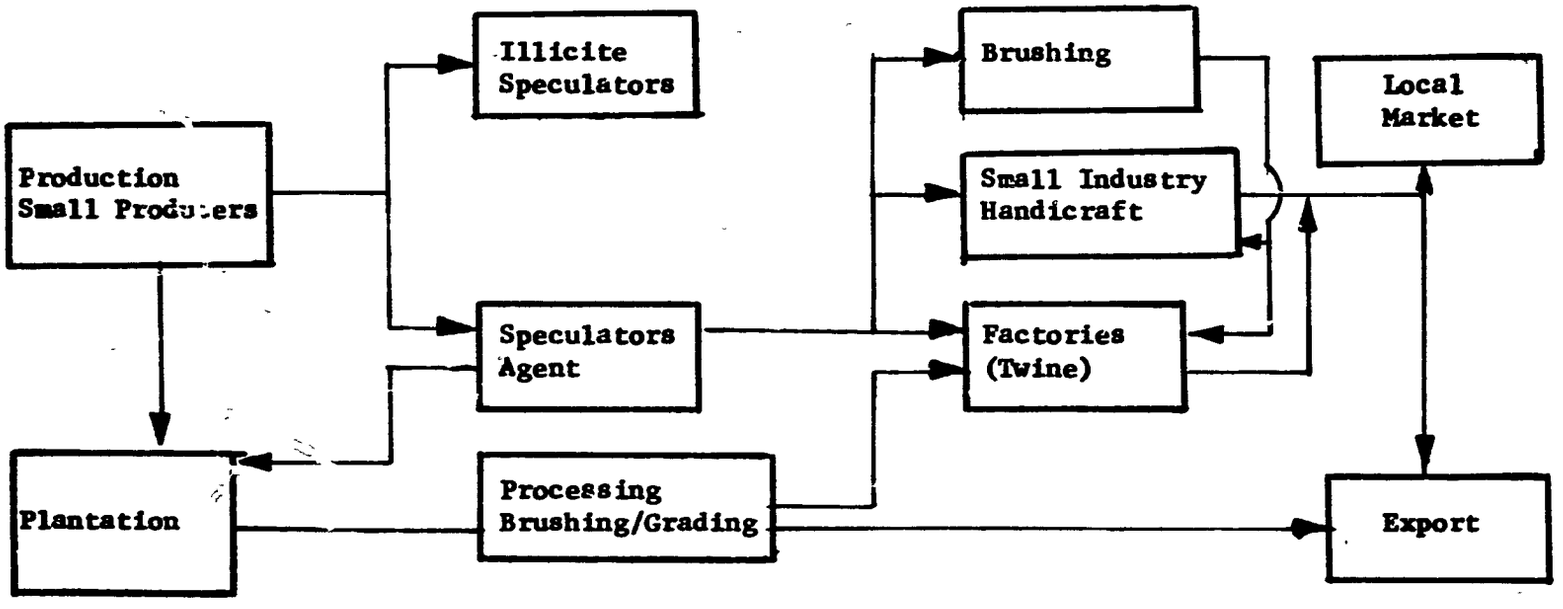
Source: JWK International Corporation, Agricultural Policy Studies In Haiti: Sisal, DARNDR, Damien, Haiti, July, 1976.

[1/] These figures do not include the years 1974-75 and 1975-76 as output decreased substantially those years.

[2/] Estimates.

FIGURE XIII

MAJOR SISAL MARKETING CHANNELS



otherwise be unavailable to the producer, or by paying for the sisal in advance of harvest (26). This type of speculator is frequently another farmer who then sells the sisal to the plantation or to another licensed speculator.

After brushing the sisal, it is graded. In the case of sales to plantations, they perform the brushing and grading process. The largest plantation, Dauphin, owns its own port facilities from which it exports both rope and raw fiber. The NABASA plantation sells all of its fiber to Twincord, a bailer twine factory. A major product of other local sisal factories is bags used primarily by the coffee industry. The handicraft industry (hats, baskets, brooms, sacks, etc.) is also an important user and exporter of sisal products. IHPCADE estimated that this accounted for nearly 18 percent of the value of sisal exports in 1971-72, while the exports of raw sisal and rope accounted for about 19 percent and 59 percent, respectively (Table XX). However, the exports of handicraft products have dropped persistently from 1972-74.

It appears that the expansion of exchange earnings from increased sales of sisal are not favorable. While the demand for rope in agricultural bailing materials (the mainstay of sisal exports) might continue to grow, prices are not likely to rise rapidly since the cost of substitutes, such as synthetic string, acts as a barrier to increased sisal prices. Furthermore, Haiti must compete with other countries (Mexico, Brazil) who have strong support programs for farmers to produce sisal.

TABLE XX

USE OF SISAL AS A PERCENTAGE OF LOCAL PRODUCTION

Year	Total Production (%)	Raw Sisal Export (%)	Rope Production (%)	Bags (%)	Rugs (%)	Door-Mats (%)	Rural Crafts & Others (%)
1963-64	100	71.97	17.79	1.47	.33	.23	7.77
1964-65	100	72.94	14.25	1.79	.47	.29	10.23
1965-66	100	86.78		1.93	.56	.31	10.39
1966-67	100	75.18	8.25	1.90	.39	.27	13.97
1967-68	100	60.49	28.50	1.41	.36	.16	9.05
1968-69	100	73.51	17.04	1.26	.21	.12	7.84
1969-70	100	60.03	25.72	1.16	.44	.12	9.28
1970-71	100	31.70	52.16	1.93	1.03	.19	12.96
1971-72	100	19.18	59.36	2.11	.64	.04	18.65
1972-73	100	19.03	50.77	1.85	.70	.04	17.59
1973-74	100	47.92	47.62	1.66	-	-	2.79

Source: JWK International Corporation, Agricultural Policy Studies In Haiti: Sisal

Marketing of Other Export Crops

Other export crops include sugar and cocoa. Of these crops, sugar accounts for about 25% of the value of exports and cocoa only about 1%. There is very little literature available on the production of these crops in Haiti. Girault and La Gra (30) indicate that the commercial marketing channels of sugar are primarily through plantation agriculture to processing and exporting of raw or refined sugar. The major areas of sugar cane production are in the vicinity of Legone, Hinche, Arcahaie, Plaine du Cul-de-Sac, Montagnes Noires and Route Freres. The Ministry of Agriculture estimates that about 82,600 ha (10% of all land under cultivation) are planted to sugar cane. However, only about 19,000 hectares are used for production of centrifugal sugar. The remaining cane is channelled into semi-artisonal "mills" and distilleries producing mainly brown sugar and alcohol for local consumption (36). Again, cane production characteristics are: traditional technology, no or little chemical and biological inputs, small sized farm holdings, and low yields. Yields range from 49 tons in the Plaine de Cul-de-Sac, which benefits from partial irrigation, to about 35 tons in the other non-irrigated alluvial plains. These yields compare to yields over 100 tons per hectare obtained elsewhere (36). Sugar production is seasonal and occurs over the months of December to May (30).

Ministry officials indicated that there are three major sugar mills in Haiti, with an estimated total production capacity of about

130,000 tons of raw sugar. A fourth plant is reportedly being built near Leogane with an additional capacity of about 19,000 tons.

The price of sugar at the wholesale and retail level is controlled through the Regie de Tobac, which has a monopoly on the internal marketing of sugar. The price of sugar cane to the producer is supposedly fixed. The price had been fixed at $4.10 a ton for 12 years, then changed to $5.10, $6.10 and to $9.00 per ton for the years 1973, 1974 and 1975, respectively. Prices at the retail level are: 8¢, 1972; 10¢, 1973; 14¢, 1974; and 15¢ per pound in 1975. The largest of the three mills is required to meed local demand before exporting. The remaining two mills are allowed to pay lower sugar export taxes than the mill processing cane for the local market (36).

A serious pricing problem is that cane is purchased by the pound instead of by the yield of sugar from the cane. This practice is inconsistent with maximizing sugar yield per pound of cane or encouraging the production of high sugar yielding varieties of cane. Consequently, the recovery rates in cane processing are nearly the lowest in the world, averaging about 9 percent per pound of cane.

If little information is available regarding the infrastructure for sugar marketing, less information is available on cocoa marketing. Areas of cocoa production are shown in Figure XIV. Cocoa production declined by approximately 15% between 1970 and 1974, and has remained near 1974 levels since. The underlying reasons for declining production

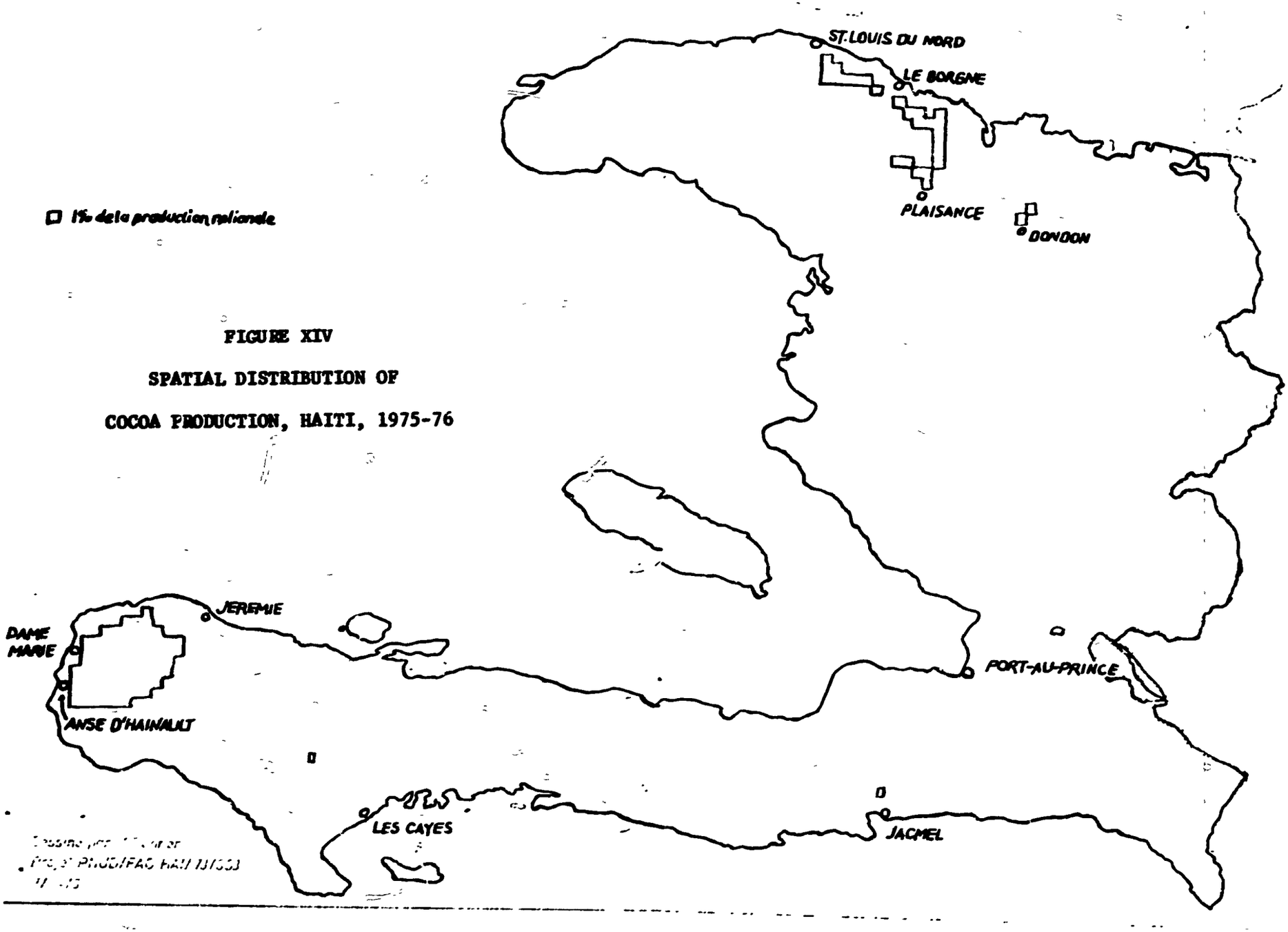


FIGURE XIV

SPATIAL DISTRIBUTION OF

COCOA PRODUCTION, HAITI, 1975-76

levels are reportedly similar to those for the fall of coffee exports (39). In addition, however, production must be sold to a single exporter, thus raising competitive market questions. Apparently, producers also have to cope with rat infestations of trees, which has greatly reduced yields. These factors have been sufficiently important that cocoa production has not been able to respond to cocoa prices, which have increased in recent years.

AGRICULTURAL INPUT MARKETS

The development of input markets suffers from several factors, including scale diseconomies, high rural illiteracy rates (80-90%), farmer operative capital (cash) and historical agronomic practices. While increases in production can be stimulated by high farm level product prices, long term production and productivity increases are encouraged by the adoption and exploitation of mechanical, biological and chemical technology, which in turn are dependent on the development of input markets. The development of input markets, unlike product markets, are complicated by the need to coordinate a "bundle" of interrelated inputs. That is, the productivity of an input (nitrogen) is generally dependent on the productivity of the other inputs (phosphate, seeds, soil tillage) with which it is combined, and all of which are generally related to the availability and cost of credit.

The major sources of information on the structure of Haitian agricultural input markets is a study, published in 1975 by Duplan (15) and a report prepared in 1973 for USAID by Brummitt and Culp of the Tennessee Valley Authority (5). Both studies point out the exceptionally low level of purchased input used by Haitian farmers.

Neither study provides the farm level detail of input marketing that existed for food grains. Thus, this section focusses primarily on importers and input retailers. Duplan's estimates of the volume of chemical and biological imports for agricultural use from 1972-1974

appear in Table XXI. The majority of 1973-1974 seed imports are accounted for by the DARNDR when, in 1973, orders for seeds were placed because of the expansion of the Bas-Baen project and because of the unfavorable growing conditions in the Artibonite in 1972.

TABLE XXI

IMPORTS OF CHEMICAL AND BIOLOGICAL INPUTS, 1972-1974

	1972	1973	1974
Fertilizer (MT)	1324.0	2926.0	3338.0
Pesticides (MT)	116.8	169.4	183.0
Raticides (MT)	11.0	6.0	14.0
Seeds (1000 lbs.)			
Corn	31.180	210.550	83.295
Rice	40.540	267.660	11.000
Millet	3.640	129.429	.92
Potatoes	-	17.490	229.68
Legumes	8.322	32.140	4.476

Source: Duplan

A small number of importers accounted for the majority of fertilizer imports. The Dartigue - Boucard Co., DARNDR and the Jardin Tropical Co. accounted for 22, 21 and 15 percent, respectively, of total fertilizer imports over the 1972-74 period. The remaining 42 percent of fertilizer imports are evenly divided among seven remaining firms. Institut de Developpement Agricole et Industrial (IDAI) accounted for over 63 percent of total pesticide imports with seven other importers accounting for the majority of the remaining 37 percent of pesticide imports.

With the exception of millet and rice seeds, Duplan reports that the majority of farm level transactions for inputs were in terms of credit followed by cash transactions and grants, Table XXII. Input grants were obtained through IHPCADE for fertilizer and insecticides, the Haitian-American Community Help Organization (HACHO) and the Service Chretien d'Haiti for pesticides and seeds. Loan for fertilizer and rice seeds were made available by the Organisme de Developpement de la Vallee de l'Artibonite (ODVA), and IDAI and Compangie des Tabacs Comme Il Faut (CTCIF) for fertilizer and pesticides. The majority of cash sales were accounted for by Le Projet Bas-Baen, le programmer d'Urgence du DARNDR and to a lesser degree by IHPCADE and le Service Cretien d'Haiti.

TABLE XXII

PERCENT OF INPUT PURCHASES BY TYPE OF TRANSACTION

	Grant	Loan	Cash
Fertilizer	10.8	11.0	3.2
Pesticides	17.1	80.3	2.6
Seeds			
Corn	.8	55.7	43.5
Millet	13.3	-	86.7
Rice	-	100.0	-
Legumes	88.3	9.4	2.3

The marketing margins reported by Duplan (15) appear large for importers and "reasonable" for retailers, Table XXIII. The market area

upon which these estimates are based is reported to be near Port-au-Prince. These cost and profit estimates were synthesized from a sub-sample of the marketing institution included in the study. Consequently, these estimates may not be representative of input marketing margins. Nevertheless, these estimates raise questions regarding the nature of competition in the import market and suggest that additional information on the degree of competition should be obtained.

Little is known of the nature and factors influencing farm level demand for agricultural inputs. Brummitt and Culp report that, while

TABLE XXIII

ESTIMATES OF MARKETING MARGINS FOR FERTILIZER BY TYPE OF DISTRIBUTOR AS A PERCENTAGE OF THE COST OF 100 lbs. OF CHEMICAL FERTILIZER

Distributor	Margin	Costs	Profit
Importer	20.6	3.0	17.6
Retailer	7.6	2.2	5.4
Total Margin	28.2	5.2	23.0

Source: Duplan

fertilizer prices and marketing margins are rather high, excess capacity in the marketing system exists for chemical and biological inputs,

especially in areas near roads and urban markets, such as the Artibonite. Several general factors believed to restrict purchased inputs at the farm level can and have (5) been listed. These include: institutional weakness, transportation and physical facility deficiencies, peasant illiteracy and isolation, lack of credit, market uncertainties and high prices. However, the incidence of impact of these factors at the farm level, by crop and region, is unknown. Farm level studies designed to determine the factors influencing farm level demand for inputs and the adoption of new practices and technologies (and appropriate technologies) need to be undertaken in order that farm level input marketing and use constraints can be identified and their magnitudinal impact on demand estimated. This type of information is essential to plan the mobilization of government agencies and resources in stimulating the development of the agricultural sector.

PRICE DIMENSIONS OF MARKET PERFORMANCE

The price dimensions of market performance generally refer to price levels and adjustments over time (seasonal), space and form. In the short run, seasonal price variation is reflective of storage capacities and costs. Spatial price variation is dependent on the interdependence between horizontal markets (e.g., between urban markets) and vertical markets (e.g., between farm level-regional-urban markets). Price variation over form refers to the nature of interdependence between, for example, the market for corn grain and the market for ground corn, or between the price of live cattle and the price of beef. These price interrelationships are expected to be of a particular form in competitive and "efficient" markets. The extent to which they vary from this ideal is then a rough measure of market pricing inefficiency.

Seasonal price variation is considered first.[1/] The, price relationship over time, space and form are discussed for selected markets and commodities. While this analysis is not definitive, it, nevertheless, suggests that (a) in recent years seasonal price variation is in excess of the variation required to stimulate an increase in storage capacity, (b) the markets for food grains are reasonably efficient in transmitting price information and (c) that the spatial dimension of market inefficiency is directly related to spatial costs and commodity perishability.

[1/] Price data used in this section appears in Appendix Tables AIII to AVI unless otherwise indicated.

Seasonal Price Variation - Storage Needs

Seasonal variation in food grain prices appears more pronounced in recent years (Figures XV, XVI, XVII, XVIII, XIX). This variation reflects a failure of the marketing system to expand storage capacity to meet out of season food grain consumption needs. That is, growth in urban market demand requires an increase in storage capacity to satisfy consumption needs for crops that are seasonally produced. While seasonal variation in prices under conditions of adequate storage capacity would still be expected, (i.e., prices would be expected to increase through the season so as to just cover storage costs) the levels of price variation in recent years appears to substantially exceed the investment cost required to increase the present storage capacity levels.

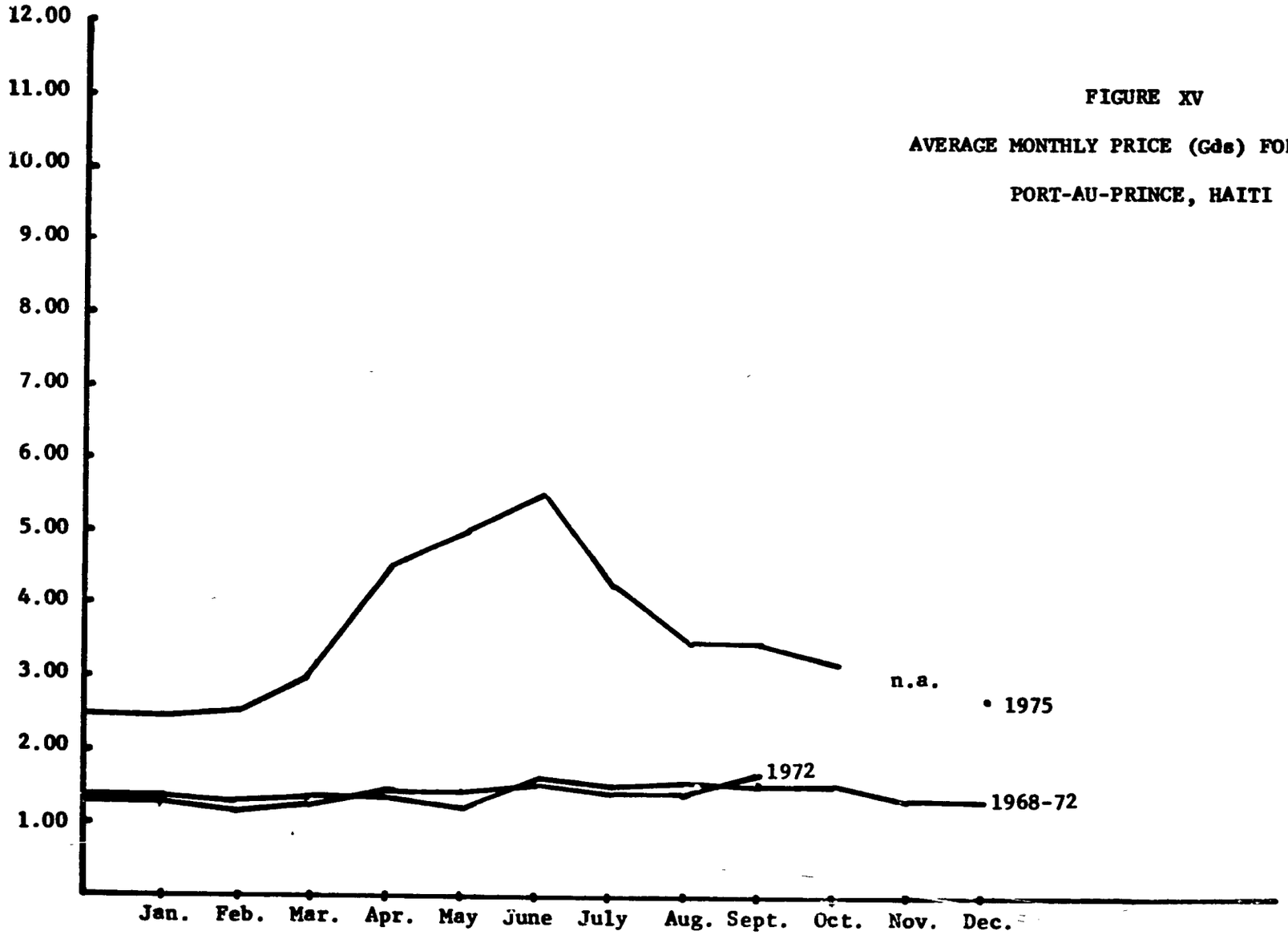
From a volume of production point of view, storage needs by crop would be ranked as follows: corn, millet, rice and beans. However, from the basis of susceptability to moisture, mildew, insects, etc., the ranking would be reversed, with beans the far most difficult to store.

Dorville (11) indicates that with traditional storage methods, humidity-temperature conditions are the most important factors contributing to storage problems, while the lack of financing capability at the farm level has been the major factor explaining farmers' reluctance to expand storage capacities. Dorville provides cost estimates of

FIGURE XV

AVERAGE MONTHLY PRICE (Gds) FOR MILLET

PORT-AU-PRINCE, HAITI



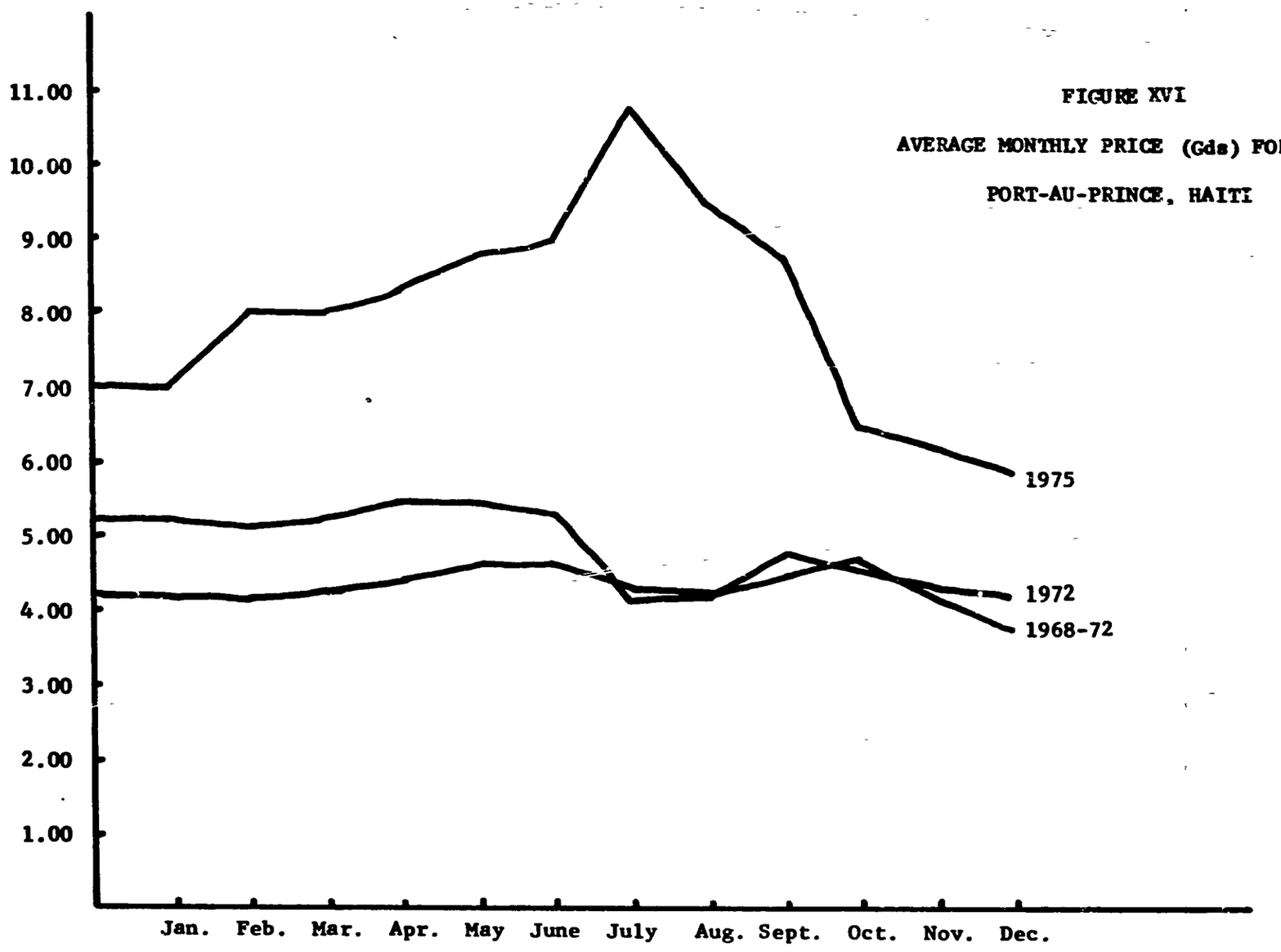


FIGURE XVI

AVERAGE MONTHLY PRICE (Gds) FOR RICE

PORT-AU-PRINCE, HAITI

FIGURE XVII

AVERAGE MONTHLY PRICE (Gds) FOR BANANAS

PORT-AU-PRINCE, HAITI

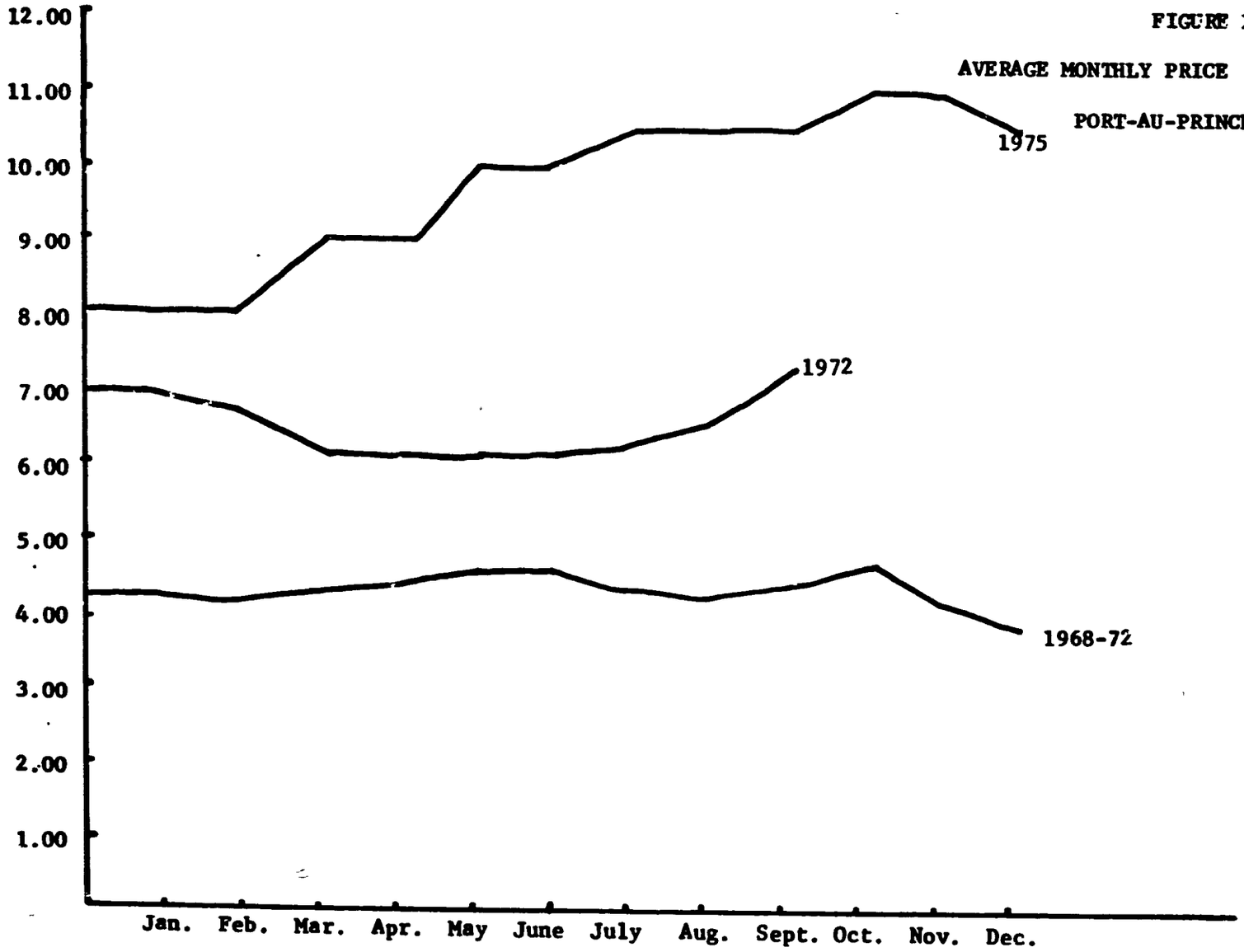


FIGURE XVIII

AVERAGE MONTHLY PRICE (Gds) FOR CORN

PORT-AU-PRINCE, HAITI

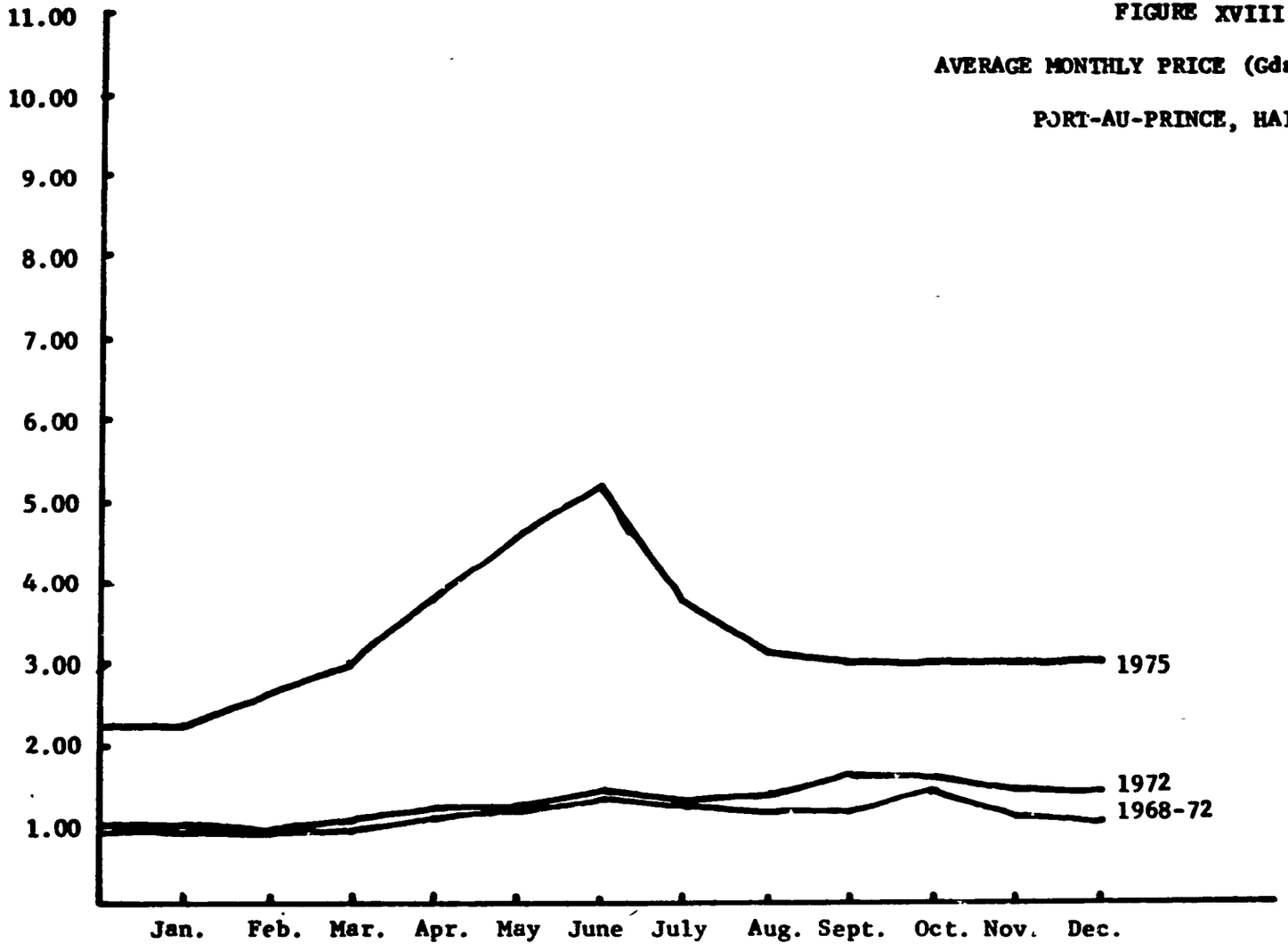
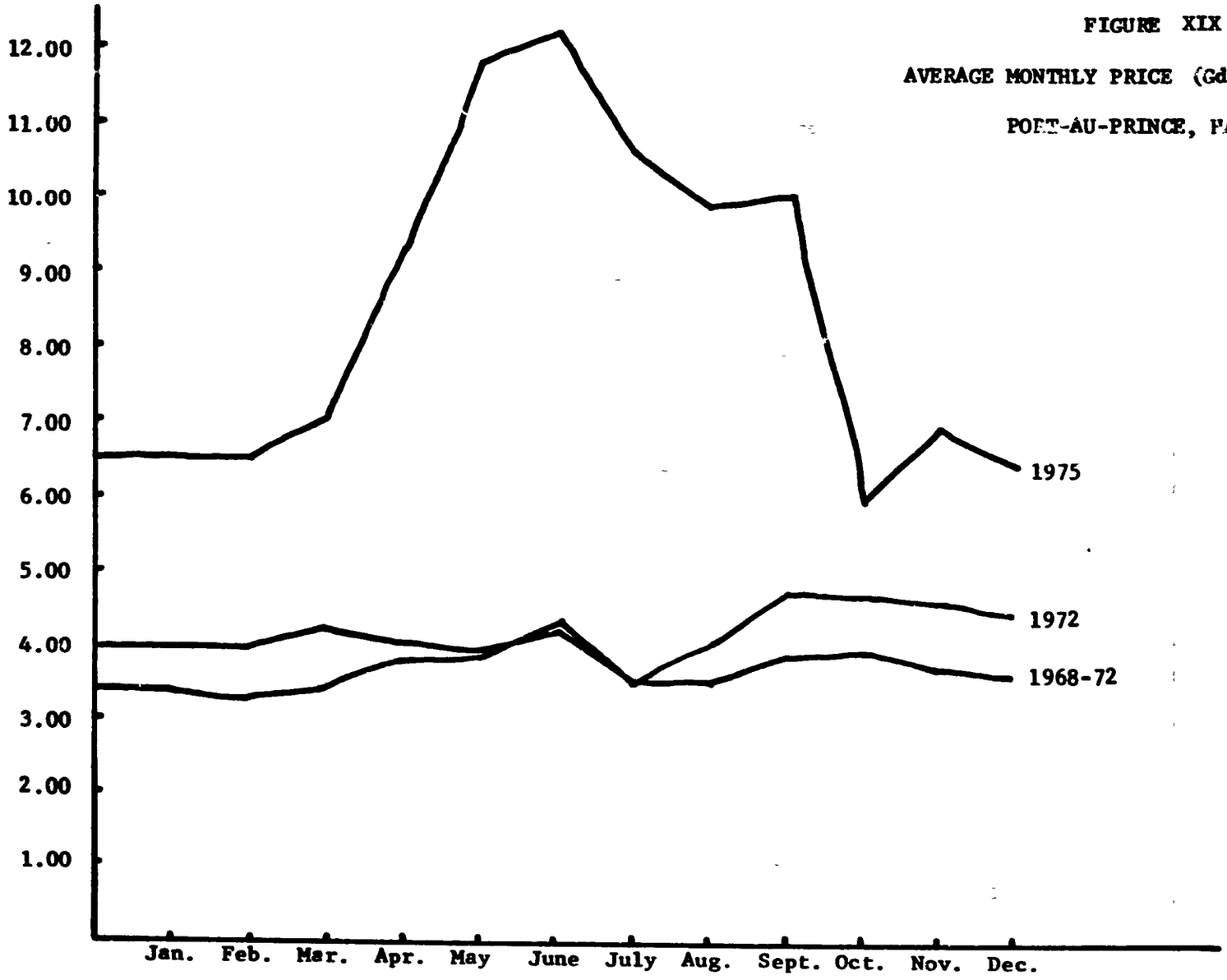


FIGURE XIX

AVERAGE MONTHLY PRICE (Gds) FOR BEANS

PORT-AU-PRINCE, HAITI



alternative storage facilities and considers that at the farm level metal drums with lids (at a cost of $10 per drum in 1974 prices) appear to be a viable, though not necessarily exclusive, alternative to other storage methods. In the case of metal drums (55 gal), the grain needs to be dried in the sun in order to lower moisture levels prior to storage. Similarily, a USAID sponsored consultant study (53) recommended an expansion of on-farm storage capacities. This study also recommended the development of local marketing associations, an evaluation of the need to import basic food grains during the months of May and June, and the expansion and improvement of grain import-export and storage facilities at Port-au-Prince. However, neither of these studies considered the central question; what volume of grain must be stored in order to reduce the seasonal variation in price to levels approximating costs of storage. Before the benefits from a public financed and managed storage program (such as a marketing board) can be estimated, this question needs to be addressed.

Returns to storage required to just cover the cost of storage can be roughly approximated. Dorville's estimated cost of $10 per drum is perhaps low. Based on correspondence from USAID files, the cost of a drum with lid capable of storing 810 kg. of grain was approximately $34 in 1976. Thus, to pay for the investment in one year requires the capturing of a seasonal price differential of at least 4.6 cents/kg (.63 gourdes/marmite), assuming a 10 percent interest cost on the $34 investment. A price differential of at least this

magnitude is perhaps required to induce investment in storage capacities because the calculation assumes that a volume of a farmer's commercialized production is sufficient to fill the drum. Furthermore, other costs, such as the cost of transporting the drum to the farm site and the returns required to cover the risk premium of storage (due primarily to the possibility of spoilage), are not included in the storage cost estimate.

The maximum range in monthly Port-au-Prince prices (gourdes per marmite) during 1972 is: corn, .65; rice, 1.30; millet, .50; and beans, 1.15. The corresponding range in seasonal prices during 1975 is: corn, 2.95; rice, 4.90; millet, 3.25; and beans, 6.25 gourdes per marmite. Thus, based on the level of seasonal variation in 1972 prices, it is not likely that a farmer could pay off his investment in one year. In other words, the seasonal variation observed in 1972 prices is perhaps not sufficient to attract substantial investments in storage capacity at the farm level. However, the seasonal variation observed in 1975 prices should be sufficient to attract investments to increase storage capacity, since the price variation for corn exceeds our minimum cost estimate (.63) by a factor of 4.68. The incentives for storage are even greater for the other food grains.

It is beyond the scope of this study to identify or suggest the best storage alternatives since this requires current estimates of

alternative facility storage costs and, more importantly, estimates of the percentage of commercialized production that must be stored to decrease seasonal price variation to levels where no incentive exists to increase storage capacity. Nevertheless, a rough estimate of storage requirements based on the 810 Kg drum might be useful to provide insights on relative order of magnitudes. Food grain production estimates in 1000's of metric tons for 1976 are: corn, 180 MT; rice, 131 MT; millet, 134 MT; and beans 31.5 MT (Appendix Table AI). Dorville estimates that 50 percent of the corn produced is commercialized, and 90 percent and 75 percent, respectively, in the case of rice and beans. He also estimates that the majority of millet is not commercialized. Together, this implies that approximately 90 thousand MT of corn, 118 thousand MT of rice and 23.6 thousand MT of beans were commericalized in 1976. It's likely that less than 20 percent of the volume of grains commericalized (46 thousand MT) needs to be stored in order to reduce price variation to acceptable levels. In other words, given the number of Haitian farmers producing food grains and the 810 KG capacity of the drum, if only 10 percent of the farmers invested in storage drums (approximately 55 gal.), seasonal price variation could be reduced to 1972 levels. Given the extent of dispersed production in Haiti, this increase in storage capacity could be met at the farm level <u>without</u> having an adverse effect on spatial price differentials. Investments in storage capacity by a portion of Haitian farmers would, of course, yield benefits to all farmers.*

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*Increasing storage capacity at the farm level should also decrease the seasonal variation in farm level household consumption, and thus, tend to increase over-all nutrition levels.

Price Relationships Over Space and Form

Johnson and La Gra (39) attempted to determine if detectable, consistent price differences existed between semi-rural, regional and urban markets and if any differences also existed between geographic regions of the country. Their analysis of variance was based on monthly prices of the four basic food grains for the period 1971-1974. The 1971-74 average prices of food grains reported by Johnson and La Gra for three market classifications appear in Table XXIV.

TABLE XXIV

AVERAGE MONTHLY PRICES IN GOURDES PER MARMITE
FOR SIX SELECTED PRODUCTS IN
REGIONAL, URBAN AND SEMI-RURAL MARKETS, 1971-74

Product	Market Type		
	Regional	Urban	Semi-rural
Rice, ordinary	6.27	6.13	5.91
Millet, grain	1.59	1.79	1.56
Millet, ground	1.96	2.14	2.28
Corn, grain	1.66	1.72	1.96
Corn, ground	2.06	2.17	1.96
Beans, red	4.44	4.48	4.40

Source: Johnson and La Gra

In 14 of the above 18 cases (Table XXV) they concluded that the mean differences in prices were not significant. Significant differences were only found for the case of ground millet and corn betwen the urban/regional and urban/semi-rural markets. Significant differences were found in spatial prices, however. In all cases, prices by region were found to be significantly different. The factors explaining these price differences are not identified by the analysis. However, shipment costs and the department ratio of urban to farm level markets are felt to be the major factors explaining these differences (Table XXV).

Given the limited scope of the Johnson and La Gra study, the spatial price interdependence between the Port-au-Prince urban market and the urban markets in Gonaives, Cap Haitian and Les Cayes were analyzed. The results appear in Table XXVI. The procedure is to regress the monthly prices for 1975 of three urban markets for selected commodities on the corresponding Port-au-Prince monthly prices for 1975. In theory, the horizontal price relationship between competitive markets should be of the form:

$$\text{PRICE}_{(\text{urban})} = \text{PRICE}_{(\text{Port-au-Prince})} \pm T_{(\text{transportation cost})}$$

Thus, in fitting an equation, the form

$$Y = a + bX,$$

where Y denotes the price in other urban markets and X denotes the price in Port-au-Prince, the expectation is that the coefficient (a) should approximate transportation costs, while the coefficient (b) should not be statistically different from one. Furthermore, the

TABLE XXV

AVERAGE MONTHLY PRICES OF SELECTED PRODUCTS

BY GEOGRAPHIC DEPARTMENT OR REGION, 1971-74 (GOURDES*)

Product	Department or Region								
	North-West	North	North East	Artibonite	Center	West	South-East	Grande Anse	South
Rice	6.3022	7.1673	--	5.7484	--	6.3147	5.3506	5.9122	6.6798
Millet, Grain									
regional/semi-rural	1.8907	--	--	1.6179	1.5484	1.5092	2.0955	1.4573	1.5062
urban	--	2.2727	--	1.4361	--	2.0023	--	1.9131	1.6745
Millet, Ground									
regional/urban	--	--	--	2.3033	--	1.5824	2.0757	2.0004	1.8619
semi-rural	2.3500	2.8870	--	2.3075	2.5480	--	2.0192	1.6055	1.8362
Corn, Grain	1.6593	1.5144	--	1.6893	1.5562	1.6241	1.9507	1.4195	1.6266
Corn, Ground									
regional/urban	2.1132	2.5115	--	2.5568	--	1.8741	1.7506	1.9991	2.0470
semi-rural	1.7584	1.9173	--	2.4679	2.0819	--	1.6881	1.5541	1.9757
Red Beans	4.4405	4.6764	--	4.7024	4.7432	4.5783	3.9942	4.1826	4.2635

Source: Johnson and La Gra

*Gourdes per Marmite

TABLE XXVI

CORRELATION OF SPATIAL COMMODITY PRICES BY MONTH

PORT-AU-PRINCE WITH OTHER SELECT URBAN MARKETS, 1975*

Urban Market	Crop	Intercept (a)	Slope (b)	Standard Error of Slope	R^2
Gonaives	Corn Grain	1.052	1.094	.606	.553
	Red Beans	- .073	1.006	.112	.962
	Poultry	3.454	.271	.129	.546
	Ord. Rice	2.330	.626	.181	.793
	Tomatoes	2.321	.192	.733	.227
Cap Haitian	Corn Grain	.765	.789	.176	.814
	Red Beans	2.852	.619	.109	.867
	Poultry	14.462	-.609	.239	-.619
	Ord. Rice	.503	.959	1.317	.781
	Tomatoes	Insufficient Data			
Les Cayes	Corn Grain	1.450	.783	.701	.323
	Red Beans	2.821	.624	.130	.834
	Poultry	Insufficient Data			
	Ord. Rice	- .858	1.128	.109	.956
	Tomatoes	Insufficient Data			

*/ Y = Monthly Commodity Price, Selected Urban Market
X = Monthly Commodity Price, Port-au-Prince
Equation fit to the data: $Y = a+bX$
R^2 denotes the percent of variation in Y (i.e., price in Gonaives, Cap Haitian and Les Cayes) that is explained by the variation in X (i.e., price changes in Port-au-Prince).

correlation between prices (Y and X) should be positive. If this relationship does not hold, then, for the commodity in question, the markets are not related. No relationship may exist between widely separated urban markets because of spatial costs or between markets for perishable commodities, such as tomatoes.

In practice, the statistical assumptions required to fit this relationship are such that the intercept term (a) is not a good estimate of transportation costs. Thus, we must be content to draw conclusions based primarily on the correlation between prices (R^2 in Table XVI), and secondarily on the significant difference of the slope coefficient (b) from unity.

In spite of the strong statistical conditions that must exist to fit $Y = a + bX$ to the data, the results (R^2) suggest that the prices of beans, corn and rice in the three urban markets selected are strongly correlated with price changes for these commodities in Port-au-Prince. This result is consistent with the behavior of a competitive market and suggests that the marketing system is reasonably efficient in responding to spatial market surplus and deficits between urban markets. It also suggests indirectly, that semi-rural and regional food grain markets operate effectively in differentiating between spatial surplus and deficits in urban markets. More on this topic later.

The estimate of the slope coefficient (b) for food grains ranges between .624 and 1.128. When the variance of this estimate is

taken into consideration, the coefficient is not significantly different from one, as predicted by theory. However, the intercept coefficients (a theoretical estimate of transportation costs) vary substantially and appear to be a poor estimate of transportation costs. For instance, they suggest that the transportation cost differential to ship corn grain between Port-au-Prince and Gonaives is approximately 1.052 gourdes per marmite, .072 gourdes per marmite for beans and 2.33 gourdes per marmite for rice. It should also be pointed out that these intercept (a) values, i.e., 1.052, .072 and 2.33, etc., reflect the average difference in prices between Port-au-Prince and the other three urban markets. Finally, it bears emphasizing that the analysis does not indicate whether or not shipment costs are high or low, or whether or not marketing costs, however defined, are large or small. The analysis merely suggests that for food grains the markets are interdependent and, in a pricing context, operate efficiently given the level (unknown) of marketing costs.

In contrast to the food grain markets, note the rather poor and inconsistent results obtained for tomatoes, bananas and poultry in markets where data is available. In the case of tomatoes, no price interdependence appears to exist between Port-au-Prince and Gonaives. This lack of interdependence is to be expected because of the perishability characteristics of tomatoes and the damage they tend to sustain in shipment. Thus, due to spatial costs and shipment difficulties, the market for tomatoes in Gonaives is not "part of"

the market for tomatoes in Port-au-Prince. Notice also that a similar relationship is suggested in the case of bananas.

The analysis of poultry presents a dilemma. It suggests that while the price of poultry in Gonaives is related to the price of poultry in Port-au-Prince, the price relationship is effected by the magnitude of the price difference, i.e., the slope coefficient (b) is different from one. Taken literally, this suggests that the transportation of poultry between these markets, or between regional and rural markets servicing Port-au-Prince and Gonaives results in a significant weight or death loss of the birds. This needs to be confirmed with more reliable analysis. In the case of Cap Haitian, a negative relationship is suggested. This is not consistent with theory and cannot be rationalized.

An analysis of vertical market relationships appears in Table XXVII. The theory underlying this analysis is that the price in semi-rural (i.e., farm level) markets should be positively correlated with the price in the urban market and, in fact, equal the urban market price less transportation costs. The extent to which the slope coefficient (b) is significantly less than unity is an estimate of the extent of weight losses through the marketing channel. In other words, we expect a price relationship as follows:

$$Y_{\text{(price in rural market)}} = nt + nX_{\text{(price in Port-au-Prince)}}$$

where t denotes transportation cost and n denotes the percentage of weight loss per marmite.

TABLE XXVII

VERTICAL MONTHLY PRICE RELATIONSHIPS FOR SELECTED COMMODITIES BETWEEN

SEMI-RURAL AND PORT-AU-PRINCE URBAN MARKET, HAITI, 1975*

Semi-rural Markets[a/]	Crop	Intercept (a)	Slope (b)	Standard Error of Slope	R^2
Croix des Bouquets	Bananas	-2.895	.753	.184	.790
	Corn Grain	1.065	1.281	.189	.903
	Red Beans	1.286	.773	.089	.935
	Potatoes	1.602	.389	.164	.600
	Poultry	8.313	.112	.387	.091
	Ord. Rice	.371	1.040	.232	.817
Petit Goave	Bananas	-	-	-	-
	Corn Grain	.811	.527	.167	.706
	Red Beans	.685	.974	.083	.962
	Potatoes	-	-	-	-
	Poultry	2.144	.583	.491	.350
	Ord. Rice	-4.908	1.487	.477	.873
St. Marc	Bananas	3.687	.261	.154	.463
	Corn Grain	.416	.759	.236	.709
	Red Beans	.468	.834	.100	.932
	Potatoes	-1.277	1.076	.298	.752
	Poultry	-4.368	.956	.343	.659
	Ord. Rice	1.583	.823	.454	.496

*Y = Monthly Commodity Price, Selected Semi-rural Markets
X = Monthly Commodity Price, Port-au-Prince
Equation fit to the data: $Y = a+bX$

[a/] These markets are defined as semi-rural, i.e., farm level markets, by (48).

In the case of food grains, the percent of price variation in the semi-rural market explained by the variation in Port-au-Prince prices (R^2) ranges from .496 to .962 percent. Overall, this is a fairly hi correlation*, and suggestive of a responsive and price efficient food grain marketing system. In all cases, the slope coefficients, which range from .527 to 1.281, are not statistically different from unity when consideration is given to the standard error of these estimates. This leads to the conclusion that the analysis cannot detect a weight loss in food grains marketed through the semi-rural to Port-au-Prince marketing channel. As in the previous case, the intercept coefficients (a) must be interpreted with caution.

The vertical price relationship for those perishable commodities (bananas, potatoes and poultry) for which sufficient data was available provides mixed results. In the case of bananas, the price relationship deteriorates as distance from the urban (Port-au-Prince) market increases. Detectable market channel weight losses in shipments between St. Marc and Port-au-Prince are suggested. The results appear contradictory for potatoes. Potato prices are positively correlated with Port-au-Prince prices as expected. However, the results suggest that some weight loss occurs in shipments between Croix des Bouquets and Port-au-Prince, while no losses occur between St. Marc and Port-au-Prince; a result that cannot be rationalized without additional information. As in the previous analysis, poultry prices also yield

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*In the case of U.S. markets, R^2's are in the .5 to .7 range (25).

mixed results. While a positive correlation is clearly evident, no conclusion can be drawn as to market channel losses. Nevertheless, it is worthwhile to point out that for commodities that are sensitive and susceptible to damage in shipment, generally poorer statistical results are obtained. This in itself suggests that while the market seems competitive, shipment and packaging difficulties associated with perishable commodities limit its performance.

An FAO sponsored study (29) suggested that milling capacity may present a marketing "bottleneck", especially for the case of ground corn. If this is the case, excessive economic rents could be expected to occur to owners of mills. The analysis here is not intended as a definitive test of this hypothesis. Essentially, theory suggests that in a competitive market the price relationship between corn grain and ground corn is of the form:

$$P_{(\text{price of grain})} = A_{(\text{cost of grinding, in corn grain equivalents})} + nP_{(\text{price of ground corn})}$$

where n denotes the marmite equivalent of corn grains, i.e., one marmite of corn grain should yield less than one marmite of ground corn. Thus, n is a faction. The results of this analysis appear in Table XXVIII, for three urban markets. First, note that as an indication of market responsiveness, corn grain and ground corn prices are very highly correlated, ranging from .915 to .99. Again, caution must be exercised in the interpretation of the intercept coefficient for statistical reasons alone. The intercept coefficient suggests that

TABLE XXVIII

CORN/GRAIN AND CORN/GROUND PRICE INTERDEPENDENCE

IN SELECTED URBAN MARKETS, HAITI, 1975

Market	Intercept (a)	Slope (b)	Standard Error of Slope	R^2
Cap Haitian	.932	.537	.044	.958
Les Cayes	.751	.688	.094	.915
Port-au-Prince	.671	.679	.03	.990

the cost of grinding corn is in the vicinity of .671 to .932 gourdes per marmite of corn grain. The slope coefficient (b) is significantly different from one and zero in all cases. The (b) estimates suggest that one marmite of corn grain reduce to approximately .537 to .679 marmites of ground corn. In order to determine if "unfair" rents are occurring, the cost of milling machinery, etc., needs to be compared to the prices asked for milling corn. Thus, while these results are not definitive, they suggest that there is no distortion in corn grain and ground corn market price adjustments.

In summary, the results obtained by Johnson and LaGra suggest that significant differences in spatial prices exist. The analysis performed here suggests that at least selected food grain markets perform efficiently in responding to horizontal and vertical market surpluses and deficits. Some evidence exists to suggest that shipment and packaging difficulties cause inefficiencies in market performance for perishable commodities. No evidence is found to support the contention that milling capacity is a serious and significant constraint on the marketing system. Overall, the marketing system for food grains and at least selected perishables appears to operate competitively. This does not imply, however, that marketing costs are low. To the contrary, the results suggest that if marketing costs, particularily shipment costs, were lower the spatial market for perishable commodities would increase.

TRANSPORTATION

The state of transportation in a mountainous country such as Haiti has an impact on the volume and spatial flow of inputs, goods and services. The road transportation network consists of some 3,724 Kms. of highways and roads, excluding urban streets. Of these, only 15% are paved (56). Fifty-three percent of the unpaved roads were found to be in fair to poor condition, 13% in poor to bad condition, and 20% in bad to very bad condition. A similar perspective of the roads in Haiti can be obtained from La Gra and Fanfan (48). Of the 519 markets surveyed, 36 percent had no roads, 43 percent reported bad roads, 12 percent reported roads in "normal" condition and only 9 percent reported good roads, (Table XXIX). The percentage of markets by departments reporting both non-existent and bad roads are: Northwest, 81 percent; North, 81 percent; Artibonite, 71 percent; West, 71 percent and South, 95 percent.

Diagrams presented in Figures XX.a and XX.b demonstrate the type of economic impacts that can be expected from a decline in spatial costs. Figure XX.a depicts farm level product prices as the distance from product markets A and B increases, while Figure XX.b depicts the effect on farm level input costs as the distance from markets A and B increases. In the product case, as distance from the market increases, lower spatial costs will result in an increase in farm level product market prices for producers who live at a distance greater than A.1, A.2 in the case of market A, and at a distance greater than B.1 and B.2 in the case of market B. Producers living within a circumference 0 to A.1 and 0 to A.2, 0 to B.1 and 0 to B.2

TABLE XXIX

HAITIAN MARKETS AND QUALITATIVE CONDITION OF ROADS

	North-West	North	Artibonite	West	South	Total
Number of Markets						
Urban	2	2	2	24	4	34
Regional	6	5	10	19	19	59
Semi-Rural	29	75	57	163	102	426
Total	37	82	69	206	125	519
Number of Markets Reporting Condition of Roads						
Non-existent	19	17	28	77	46	187
Bad Condition	11	49	21	70	72	223
Normal Condition	7	14	13	25	4	63
Good	0	2	7	34	3	46

Source: La Gra, J. Fanfan and Charleston

FIGURE XX

IMPACTS ON FARM LEVEL PRICES FROM LOWER SPATIAL COSTS

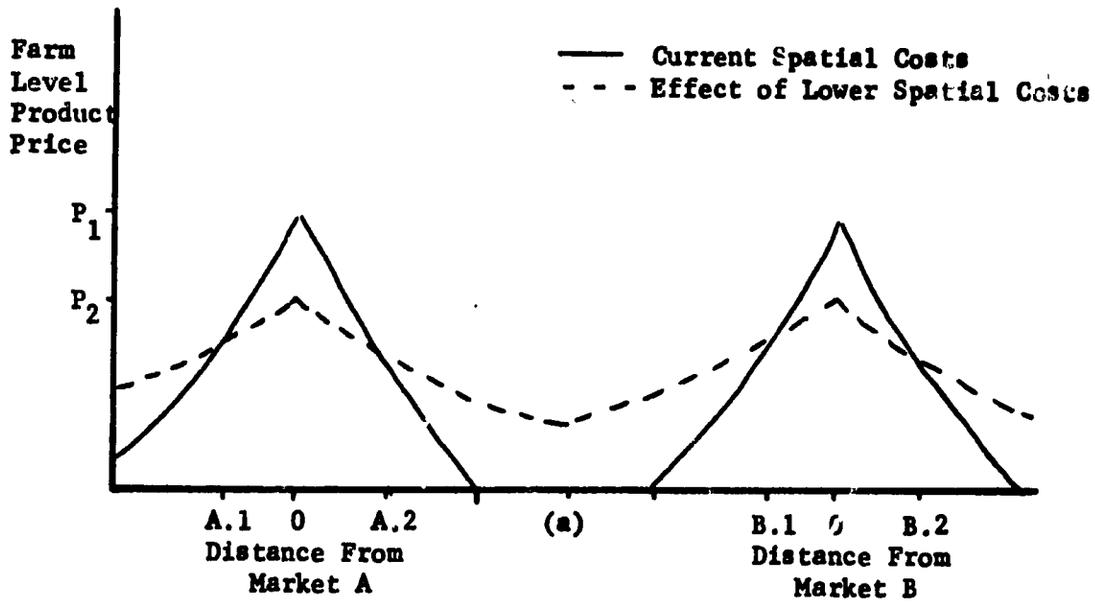


Figure XXa

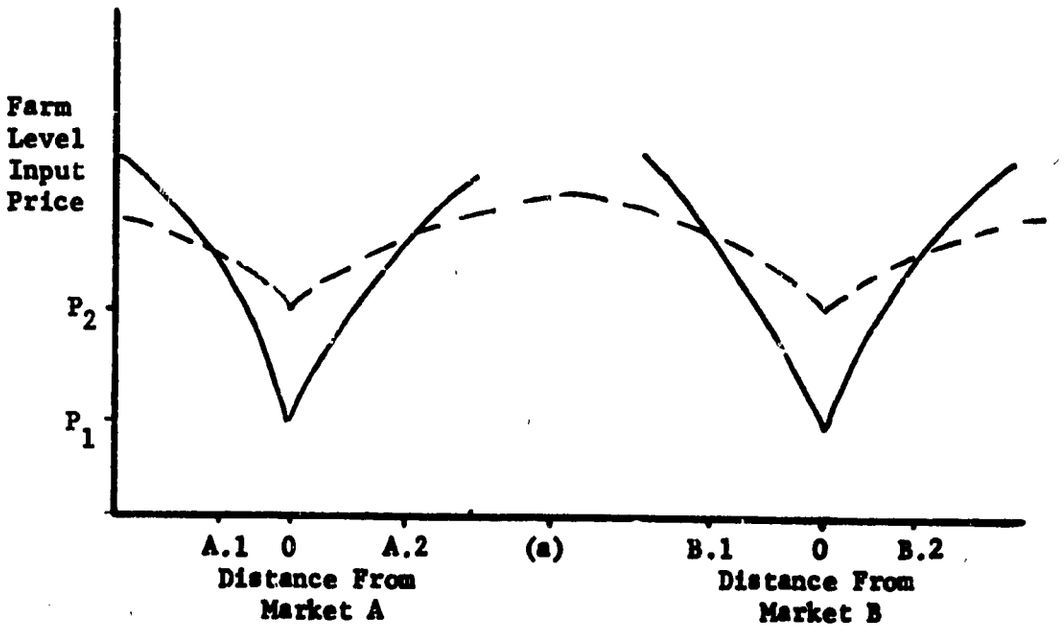


Figure XXb

will likely experience a decrease in product price. They will likely experience a price decrease (all else held constant) because of the increase in agricultural product supplies now entering the market from a greater distance than was previously the case. The benefit to consumers is represented by the decrease in product price from P_1 to P_2.

In the case of agricultural inputs, or for that matter, the flows of goods and services from the market, farm level costs will decrease for those producers living outside of the area A.1, A.2 and B.1, B.2, Figure XX.b. The costs to producers living within the area 0 to A.1, 0 to A.2, 0 to B.1 and 0 th B.2 will probably increase, because of increased demands for inputs, goods and services by producers outside the A.1, A.2 and B.1, B.2 area. The effect of a decrease in spatial costs that are not clearly depicted in Figure XX is that the differences in spatial market prices will tend to decrease. For instance, the point of intersection (a) in both diagrams implies that producers who before did not have access to either market A or B now have access to both. Thus, lower spatial costs are likely to decrease the existence of "local monopolies" that might exist as a consequence of high spatial costs.

In addition to the internal transportation network, about 18 percent of all freight is transported by coastal vessels from nine major ports (Table XXX). In the case of Port-au-Prince, Duplan and La Gra estimated that about 14 percent of the total freight entering the city was transported by boat (18).

TABLE XXX

PRINCIPAL COASTAL SHIPPING PORTS, 1975

	Tonnage Unloaded	Passenger Arrivals
Port-au-Prince	54,000	30,000
Jeremie	15,000	25,000
Gonaive	10,000	-
Les Cayes	8,000	-
Miragoane	7,000	5,000
Anse Rouge	7,000	10,000
Port-de-Paix	6,000	22,000
Anse a Galet	6,000	50,000
St. Marc	5,000	10,000
Ile de la Tortue	-a	20,000
Ile a Vache	-a	N/A
Montrouis	-2	50,000

-a: Not Significant

Source: National Transportation Study, Vol. 2

Several inefficiencies are reported to exist in coastal shipping (56). No warehouse facilities exist at most ports. Consequently, ships must await the arrival of trucks before sufficient tonnage can be accumulated. Likewise, the unloading of material must either await the arrival of trucks or be stored at the dock exposed to the weather. The largest percentage of tonnage is carried in sail boats,

frequently with an on-board engine. However, the ships are not licensed, there is no coastal fleet to assist ships in distress, and their trip schedules are irregular.

As is pointed out in the previous sections of this paper, the Haitian agricultural marketing system is characterized by a labor intensive process and, except for shipment from regional to urban markets, most shipments are of small scale. The impact of lower spatial costs will probably increase the scale of shipments and decrease the labor intensity of the marketing process along those routes that are improved. Conversely, the higher the transportation costs, the "smaller" the spatial and volume dimensions of the market. The price analysis results presented in Section VI indicate that markets for food grains among the cities from which the data was obtained appear to be interdependent. In terms of Figure XX, this implies that the price contours denoted by a broken line (---) in fact intersect. The results suggest that this may not be the case for perishables. That is, the unbroken line (——) may be representative of perishable commodities (especially mangoes) for many markets. More difficult to estimate, however, is the net social returns accruing to economies of market size.

Clearly, the present Haitian transportation network is undeveloped and a constraint to economic growth. The availability of data and information allowing for the quantification of the above diagram would

require more resources than are available for this effort. However, some insights can be obtained from other previously conducted studies.

A study of the Haitian transportation network was undertaken by Louis Berger International, Inc. for the UNDP and the IBRD and published in seven volumes in August, 1977 (56). Another study, released in August, 1977, was undertaken by the IBRD (37). This study focussed primarily on the net economic impacts of road improvement from Port-au-Prince to Cap Haitian and from near Joffre to Gros Morne.

The methodology employed in the national transportation study to establish the short and medium range transport sector plan was (56):

1. Analysis of the present trends affecting transportation, and definition of the government's current role.
2. Analysis of the demand for transportation, the elements influencing model choice and the definition of alternative strategies for transportation development.
3. Diagnosis of transport constraints by mode and project identification.
4. Economic evaluation of strategies and projects and the determination of an economically optimum transportation plan.
5. Determination of the potential user charges and budget constraints and consequent modification of the optimal transportation plan.

Based on this study, some insight can be obtained into the impact of transportation costs on overall welfare. This study found that the rehabilitation of existing roads would earn an economic rate of return on investment in the range of 33 to 39 percent (56). The net present value (1975) of these projects, assuming an opportunity cost of 9 percent and a useful life of the investment of 20 years, is 13.2 million dollars. This includes the rehabilitation of 127 Km of paved roads and 731 Km of unpaved roads. These project activities were given first priority. The economic rate of return on port improvements for internal shipping yielded an estimated rate of return in the neighborhood of 23 to 35 percent (a net rate of return of $4.1 million) and consequently, earned a second priority rating. Third priority is the modernizing of the shipping fleet with estimated economic rates of return in the neighborhood of 25 percent.

The economic engineering study (37) evaluated the cost-benefits of road improvements in the northern section of the country; namely from Cap Haitian to Acul du Nord, from Cap Haitian to Milot to Grande Riviere and from Gros Morne to the intersection Joffre. Essentially, the methodology of the study was to synthesize costs for four classes of vehicles: passenger cars, pick-up trucks and jeeps, passenger trucks, and larger trucks. These costs were synthesized for three types of road conditions: trails, good trails, and paved roads. Estimated costs per Km appear in Table XXXI.

TABLE XXXI

OPERATING COST ($) PER Km, BY TYPE OF VEHICLE AND ROAD

	Trail	Good Trail	Paved Road
Passenger Car	.1825	.1472	.0893
Jeep, Pickup	.2111	.1646	.0923
Passenger Truck	.8148	.6537	.4060
7.5 Ton Truck	.7346	.5783	.3554
12 Ton Truck	.9093	.7352	.3905

Source: IBRD, Economic and Engineering Studies of Roads and Coastal Ports in Haiti, August, 1977.

Next, a survey was taken to determine the levels of existing traffic flows, and the estimation of road construction costs to convert, for instance, a trail into either a good trail or a paved road. These computations, when discounted to present values, gave estimates of the benefit to cost of road improvements. The immediate rates of return and internal rates of return are depicted in Table XXXII.

TABLE XXXII

RATES OF RETURN TO ROAD CONSTRUCTION PROJECTS IN NORTHERN HAITI

Road	Internal Rate of Return (%)	Immediate Rate of Return (%)
Cap Haitian-La Mort	37	31
La Mort-Frere du Nord	19	14
La Mort-Milot-Gde. Riviere	14.5	9
RN1-Plain du Nord	13	8
Joffre-Gros Morne	18	14

Thus, while it is not possible to determine from these studies the effect on producer income of road improvement, clearly the return on investment appears substantial. The agricultural sector, containing 80% of the population, should receive a major portion of the savings from lower transportation costs, since over 92% of the goods transported are of agricultural origin (56). The agricultural subsectors receiving a major relative increase in benefits would be those producing perishable goods, such as fruits and vegetables.

The over-all effect of lower spatial costs should yield benefits to those agricultural products characterized by free or competitive markets. The competition for farm level supplies, as characterized by the activities of the Madam Sara, should result in the transportation cost savings being distributed to producers in terms of slightly higher prices for their products and lower prices for their inputs. As implied above, the benefit to consumers should be in terms of lower product prices because of increases in supplies. If the historical rate of urban population growth continues, lower spatial costs will mean a decrease in the committment of scarce resources to the spatial flow of goods and services, as implied by the cost-benefit studies.

For those subsectors where some evidence exists to suggest the existence of monopsony behavior, (e.g., coffee, sugar, cotton, sisal) it is probable that a lower percentage of the savings resulting from lower spatial costs will be passed on to growers. Nevertheless, lower spatial costs will likely make it more difficult for local speculators

to maintain local market control. In the case of coffee, for instance, improved roads should encourage the marketing of cherries (which are more difficult to transport than beans) to washing factories, thus increasing competition between speculators and the factories.

In closing, it is the opinion of the author that the transportation studies cited tend to underestimate the net social value of road construction and improvement. First, these studies do not adequately consider the additional value from the increase in quality of the agricultural products marketed (such as less damage to fruits and vegetables, and less weight loss to animals transported on hoof) or the value of increased production that might occur from lower cost access to input markets. Furthermore, it appears that traffic on recently improved roads exceeds the volume increases estimated prior to construction.

VIII. WEIGHTS AND MEASURES, GRADES AND STANDARDS

Duplan (16) provides a list of the alternative units of weights and measures employed in the marketing of agricultural products. For a majority of the products marketed for internal consumption, measures such as large sac, small sac and marmite are common. However, products marketed for export (coffee, sisal, sugar, cattle) tend to be marketed by an internationally accepted measure, such as the 60 Kg. sac in the case of coffee, or metric tons in the case of sugar.

The effects of these measures on marketing efficiency of food grains, legumes and fruits and vegetables, i.e., those crops where competition appears to be intense, is in all likelihood slight. If a sale occurs where a sac of produce is not at its expected weight or volume, competition will force the unscrupulous dealer to modify trading practices. And, given the low opportunity cost of labor, the value of the additional time required in a transaction to determine the volume of produce involved is probably small. In a similar vein of reasoning, the lack of grades and standards for the internal marketing of agricultural products is also likely to not induce any significant inefficiency in the marketing system. A possible source of difficulty with the various units of measurement employed is in the transformation of information, perhaps less so to producers and marketing agents than to government planners who must devise data collection and monitoring systems and make price forecasts. Nevertheless, this seems to be a rather small obstacle compared to the many other problems that must

be faced. Most purchases of food stuffs in local markets is scrutinized by the buyer. Consequently, lower quality produce automatically tends to command a lower price. In a competitive system, these signals are undoubtedly passed back to producers.

The need for grades and standards are important for crops sold through speculators and for export crops. The lack of grades and standards in the case of cotton and sugar, and perhaps coffee, markets appear to be most severe. In the case of cotton, grades relating to fiber and oil yield may, if corresponding price differentials are permitted, induce better farming practices and encourage the choice of better varieties of cotton seed. The most outstanding case is sugar. The price paid for sugar is based on weight rather than on sugar content. This practice tends to perpetuate the production of cane that yields less than 9 percent sugar. Standards should be established so that cane with a higher sugar content commands a higher price. The problem with coffee arises when small producers dry their coffee cherries by placing them on the ground or other surfaces which impart an undesirable taste to the coffee. Grades and standards, accompanied by appropriate price differentials, should be established to encourage better practices. Consistent grades and standards generally improve market performance in marketing channels characterized by imperfect competition and/or poor channels of communication between final consumer and raw product supplier (as in

the case of export markets). However, additional research is required to assess the net benefit of implementing weights and measures and/or grades and standard measures for these crop categories.

IX. DISPERSED PRODUCTION

As pointed out above, except for the Artibonite where a majority of rice is grown, the production of food grains is dispersed throughout Haiti. This dispersion of production is, in part, explained by factor endowments, a high rural population density, lack of alternative economic opportunities, lack of roads, and small scale farm holdings. Dispersed production precludes attainment of scale economies at the farm level and tends to increase the quantity of resources that must be allocated to perform product assembly and input distribution activities. Consequently, dispersed production tends to be a constraint to long-run economic growth of the economy and a problem which can only be partially addressed through marketing policies. Policies designed to decrease population growth rates, increase alternative non-agricultural economic opportunities to "pull" labor from agricultural areas; and policies designed to decrease spatial costs and encourage the adoption of more efficient but labor intensive mechanical, biological and chemical technology in agricultural production will tend to decrease dispersed production, while at the same time increasing agricultural productivity.

In a spatial marketing context, the configuration of semi-rural markets are points from which larger quantities of goods can be obtained and delivered to the regional markets, where a further aggregation of goods into larger quantities occurs for shipment to other regional and urban markets. Especially with the absence of roads, the assembly-

distribution of goods and services in rural areas is a labor intensive activity. Yet, in a labor surplus economy with low opportunity costs to labor, this marketing mechanism seems to function adequately (efficiently) given the constraints (lack of roads, small scale production, etc.) imposed upon it. Improvements in roads and increases in production efficiency can be expected to increase specialization (concentration) in crop production. A larger volume of agricultural products will likely be produced in those areas having a comparative advantage in their production with an increase in purchase of those goods previously produced on the farm for household consumption. The magnitude of this shift in production, however, may not be substantial, owing to the small scale of production units. For purposes of risk aversion alone, many producers may prefer some form of crop diversification.

The capacity of the present food grain distribution system to market larger quantities of inputs, goods and services has not been assessed. Thus, the changes in marketing costs that can be expected with changes in the quantity marketed are unknown. Perhaps the most serious consequence of the dispersion of production and small scale units lies in the difficulty of developing an efficient input (chemical, biological, credit, extension services) marketing system. While product marketing infrastructure has evolved over a long period of time, the input marketing system has not evolved, in part because

producers have customarily provided their own inputs (seeds, manure for fertilizer). More information needs to be obtained on factors affecting farm level demands for mechanical, chemical and biological inputs, and on the nature, cost and quantity of inputs marketed through the present system. In particular, how can farm level demand for modern inputs be stimulated? What goods and services are carried on back hauls from the urban markets? How are these goods redistributed in the regional and semi-rural markets? What is the level of costs associated with this marketing process? Knowing the physical and behavioral characteristics of the present production and input marketing system should provide important insights on how this system might be used to stimulate the demand for distribution of chemical and biological inputs. However, it may be necessary to establish, in the regional market centers, government subsidized and perhaps operated offices that specialize in a "bundle" of inputs, such as credit and fertilizer and/or pesticides. In any event, care must be taken to assure that:
(1) the inputs marketed are available in the appropriate quantity and place when needed, (2) that these inputs are not information intensive, (i.e.) differ substantially from traditional procedures and practices or require substantial information to use correctly.), (3) that initially thier use be encouraged in a manner that builds farmers' confidence and minimizes their risk (beginning with small quantities or small parcels of land), and (4) the system or program supporting

the marketing of inputs should be flexible in the input package in order to accomodate individual farmer's capabilities, factor endowments and risk preferences.

The supplying of these types of input services to large numbers of small scale producers likely implies high unit input marketing costs. These costs may prevent or slow down the movement from a traditional based technology to a technology based system that relies on "modern" inputs. Furthermore, unless intensive efforts are made, it is likely that the poorest segment of the rural community will find it the most difficult to afford the use of purchased inputs because of poor land resources and greater distances from transportation networks.

X. INFORMATION NEEDS

Several government agencies collected and published price data. These include IHS, IHPCADE, IDAI and SENACA. The collection of monthly data precedes 1948 and since 1951 have been published by IHS for selected markets and products. The collection procedures generally involve sending an agent to the market where sales are then observed and recorded. IHPCADE is the only institution that has systematically collected prices on a large array of agricultural products. These prices are collected through ten regional offices. Recently, SENACA has been collecting and publishing weekly price data for selected commodities and regions for three levels in the marketing channel: farm level (semi-rural markets) wholesale level (regional markets) and retail level (urban markets).

Based on the statistical results reported in Section VI, it appears that the price data for food grains is reasonably reflective of market prices. This, in part, is due to the overall product uniformity among food grain commodities. This level of uniformity tends not to exist with more perishable commodities and commodities that are easily damaged in transit. Consequently, prices reported for these commodities tend to be less reflective of market conditions, since these prices may or may not consistently reflect overall commodity quality profiles. The social value of economic information depends on the extent to which it helps private and public decision makers make "better" decisions. Better decisions are decisions whose

consequences result in higher utility (either in consumption, income, or social outcome) to the decision maker. In principle, the total value obtained from using the information should, of course, exceed its cost. With this concept in mind, various dimensions of private and public information needs can be considered.

Private Sector Information Needs

In the Haitian case, it appears that producers are seldom, if ever, aware of prices received for their products in the urban market or the international market, except in the case of those products, primarily perishables, that are marketed directly. However, if effective competition in marketing channels exists, then producer level prices are reflective of retail prices. Competition between a large number of intermediaries in food grain markets appears to result in farm level prices that adequately reflect final demand conditions. Thus, the net benefit of reporting retail market price information to the farm level does not appear to be significant. For those crops that are marketed through licensed speculators (cotton, coffee, sugar, etc.) current price information to producers on prices offered by various speculators may be more useful in increasing competition at the farm level than in the case of food grains. However, according to the coffee producers survey (40), some farmers were found to carry sacks of coffee more than two miles for a price differential of one cent/Kg. If this behavior is typical, then it is not clear whether or not a price reporting system of reasonable cost can be "fine tuned" to the point of recording such small differentials.

Market information needs for purchased agricultural input decisions may not be substantial owing to the low level of purchased agricultural inputs. However, given the apparent lack of marketing infrastructure for agricultural inputs, market information concerning when, where and

how to obtain production inputs may yield long run, though perhaps not short run, returns. For instance, Cummings (7) suggests that this type of information helps small and newer traders by easing their entry into the input market and thereby increasing its development and competitiveness.

The cost of information to intermediaries in traditional marketing systems is generally high. This cost becomes part of the marketing margin. The cost is high because its dissemination is "person" specific. That is, each Madam Sara must obtain market information which, according to Murray and Alvarez (52), is closely guarded. This in itself suggests that information at this level in the marketing channel is recognized as having value and, therefore, is scarce. Nevertheless, there remains a dilemma. Given the low opportunity cost to labor, relatively small spatial or temporal price differences may be important to the decision maker and significantly affect his action. Since difference in quality and negotiating ability are significant factors in price determination, can a reasonably effective, non-costly price reporting mechanism be established that is sufficiently "fine tuned" to identify, in wholesale and retail product markets, these subtle price differences? The answer is probably negative, in which case, the collecting and publishing of the information would not help make better decisions. In Section VI, monthly food grain prices were found to be correlated. However, more information needs to be

obtained on weekly spatial price changes to assess the efficiency of market response to weekly changes in supply and demand conditions. If inefficient adjustments are suggested, then weekly market information reports are perhaps justified.

An important type of information, particularly to producers, is price forecasts. Forecasts are generally based on previous market behavior, and, therefore, require a market information system. Forecasts should provide market information for major cash crops, such as beans, and indicate important future directional changes in price and yearly price trends. Since it appears that retail commodity prices are rather quickly reflected back to the farm level, these forecasts can be based on urban market conditions where data is most easily available. Given the underlying data requirements to make price forecasts, these forecasts should initially be restricted to national estimates. The level of accuracy of these forecasts should be sufficient to maintain producer and other user condifence in them. Initially, it may be sufficient to predict directional price changes by semester (shorter time periods, if possible) and to state their relative ranking (e.g., bean prices are expected to increase by a greater percentage than rice prices).

The method for disseminating market information among a population with illiteracy estimates of 80-90 percent must be given careful consideration. If all primary producing units are to benefit from information, the form and method in which the information is distributed may be as important as the information itself.

Public Sector Information Needs

Public information needs on marketing activity is required for both planning and market monitoring purposes. Public decision making is characterized by information needs that, relative to information for private sector decision making needs, (1) can tolerate a larger magnitude of error, but (2) must include information on a far larger set of commodity and input markets in both space and form and, for purposes of economizing on large information needs, (3) the information obtained or sought (a) should seek to support policy management of those instruments (prices, interest rates, projects) that are at the discretion of public decision making authorities to manipulate and (b) should be consistent with and facilitate activities designed to monitor economic development objectives and targets. Presently, these needs appear to exceed the information needs of the private sector. The dimension of data needs is complex and cannot be adequately handled here. Some guidelines can, nevertheless, be suggested.

The information should be collected in a systematic and consistent manner so that data errors are reasonably small or held to some constant level. That is, a consistent and constant bias in the data is preferred to varying biases in a data series, since the effects of a constant bias are easily handled when using the series to monitor variations in economic activity. Otherwise, it is difficult to determine if the variation in a data series is due to data errors, a variation in economic activity, or both.

The need for "fine tuning" a data collection procedure is not as essential for improving public decision making as it is for private sector decision making, as discussed above. In the case of public decision making (for such activities as planning, policy formulation, program implementation) a 1-4 percent error in price estimation will not likely have a significant impact on final decisions. However, more emphasis on the range of coverage (for example, regional markets, number of commodities, input markets) is generally required for public decision making purposes. Currently, little information is available on quantities of agricultural products commercialized, transported and supplied to the various markets. This information is essential for measuring market performance, efficiency, monitoring food costs and consumption levels, and the making of price and production forecasts. Frequently, needs arise for understanding the factors influencing specific market and/or farm level production-marketing activities. Resources should be "set aside" with the intent of their allocation for these periodic, diverse and special needs.

Three steps are essential if a low income country is to develop information wisely in support of its development efforts (7). These steps are:

1. Identify the information required for the most important private and public decisions and specify the kinds of information that have the highest priority.

2. Utilise methods of collecting, processing and analysing data that meet reasonable standards of accuracy, timeliness and coverage, while at the same time minimise data collection costs.
3. Perhaps most importantly, do this within an institutional structure which brings users and suppliers of information together in a continuous dialogue, thus building a capacity to change.

While recommendations for designing an information data collection system are beyond the scope of this paper, clearly efforts must be made to design such a system and resources committed to its implementation. It is the opinion of the author that the system should be designed with more emphasis on meeting information requirements for public sector decision making needs than on the information needs of the private sector. A possible exception being those crops which are marketed through licensed speculators. Input market data also needs to be collected on a systematic basis and disseminated to both the private and public sectors.

XI. FOOD GRAIN IMPORTS

The general objective of this section is to discuss some of the positive and negative aspects of concessional food grain imports. An empirical analysis of Haitian food grain supply and demand behavior is required to adequately deal with this subject. Analysis is made somewhat more difficult because only during the last year have concessional grain imports been of large magnitudes and, at the time of this study, 1976-77 food grain prices were not available. While an empirical analysis is beyond the scope of this study, some useful insights can, nevertheless, be obtained from the information presented thus far.

The level of concessional and commercial imports of food grains are reported in Table XXIII. The far majority of concessional rice and corn imports are through PL 480, Title I/III agreement. Not reported in Table XXIII are wheat grain and flour imports, which totaled 96,000 MT of grain and 10,000 MT of wheat flour in 1976-77. Projected imports for FY 1978 are 50,000 MT of wheat grain under PL 480, Title I/III, 46,000 MT of wheat grain from other sources and 10,000 MT of wheat flour. Clearly, in recent years the level of rice,wheat and corn imports has been sufficient to have an impact on food grain prices. Based on discussions with Ministry of Agriculture and USAID officials, the consumption of wheat is almost entirely restricted to consumers residing in urban market areas. The majority of rice imports are also believed to be consumed in urban market areas.

TABLE XXXIII

FOOD GRAIN IMPORTS IN METRIC TONS, 1972-1977

	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
Rice						
Concessional	261	-	93	925	5	15,000
Commercial	89	5,400	707	3,525	11,445	35,000
Total	350	5,400	800	4,450	11,500	50,000
Percent of Prod.	.4	7.7	.9	5.1	12.5	100.0
Corn Grain						
Concessional	-	-	-	3,000	-	10,000
Commercial	100	4,800	-	1.651	1.041	7,000
Total	100	4,800	-	4,651	1.041	17,000
Percent of Prod.	.03	1.9	-	2.3	.6	10.6
Corn Meal						
Concessional	726	665	590	136	136	1,000
Commercial	-	-	83	1,860	2,404	2,000
Total	726	665	673	1,996	2,540	3,000
Beans	-	-	-	-	-	-

Source: Five Year Outlook FY 1978-82, Preliminary Draft, U.S. Embassy

Wheat is felt to substitute for corn meal, although the extent of the substitution is unknown.

The negative effects of concessional imports lies in their depressing effect on domestic prices and, therefore, the disincentives induced to increase the domestic production of these commodities. Beneficial aspects of concessional food grain imports include price stabilization, saving of foreign exchange and, of course, increasing consumption levels, and indirectly, levels of discretionary consumer income. First, we briefly consider the important aspects of concessional imports that have likely had either a positive effect or at least no adverse economic effects. Then, the important adverse effects of concessional imports are considered. The discussion of these effects draws on the line of reasoning presented in Appendix B, Models of Farm Household Production-Consumption Behavior.

With population growth exceeding increases in food production, and increases in urban population and urban income levels, the demand for agricultural commodities has increased substantially in recent years. Concessional imports have, in all likelihood, alleviated already high food grain prices and supplemented diets with somewhat higher protein foods. Since food grain prices are likely to be elastic, and, as demonstrated in Section VI, spatial food grain market prices are definitely related, increases in food grain supplies in Port-au-Prince can be expected to have an impact on prices throughout Haiti. Thus, even though urban consumers are the major recepients of

concessional imports, rural consumers also benefited because of the overall depressing effect on food grain prices.

Lower food grain prices do not necessarily cause disincentives to increases in domestic food grain production, or disincentives to increase food grain storage capacity. Clearly, rural households which consume all of the food grains produced on the farm, Appendix B Figure BV, can only benefit from concessional imports. Low food grain prices lower the cost of any food grain purchases required to supplement diets beyond the quantities produced on the farm. Concessional food grain imports during years of unusually high seasonal food grain prices, such as in 1975, should not have a disincentive effect on investments to increase storage capacity. Concessional imports during 1975 could perhaps have been increased without affecting incentives to increase storage capacity.

It is frequently stated that since Haitian farmers do not purchase agricultural inputs, and since they appear to produce as much as possible given their factor endowments and traditional production technology, food grain supplies are not sensitive to "reasonable" changes in food grain prices. With the exception of the farm household behavior depicted in Appendix B Figure BV, concessional imports of rice, corn and, perhaps, wheat at 1976-77 levels (Table XXXIII) very likely had disincentive effects on farm production of food grains and, perhaps surprisingly, a detrimental effect on the diet of some households

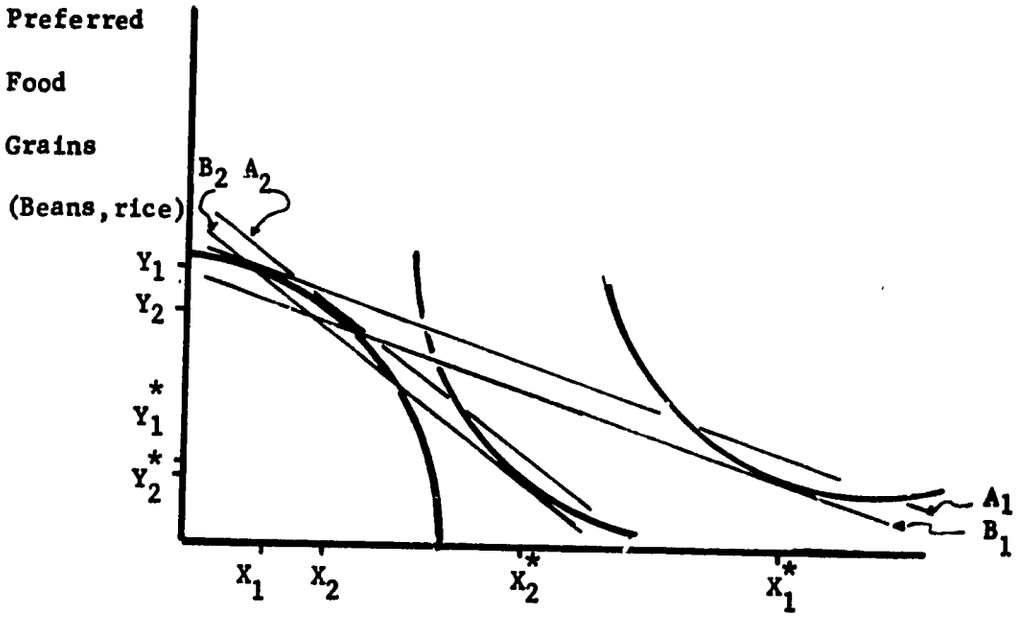
Consider first those Haitian farm households which are net exporters of the preferred food grains, especially beans and rice, and purchasers of the less preferred food grains, such as millet. Appendix B, Figure XVI is reproduced below.[1/]

FIGURE XXI

EFFECTS OF FOOD GRAIN PRICE CHANGES ON

PRODUCTION-CONSUMPTION LEVELS OF FARM HOUSEHOLDS

COMMERCIALIZING PREFERRED FOOD GRAINS



Less Preferred Food Grains (Millet, Corn)

[1/] The reasoning underlying Figure XXI is given in Appendix B.

Before Imports:

farm level price ratios A_1

retail price ratios B_1

production Y_1, X_1

consumption Y_1^*, X_1^*

After Imports:

farm level price ratios A_2

retail price ratios B_2

production Y_2, X_2

consumption Y_2^*, X_2^*

Net Change:

production

decrease Y by $Y_1 - Y_2$

increase X by $X_2 - X_1$

consumption

decrease Y by $Y_1^* - Y_2^*$

decrease X by $X_1^* - X_2^*$

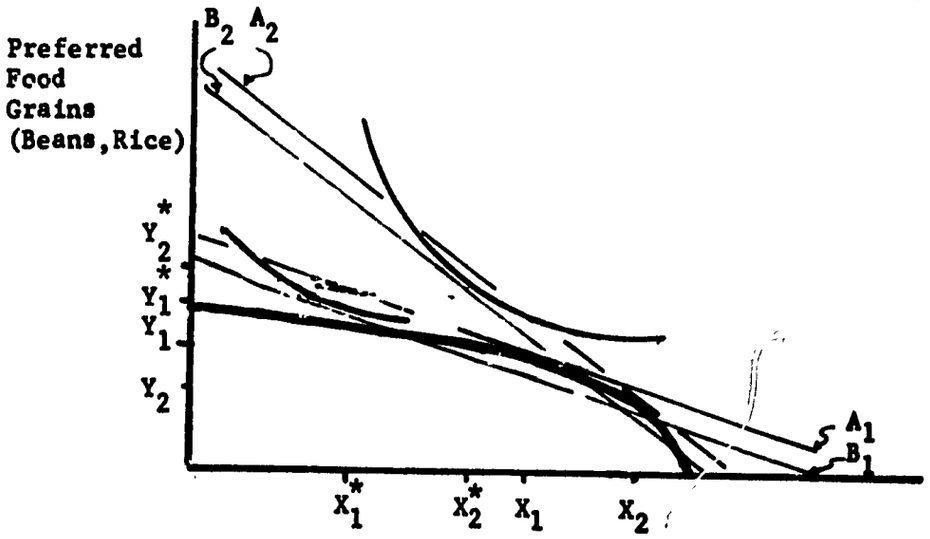
The overall impact is to decrease the production of the imported food grains and increase production of the less preferred food grains, such as millet. Consumption of the less preferred food grains decreases because the farm income earned from the sale of the preferred food grains has decreased. Farm income has decreased because of the depressing effect on preferred food grain prices from concessional imports. Alternative constructions of Figure XXI are possible, given

the evidence of farm household behavior discussed in Appendix B. One alternative construction yields a slight increase in the ratio of consumption of the preferred to less preferred food grains. In this case, the negative income effect of falling farm income is outweighed by the positive price effect of lower preferred food grain prices. However, total income is still decreased. In no case consistent with available evidence on farm household behavior will the production or consumption of both categories of food grains increase.

Next, consider a second category of Haitian farmer households, households which are net purchasers of the preferred foods. A model of this category of farm households appears below (Figure XXII).

FIGURE XXII

EFFECTS OF FOOD GRAIN PRICE CHANGES ON PRODUCTION-CONSUMPTION LEVELS OF FARM HOUSEHOLDS COMMERCIALIZING LESS PREFERRED FOOD GRAINS



Before Imports

farm level price A_1

retail level price B_1

production Y_1, X_1

consumption Y_1^* X_1^*

After Imports

farm level price A_2

retail level price B_2

production Y_2, X_2

consumption Y_2^*, X_2^*

Net Change

Production

decrease Y by $Y_1 - Y_2$

increase X by $X_2 - X_1$

Consumption

increase Y by $Y_2^* - Y_1^*$

increase X by $X_2^* - X_1^*$

In this case, the net impact of concessional imports at a level sufficient to effect food grain prices is to increase consumption of both preferred and non-preferred food grains, even though total farm income has decreased. But, the deflationary effect on prices means that the lower income can purchase more food grain. However, as in the previous case, lower preferred food grain prices leads to a decrease in production of the preferred food grains.

Finally, consider those Haitian farmers who have traditionally specialized in the production of other non-food grain crops, such as coffee or cotton, and only within recent years have become net exporters of food grains. Clearly, concessional imports will tend to decrease the production of food grains on this category of farms, and result in a decrease in nominal and real farm income. In this case, consumption will also decrease. It must be emphasized that this analysis only suggests directional impacts. Consequently, an empirical analysis is required in order to determine the magnitudinal benefits (positive or negative) of concessional imports at levels which effect domestic prices.

In summary, concessional imports at levels which effect food grain prices results in benefits to those consumers and losses to those producers who are engaged in commercial food grain consumption-production activities. Since over 80 percent of the Haitian population resides in the agricultural sector, producers and consumers are often the same individual. Thus, the net change in welfare for this individual, referred to as the farm household, depends if the farm household is a net exporter or consumer of the grain imported. If the farm household is a net exporter of the same grain that is imported, the farm household is worse off. If it is a net importer, then it is better off. In all cases, domestic production of the same grain that is imported decreases. Clearly, the impact of concessional imports is complicated. Nevertheless, policy guidelines can be stated for PL480 Title I/III imports.

These are:

1. Concessional imports should be such as to have a minimal impact on relative food grain prices.
2. Concessional imports can be justified if seasonal prices are in excess of the magnitude required to induce investments in storage capacity and if high seasonal prices are reflective of adverse, non-controllable supply conditions, such as drought.
3. Concessional imports can be justified if dispersed to non-market participants, subject to need.
4. Concessional imports can be justified if dispersed in such a manner as to not compete with domestic producers for the consumers' disposable income. This category includes consumers who, if given free concessional food grains, still spends roughly the same amount of income on food grains.

XII. MAJOR FOREIGN ASSISTANCE PROGRAMS IN THE MARKETING AREA

The major foreign assistance programs in the marketing area, exclusive of road construction and renovation, are funded through USAID, CIDA, IBRD and IICA. A UNDP program to expand storage facilities and create a marketing board is in the planning stage and is consequently not discussed here. The activities of several private voluntary organizations, whose projects have marketing implications, are also not discussed here. A discussion of these programs and others are presented in USAID's Development Assistance Program report (1).

USAID's Small Farmer Marketing Project: Coffee

This project involves a $2.2 million grant to the Government of Haiti to assist in the development of coffee marketing cooperatives and to assist in the development of coffee processing and technology. The project paper states that:

> "The goal of the project is to increase the income and, thereby, improve the standard of living of an estimated 384,000 poor farm families in Haiti. The project will also provide additional foreign exchange to alleviate Haiti's deteriorating balance-of-payments position. This will be accomplished through the development of a marketing network composed of local coffee producers' cooperatives, centering on a national coffee processing and exporting facility. The national facility is scheduled for financing under the terms of a follow-on FY 1978 USAID loan. The marketing system is described as a parallel infrastructure to the existing system, which is solely in private hands."

The authors of the project paper concluded that the project is feasible and timely and, therefore, recommended that a grant of $2.2 million be authorized with a companion loan in FY 1978 to complete the construction and equipping of a National Coffee Processing Center.

The project is designed to provide assistance to coffee marketing cooperatives in the functional areas of, (1) formation and organization, (2) management and administration, (3) the provision of physical coffee washing facilities, and (4) short-term financial management assistance. The projected expenditures for each of these categories are:

	Funding Source Thousands of Dollars	
	AID	GOH
Assistance to Co-ops		
Formation, Organization	470	100
Management and Administration	975	700
Physical Facilities	330	30
Short-term Financial Assistance	30	125
Coffee Processing and Marketing		
Local Co-ops	310	10
National Coffee Processing Center	85	40
Total	2,200	1,005

A three man U.S. technical assistance team will assist and train IHPCADE field extension agents. The extension agents are to motivate small farmers to develop cooperatives. The strategy for developing management skills is to carefully select individuals (supposedly from the membership) with demonstrated management abilities or instincts and to provide them with additional training. This category accounts for the largest portion of funding.

The cooperative is to be built around the establishment of a coffee washing plant with an average capacity for processing 1,000 bags of coffee per year. Three plants are to be financed under the grant with the actual construction of the facility to be financed by the follow-on loan. Short-term financial assistance to the cooperatives is to be coordinated through a new Financial Management Section of IHPCADE and the Haitian National Bank. The cooperatives will provide producers an 80 percent downpayment for the coffeecherries at the time of delivery to the washing factory. Final payment is made when the processed berries are sold and costs deducted. Financial assistance is thus designed to meet these short term committments.

The establishment of a national coffee processing center is primarily for the purposes of developing a specialty market for the high quality Haitian coffee forthcoming from the washing factories, to develop a marketing channel alternative to the current channels, and the processing of coffee to higher specifications. Haitian coffee averaged about $.84 per pound between 1974-76, while an equivalent quality of Jamaican coffee averaged $1.50. However, high quality Jamaican coffee averaged $4.28 per pound. Supported by the Jamaican case, it is felt that higher prices can also be obtained for quality Haitian coffee. To encourage the formation of cooperative washing factories, the GOH provides a tax incentive of a 19% ad valorem tax as compared to the 24% tax on sun-dried production.

Closely coordinated with this project is a planned USAID $6 million loan to assist small farmers in coffee production. Approximately $4.6 million of the loan is allocated to fertilizer purchases and distribution within the six target areas: Fond des Negres, Macary, Thiotte, Dondon Pilate, Beaumont and Baptiste Changieux. The remaining portions of the loan are planned for the support of extension services and development of coffee procurements and input distribution centers within each area. Furthermore, loans from the IBRD and the IDB are rebuilding the national highways from Les Cayes in the south, through Port-au-Prince, and to the northern port of Cap Haitian. Two USAID projects, Road Maintenance and Agricultural Feed Road Construction, complement not only the two international donor programs, but also have been specifically designed to meet the objectives of this coffee marketing project.

Management, pricing-promotion and transportation are very likely among the vital factors which will determine the viability of this project. No documentation could be found which cited GOH and USAID efforts to contact and consult with experts and management of private Haitian coffee purchasing-exporting firms regarding, at least, management and pricing promotion characteristics and difficulties that might be unique to the Haitian coffee market. No evidence could be found to suggest that consideration was given to the possibility of soliciting cooperation and support from the private sector. For instance, rather than developing a coffee promotion program through

the national coffee processing center alone, efforts should also be made and financially supported, either directly or through tax incentives, to develop a promotion program through the organization of private coffee exporters. Furthermore, efforts should be made to entice a small number of individuals from these firms who are skilled and experienced in coffee processing and marketing to join the national coffee processing center program. These individuals could then become key managers, directors and/or advisors of the cooperative coffee washing factories, thereby relaxing the need to find, train and supply managers in a short period of time.

It is pointed out in a previous section that only 10 percent of the Haitian coffee marketed is washed and that the coffee cherry procurement radius about a washing factory is in the neighborhood of five to seven miles. Thus, in order to yield benefits to a larger portion of growers and/or to support and operate the factories at efficient capacity levels, either the procurement radiuses and/or the density of cherry production will need to be increased. Herein lies an important potential contribution of both the road construction program and, particularily, the planned USAID $6 million loan program, $4.6 million of which is intended to support fertilizer purchases and extension activities. Development Alternative Inc. (9) concluded from their review of the porject that little progress can be made toward

attainment of the primordial project objectives. Low returns to coffee production, high taxes, and poorly trained technicians who are spread too thin are felt to be deterents to project objective accomplishment. In any case, the stated goal of the program is too optimistic.

Other Bilateral and Multilateral Assistance

Canada (CIDA) and the Inter-American Institute of Agricultural Sciences (IICA), an OAS agency specializing in the agricultural sciences, have programmed a total of $510,000 for the years 1976-77 - 1980-81 to support the DARNDR's National Agricultural Marketing Service (SENACA) with a planned contribution of $237,300 from the GOH. The yearly budget of SENACA is as follows:

	CIDA	IICA	GOH
	Thousands of Dollars		
1976-77	109.2	9.0	26.8
1977-78	89.0	9.0	39.8
1978-79	78.9	9.0	48.3
1979-80	78.9	9.0	56.8
1980-81	109.0	9.0	65.6

where CIDA's 1976-77 contribution is:

Activities	1976-77 CIDA Contribution Thousands of Dollars
Operating Expenses	28.9
Scholarships	5.0
GOH Staff	12.9
Foreign Staff	30.0
Equipment	22.0
Contingencies	10.6

The intent of this assistance can thus be best explained by focussing on SENACA's present and planned activities.

According to DARNDR (8) SENACA's first priority is to improve the marketing of the high protein, low cost of production food grains. Second priority is to focus on the marketing of perishable commodities such as tomatoes, mangoes, avocados, etc. The strategy involves

working with other government agencies, credit institutions, and particularly with the DARNDR's Ilot de Developpement. The agency also intends to focus on the development of farm cooperatives. Major activities include: (a) collection and publication of market price information, (b) participation in marketing activity of the DARNDR's six growth center Ilots, as discussed in the national plan, (c) a study of rice production and marketing in the Artibonite, (d) to sponsor and supervise in-country seminars on marketing and the preparation of marketing projects, (e) participation in the development of a national marketing plan and (f) plans are underway for the training of rural marketing agents. The collection of market price information was begun in January, 1977. This information will be collected in forty markets at the semi-rural, regional and urban market levels. SENACA's participation in the marketing activities of the DARNDR's growth centers includes the management of facilities for purchasing and storing farm produce and selling agricultural inputs, such as fertilizer and pesticides.

The current staff of SENACA includes: a director (Mr. Verdy Duplan), a director's assistant, and three technical staff. While approximately 14 regional representatives have been requested, SENACA presently has no field staff and is dependent upon the cooperation of other government agency personnel to carry out its field activities, such as activities (a) and (b) above.

SENACA's director is well trained and is very knowledgeable of Haitian agricultural marketing characteristics and activities. Although

the agency has only been in existence since January, 1977, its effectiveness is seriously limited by lack of staff and field personnel, and its effectiveness is dependent on CIDA and IICA for funding and technical support. It appears, however, that while the overall priorities of the agency are appropriate, activities should also be ranked on a priority basis in light of the DARNDR's decision needs and SENACA's resources. For instance, the supplying of "marketing intelligence" to the DARNDR's efforts in developing the six Ilot's, and the timely reporting and analysis of market data, should perhaps receive top priority in the short run. As additional resources become available to the agency, these activities can be intensified, additional activities added and a field staff developed. Perhaps included, though not articulated in the available documents, are needs to forecast future market prices so that, at least, possible food grain surpluses and shortages can be anticipated and actions taken.

The IBRD's rural development project in the Northern Department includes about $1.2 million for the renovation of retail marketing facilities in Cap Haitian and in St. Raphael. The Cap Haitian component of the program includes $449,000 for the construction of a roof over a 5,000 M^2 central market, renovation of the market and equipment with adequate water and drainage facilities. About $674,000 is targeted for renovation of the Cap Haitian abattoir market, which will also be provided with appropriate water supply and drainage facilities. The renovation of the municipal market in St. Raphael accounts for the remaining $69,400.

XIII. SUMMARY, RECOMMENDATIONS

Of all the crops produced for domestic consumption, food grain crops enjoy a comparative and absolute advantage from both production and marketing points of view. Relative to the other food crops they are easiest to transport, store and they are marketed in competitive markets. Food grain marketing is labor intensive and one which appears to have made the "best" use of Haitian factor endowments, given the nature of dispersed production and shipment difficulties. The marketing of vegetables and fruits also appears to be competitive. However, shipment, packaging and handling seriously limit the spatial dimensions of the market for these crops, giving rise to spatial market price distortions. Livestock-meat marketing suffers from weight losses to already underweight animals transported on hoof. From a marketing perspective, poultry appears more economical to transport, store and market than cattle. However, cattle serve other functions aside from meat production. Loss in value at the retail level occurs to all of the perishable commodities because of retail marketing facilities, whose renovation and expansion appear to have not kept pace with the increase in urban population.

The marketing of the major export crops is controlled by one or more government agencies. Consequently, the structure of the marketing system for these crops differs substantially from the crops discussed above. At the farm level the majority of sales are to licensed government speculators. This "bottle necking" of the marketing channels

gives rise to allegations of oligopsonistic competition. On the other hand, this "bottle necking" provides government agencies an instrument to feasibly encourage or promote better agronomic and marketing practices. In an economy such as Haitie's, "perfect competition" cannot necessarily be expected to yield the highest levels of market performance, since the capturing of scale economies in performing marketing functions (procurement, processing, and distribution) will necessarily result in a small number of firms. Thus, a form of "workable competition" should be encouraged where government agencies monitor the economic activities of firms to insure competitive markets.

The most important export crop is coffee, a product for which Haiti has a demonstrated economic comparative advantage in producing. Other crops in this category include cotton, sisal, sugar and cocoa. The production of these crops face "stiff" competition, particularily for land and labor resources, with the production of food grains because of recent increases in food grain demand.

The use of purchased chemical and biological inputs at the farm level is nil. While the Haitian product marketing system has developed out-of-need, the input marketing system has not developed because farmers have traditionally provided their own inputs, such as seed and manure for fertilizer. While one study has made a significant contribution to knowledge of this marketing system, little is known of farm level input markets or the factors influencing input demand.

Various factors inhibiting the performance of the Haitian agricultural marketing system were discussed. Factor endowments, high

rural population density, lack of alternative economic opportunities, lack of roads and small scale diversified farm structures preclude attainment of scale economies in input and product marketing activities and generally result in large ranges in product quality. These factors preclude "quick" solutions to overcoming marketing problems. Instead, these factors must be addressed by policies designed to decrease population growth rates, increase literacy rates, increase alternative economic opportunities, and by policies designed to encourage both the adoption and use of more efficient labor intensive mechanical, biological and chemical technology in crop production.

A list and ranking of the factors inhibiting market performance appears in Table XXXIV, which in part serves to summarize the material presented thus far. Clearly, the ranking of the factors is based on impressions and intuition derived from the material presented above and not on an empirical economic analysis. The constraints to improved market performance are ranked according to commodity categories. Again, rankings are conjectural. Their usefulness then lies in making a conjecture explicit; and it is in this sense that it should be interpreted.

It is the conjecture of the author that dispersed production, transportation and storage are the major marketing problems in the case of food grains. Transportation, packaging and handling are conjectured to be the most important problem inhibiting the marketing of perishable commodities. The storage of most perishable commodities,

such as fruit, is not practicable, while for potatoes it may be. In the case of meat, energy required for refrigeration is sufficiently expensive that meat storage is also not practicable. The processing of perishable commodities can be undertaken to increase their storabilit Yet, this category receives a low ranking because Haitian incomes do not appear to be at sufficient levels to make this a viable alternative on a large scale. However, the construction and renovation of retail facilities to prevent spoilage and promote sanitation is a viable alternative to improving market performance.

Imperfect competition is conjectured to be a major factor inhibitin sugar and cotton production, primarily, in the case of cotton, through low farm level prices relative to world market prices. Sugar prices are based on the weight of cane rather than the sugar content.

The major factors in coffee marketing are export taxes and transportation costs, which have decreased the profitability of coffee production to marginal growers, and encouraged these growers to produce food grains. Transportation costs, the lack of significant price differential and the lack of competitive markets at the farm level are felt to be the major factors explaining the small percentage of coffee cherries marketed through washing factories.

TABLE XXXIV

SUMMARY OF THE MAJOR FACTORS INHIBITING MARKET PERFORMANCE

	Constraints fo Improved Market Performance*									
									Institutions	
Product	Transportation Pack-Handling	Dispersed Production	Storage	Processing	Imperfect Competition	Pricing	Taxes	Grades/ Standards	Retail	Farm Level
Food Grains	2	1	3							
Vegetable Crops	1 a/		4	3		d/			2	
Fruits	1	3		3		d/		b/	2	
Meat	1 d/	3		2		d/			3	
Cotton	3	3			1	c/		2		c/
Coffee	2	4		3	4	c/	1	b/		c/
Sisal	3			1	3	c/	2			c/
Sugar/Cocoa	2			3	1	c/	2	c/		c/

*/ Blank cells (no entry) are either not significant or too difficult to rank
a/ Related to shipment difficulties
b/ A problem for perishable export crops
c/ Related to imperfect competition
d/ Related to transportation costs, and value losses in the marketing chain

Donor Project-Program Considerations

Categories of donor assistance to improve the performance of agricultural markets and increase farmers' access to markets include (a) roads, transport facilities and infrastructures, (b) storage facilities, (c) processing and retail marketing facilities, (d) input marketing facilities and infrastructures, (e) human resource programs, (f) programs to strengthen Haitian policy making, monitoring and policy management agencies, and (g) efforts to increase market competition. Several donors have projects underway or in mind in these areas (see Section XII). Given the limited "absorptive capacity" of government institutions, care must be taken in sponsoring and designing projects whose returns are dependent on their institutionalization in the public sector.

Roads, Transport Facilities and Infrastructures: Road construction in areas of high value, perishable crop production (such as irrigated crops, coffee and perhaps fruits and sugar producing areas) and the construction and renovation of roads linking major urban and regional markets can be expected to reduce commodity marketing costs and expand the spatial dimension of both the product and agricultural input markets (see Section VII). USAID should continue to provide funds and technical assistance to the Haitian National Highway Maintenance service to establish operating procedures and to train personnel. Improvements in the network of agricultural feeder roads, such as USAID has planned in selected coffee producing areas, are also urgently needed. However,

these roads should be constructed with consideration given to lowering future maintenance costs. More attention and study should also be given to the construction of low cost dock and storage facilities at such cities as Les Cayes, Jeremie, and Port-de-Paix. Loans from the IDB or IBRD to renovate and improve coastal shipping vessels and navigation aides should also be studied.

Storage Facilities: Seasonal variation in food grain prices in recent years has been substantial (see Section VI). An expansion of on-farm storage facilities should be encouraged through a small farm loan program administered by, for instance, the BCA. Emphasis should be placed on appropriate technology, of which a 55 gallon barrel is an example. Investment in additional storage and dock facilities at Port-au-Prince should also be considered, not as a substitute for on-farm or community storage facilities, but for crop failure contingency purposes and for purposes of somewhat alleviating price variations in the short-run. That is, seasonal price variations that might be expected to continue until increases in on-farm storage capacity is realized.

Processing and Retail Marketing Facilities: Investments in processing facilities for vegetable and fruit crops may not be economically viable if designed to meet domestic needs alone. Further study is needed to assess foreign market potentials for processed vegetables and fruits before an expansion of processing facilities on any significant scale can be considered. In any case, export markets for these crops in all likelihood require efficient-responsive marketing

structures in order to supply time, place and form utility of the marketed product. Joint ventures between private sector and foreign firms may be required in order to supply these marketing structures. An exception to the viability of processing facilities is the construction and renovation of facilities to process essential oils, whose export value has increased substantially in recent years. Foreign demand for these oils in developed countries is likely to remain strong. The renovation and construction of retail market facilities is planned for Cap Haitian (see Section XI). Financial assistance from IDB is perhaps the best source of donor assistance to support this type of aide.

Input Marketing Facilities and Infrastructure: The development of marketing structures to supply at reasonable cost "appropriate" mechanical, biological and chemical technology to the farm level is almost certainly required in order to obtain and sustain increases in agricultural productivity and rural incomes. Intrically linked with the development of these structures are credit, effective, competent and relevant extension services, and farm level input demand characteristics. USAID's on-going and planned programs in feeder roads, coffee project, irrigation, agriculture management improvement and training, and adaptive agricultural research programs are in the spirit of these needs.

Development of programs in this area are complicated by high illiteracy rates, and generally speaking, the need to accompany the

supplying of inputs with information and credit. This author disagrees with Brummitt and Culp (5) who maintain that a bulk fertilizer blending plant cannot be justified until consumption reaches 20,000-25,000 M.T. annually. Given high illiteracy rates and transportation difficulties, it may be necessary to pre-mix fertilizers specifically for the crops to which a farmer intends to apply the fertilizer. Furthermore, the small size of farm units may imply that farmers prefer kilograms, rather than sacks, of fertilizer. Thus, a local small scale bulk blending plant may be required to meet these varying input demands. USAID grants and/or loans to support chemical processing facilities may thus be desirable, especially in areas and circumstances supportive of other USAID projects. While USAID has experience in this general area, specialized assistance in the input marketing area should be sought from, for instance, the International Fertilizer Development Center (a non-profit international institute of a rank equivalent to CYMMIT) located in Muscle Shoals, Alabama.

It bears mentioning that the development of input market structure for irrigated crops should also take into consideration the commodity market structures for these crops. Especially since the limited spatia dimensions of the commodity market for this crop implies that increases in in-season crop production can result in significant decreases in commodity prices.

Human Resources: There is an unquestionable need for qualified Haitian personnel in both public and private sectors. Personnel traine in the fundamentals of agribusiness, managment, domestic and internatio

marketing, project analysis, transportation economics and specialists trained in the techniques of processing particular crops, such as coffee, sugar and essential oils, should, from a marketing perspective, receive priority. In the short-run, the far majority of these personnel should perhaps receive non-degree objective training. Such training as provided in short-courses offered by UNDP, USAID and other donor training programs should be encouraged. Foreign technical assistance teams organized to provide advice, guidance and on-the-job training, especially in the input-marketing area, should also be considered to augment the limited number of trained Haitian personnel currently available.

The training of college level faculty, particularily in areas consistent with Canadian assistance in this area, should also be undertaken. To insure that qualified personnel return to and remain in responsible civil service positions, salaries will certainly need to be increased to keep pace with private sector salaries.

Programs to Strengthen Haitian Policy Making, Monitoring and Policy Management Activities: Programs in this area should obviously be directed to the major government agencies with responsibilities in either one or all of these areas (policy making, monitoring and management) such as SENACA, IHPCADE and DARNDR. However, prior to initiating programs in this area, the structure of policy decision making, program implementation and needs for decision making within an agency or ministry should be given careful consideration. Consideration should be given to the policy instruments and their dimensions

(subsectional, spatial) that are at the discretion of the upper level authorities in the agency and/or ministry, and those policy instruments that are "shared" with other government units. Insights should also be obtained on the mechanism for resolving conflict in the use of policy instruments. Program implementation procedures, qualified personnel, data, data collection and processing capacity and other factors influencing program formulation and implementation should also be considered.[1/] Together, these factors will provide insights into the capacity and needs for decision making and, therefore, the designing of programs and technical assistance teams to best meet these needs.

Important technical assistance programs in this category should be designed to increase Haitian institutional capacity to collect input and commodity market price and quantity information, base line surveys to establish its basic level of farm endowments such as livestock number and types, area planted to crops, quantities and types of crops commercialized, etc. Technical assistance should also be made available to assist in special data collection efforts and, perhaps specific policy (project) monitoring activities. When the important policy decision making needs are reasonably understood and/or are otherwise identified, economic analyses and forecasts of various types can be designed and carried out to meet these needs. Training programs and supportive technical assistance teams in annual and stratigic planning, data collection and analysis of market activity

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[1/] See Section X for a discussion of private and public sector information needs.

are critical to building institutional capacity in effective policy decision making and management (see Section XII regarding CIDA efforts in this area).

Other Approaches to Improved Market Performance: High commodity export taxes and noncompetitive markets for important export crops result in low prices, limited market areas at the farm level and result in prices which are not reflective of true commodity value or take into account product quality differences (coffee, cotton, sugar). The resolution of these problems will likely be "quickened" if alternative sources of tax revenue and/or sources of foreign exchange earnings can be identified and substituted for existing tax revenue sources. A preliminary step in this direction might be research into alternative sources of revenue where specific tax collection procedures are considered and tax revenue earnings explicitly estimated. Research might be undertaken to estimate the long-run supply response for coffee production from a percentage decrease in taxes. Together, this information might be used to support efforts to modify overall commodity export taxes to more reasonable levels.

The imperfectly competitive markets, particularily for cotton and sugar and perhaps, though to a lesser extent coffee, may require political will to resolve since cotton and sugar purchasers will in the short run very likely be made worse off from a dissolution of their market power. Again, studies designed to estimate the total short and long run gains from the dissolution of this market power can provide support for this position. It is quite possible that long run gains

will yield increased benefits to purchasers as well. In any case, support for semi-autonomous agencies with self generated funding for their own use should be discouraged.

Supportive Studies

Studies in the area of (i) commodity demand supply (price analysis), (ii) farm level input demand and input marketing channels, and (iii) inter-regional competition and the spatial location of economic activity within Haiti can provide support to GOH and USAID projects and planning efforts in coffee and food grain production and marketing. A fourth possibility is the development of a preliminary agricultural sector analysis framework as a potential over-all tool to guide project analysis, data collection and policy formulation and planning efforts. The usefulness of this research, especially (i)-(iii) can be exemplified by the usefulness of the IICA sponsored studies. The design and undertaking of studies in this area should be coordinated with the efforts of SENACA, IICA and CIDA.

Commodity Demand-Supply (price analysis): Studies in this area should initially focus on food grains and coffee because of their income and nutritional importance. These studies should be designed to estimate consumer food grain demands, responses to changes in food grain prices, the degree to which consumers substitute preferred food grains for the less preferred food grains when relative food grain prices change, and the effect of income on food grain consumption. This information is important to predicting the effects of changes in urban population, concessional and other food grain imports and effects of variation in domestic supply on food grain price, consumption, and by implication, nutrition levels and storage requirements.

Food grain supply response studies should seek to estimate changes in the quantities of food grains commercialized to changes in direct and relative food grain prices, marketing costs and weather conditions. Together, this type of analysis is useful in forecasting commodity market conditions and to providing inputs to decisions regarding food grain price policy and, as above, food grain import and storage needs.

In the case of coffee, studies designed to estimate farm level, supply response to changes in (a) farm level coffee prices (by implication, taxes), (b) factors effecting grower costs of production (storage, input costs, credit, errosion, spatial costs) and supply response to (c) changes in the prices of competitive crops, such as food grains, should be undertaken. USAID's coffee project could provid a vehicle in collecting otherwise unavailable data for this type of analysis.

Farm Level Input Demand: Critical to increasing agricultural productivity and obtaining and sustaining increases in rural incomes is the use of appropriate mechanical, biological (e.g., new improved seed varieties) and chemical technology in food grains, irrigated crops and coffee production. Studies in this area should be based on farm level data collected in specially designed farm surveys. These studies should seek to identify and estimate the impact of the behavioral and technical factors influencing farmers' decisions to BOTH <u>adopt</u> and <u>use</u> purchased inputs. These studies should attempt to assess the behavioral effects of such factors as farmer's risk aversion, farm household consumption needs and taste and preference

characteristics on the decision to adopt and use purchased inputs and new agronomic practices. These studies determine the productivity increases obtainable from purchased inputs and new practices and determine the level of increases required before farmers are willing to adopt and use new inputs and practices. Since subsistance farmers are generally risk averters, lack liquidity and, in the case of Haiti, are largely illiterate, these studies should also address: variations in production attributable to weather and whether or not new inputs and practices tend to increase or decrease this variation; variations in production attributed to allocative errors in the use of new inputs and techniques, (e.g., improper water control in irrigated crops, improper fertilizer application rates); credit requirements.

Together, this information characterizes the nature of farm level demands for inputs, information essential to the development of an effective input marketing system. This type of analysis has been carried out by the author with USAID support and by others (IFDC, CYMMIT). This type of research becomes more useful the greater the degree of change in farm level practices sought relative to traditional practices, the more "control" the farmer must exercise on the technology to insure its profitability, and the shorter is the time period sought to induce changes in productivity and rural income.

Inter-regional Competition and Spatial Location Studies: This type of economic research generally seeks to determine the "best" regions (a) for growing crops, producing livestock, etc., (b) the

"best" locations for processing agricultural products (such as coffee washing factories) (c) the number and size of such processing facilities and (d) the "best" modes (truck routes, ports, shipping vessels) to utilize in the procurement (assembly) of agricultural commodities and distribution of these commodities to final consumers. In light of shipment difficulties, alternative modes of transport, large variety of commodities and rather substantial levels of planned investments to alleviate shipment problems, studies of this sort should provide information useful in assessing the impact of spatial costs on economic activity and returns to road and port facility renovation and construction. Extensive data collection efforts would need to be undertaken to carry out this research, however.

Sector Analysis: An agricultural sector analysis framework is, essentially, only useful if it can be used to yield sufficiently better decisions (by USAID and/or the GOH) to cover the cost of resources allocated to the sector analysis effort and if the resulting decisions are sufficiently "better" than the decisions that could be made by allocating the equivalent amount of resources to other approaches supporting decision making, managment tasks. Consequently, "good data" is not necessarily a pre-requisite to the allocation of resources to such efforts. Rather, the sufficiency of the present level of policy decision making and management and the proper institutio environment (i.e., an environment in which such a tool can become part of the planning process) are pre-requisites to the development of such

a framework. Thus, these factors must be given careful consideration before a sector analysis effort is undertaken. Approximately three U.S. universities, USDA and the Development Resource Center of the IBRD have capacity and experience in undertaking this type of effort.

APPENDIX A

PRODUCTION, EXPORT AND PRICE DATA

TABLE AI

PRODUCTION OF SELECTED AGRICULTURAL COMMODITIES, HAITI, 1970-1976

(Thousands of M.T.)

Product	Source	1970	1971	1972	1973	1974	1975	1976
Coffee	(a)	24.3	32.3	32.6	33.3	35.0	34.9	
	(b)	33.0	30.0	32.0	33.0	34.0	33.0	34.0
	(c)		27.0	32.6	32.4	34.8	33.0	
	(d)	27.0	32.5	34.5	32.4	33.3		
Sisal	(a)	27.7	18.0	18.0	18.5	22.5	24.0	
	(b)	18.0	18.0	14.0	17.0	19.0	12.0	13.0
	(c)	27.7	18.0	18.0	18.5			
	(e)	27.6	25.2	19.6	22.5	22.4	10.0	
Sugar (cane) (Millions of MT)	(a)	4.25	4.0	4.0	4.0	4.0	4.0	4.0
Sugar (raw)	(b)	316.0	374.0	319.0	270.0	346.0	305.0	355.0
Cocoa	(a)	3.7	3.1	3.1	3.1	3.5	3.5	3.5
	(b)	2.0	4.0	3.0	3.0	3.0	3.0	3.0
Cotton	(a)	4.0	4.0	4.0	4.0	3.15	3.15	3.15
	(b)	4.0	4.0	4.0	3.0	3.0	3.0	3.0
Corn	(a)	235.0	240.0	252.0	257.0	204.0	204.0	180.0
	(b)	240.0	252.0	257.0	250.0	250.0	250.0	250.0
	(c)	235.0	240.0	252.0	257.0	260.0		

TABLE A I (cont.)

Produce	Source	1970	1971	1972	1973	1974	1975	1976
Rice	(a)	74.2	72.7	72.7	43.6	119.0	108.0	131.0
	(b)	80.0	81.0	82.0	80.0	82.0	82.0	82.0
	(f)			80.0	70.0	85.0	88.0	92.0
Millet	(a)	195.0	210.0	211.0	215.0	134.0	134.0	134.0
Manioc	(a)	118.0	130.0	134.0	137.0	137.0	137.0	137.0
	(c)	121.0	130.0		135.0			
Sweet Potato	(a)	85.0	74.0	66.0	70.0	106.0	106.0	106.0
	(c)	85.0	85.0	74.0	66.0	70.0		
Beans	(a)	40.0	38.0	32.0	20.0	31.5	31.5	31.5
Potatoes	(a)	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Bananas	(a)	156.0	188.0	190.0	191.0	191.0	191.0	191.0

Source: (a) Current Economic Position and Prospects of Haiti, IBRD, Vol. II, Statistical Appendix. Data source cited: Ministry of Agriculture
(b) Indices of Agricultural Production for the Western Hemisphere, 1967-1976, ERS, USDA Statistical Bulletin 569.
(c) Une Politique et us Plan d'Action Pour Renforcer la Securite Nationale Alimentaire au Haiti, Food and Agricultural Organization of the United Nations, Haiti, Draft 27/4/76.
(d) Agricultural Policy Studies in Haiti: Coffee, JWK International Corporation, July, 1976. Data source cited: IHPCADE.
(e) Agricultural Policy Studies in Haiti: Sisal, JWK International Corporation, July, 1976. Data source cited: IHPCADE
(f) USAID/H Mimiograph

TABLE AII

SELECTED EXPORTS, HAITI, 1970-1976

(Thousands of M.T.)

Product		1970	1971	1972	1973	1974	1975	1976
Coffee	(a)	16,182	21,535	18,637	19,420	18,767	17,820	
	(b)	16,487	21,507	18,715	19,407	18,593	17,872	26,737.0
Sugar	(a)	18,030	22,901	20,684	13,715	7,738	25,361	
Sisal	(a)	16,672	8,517	4,026	6,474	12,219	5,657	
	(d)	17,433	8,001	3,757	6,524	10,748	1,762	
Cocoa	(a)	1.1	1.2	.5	.2	1.2	.3	
Cotton	(a)		46.5	41.7	415.1	603.6		
Meat	(a)	563	741	1,367	1,139	1,058	472	
	(d)	563.9	741.9	1,367.3	1,139.9	1,058.1	748.8	

(a) Same as (a) on production table, but no source cited.
(b) Same as (d) on production table, data source cited Year Book of External Table of Haiti, 1970/71, 1971/72, 1972/73, 1973/74, customs administration, Ministry of Finance
(c) Same as (c) production table, Data source cited: IHPCADE
(d) Agricultural Policy Studies in Haiti: Meat JWK International Corporation, July, 1976: Data source cited Year Book of International Trade, 1969-70 to 1974-75.

TABLE AIII

ANNUAL MARKET PRICES (GOURDES PER MARMITE)

FOR RICE, BEANS, CORN, MILLET AND BANANAS, PORT-AU-PRINCE, HAITI, 1968-75

Year	Rice	Beans	Corn	Millet	Bananas
1968	3.38	3.56	1.20	1.47	5.11
1969	3.52	3.40	.90	1.45	6.52
1970	4.06	3.43	1.00	1.43	6.31
1971	5.53	3.80	1.09	1.53	6.58
1972	4.90	4.40	1.27	1.47	6.60
1973	5.41	4.90	2.83	3.50	10.29
1974	7.13	6.94	3.00	2.58	9.96
1975	10.30	7.41	4.11	3.98	13.07

Source: 1968-72: Grain Marketing and Market System Development in Haiti, Report No. 43, Dec., 1973.

1973-75: Guide Economique de la Republique d'Haiti, IHS, April, 1977.

TABLE AIV

AVERAGE MONTHLY MARKET PRICES (GOURDES PER MARMITE)

FOR RICE, BEANS, CORN, MILLET AND BANANAS, PORT-AU-PRINCE, HAITI, 1968-72

Product	January	February	March	April	May	June	July	August	September	October	November	December
Rice	4.24	4.22	4.29	4.48	4.65	4.65	4.41	4.31	4.50	4.72	4.23	3.83
Beans	3.40	3.36	3.45	3.80	3.85	4.39	3.58	3.51	3.90	3.99	3.72	3.64
Corn	.92	.93	.97	1.03	1.18	1.32	1.21	1.17	1.17	1.35	1.06	1.01
Millet	1.45	1.38	1.40	1.44	1.26	1.68	1.55	1.58	1.56	1.56	1.48	1.48
Bananas	6.05	5.81	5.91	6.37	6.60	6.53	6.07	6.00	6.45	6.00	6.25	6.24

Source: Grain Marketing and Market System Development in Haiti, 1973.

TABLE AV

URBAN MARKET PRICE (Gds) FOR SELECTED PRODUCTS

HAITI, MARCH, APRIL, MAY, JUNE, 1977

Market	Product	(Gourdes per Marmite) March	April	May	June
Jeremie	Corn, Grain	3.30	4.30	5.60	3.75
	Corn, Ground	3.90	3.70	3.50	3.65
	Millet	-	-	-	-
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	11.70	-	-
	Red Beans	8.10	8.40	8.90	7.85
Port de Paix	Corn, Grain	3.95	5.25	4.95	5.10
	Corn, Ground	4.05	5.35	5.70	6.00
	Millet	3.80	4.70	4.70	-
	Rice, Ordinary	7.00	7.70	7.70	8.25
	Rice, Superior	6.75	8.10	7.70	8.85
	Red Beans	8.70	9.85	13.45	10.05
Gonaives	Corn, Grain	4.35	4.20	5.00	4.30
	Corn, Ground	4.90	5.50	5.30	5.25
	Millet	4.50	5.10	5.40	5.60
	Rice, Ordinary	6.70	7.15	7.80	7.15
	Rice, Superior	7.10	8.70	8.05	8.05
	Red Beans	8.20	11.00	13.80	10.55
St. Marc	Corn, Grain	3.90	4.30	4.55	4.75
	Corn, Ground	5.40	5.50	6.30	6.60
	Millet	4.90	4.30	4.95	6.60
	Rice, Ordinary	8.00	6.85	7.05	8.10
	Rice, Superior	-	7.50	7.65	7.80
	Red Beans	8.15	10.90	13.80	14.40
Gde-Riviere-du Nord	Corn, Grain	3.70	4.75	3.90	3.40
	Corn, Ground	3.70	4.30	3.80	3.60
	Millet	4.40	-	4.20	-
	Rice, Ordinary	8.20	8.30	-	7.70
	Rice, Superior	7.65	7.70	7.70	-
	Red Beans	8.40	9.65	12.60	8.45

TABLE AV cont.

Market	Product	March	April	May	June
Fond-des-Negres	Corn, Grain	4.00	5.20	5.35	5.25
	Corn, Ground	4.40	5.90	5.75	5.80
	Millet	3.70	4.90	4.85	4.95
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	-	-	-
	Red Beans	-	-	10.90	11.20
Vialet	Corn, Grain	4.20	5.20	4.95	4.40
	Corn, Ground	4.75	5.45	5.35	4.90
	Millet	4.45	4.70	5.35	4.95
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	-	-	-
	Red Beans	8.70	9.10	10.25	10.05
Port Sonde	Corn, Grain	3.50	3.85	4.40	4.15
	Corn, Ground	3.60	5.30	5.45	4.80
	Millet	4.50	5.00	5.30	5.05
	Rice, Ordinary	7.00	6.85	7.25	5.40
	Rice, Superior	12.00	9.60	8.50	7.00
	Red Beans	8.00	10.75	11.75	11.25
Leon	Corn, Grain	3.00	3.65	4.75	4.95
	Corn, Ground	3.00	3.30	3.50	3.75
	Millet	-	-	-	-
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	-	-	-
	Red Beans	8.25	9.10	9.35	9.25
Chansolme	Corn, Grain	4.20	5.15	4.75	-
	Corn, Ground	4.20	-	-	-
	Millet	4.50	-	-	-
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	-	-	-
	Red Beans	8.40	10.15	-	10.15
Cerca-Cavajal	Corn, Grain	3.10	3.65	3.45	3.40
	Corn, Ground	-	3.85	3.80	4.15
	Millet	-	-	4.55	-
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	-	-	-
	Red Beans	6.85	7.65	9.45	8.55

TABLE AV cont.

Market	Product	March	April	May	June
Marc Franc	Corn, Grain	3.50	3.85	4.60	4.25
	Corn, Ground	9.20	3.40	2.95	3.30
	Millet	-	-	-	-
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	-	-	-
	Red Beans	7.00	7.25	9.25	8.65
Desarmes	Corn, Grain	3.50	4.20	4.20	4.10
	Corn, Ground	4.35	5.00	4.85	4.80
	Millet	4.35	5.00	5.15	4.95
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	-	-	-
	Red Beans	8.75	10.10	13.50	11.25
Foret-des-Pins	Corn, Grain	3.40	3.75	3.75	4.15
	Corn, Ground	4.20	4.30	4.60	4.95
	Millet	5.15	5.65	5.75	6.20
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	-	-	-
	Red Beans	7.75	9.45	11.00	9.05
Gaillard	Corn, Grain	4.50	5.75	4.45	4.65
	Corn, Ground	4.25	4.60	4.75	4.85
	Millet	4.70	5.10	5.25	5.25
	Rice, Ordinary	-	-	-	-
	Rice, Superior	-	-	-	-
	Red Beans	7.75	8.60	8.85	7.90

Source: Bulletin des Prix des Produits Agricules Sur les Marches de la Republique, 1977.

TABLE AVI

MONTHLY PRICE, SELECTED MARKETS, HAITI, 1975

(Gourdes per Marmite)

Market	Month	Regime Figue Bananas	Marmite Corn Grain	Marmite Corn Ground	Piece Cocoa	Grand Marmite White Beans	Grand Marmite Black Beans	Grand Marmite Red Beans	Marmite Potatoes	Tete Chicken	Grand Marmite Ordinary Rice	Grand Marmite Superior Rice	Grand Marmite Tomatoes	Livre Beef
Cap Haitian	Jan.	6.00	2.75	3.00	.75	6.90	6.90	6.25	7.00	8.00	6.00	9.00	-	2.50
	Feb.	7.00	3.00	4.00	.75	5.70	6.00	6.00	7.00	7.00	6.00	9.00	-	2.50
	Mar.	8.50	3.50	4.20	.80	6.00	6.90	7.20	5.00	8.00	7.20	9.60	-	2.50
	Apr.	11.00	3.88	5.32	.75	7.80	7.87	8.25	5.00	8.00	8.10	10.35	-	2.50
	May	13.00	4.18	6.90	.76	9.97	10.27	10.35	5.50	8.00	9.00	10.80	-	2.50
	June	13.25	5.00	7.12	.65	10.52	10.70	11.25	5.75	8.00	8.70	12.00	-	2.50
	July	13.00	3.75	5.40	.77	8.60	8.63	9.33	5.00	8.00	12.00	8.26	1.00	2.50
	Aug.	12.50	4.08	5.33	.82	8.40	8.40	8.00	4.50	8.00	10.20	7.50	1.00	2.50
	Sept.	12.50	3.37	4.55	.77	8.25	8.70	8.60	4.50	8.00	9.60	7.50	1.00	2.50
	Oct.	12.50	2.52	3.30	.80	5.70	6.00	6.30	5.50	8.00	7.40	9.55	1.00	2.50
	Nov.	12.50	2.44	3.00	.80	6.30	6.60	8.20	6.25	8.50	6.90	10.75	1.00	2.50
	Dec.	13.00	2.45	3.15	.85	6.75	6.75	8.55	6.50	9.00	7.90	12.00	1.00	2.50
Les Cayes	Jan.	12.00	3.00	3.25	.35	4.50	4.50	5.50	2.75	6.00	7.00	6.50	2.50	2.85
	Feb.	12.00	3.00	3.25	.40	4.50	4.50	5.50	3.00	7.00	9.00	7.00	2.50	2.85
	Mar.	8.63	4.25	5.50	.70	7.25	7.50	8.80	3.00	5.50	8.00	7.60	2.50	3.00
	Apr.	8.00	6.00	7.00	.50	7.00	9.00	9.50	2.50	5.00	8.50	10.00	2.00	2.75
	May	8.00	4.50	6.50	.60	8.60	9.50	10.00	3.50	5.00	9.00	10.00	2.00	2.75
	June	7.00	5.00	6.00	.40	9.00	10.25	11.00	4.00	4.50	8.50	12.00	2.00	2.75
	July	10.66	4.90	5.00	.80	8.00	9.00	9.25	3.25	5.00	11.00	7.75	2.50	3.60
	Aug.	12.66	3.75	4.25	.95	8.00	8.87	8.87	3.50	5.50	10.00	6.50	2.50	3.60
	Sept.	12.00	3.75	4.83	.83	7.50	9.00	8.00	3.50	6.00	10.00	6.50	2.50	3.80
	Oct.	13.50	4.25	4.75	.95	7.50	6.76	7.50	3.00	6.00	6.00	10.00	2.00	3.80
	Nov.	14.00	3.50	4.00	.85	6.50	6.50	7.25	3.25	6.00	6.00	10.00	2.00	3.80
	Dec.	14.00	3.00	3.63	.80	6.75	7.00	7.25	3.50	6.50	6.00	10.00	2.00	3.80

TABLE AVI cont.

Market	Month	Bananas	Corn Grain	Corn Ground	Cocoa	White Beans	Black Beans	Red Beans	Potatoes	Chicken	Ordinary Rice	Superior Rice	Tomatoes	Beef
Gonaives	Jan.	5.62	2.18	3.60	.75	6.25	5.50	7.00	-	7.00	7.50	5.40	-	3.50
	Feb.	5.00	1.90	3.27	.90	5.27	5.50	6.87	-	6.00	7.62	6.05	-	3.00
	Mar.	6.25	2.80	4.20	1.00	5.50	5.00	7.25	-	6.75	8.50	6.80	-	3.00
	Apr.	-	-	-	-	-	-	-	-	-	-	-	-	-
	May	-	-	-	-	-	-	-	-	-	-	-	-	-
	June	-	-	-	-	-	-	-	-	-	-	-	-	-
	July	5.00	3.86	5.07	.67	9.15	9.16	10.15	-	6.50	8.50	7.10	2.60	4.50
	Aug.	5.00	2.50	3.75	.60	9.50	9.00	10.00	-	6.00	8.00	6.60	2.50	4.50
	Sept.	5.00	1.75	2.85	.60	2.75	9.25	10.50	-	6.00	7.75	6.60	2.60	4.75
	Oct.	5.00	1.55	2.70	.60	5.00	4.00	6.00	-	6.00	6.60	7.50	-	4.50
	Nov.	5.00	1.50	2.70	.60	5.00	4.00	6.00	-	6.00	6.30	7.25	-	4.50
	Dec.	5.50	1.65	3.00	.60	5.50	5.00	6.00	-	6.00	4.50	6.50	-	4.50
Croix des Bouquets	Jan.	2.69	2.50	2.40	.60	5.00	5.75	5.75	3.00	8.00	8.50	5.50	-	2.83
	Feb.	3.33	2.65	2.80	.70	5.50	6.00	6.00	3.50	10.00	9.00	6.62	-	2.75
	Mar.	3.99	3.00	3.20	.80	5.71	6.00	6.25	3.25	9.00	10.00	7.50	-	2.50
	Apr.	4.25	3.46	6.52	.80	10.31	7.86	7.87	3.67	9.00	8.65	11.25	-	2.50
	May	4.50	5.16	5.22	.76	9.75	10.62	10.70	3.70	8.50	9.05	11.50	-	2.50
	June	4.00	5.61	5.72	.75	7.75	11.47	11.46	3.60	9.37	8.15	10.25	-	2.50
	July	4.50	4.00	4.13	1.00	8.25	8.85	9.85	3.50	10.33	10.33	6.35	-	2.50
	Aug.	5.16	3.50	3.67	1.00	8.47	8.40	8.00	3.75	9.00	12.00	6.88	-	2.50
	Sept.	4.50	2.63	2.72	1.00	8.75	8.75	8.50	3.26	9.00	10.66	7.00	-	3.25
	Oct.	4.75	2.14	2.17	.70	6.50	6.25	6.50	3.12	10.00	6.50	10.00	-	2.75
	Nov.	5.50	2.00	2.10	.70	6.75	6.72	7.00	3.25	9.50	6.41	9.25	-	2.75
	Dec.	6.50	2.10	2.22	.65	6.00	7.50	7.50	3.00	12.00	6.00	9.75	-	3.00

TABLE AVI cont.

Market	Month	Bananas	Corn Grain	Corn Ground	Cocoa	White Beans	Black Beans	Red Beans	Potatoes	Chicken	Ordinary Rice	Superior Rice	Tomatoes	Beef
Jacmel	Jan.	5.50	2.30	1.75	.50	4.20	3.16	3.50	3.50	5.00	9.00	8.00	.60	2.50
	Feb.	5.50	2.70	2.00	.60	-	4.20	4.20	3.50	4.00	9.00	6.50	.50	2.50
	Mar.	5.50	2.30	2.15	.50	-	4.06	4.20	4.50	4.06	9.50	6.50	.75	2.50
	Apr.	6.75	4.00	5.45	.50	-	9.80	9.80	5.00	5.00	-	10.25	1.80	3.00
	May	6.50	3.50	6.20	.60	-	10.00	10.25	5.50	5.25	-	11.00	1.90	3.00
	June	7.25	4.20	6.32	.55	-	10.50	10.60	4.50	6.00	-	11.50	1.75	3.00
	July	8.00	4.58	3.93	.76	-	10.50	9.60	4.00	5.25	11.16	9.50	.90	3.00
	Aug.	7.75	3.42	2.65	.70	-	10.05	8.40	3.00	7.00	10.75	8.50	.90	3.00
	Sept.	8.50	3.37	2.62	.60	7.50	9.70	8.05	3.75	6.75	9.50	7.75	.60	3.25
	Oct.	7.75	3.30	2.28	.50	6.50	6.00	6.70	4.00	6.00	6.50	10.00	.90	3.50
	Nov.	8.50	3.00	2.10	.50	6.50	6.00	6.00	4.00	6.00	6.50	10.00	.60	4.00
	Dec.	9.25	3.10	2.65	.50	-	6.50	6.50	4.00	6.00	7.67	9.50	.80	3.50
Jeremie	Jan.	4.50	3.00	3.00	.50	-	-	-	4.50	5.00	8.31	6.50	-	1.00
	Feb.	4.50	2.03	2.25	.50	-	-	-	8.00	5.00	8.00	6.00	2.50	1.00
	Mar.	5.02	3.05	3.25	.50	-	-	6.30	6.00	5.50	8.00	6.52	2.50	1.00
	Apr.	5.62	3.33	4.06	.57	-	-	8.50	6.37	5.75	7.06	8.57	2.50	1.00
	May	7.00	3.65	4.90	.44	-	-	9.00	7.00	5.50	8.00	9.00	2.50	1.00
	June	6.50	4.04	4.97	.50	-	-	8.76	7.10	5.00	8.30	10.00	2.50	1.00
	July	3.08	2.75	2.95	.40	-	9.60	8.00	-	5.00	10.30	9.60	1.25	1.00
	Aug.	5.68	2.58	2.37	.43	-	9.00	9.25	3.00	5.50	9.00	8.33	1.50	2.00
	Sept.	7.18	2.20	2.35	.45	7.00	9.70	8.25	3.00	5.75	9.75	9.00	1.75	2.00
	Oct.	7.86	2.55	2.55	.40	-	5.00	5.00	-	6.50	9.00	9.50	-	1.00
	Nov.	6.50	2.50	2.50	.50	-	6.00	7.00	-	7.00	9.41	9.50	-	1.00
	Dec.	8.47	2.50	2.50	.55	-	-	6.50	-	8.33	9.00	9.25	-	1.00

TABLE AVIcont.

Market	Month	Bananas	Corn Grain	Corn Ground	Cocoa	White Beans	Black Beans	Red Beans	Potatoes	Chicken	Ordinary Rice	Superior Rice	Tomatoes	Beef
Petit Goave	Jan.	-	2.00	1.55	.50	4.00	4.00	5.25	-	9.00	-	-	-	-
	Feb.	-	2.00	1.50	.50	4.00	4.00	5.25	-	9.25	-	-	-	2.00
	Mar.	-	2.25	1.60	.50	4.75	4.50	5.75	-	9.50	-	-	-	2.00
	Apr.	-	3.00	4.05	.70	8.00	8.00	9.00	-	8.00	7.00	10.00	-	2.00
	May	-	3.20	4.20	.60	8.00	9.25	10.00	-	7.00	8.00	10.25	-	2.00
	June	-	3.10	4.26	.65	8.50	10.50	11.25	-	6.00	8.50	11.00	-	2.00
	July	13.50	3.75	3.98	.81	8.50	8.50	9.50	6.50	7.50	10.50	8.50	2.25	2.00
	Aug.	9.00	3.18	2.96	.67	8.50	8.32	9.74	4.50	7.30	10.50	9.25	1.88	3.00
	Sept.	10.97	2.37	2.51	.67	8.25	8.25	9.25	-	7.50	-	-	1.24	-
	Oct.	-	2.00	2.25	.73	5.00	5.00	5.00	-	8.00	-	-	-	-
	Nov.	-	2.00	2.25	.74	5.50	5.50	5.50	-	9.00	-	-	-	-
	Dec.	-	2.12	-	.65	7.00	7.00	7.00	-	10.33	-	-	-	-
Port-Au-Prince	Jan.	8.00	2.25	2.60	.50	5.50	6.00	6.50	4.50	11.00	7.00	5.50	1.50	2.50
	Feb.	8.00	2.60	2.50	.60	5.50	6.00	6.50	4.50	11.00	8.00	5.75	1.10	2.50
	Mar.	9.00	3.00	3.50	.60	6.00	6.50	7.00	5.00	11.00	8.00	6.00	1.25	2.50
	Apr.	9.00	3.76	4.30	.70	7.81	9.25	9.37	5.00	11.00	8.37	11.75	1.25	2.40
	May	10.00	4.55	5.67	.70	8.56	11.00	11.72	5.00	10.00	8.80	12.87	1.50	2.40
	June	10.00	5.20	6.75	.70	9.13	11.97	12.25	5.00	11.00	9.00	12.62	1.50	2.40
	July	10.50	3.76	4.45	.67	10.68	10.25	10.60	5.00	10.50	10.75	7.25	1.37	2.21
	Aug.	10.50	3.10	3.60	.72	10.25	10.81	9.90	4.50	9.50	9.50	6.50	1.25	2.00
	Sept.	10.50	3.00	3.50	.67	10.00	10.62	10.00	4.10	9.50	8.75	6.25	1.21	1.90
	Oct.	11.00	3.00	3.40	.75	5.00	5.50	6.00	4.00	9.00	6.50	9.50	1.40	1.80
	Nov.	11.00	3.00	3.40	.75	6.50	6.75	7.00	4.00	10.00	6.24	9.26	1.40	1.80
	Dec.	10.50	3.00	3.58	.75	6.00	6.25	6.50	4.25	11.00	5.91	9.00	1.45	1.90

TABLE AVI cont.

Market	Month	Bananas	Corn Grain	Corn Ground	Cocoa	White Beans	Black Beans	Red Beans	Potatoes	Chicken	Ordinary Rice	Superior Rice	Tomatoes	Beef
Port-de-Paix	Jan.	-	3.00	3.60	-	4.80	5.00	6.00	-	-	-	-	2.50	-
	Feb.	-	3.00	3.60	-	4.80	5.00	6.00	-	-	-	-	2.50	-
	Mar.	-	-	-	-	-	-	-	-	-	-	-	-	-
	Apr.	-	-	-	-	-	-	-	-	-	-	-	-	-
	May	-	-	-	-	-	-	-	-	-	-	-	-	-
	June	-	-	-	-	-	-	-	-	-	-	-	-	-
	July	5.40	4.50	4.80	-	8.20	-	8.80	-	-	-	-	.80	-
	Aug.	4.97	3.75	5.00	.30	8.23	8.50	8.63	-	7.25	10.00	7.20	1.50	-
	Sept.	5.00	4.50	4.80	.25	9.20	-	8.80	-	5.00	-	7.20	.80	-
	Oct.	5.50	3.75	3.90	-	7.20	-	7.80	-	5.50	7.20	-	1.66	-
	Nov.	5.00	4.50	4.80	-	7.20	-	7.80	-	5.35	7.20	-	.70	-
	Dec.	5.00	4.50	4.80	-	7.20	-	7.80	-	5.00	7.20	-	.80	-
St. Marc	Jan.	6.00	2.30	3.50	.70	5.00	5.00	5.75	4.00	6.50	9.00	6.50	-	-
	Feb.	5.50	2.25	3.75	.60	5.50	5.50	6.10	4.00	6.00	10.50	5.75	-	-
	Mar.	6.00	3.00	4.00	.60	5.75	5.75	6.25	4.00	6.00	13.00	6.25	-	-
	Apr.	5.87	3.55	5.33	.60	7.25	7.25	8.26	4.00	7.25	7.12	12.87	1.20	-
	May	6.02	3.60	6.75	.68	10.50	10.50	10.51	4.37	6.50	8.10	12.00	1.25	-
	June	6.25	4.00	6.30	.65	11.00	11.50	12.00	4.25	6.12	7.06	10.37	1.10	-
	July	7.50	4.60	6.83	.72	8.25	8.00	8.00	4.00	5.50	8.87	6.25	-	-
	Aug.	6.50	3.50	5.75	.68	8.00	8.25	8.50	2.48	4.50	9.75	6.46	-	-
	Sept.	7.00	2.83	4.50	.67	8.50	8.50	8.25	3.25	5.33	9.50	7.16	-	-
	Oct.	6.50	2.00	3.25	.70	5.75	5.75	5.77	3.00	4.00	6.00	9.50	.20	-
	Nov.	5.37	2.00	3.25	.73	5.50	5.50	5.50	3.09	4.50	5.25	9.50	.25	-
	Dec.	6.59	1.90	2.88	.70	6.50	6.50	7.00	3.25	5.00	4.57	8.33	.25	-

Source: Guide Economique de la Republique d'Haiti, IHS, 1er trimestre, 1975
IBID: 2eme trimestre, 1975
IBID: 3eme trimestre, 1975
IBID: 4eme trimestre, 1975

APPENDIX B: MODELS OF FARM HOUSEHOLD PRODUCTION-CONSUMPTION BEHAVIOR

It has been observed in several studies (3, 4, 14, 52) that peasant farmers tend to sell high cash value products (beans) that are also important protein sources for their diet, and consume products that are relatively less nourishing, such as millet and potatoes. The products sold include rice, beans, meat and eggs. It is estimated that in the Artibonite, only 10 percent of the rice produced is consumed by the household (52) and, in the Vallee des Trois-Riviere, only 25 percent of the beans produced are consumed by the farm household (28). The more preferred products (meat, rice, beans, etc.) are consumed by the higher income segments of the population, generally residing in the urban areas. It is reported by Murray etal. that an increase in the price of the preferred foods tends to decrease the percent of these foods consumed by the farm household. Another important observation is the low consumption and caloric intake levels of the rural population (59). Together, this evidence suggests farm household consumption behavior, such as that depicted by the indifference map in Figure BI. The vertical axis depicts commodities that are high in protein content relative to the commodities depicted on the horizontal axis. The curve ICC indicates that as income of the rural household increases so that the household can afford to consume at food levels beyond point A, it will tend to increase its consumption of the higher protein foods

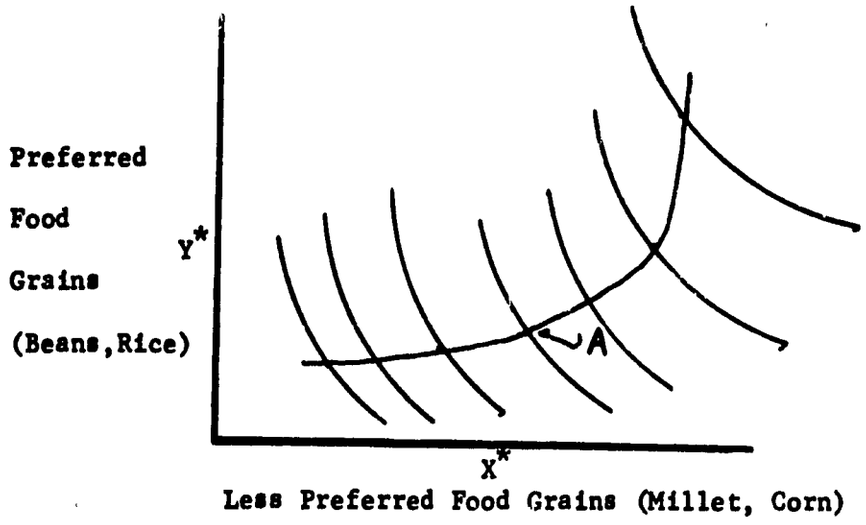


FIGURE BI

HOUSEHOLD INDIFFERENCE MAP BETWEEN PREFERRED (Y) AND LESS PREFERRED (X) FOOD GRAIN CROPS

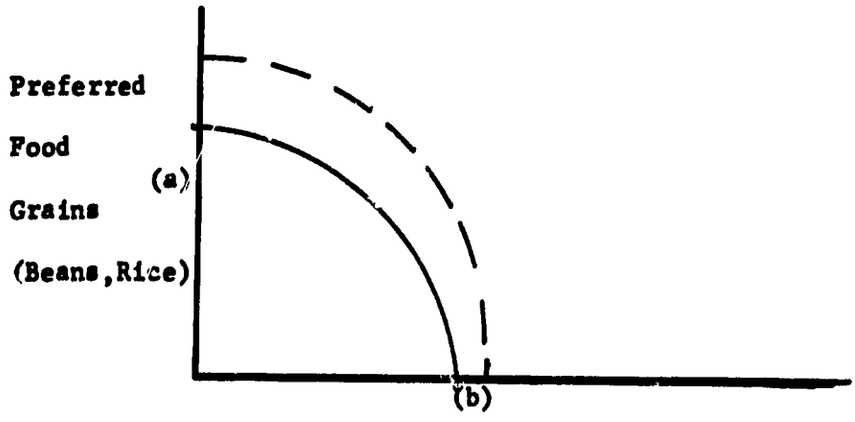
(rice, beans, meat) relative to its increase in consumption of the relatively less desirable foods. The reverse is true for income levels which constrain consumption levels to points left of A. Since incomes and caloric intake are low, it appears that a significant proportion of farm households are consuming at levels to the left of A. Now, consider briefly the production characteristics of rural producers.

Land holdings are small, production technology is traditional and the use of purchased chemical and biological inputs are nil. Figure BII depicts a production frontier of the typical rural producer.

The diagram shows that if the producer were to allocate all of his resources to producing items such as rice, beans or other high protein foods, he could produce a maximum of (a) units, or, contrarily, he

FIGURE BII

PRODUCTION FRONTIER



Less Preferred Food Grains (Millet, Corn)

could produce a maximum of (b) units of the foods commonly consumed by the household. An increase in resource base, such as an increase in farm size, water availability, new seeds, improved production practices and ideal weather conditions, are expected to increase the production of these crops (depicted by the broken line).

The next step is to superimpose Figure BI on Figure BII, given some price for the preferred (P_p) and relatively less preferred (P_e) products. This is depicted in Figure BIII. This diagram indicates that the producer perceives himself to be better off by producing (Y_1) units of the preferred product and (X_1) units of the less

preferred products. He then sells $(Y_1 - Y_2)$ units of the preferred product to purchase $(X_2 - X_1)$ units of the less preferred product. In other words, he perceives himself as being better off because for every unit of the preferred product he sells, he can buy back several units of the less preferred product. The farm household income-expenditure equation is:

$$P_p(Y_1-Y_2) = \text{Income} = P_e(X_2-X_1) = \text{Expenditure}$$

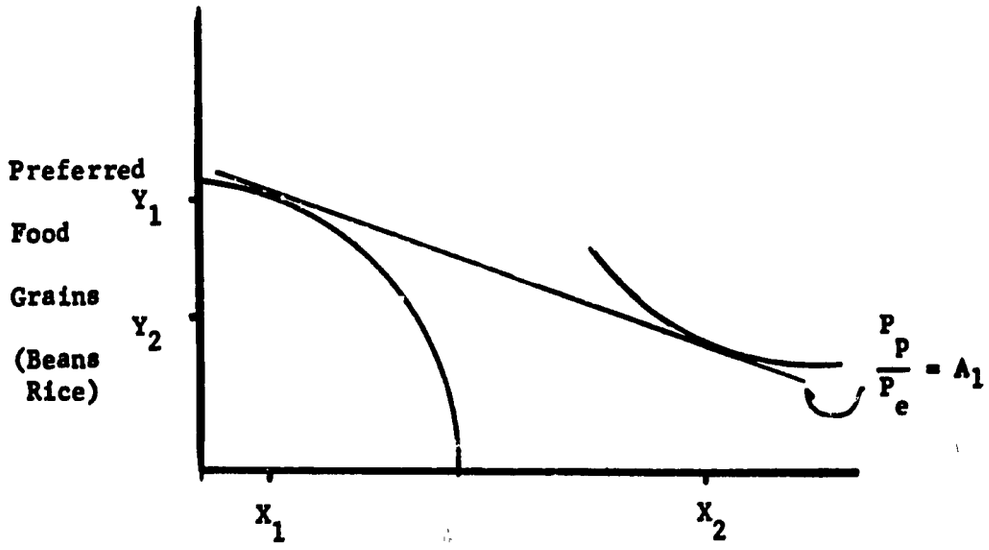


FIGURE BIII

FARM HOUSEHOLD PRODUCTION-CONSUMPTION LEVELS:

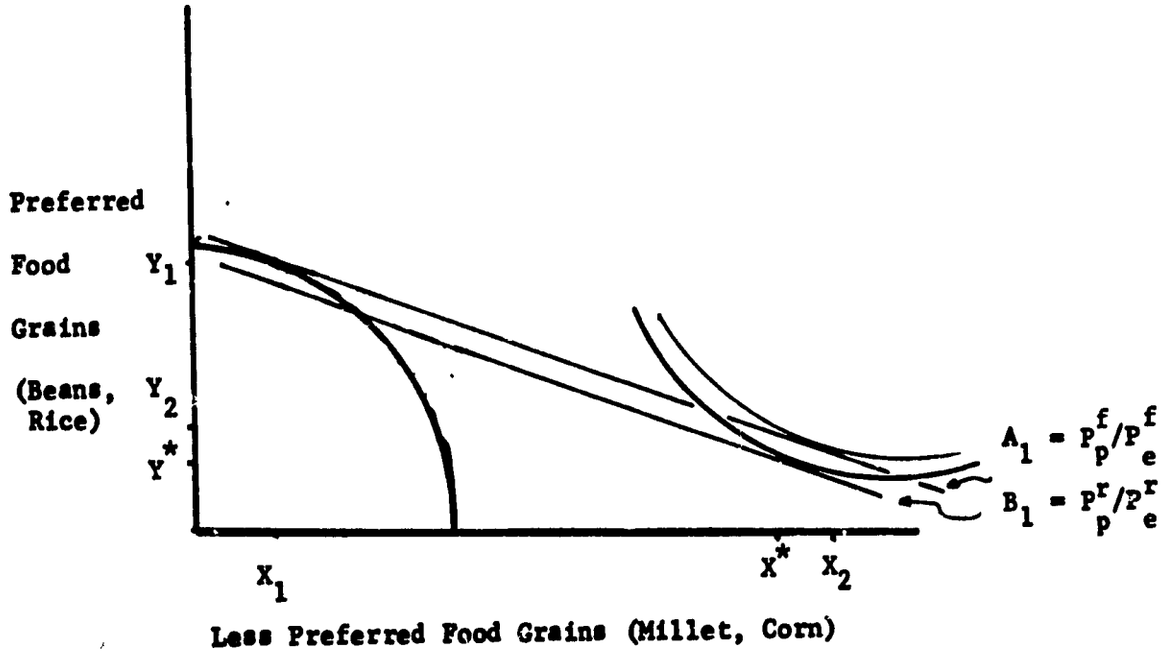
NO MARKETING COSTS

The failing of this model is that it treats the prices the farmer receives for his products as equal to the prices he pays for consumption goods. To account for differences in farm level and retail prices, let P_p^f, P_p^r denote the respective farm level and retail prices for the preferred commodity, while P_e^f, P_e^r reflect the respective farm and retail level prices for the less preferred commodity. The difference in these prices reflects the marketing margin. The effect of a marketing margin is depicted in Figure BIV. In this case, farm income

FIGURE BIV

FARM HOUSEHOLD PRODUCTION-CONSUMPTION LEVELS

WITH MARKETING COSTS



remains equal to household expenditures, as in the above equation, but less of X can now be purchased. In other words, because of the marketing margin, only X^* units of the commodity can be purchased, whereas in the previous case (Figure 6) X_2 units of the commodity could be purchased. Thus, spatial and other marketing costs decrease the amount of commodity X that can be obtained with commodity Y. The income expenditure equation is:

$$P_p^f(Y_1-Y^*) = \text{Income} = P_e^r(X^*-X_1) = \text{Expenditure}$$

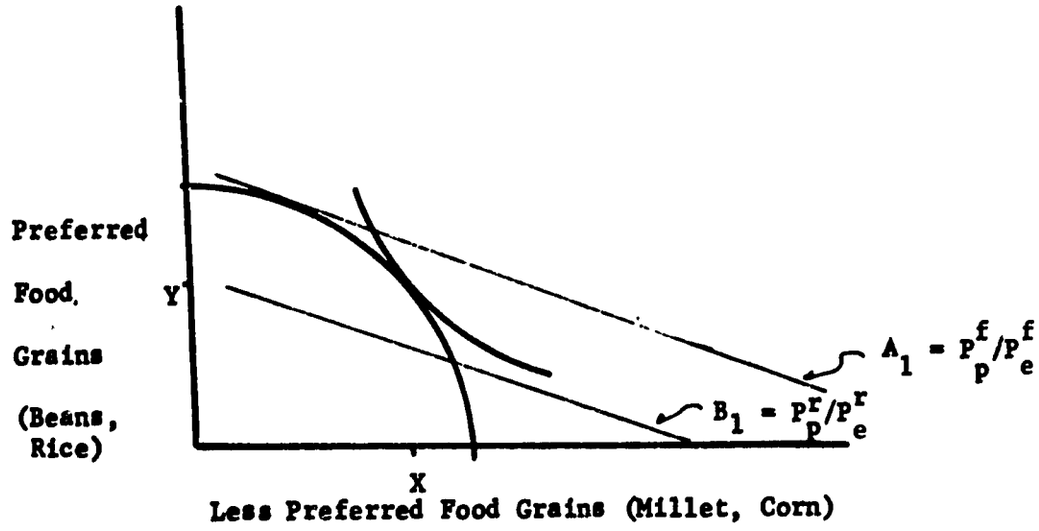
This essentially completes the model. The model can be used to demonstrate the directional impacts of concessional grain imports, changes in spatial and other marketing costs, improvements in production technology and effects of increases in household size and farm income on farm household welfare. For our purposes here, it is used to demonstrate the impact of concessional food grain imports on various categories of farm households. Essentially, concessional imports are felt to make consumers better off and to frequently make producers worse off. However, in a country such as Haiti where 80% of the population resides in the rural sector, many producers and consumers are the same individual. Then the question becomes, what is the net pay-off to a level of concessional food grain imports that effect food grain prices? The framework presented here can be used to provide insights into this question.

To demonstrate, suppose that marketing margins are large, Figure BV. In this case, there is no commercialized production,

FIGURE BV

FARM HOUSEHOLD PRODUCTION-CONSUMPTION LEVELS

WITH HIGH MARKETING COSTS



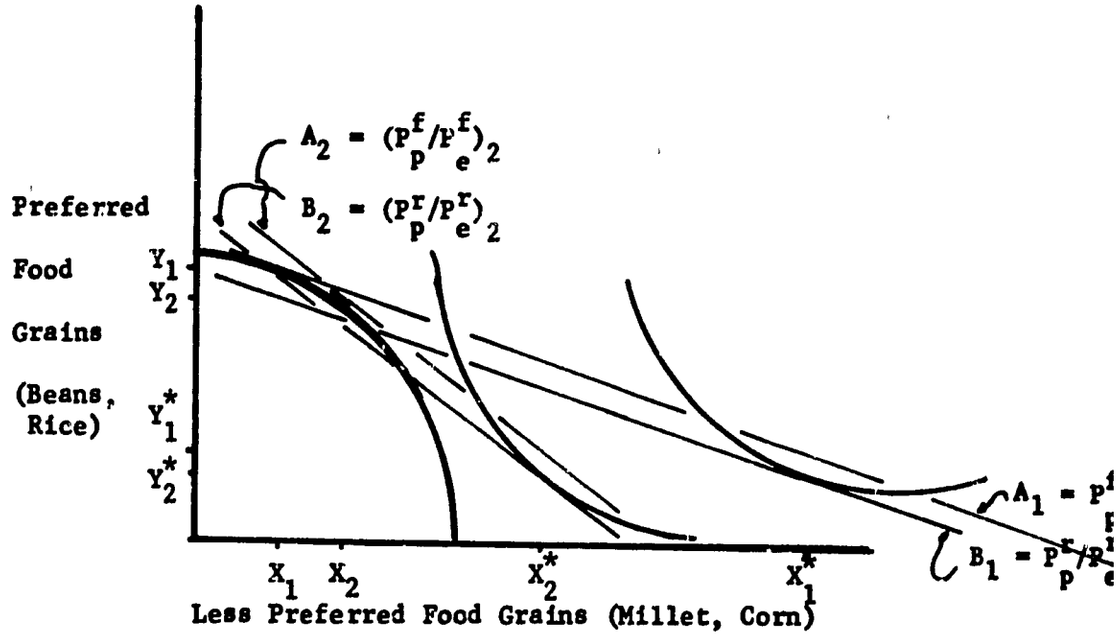
the entirety of production is consumed by the household. In this case, the food grain production is not directly effected by food grain market prices.

Next, consider the case where concessional imports of the preferred commodities (rice, beans, meat and their substitutes, such as wheat) effects farm household welfare (Figure BVI).

FIGURE BVI

EFFECT OF RELATIVE PRICE CHANGES ON FARM HOUSEHOLD

PRODUCTION-CONSUMPTION LEVELS



The impact of imports decreases farm and retail prices of the preferred commodities.

Before Concessional Imports:

Farm level price ratios: A_1

Retail price ratios: B_1

Production: Y_1, X_1

Income: $P^f_p(Y_1-Y^*_1)$

Expenditure: $P^r_e(X^*_1-X_1)$

Consumption: Y^*_1, X^*_1

After Concessional Imports - Price Changes:

Farm level price ratios: A_2

Retail price ratios: B_2

Production: Y_2, X_2

Income: $P_p^f(Y_2-Y_2^*)$

Expenditure: $P_e^r(X_2^*-X_2)$

Consumption: Y_2^*, X_2^*

Net Change:

Production

Decrease Y by Y_1-Y_2

Increase X by X_2-X_1

Income

Nominal: decrease

Real: decrease

Consumption

Decrease Y by $Y_1^*-Y_2^*$

Decrease X by $X_1^*-X_2^*$

The consequences, as indicated above, are to (i) decrease the production of the preferred commodities, (ii) decrease consumption of both the less preferred and more preferred commodities, and (iii) to decrease both nominal and real farm household income. The decrease in consumption comes about because of a decrease in income. That is, one unit of Y will now purchase fewer units of X and the overall welfare of the farm household is decreased, all else held constant.

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