

Report No. 9357-HA

Haiti

Agricultural Sector Review

April 30, 1991

Country Department III

Latin America and the Caribbean Regional Office

FOR OFFICIAL USE ONLY



Document of the World Bank

This document has a restricted distribution and may be used by recipients only in the performance of their official duties. Its contents may not otherwise be disclosed without World Bank authorization.

FISCAL YEAR

October 1 - September 30

CURRENCY AND EQUIVALENCY UNITS

Currency Unit - Gourde (G)

Official Exchange Rate Effective February 1990

US\$1.00 = G 5.00

WEIGHTS AND MEASURES

Metric System

GLOSSARY OF ABBREVIATIONS

APA	-	Agriculture Producer Association
BCA	-	Agricultural Credit Bank
BNDIAI	-	National Bank for Agricultural and Industrial Development
BRH	-	Bank of the Republic of Haiti (Central Bank)
CIAT	-	International Center of Tropical Agriculture
CIDA	-	Canadian International Development Agency
CIMMYT	-	International Center for the Improvement of Maize and Wheat
CIP	-	International Potato Center
CNC	-	National Corporative Council
CRDA	-	Center for Research and Agricultural Documentation
CRIN	-	Caribbean Rice Improvement Network
DGI	-	Direction General des Impots (Internal Revenue Service)
FAO	-	Food and Agriculture Organization
IDB	-	Inter-American Development Bank
IICA	-	Inter-American Institute for Cooperation on Agriculture
IMF	-	International Monetary Fund
IHSI	-	Haitian Institute of Statistics
MARNDR	-	Ministry of Agriculture, Natural Resources and Rural Development
Minoterie	-	Flour Mill
ODPG	-	Organization for the Development of the Gonaives Plain
ODN	-	Organization for the Development of the North
ONACA	-	National Cadastre Office
ODVA	-	Organization for the Development of the Artibonite Valley
PRECODEPA	-	Regional Cooperative Program for Potato
PROFRIJOL	-	Bean Cooperative Program for Central America, Mexico, and Caribbean
PRONATHAR	-	National Bean Production Program
PRONATMA	-	National Maize Production Program
SIGR	-	Rural Irrigation Service
SOFIHDES	-	Haitian Financial Corporation for Development
UNDP	-	United Nations Development Program
USDA	-	U.S. Department of Agriculture
USAID	-	U.S. Agency for International Development

HAITI**AGRICULTURAL SECTOR REVIEW****Table of Contents**

	<u>Page No.</u>
<u>COUNTRY DATA</u>	
<u>ABSTRACT</u>	
<u>SUMMARY AND CONCLUSIONS</u>	1
I. <u>OVERVIEW OF SECTORAL PERFORMANCE AND POLICY: 1970-89</u>	1
A. Output Structure and Trends	1
B. Growth and Sources of Growth	3
C. Fiscal and Trade Policies, and Relative Prices	5
Fiscal and Trade Policies	5
The 1986 Reforms	6
The Evolution of Prices	6
D. Conclusions	7
II. <u>AGRICULTURAL TRADE AND PRICING POLICIES</u>	8
A. The International Trade Regime	8
The Legal Import and Export Regime	8
Application of the Legal Trade Regime	8
Contraband	9
B. Agriculture's Trade Regime and Pricing Policies	9
Import Substituting Sector	9
Effect of Trade and Pricing Policies on Import	
Substitute Prices	12
Export Sector	14
Non-Traditional Exports	15
The Coffee Sector	16
C. Conclusions	17
III. <u>AGRICULTURAL CREDIT</u>	18
A. Government Credit	19
BCA	19
B. Commercial Banks	19
C. Credit Unions	20
Constraints to Credit Union Development	21

This report is based on the work of a World Bank mission which visited Haiti in September 1990. The mission comprised Mr. Hugo Diaz, Chief of mission, Mr. John Panzer (Sector Economist), Mr. Adrian Guissarri (Economist, Consultant), Mr. George Mosselmans (Irrigation Consultant), Mr. Edward Pulver (Agriculture Consultant), Mr. Peter Jennings (Agriculture Consultant) and Mr. William Amponsah (Summer Intern). The report was written by Mr. John Panzer, who also led the discussions with Government, March 27-28, 1991.

Table of Contents

	<u>Page No.</u>
D. Informal Credit	22
General Considerations Regarding Informal Credit	22
E. Conclusions	23
IV. <u>LAND TENURE</u>	23
A. Land Tenure Patterns and Characteristics	24
Land Distribution	24
Public Lands	24
Land's Exclusive Rights and Use	26
B. Land Titling and Tenure Security	27
Land Titling and Land Security	27
The Supply and Demand of Land Titling	28
National Cadastre	29
C. Land Tenure and Economic Performance	29
Tenure Security and Desired Investment.	29
Access to Credit	30
Land Tenure Patterns and Productivity	30
Land Tenure, Tenancy and Production Decisions	31
D. Conclusions	31
V. <u>THE IRRIGATION SUBSECTOR</u>	32
A. General Background	32
B. Design and Effectiveness of Rehabilitated Irrigation Systems	33
Design and Maintenance	33
Effectiveness of Irrigation Systems	33
C. Water Pricing and Water Charges	35
Gravity Systems	35
Pumping Systems	36
D. Subsector Strategy and Program	37
E. Conclusions	37
VI. <u>AGRICULTURE PRODUCTION, TECHNOLOGY GENERATION AND DISSEMINATION</u>	37
A. Assessment of the Current Situation	37
Rice	37
Maize	38
Sorghum	39
Grain Legumes	39
Other Food Crops	40
Non-Food Crops	41
Other Non-Basic Crops	41
Livestock Production	42
B. Organization of Research and Extension Activities	42
Varietal Development	42
Crop Management	43
Fertilizer and Pesticide Use	43
Seed Production	44

Table of Contents

	<u>Page No.</u>
Research, Extension and Irrigation	44
C. Institutional Arrangements	45
Research	45
Extension	45
D. Conclusions	46
VII. <u>THE FORESTRY SUBSECTOR</u>	48
A. Forestry and the Environment	48
B. The Renewable Energy Sector	48
C. Agro-Forestry Activities	48
D. The Government's Institutional Responsibilities and Constraints	49
E. Conclusions	49

APPENDICES

1 - Policy Matrix	51
2 - Statistical Appendix	54

Map: (IBRD 21143)

HAITI - COUNTRY DATA SHEET

Area: 27,800 sq km

Population: 6.4 million (1989)

Density: 223 per sq km

Rate of growth: 1.8 % (1989)

Population characteristics

Crude birth rate (per 1,000): 34.4
 Crude death rate (per 1,000): 12.7

Income distribution

% of national income, highest quintile: ..
 lowest quintile: ..

Access to safe water

% of population - urban: 59
 - rural: 30

Nutrition

Calorie intake as % of requirements: 80
 Per capita protein intake (g/day): 30

Health

Infant mortality (per 1,000 live births): 117
 Population per physician: 7179
 Population per hospital bed: 1397

Distribution of land ownership

% owned by top 10% of owners: ..
 % owned by smallest 10% : ..

Access to electricity

% of population - urban: 45
 - rural: 3

Education

Adult literacy rate (%): 62.4
 Primary school enrollment
 (%) of relevant age group: 78

GNP per capita (US\$, 1989) 1/ : 400

GROSS NATIONAL PRODUCT, FY89

	US\$ Mn	%	ANNUAL RATE OF GROWTH (%, FY80 prices)				
			FY75-80	FY80-85	FY86-87	FY88	FY89
GNP at Market Prices	2552.3	100.0	5.2	-0.9	0.1	-1.6	-0.6
Gross Domestic Investment	291.6	11.4	10.1	-2.1	-6.0	-1.0	-1.0
Gross National Saving	147.4	5.8	14.0	-3.5	-11.2	-1.9	-12.6
Current Account Balance	-126.9	-5.0					
Export of Goods, NFS	259.3	10.1	10.3	-1.3	-6.5	0.8	-0.5
Import of Goods, NFS	423.5	16.6	10.0	-2.9	-6.5	-1.1	2.2

OUTPUT, EMPLOYMENT AND PRODUCTIVITY IN FY89

	Value Added		Labor Force		V.A. per Worker
	US\$ Mn	%	Mn	%	US\$
Agriculture	339.9	19.1	2.0	66.7	170.0
Industry	514.9	29.0	0.3	10.0	1716.3
Services	922.1	51.9	0.7	23.3	1317.3
Total / Average	1776.9	100.0	3.0	100.0	592.3

GOVERNMENT FINANCE

	Consolidated Public Sector			General Government		
	G Mn FY89	Percent of GDP FY86	Percent of GDP FY89	G Mn FY89	Percent of GDP FY86	Percent of GDP FY89
Current Receipts	2097.4	18.1	17.7	1140.2	10.1	9.6
Current Expenditure	2189.0	17.7	16.5	1889.8	11.4	11.7
Current Surplus	-91.6	0.4	-0.8	-249.6	-1.3	-2.1
Capital Expenditure	538.6	5.3	4.6	396.3	3.9	3.3

1/ World Bank Atlas methodology.

HAITI - COUNTRY DATA SHEET

MONEY, CREDIT & PRICES

MONEY, CREDIT & PRICES	FY85	FY86	FY87	FY88	FY89
-----	----	----	----	----	----
	(Mn Gourdes outstanding at end of period)				
Broad Money Supply	2547.5	2935.3	3133.6	3463.3	3909.2
Bank Credit to Public Sector	2150.2	2113.6	2199.3	2328.0	2538.9
Bank Credit to Private Sector	1164.7	1172.4	1185.0	1279.2	1370.0
	(Percentage or Index Numbers)				
Broad Money as % of GDP	25.4	25.3	29.0	31.3	33.0
General Price Index (FY80 = 100)	148.7	160.8	144.1	149.6	154.9
Annual percentage changes in:					
General Price Index	8.4	8.5	-11.4	4.0	3.5
Bank Credit to Public Sector	12.0	0.9	3.2	8.0	9.1
Bank Credit to Private Sector	8.8	0.7	1.1	7.9	7.1

BALANCE OF PAYMENTS

MERCHANDISE EXPORTS (AVERAGE FY84-89)

	FY86	FY87	FY88	FY89		US\$ Mn	%
	----	----	----	----		-----	----
	(US\$ million)						
Exports of Goods, NFS	291.6	281.6	273.4	269.3	Coffee	42.8	20.3
Imports of Goods, NFS	423.3	451.8	425.6	423.5	Cocoa	4.8	2.3
	-----	-----	-----	-----	Essential Oils	4.3	2.1
Resource Gap (deficit = -)	-131.7	-170.3	-152.2	-164.2	Other Agriculture	6.7	3.2
					Manufactured Goods	130.8	62.7
Interest Payments (net)	9.1	8.4	6.8	10.9	Other Commodities	19.8	9.5
Other Factor Payments (net)	7.6	6.9	10.7	11.1			
Net Current Transfers	52.0	56.3	63.4	59.3	Total	208.7	100.0
	-----	-----	-----	-----		-----	-----
Balance on Current Account	-96.4	-129.3	-108.3	-120.9			

EXTERNAL DEBT, SEPTEMBER 30, 1989

EXTENDED DEBT, SEPTEMBER 30, 1988					US\$ Mn
Direct Pvt. For. Investment	4.8	5.0	10.1	9.4	
Net MLT Borrowing	33.0	55.2	34.4	15.5	
Disbursements	43.8	67.0	48.3	28.9	
Amortization	10.8	11.8	13.9	13.4	
Subtotal (Dir.Inv.+Net MLT)	37.8	60.2	44.5	24.9	
Other Capital (net) and Capital n.e.i.	89.8	104.6	122	93	
Increase in Reserves (-)	-31.2	-35.5	-60.2	9.0	
Gross Reserves 1/(end-year)	15.7	23.5	22.3	21.8	
					Public Debt, incl. Guaranteed
					Non- Guaranteed Private Debt
					Total Outstanding & Disbursed
					NET DEBT SERVICE RATIO FOR FY87
					2/
					%
					19.3
					..
					19.3

RATE OF EXCHANGE

IBRD/IDA LENDING (Sept. 30, 1987)

Annual Average (end of period)					IBRD	IDA
	FY86	FY87	FY88	FY89		(US\$ Mn)
	----	----	----	----		----
US\$1.00 = G	5.00	5.00	5.00	5.00	Outstanding & Disbursed	0.0 268.3
Q1.00 = US\$	0.20	0.20	0.20	0.20	Undisbursed	0.0 82.6
					Outstanding incl. Undisbursed	0.0 348.9

1/ Includes gold holdings.

2/ Debt service, net of interest earned on foreign exchange reserves, as a percentage of Exports of Goods and NFS.

TITLE : Haiti - Agricultural Sector Review

COUNTRY : Haiti

REGION : Latin America and the Caribbean

REPORT	: <u>TYPE</u>	<u>CLASSIF</u>	<u>NUMBER</u>	<u>LANGUAGES</u>
	SEW	Restricted	9357-HA	English

PUBDATE : April 30, 1991

ABSTRACT : The performance of Haiti's agricultural sector has been disappointing. Between 1985 and 1989, agriculture's average annual growth rate was -0.5%, continuing the negative trend that began in 1980. Agricultural value added has been decreasing even though land and labor resources allocated to agricultural production have been increasing. Land and labor productivity losses have mainly resulted from the deterioration in the quality of the country's capital stock (e.g., soil properties, irrigation systems and roads), reflecting a political and economic environment in which investment has not taken place. Yields, with the exception of rice, show a negative trend and are becoming increasingly lower than those recorded in other countries of the region. The State's failure to supply much needed public goods has been the key factor hampering the development of an institutional framework conducive to growth. In agriculture, the most blatant failure has been the lack of adequate property rights resulting from lack of titling services and a reliable judicial system. This has led to alternative, less efficient titling arrangements that have constrained the development of the market for land and the ensuing modernization of agriculture. Other shortcomings include the State's inability to establish and collect adequate fees to cover the irrigation systems' operational and maintenance costs, causing their increased deterioration; the absence of public sector leadership in technological growth and transfer, resulting in a series of uncoordinated donor-driven efforts with diminished impact on productivity; and the lack of prudential regulations necessary for the development of rural financial markets. In spite of the 1986 economic reforms, distortions persist. Agricultural exports have continued to be implicitly taxed through protection to import-substituting crops and by the implicit 13% export tax arising from the foreign exchange surrendering requirement. As a result, resources have not been directed to their area of comparative advantage and Haiti has become a net importer of agricultural commodities. Contraband activities have flourished in response to the protectionist policies and currently encompass 50% of total agricultural imports. However, the uncompetitive nature of the contraband trade--there is no free entry--has prevented it from annulling the protectionist effect of import restrictions. The sugar industry has been the sector's major beneficiary of Government-induced distortions. Subsidies to the mills comprising tax-free sugar import quotas and an indirect Central Bank export subsidy amount to US\$8-12 million per annum, roughly 4% of total fiscal revenues.

SUMMARY AND CONCLUSIONS

Background

1. Over the past decade, the people of Haiti have suffered a continuing decline in their standard of living as GNP per capita has dropped to US\$400, one of the lowest levels recorded in the developing world.

2. Economic developments in Haiti have been affected by chronic political instability. But Haiti's recent democratically elected Government provides a window of opportunity for the country to move towards sustained social and economic progress. In many ways, the economy and its economic policy are at a crossroads: important decisions regarding the country's development need to be made with urgency. But some of the factors benefiting Haiti in the past are no longer in place. Coffee and sugar, major sources of past agricultural growth, face unpromising prospects, and other agricultural exports have stagnated. Meanwhile, domestic production costs have mounted, adoption of new technology has lagged, and Haiti's agricultural export potential prospects are clouded by distortions. At a time when most old problems remain and new constraints are emerging, economic policies which will contribute to a revitalization of agriculture are much needed. Nevertheless, there are encouraging elements on which to base these new policies: absence of price interventions in most commodities and the positive legacy of import liberalization that has taken place since 1986.

3. The purpose of this report is to review the recent performance of Haiti's agricultural sector and to analyze issues critical to its growth. The report seeks explanations for the sector's historic stagnation and inability to abandon traditional technologies and institutions. Policy recommendations are focused on raising allocative and productive efficiency and on creating conditions that will encourage investment, technological change, and improve market operations. The first two chapters describe and analyze the economic policies which have, directly or indirectly, influenced the performance of the sector for the past twenty years. Chapter I provides an overview of the economic policies and the sector's performance during the 1970-89 period. Chapter II analyzes the impact of current trade and pricing policies. Chapters III through VI analyze the institutional framework in which agricultural development has taken place. Chapter III provides an analysis of the factors and policies that have contributed to the lack of development of rural financial markets. Chapter IV deals with land tenure issues and explains how its resolution could provide stimulus to the modernization of agriculture. Chapters V and VI review critical issues constraining technological change in agriculture--irrigation, research and extension. Finally, Chapter VII presents a brief analysis of the forestry sector. A policy matrix (Appendix 1) summarizes the report's issues and policy recommendations.

Conetrainte to Agricultural Growth

4. The bulk of Haiti's agricultural practices are characterized as traditional. Most farming practices resemble those practiced many decades ago and, unlike more developed economies, market relations continue to be centered around a family/community structure. The shortcomings of that market/institutional framework have become increasingly evident as population growth has posed a major stress on Haiti's resources. The sector faces continuing stagnation, severe environmental degradation, and decreases in productivity and growth.

5. The key factor hampering the development of a market/institutional framework conducive to growth has been the State's failure to supply much needed public goods. In agriculture, the most blatant Government failure has been the lack of enforcement of property rights through titling services and the absence of a reliable judicial system. This has led to alternative, less efficient titling arrangements that have discouraged investment and constrained the modernization of agriculture by limiting transactions within the traditional community sphere. Other serious shortcomings include the absence of public sector leadership in technology generation and transfer, in the maintenance of public irrigation systems, and of prudential regulations that could contribute to the development of rural financial markets. Finally, the sector's efficiency and growth have also been hampered by some policy-induced distortions, mainly restrictions to international trade and Government interventions in the financial markets.

Performance of the Agriculture Sector

6. Between 1985 and 1989, agriculture's average annual growth rate was a disappointing -0.5%, continuing the negative trend that began in 1980. Agricultural value added has been decreasing even though land and labor resources devoted to the sector have been increasing. Land and labor productivity losses have mainly resulted from the deterioration in the quality of the country's capital stock (i.e., soil properties, irrigation systems and roads), reflecting a political and economic environment in which investment has not taken place. Yields, with the exception of rice, show a negative trend and are becoming increasingly lower than those recorded in other countries of Latin America and the Caribbean.

7. Despite protectionist policies, food imports soared as a consequence of declining domestic food production. The sector--traditionally the country's most important source of foreign exchange--is currently a net importer of agricultural commodities. In 1988, agricultural imports (both legal and illegal) exceeded exports by roughly US\$65 million. The sector's performance has strong implications on welfare. With an average annual population growth rate of 1.4%, per capita food availability has been decreasing even though food imports (including contraband) have been increasing. In 1987, almost 50% of households consumed less than 75% of the recommended daily calorie intake, and nearly 36% consumed less than 75% of recommended protein levels.

Strategies and Recommendations for Promoting Efficiency, Technological Change and Growth

8. Changing the pattern of stagnation in the agricultural sector will require wide ranging policies. Specific policies are needed to provide improved access to credit, promote the use of improved technologies, improve the use of the irrigation systems and curtail the present pace of soil erosion. These policies should form part of an economic framework free of distortions so that resources can be allocated in the most efficient manner.

9. The newly elected Government of Haiti has designed a strategy setting priorities for Government involvement in agriculture. The strategy would be implemented within a policy framework consistent with that proposed in this report. The plan foresees an important role of the State in the areas of: (i) land tenure; (ii) agricultural research and extension; (iii) rural infrastructure (e.g., irrigation); and (iv) soil management. The strategy also calls for Government participation--albeit not in a leading role--in the development of rural financial markets, provision of information to assist the marketing of agricultural produce, the development of livestock, fisheries and aquaculture, and facilitating farmers' access to tools and machinery.

10. The Economic Policy Framework: Following a long period of increased Government intervention, a comprehensive economic reform was introduced in 1986. The reform sought to promote economic growth by eliminating distortions and improving resource allocation. In the context of commercial and pricing policies, it focused on realigning domestic prices to world prices by liberalizing the international trade regime and local trade monopolies. In the agricultural sector, the reforms supported these objectives to the extent that export taxes on agricultural commodities were eliminated. Major agricultural commodities were granted special protection in spite of an overall tariff reform that decreased the country's average tariff level from roughly 40% to 20%. Imports of maize, sorghum, rice, and beans were subject to licensing requirements and to a 50% tariff; licenses and a 40% tariff were also introduced for meat imports while sugar and flour imports continued to be monopolies subjected to 40%-50% tariffs.

11. The sector's allocation of resources continues to be distorted in favor of import substituting crops. Exportables are implicitly taxed through:

- (a) protection granted to import-substituting crops. In spite of the massive contraband of rice, flour and sugar (estimated at US\$60 million per annum, roughly 50% of total agricultural imports), tariff protection and import licenses on rice, maize, sorghum, sugar and flour have subsidized domestic producers, taxed consumers and expanded these sectors where the country does not have a comparative advantage. In 1990, the nominal protection coefficient for these products was roughly: 1.3 for rice, 1.5 for maize, 1.5 for sorghum, 1.5 for flour, and a lower bound of 1.5 for sugar. Although contraband has played a role in correcting these relative price distortions, its impact has been limited because its incidence has not been uniform across products. There are transaction costs involved in bypassing the law, and organized

large-scale contraband industry behavior has been non-competitive because of entry restrictions; and

- (b) the implicit export tax levied by the requirement that 40% of an exporter's foreign exchange proceeds be exchanged into Gourdes at the official exchange rate (G 5/US\$1) instead of the market determined rate (G 7.5/US\$1). Import transactions (except for petroleum products) take place at the market determined rate. During 1990, this surrendering requirement was roughly equivalent to a 13% tax on exports.

12. These policies have exacerbated the difficulties faced by the exportable sector. Coffee producers face severe problems because the relative price of coffee with respect to competing crops (i.e., maize and sorghum) has not improved--in spite of the elimination of the export tax--because of the fall in the world price of coffee. These difficulties have been compounded by the outbreak of the coffee rust disease. Despite their promising prospects, mango exports have stagnated during the past five years because additional investments needed to increase output have not been undertaken. Investments have been discouraged by uncertainty, a consequence of an extremely unstable political environment, and by economic policies that have been detrimental to the export sector.

13. Sugar remains the most distorted commodity in the economy. Although nominal protection is relatively high, the industry allegedly cannot break even on its domestic production. To help the industry, the Government transferred the exclusive monopoly on raw sugar imports and over 50% of the refined sugar import permits to the mills. These licenses include tax exemptions--all the import-monopoly rents are thus captured by the importers. With international sugar prices ranging between US\$0.11-0.15/lb and the domestic ex-mill price at roughly US\$0.25/lb, these rents amount to US\$7-11 million per annum; equivalent to roughly 12% of import duty revenues and 4% of total fiscal revenues.

14. Protectionist policies have been detrimental to: (i) consumers (especially urban consumers) who must pay higher prices; (ii) the Government and all the beneficiaries of public goods--as the economic rents generated by import constraints have been appropriated by the contraband industry and the sugar mills; (iii) the agricultural export sector; (iv) the environment--since the protected import-substituting commodities are annual crops whose production in the hillsides hastens the erosion process; and (v) to the overall economy as resources have not been destined to their most efficient use.

15. For the economy to achieve an efficient allocation of resources, trade and pricing policies should be neutral and should not favor any particular sector at the expense of others. Moreover, given Haiti's lack of institutions, the trade regime should contain as little administrative discretionality as possible and the level of protection should be sufficiently low so as to make contraband unprofitable. Thus, it is recommended that: (i) all quantitative import restrictions be eliminated, except for those related to the reasonable application of health regulations; (ii) agricultural

commodities' tariffs be set at a 5% uniform level, and all imports be subject to the consumption (TCA) tax. This uniform tariff should be consistent with that to be applied to the rest of the economy; (iii) protection to the sugar industry be decreased; and (iv) the foreign exchange surrendering requirement be eliminated.

16. Credit Markets: Lack of access to the formal credit markets has limited farmers' production activities. As of June 30, 1988, even though the agricultural sector accounted for 35% of GDP, less than 1% of the total credit outstanding from banking institutions had been channeled to agriculture, most of it from the Government-owned National Bank for Agricultural and Industrial Development (BNDAI). With the closing of BNDAI in 1989, the level of outstanding credit has probably been much lower. Another Government institution--the Bureau de Credit Agricole--channels credit to farmers at subsidized interest rates, however it does not have access to external resources.

17. Commercial banks have played an extremely limited role in Haiti's agricultural sector as a consequence of the country's farm size distribution. Recorded world experience has indicated that commercial banks seldom lend to small farmers because of high transaction costs, the inability of using untitled land as collateral, and the existence of interest rate caps which promote credit rationing and discrimination vis-a-vis more risky and more costly to service customers.

18. The cooperative system is the only source of formal credit available to farmers. Cooperatives mainly operate in urban areas. Their potential expansion to rural areas will depend on changing existing laws to allow payment of competitive rates on savings deposits and on developing an adequate legal and regulatory framework.

19. The Government has an important role to play in the development of financial institutions related to agriculture by providing prudential regulations and adequate supervision. To facilitate farmers access to institutional credit, the Government would need to: (i) eliminate the 22% cap on commercial bank lending rates; (ii) eliminate the prohibition that precludes the use of land as collateral; (iii) eliminate the fixed 12% interest rate on credit union loans; and (iv) develop a suitable regulatory and supervisory framework for credit unions.

20. Land Tenure: Haiti's land titling system is under severe stress. An official cadastre does not exist and the number of hectares of titled land complying with all necessary legal requirements is exceedingly small. Nevertheless, individual property rights on land are recognized. Compliance with full legal formalities have been replaced by an informal system with partial legal compliance. This system provides some degree of land tenure security.

21. Land titling and security issues are a contributing factor to the stagnation in the development of agriculture. The lack of legal titling prevents access to formal financial markets, hindering investment and technological change. Lack of tenure security also has a negative impact on

the environment as it discourages on-farm investments such as terracing and tree planting. More importantly, the modernization of agriculture will require that traditional family/community based economic relations be extended to market type relations, with well defined/enforced property rights. This will enhance the possibility that investors and entrepreneurs that have not been traditionally linked to the sector will participate in its development. Small farmers would also benefit from enhanced tenure security arrangements, since it would enable them to undertake profitable land-specific investments and, over the medium term, the farmers' access to credit would be enhanced. While the advantages of a formal titling system are enormous, the dangers are great in attempting such a reform without having in place a well functioning land administration/legal process which preserves the rights of those who have traditionally farmed the land and to prevent land grabbing.

22. Rather than attempt a compulsory national titling program, which at Haiti's current stage of development would not be feasible to implement effectively, the Government should establish the legislative and administrative framework which would permit the issuance of titles at a pace consistent with their demand. Land titling could be provided by the National Cadastre Office (ONACA) at subsidized rates--for a limited period--to encourage land registration once appropriate procedures are in place. Steps should be undertaken to facilitate the process of land registration which at present is controlled by a few notaries. Complementary measures should be taken to ensure that acquired titled rights do not carry restrictions regarding land transferability. Legislation preventing foreigners from acquiring land, and legislation preventing land from being used as collateral should be abolished.

23. State-owned lands comprise between 5% and 11% of total cultivable land. They are generally leased at below market rates, and the leases are not transferable outside the beneficiary's immediate family. A high proportion of these lands are subleased at market rates. The State does not know exactly how much land it owns nor who it is leased to. Current leasing arrangements have negative equity considerations arising from the non-transparent system of rent transfers to lessees, who benefit from below market fees. Moreover, the non-transferability of the leases has negative efficiency implications on the environment and growth since: (i) access to credit is limited because the land cannot be used as collateral; and (ii) erosion is enhanced since cultivation practices may be biased towards substituting annual crops for perennial crops. This is a consequence of tenancy (i.e., subleasing) arrangements not being conducive to the planting of perennial crops.

24. The State should divest most of its land. As a matter of principle there is no reason for the Government to be engaged in the real estate business, much less so when such an activity serves primarily as an unclear and untargeted rent transfer mechanism with negative efficiency implications. Caution should be exercised to prevent land grabbing by wealthy and well connected individuals at prices below real value.

25. Irrigation: Haiti's public irrigation systems have deteriorated considerably due to poor maintenance. At the core of this continuing problem is the fact that user's contribution to cover operation and maintenance (O&M)

costs are minimal. Maintenance problems are extensive even in the autonomously administered public irrigation projects for which there is external financing. In the rehabilitated gravity systems, the absence of users' fees to recover ongoing O & M costs stem from the Government's unwillingness to set and enforce them. Given current yields and cropping intensities, these payments would represent between 1% and 3% of a farmer's annual income and are within the farmers' payment capacity. Pumping systems are not economically efficient, their O & M costs being excessively high compared to the land's productivity and cannot be fully repaid by users.

26. Despite these difficulties, the rehabilitated gravity schemes have experienced important increases in cropping intensity and yields. Average cropping intensities have doubled, and yield increases have ranged from 60% to 300%. These improvements still fall short of the projects' objectives (e.g., generally expected yields of 3.5 ton/ha for maize and sorghum, 4.5 ton/ha for rice and 1.5 ton/ha for beans) because neither the supporting technology is available, nor is there an effective extension service--particularly relating to water management.

27. A number of rehabilitation projects are currently being carried out with donor support. Rehabilitation efforts should continue provided that: (i) the choice of projects is conditioned on it being feasible to put in place adequate cost recovery mechanisms to cover O & M costs. Priority should be given to gravity systems where O & M costs are within farmers' capacity to pay; (ii) the Government puts into effect mechanisms to charge and collect adequate water fees; (iii) design standards are upgraded to enhance the system's reliability and limit siltation in the canals. This requires more complete studies of water availability; and (iv) catchment protection becomes a part of all water resource development projects.

28. The severity of institutional weakness in the MARNDR precludes its ability to effectively participate in irrigation development. This problem has been perpetuated by funding agencies' tendency to work with local authorities in an effort to achieve results within a very weak institutional environment. The downside effect has been the perpetuation of the Government's inability to provide supporting services, including technology development and transfer, and an inadequate focus on environmental issues. Greater attention is needed to strengthen the Ministry of Agriculture, Natural Resources and Rural Development's role in irrigation development, provision of supporting services and the establishment of water users associations to administer irrigation schemes. To date, there has been little progress in the identification or formation of such associations.

29. Research and Extension: Productivity increases could be quite rapidly achieved in agriculture provided that properly designed and sustained research and extension programs are implemented. Past research and extension impact has been dismal as evidenced by Haiti's declining food and export crop production. Food grain production technology, except for rice, has largely failed.

30. An examination of Government institutions, external donors, NGOs and farmers' organizations reveals serious problems in the direction,

coordination and cooperation of the numerous agencies involved in technology generation and dissemination. There is no one agency/institution capable of assuming responsibility for research and extension. Collectively, there are more than sufficient human and financial resources available to accelerate technology.

31. A unified program of research and extension should be centered around several promising crops. In such an approach, the production system should be viewed in its entirety. Crop-specific action programs should assist in coordinating research, extension, input supplies, and resource management. It is critical that farmers support this initiative. They should not only participate in transferring technology but should also contribute to sustaining the program without requiring large amounts of external assistance.

32. In the short-term, the most promising improvements can be achieved in the irrigated rice-growing areas. Current annual rice imports of roughly 70,000 ton indicate that domestic production can increase significantly without a negative effect on producer prices. In the better irrigated areas of the Artibonite Valley, a program based on improved water management techniques could result in a 60% increase of an average farmer's annual income. Other areas would need prior rehabilitation of their irrigation schemes before significant improvements are achieved. However, the benefits of such rehabilitation are enormous. In the areas that do not suffer from drainage problems, the gross annual income per hectare could more than double, from roughly US\$3,000 to US\$7,000. In the most destitute areas with serious drainage problems, gross annual incomes could increase from US\$1,000/ha/year to US\$6,000/ha/year. Rehabilitation costs per hectare are estimated at roughly US\$1,000 and US\$3,000, respectively. The improvement of these systems could have a significant payoff. Sorghum, maize and bean yields could increase by 15% in the short term if crop-management extension programs are successfully implemented.

33. Forestry: The existing degradation of Haiti's natural resources needs to be curtailed. The Government needs to develop adequate safeguards aimed at: (i) protecting the remaining forests and vital ecosystems from further destruction; (ii) increasing wood production through the management of State forest lands and through the promotion of agro-forestry by farmers; and (iii) reducing the pressure on the country's vegetation through conservation measures and, to the extent possible, by substituting mineral fuels for fuelwood over the medium term. The closing of open access to fuelwood is likely to increase the price of wood, making other sources of energy more competitive. Tree farming may become profitable in this circumstance. Tree farming would also benefit from better defined/enforced private property rights.

34. The Government should: (i) increase forested areas by transferring State land to the Ministry of Agriculture to be rezoned as "public domain" for environmental protection; (ii) improve forest management; and (iii) strengthen the legal and institutional framework that regulates forestry and environmental issues.

I. OVERVIEW OF SECTORAL PERFORMANCE: 1970-89

A. Output Structure and Trends

1.1 Agriculture has traditionally been Haiti's key economic activity. Its importance had initially been linked to the country's becoming a rich sugar producing colony and following independence to evolving into an economic and social structure largely based on self-sufficient, owner-operated, small-scale farming. Agriculture accounted for roughly 35% of GDP in 1989, directly affects 75% of the 6.4 million inhabitants and employs 65% of the total labor force. Crop production accounts for 85% of the sector's value added. In 1985, the last year for which disaggregate information on value added per crop is available, agriculture's main crops and their respective share of total crop value added were rice (13.8%), coffee (10.9%), sweet potatoes (10.0%), beans (9.5%), bananas (8.2%), yam/malanga (7.4%), mangoes (4.6%), sugarcane (4.6%), maize (4.3%), oranges/grapefruit (4.3%) and sorghum (4.0%). Livestock production--destined to the domestic market--included beef (36,000 ton), pork (12,000 ton), chicken (9,000 ton) and milk (50,000 ton).

1.2 The country's territory covers roughly 2.7 million ha. In 1987, approximately 1 million ha were cultivated, 0.5 million were used as pasture and only 100,000 remained as forests. Approximately 7% of cultivated land is irrigated. Most of the country was once covered with natural forests, but relentless population pressure has contributed to their disappearance, generating serious environmental problems. Approximately one million hectares of land have been eroded and can no longer support any agricultural use.

Table 1.1: FARM SIZE AND DISTRIBUTION, 1971

	Landholdings (number)	Parcels per Holding (average)	Farm Land (ha)
Less than 1 ha	361,985	1.5	184,843
1 to 3 ha	195,530	2.1	349,299
3 to 5 ha	33,810	3.4	133,552
More than 5 ha	<u>23,385</u>	3.3	<u>193,822</u>
<u>Total</u>	616,710	1.8	863,516

Source: George Anglade, Espace Haitien, 1974 (based on 1971 Census).

1.3 A distinct feature of the agricultural sector is the pattern of land distribution, with small landholdings^{1/} under 4 ha accounting for almost

^{1/} A farm is referred to as a landholding: the sum of different parcels a given farmer owns.

75% of cultivated land. While small farms are not uncommon in Latin America and the Caribbean, their importance in Haiti is unique.^{2/} This pattern of land distribution is further characterized by farms being sub-divided into several parcels. According to the 1971 census, the estimated number of farms was approximately 616,000, with an average farm size of only 1.4 ha. Moreover, since the total number of parcels was roughly 1.18 million, the average parcel size was under 0.8 ha. Although updated information regarding farm size and distribution is not available, all evidence points to a land distribution pattern of even smaller farms.

1.4 Agriculture's importance also stems from its participation in international trade, particularly exports. Until 1980 the sector accounted for at least 50% of total exports. Since 1980, agriculture's contribution to total exports has declined sharply as a consequence of: (i) the drop in the world price of coffee and lower volume of coffee exports; (ii) the fall in the value of traditional exports such as cocoa, essential oils, sisal and sugar which have either been affected by declining world demand or by loss of their competitiveness; and (iii) the stagnation of non-traditional exports.

Table 1.2: AGRICULTURAL IMPORTS AND EXPORTS, 1970-88 a/
(in US\$ million)

	1970	1975	1980	1988
<u>Exports</u>				
Coffee	15.2	18.3	90.4	38.9
Agriculture	23.7	37.8	112.3	55.5
- as % of all goods	58.5	46.5	50.0	28.9
<u>Imports</u>				
Wheat	2.3	14.7	31.9	18.0
Agriculture	10.4	33.4	100.5	119.6
-as % of all goods	20.0	23.5	28.4	34.8
<u>"Surplus" <u>b/</u></u>				
Agriculture	13.3	4.4	11.8	(63.7)

a/ Include meat, dairy products, cereals, and fishery and forestry products; exclude edible oil.

b/ Defined as the difference between the value of exports and imports.

Source: FAO.

1.5 Traditionally, agriculture has also been a net source of foreign exchange earnings. However, this role has been drastically reversed as imports have increased because of the sector's stagnation (Table 1.2). In

2/ In Jamaica 49% of all farms are under 4 ha, yet they account for only 26% of total cultivated land.

1988, imports of wheat and wheat flour from the United States accounted for roughly 40% of the sector's trade deficit. Macroeconomic factors have also affected the sector's performance. Maintenance of a fixed exchange rate regime in light of rising domestic inflation caused the real exchange rate to fall and reduced the relative price of traded goods with respect to non-traded goods. These developments stimulated imports and reduced the incentives to produce tradeables.

B. Growth and Sources of Growth

1.6 During 1970-89, agriculture grew at about 0.4% annually, roughly 1.5 percentage points below the growth rate of the economy. Its sectoral share in GDP dropped from 47% in 1970 to 35% in 1989, a phenomenon more closely associated to the sector's stagnation than with the overall pattern of the country's development.^{3/} While increasing coffee and rice production contributed to agricultural growth in the 1970s, output of most crops in the 1980s stagnated or decreased.

Table 1.3: CONTRIBUTION OF AGRICULTURE TO GDP, 1960-89
(in percentage)

	Share in GDP	<u>Annual Growth Rates</u>		Contribution to GDP Growth <u>a/</u>
		GDP	Agriculture	
1960-70	46.9	0.7	0.8	53.6
1970-75	42.3	4.3	2.1	20.4
1975-80	33.7	5.0	0.8	5.1
1980-85	35.3	-1.9	-1.3	--
1985-89	34.9	-0.2	-0.5	--

a/ Percentage of GDP growth explained by the expansion in agricultural value added.

Source: Haitian Institute of Statistics (IHSI) and mission estimates.

1.7 Explanations of growth can be provided inter alia on the basis of changes in conventional factors of production: land, labor and capital and their efficient use. Available 1970-88 data shows increases in the use of cultivated land and labor. Data on capital in agriculture is not available; however, data on the evolution of agricultural machinery imports indicate that the capital stock increased during this period (Table A.6 Statistical Appendix). Trends on other input use is mixed: pesticide imports have increased and fertilizer imports have declined. In any event, these inputs' role in production is extremely limited and their current contribution to growth is negligible.

3/ Recorded experience has shown that agriculture's share of GDP tends to decline as countries reach more advanced stages in development.

Table 1.4: AGRICULTURE'S SOURCES OF GROWTH
(in percentage)

	<u>Average Annual Growth Rates</u>			<u>Apparent Productivity Gains a/</u>	
	GDP	Labor	Land	Labor	Land
1970-88	0.43	0.31	0.69	0.12	-0.26
1980-88	-0.29	0.77	0.27	-1.06	-0.02

a/ Estimated as the difference between the growth rates of agricultural GDP and factors of production in agriculture.

Source: Mission estimates.

1.8 A comparison of the rate of growth of output with that of land and labor shows that since 1970 labor has registered extremely small productivity gains, all of them attained during the 1970s (Table 1.4). During the 1980s, the productivity of both land and labor fell. The decline in factor productivity reflected the continuous deterioration in the quality of the country's capital stock arising from: (i) continuing land erosion; and (ii) very low levels of investment in basic infrastructure (i.e., irrigation systems, roads). Yields, with the exception of rice, show a negative trend and are becoming increasingly lower than those recorded in other countries of Latin America and the Caribbean (Table 1.5).

Table 1.5: YIELDS IN PRODUCTION, 1970-87
(ton/ha)

	1970	1975	1980	1987
<u>Rice</u>				
Haiti	2.11	2.51	2.40	2.94
L. America a/	1.78	1.91	2.00	2.24
<u>Maize</u>				
Haiti	1.04	0.92	0.90	0.91
L. America	1.47	1.55	2.05	1.87
<u>Sugarcane</u>				
Haiti	36.1	37.4	37.5	35.3
L. America	54.7	54.0	56.7	61.3

a/ Weighted average of Latin American and the Caribbean countries.

Source: FAO.

1.9 The sector's performance has strong implications on welfare. With an average annual population growth rate of 1.4%, per capita food availability (as measured by available kg calories) has been decreasing even though food imports (including contraband) have been increasing. The latest data on the population's nutritional status^{4/} shows that almost 50% of households consume less than 75% of the recommended daily calorie intake, and nearly 36% consume less than 75% of recommended protein levels.

Table 1.6: FOOD PRODUCTION AND NUTRITION, 1970-89

	Food Production Index	Per Capita Food Production Index	<u>Food Supply/Capita/day</u>	
			Calories (kg cal)	Proteins (grs)
1970	86	103	1,910	43.9
1975	95	103	1,916	44.3
1980	100	100	1,888	44.8
1985	111	102	1,907	45.6
1989	106	90	1,788 <u>a/</u>	45.0 <u>a/</u>

a/ Corresponds to 1987, the last year in which estimates of calorie and protein intake were available.

Sources: Nutrition data for 1970-1985, FAO; nutrition data for 1987 from "Nutrition in Haiti", op. cit. Production indexes, FAO.

C. Fiscal and Trade Policies, and Relative Prices

Fiscal and Trade Policies

1.10 With the exception of the sugar and wheat flour markets, Government intervention in agriculture has traditionally been moderate--yet with a distinct anti-export bias. Market interventions have been closely linked to Haiti's fiscal policy and tax structure, based primarily on excise taxes and on taxes on international trade (Table A.7 Statistical Appendix).^{5/} Accordingly, prior to the 1986 economic reforms, the main sources of interventions in agriculture were: (i) export taxes affecting coffee, cocoa, sisal, cotton and essential oils; (ii) import duties; and (iii) excise taxes on sugar and wheat flour. In addition, in 1985, the Government owned two of the four mills in the country, was involved in price fixing and enforcing the price sugar mills paid for sugarcane, had the monopoly on sugar imports (and

4/ "Nutrition in Haiti: Evidence from the Haiti Household Expenditure Consumption Survey", Iowa State University, draft, June 1989.

5/ The agricultural sector had a disproportionate role of government interventions because the very nature of its commodities makes them easy targets for taxation.

on its sales), and regulated sugar's wholesale and consumer prices. Wheat production was monopolized by the Minoterie, which also had the monopoly on wheat and flour imports. The price of flour was established by the Ministry of Finance with the purpose of ensuring that the Minoterie would become a healthy financial enterprise.

The 1986 Reforms

1.11 The policy reforms undertaken in 1986 sought the realignment of domestic prices with international prices through the liberalization of the international trade regime and of the local trade monopolies. The reforms supported these objectives in the agricultural sector by eliminating direct Government price controls, and by liberalizing imports of agricultural inputs to the extent that export taxes were eliminated. Nevertheless, in contrast to an overall tariff reform that decreased the country's average tariff level from roughly 40% to 20%, agriculture's major commodities were granted special protection. Imports of maize, sorghum, rice, and bean were subjected to 50% tariffs and import licensing requirements. Licenses and 40% tariffs were also introduced for imported meat parts (pork and chicken) and sugar, while flour imports remained under monopolistic conditions and subjected to a 50% tariff. Consequently, domestic prices of the protected products continued to exceed border prices. The 1986 reforms did not eliminate the prevailing distortions in the sugar and wheat flour industries. Distortions in the sugar market remain, while those in the wheat flour market were eliminated only in September 1990.

The Evolution of Prices

1.12 While domestic production stagnated during 1970-89, the relative price of food increased during 1970-86 despite increased food imports. As the cost to consumers rose, the Government froze the retail price of sugar and flour between 1981 and 1989^{6/}. In 1986 the Government opened the provincial ports, leading to a surge in contraband. Contraband's effect on reducing domestic food prices was magnified by the 1986 drop in the world price of rice (Table 2.3).

6/ These policies also helped contain the rise in the prices of substitutes such as maize and rice.

Table 1.7: INDEX OF SELECTED DOMESTIC PRICES, 1970-89 ^{a/}
(1980=100)

	<u>Food CPI</u> Non-food CPI	<u>Rice</u> CPI	<u>Flour</u> CPI	<u>Sugar</u> CPI	<u>Coffee</u> Maize
1971	75.9	76.8	172.5	85.6	64.4
1976	98.3	86.2	131.0	92.6	82.9
1980	100.0	100.0	100.0	100.0	100.0
1986	96.9	90.4	86.5	84.7	104.9
1989	78.9	81.4	90.8	90.3	52.6

^{a/} The prices of rice, flour and refined sugar correspond to the average annual consumer price. The coffee price corresponds to the annual average producer price.

Source: Mission estimates based in IHSI and IMF data.

1.13 The favorable change in the relative price of coffee which reflected the elimination of the export tax was offset by declining coffee prices in the world market from roughly US\$1.70/lb in 1986 to US\$0.90/lb in 1989.

D. Conclusions

1.14 During 1970-89, agriculture grew at roughly 0.4% per annum, approximately 1.5 percentage points below the growth rate of the economy. While increasing coffee and rice production contributed to agricultural growth in the 1970s, output of most crops in the 1980s has stagnated or decreased. Between 1985 and 1989, agriculture's average annual growth rate was a dismal -0.5%. The decline in agricultural value added has taken place even though land and labor resources devoted to agriculture have been increasing. Land and labor productivity losses are mainly the result of the deterioration in the quality of the country's capital stock (i.e., soil properties, irrigation systems and roads) that has resulted from a political and economic environment in which investment has not taken place. Yields, with the exception of rice, show a negative trend and are becoming increasingly lower than those recorded in other countries of Latin America and the Caribbean.

1.15 Despite protectionist policies, agricultural imports have soared as a result of declining domestic food production. The sector--traditionally the country's most important source of foreign exchange--is currently a net importer of agricultural commodities. In 1988, agricultural imports (both legal and illegal) exceeded exports by roughly US\$65 million. The sector's performance has strong implications on welfare. With an average annual population growth rate of 1.4%, per capita food availability has been decreasing even though food imports (including contraband) have been increasing. In 1987, almost 50% of households consumed less than 75% of the recommended daily calorie intake, and nearly 36% consumed less than 75% of recommended protein levels.

II. AGRICULTURAL TRADE AND PRICING POLICIES

A. The International Trade Regime

2.1 While current State intervention in Haiti's agricultural markets is not as prominent as in most other developing countries, its impact on the allocation of resources should not be overlooked since future economic growth will be contingent to a sound allocation of resources. The bulk of Government interventions is carried out through the trade regime by way of import duties/licenses and an implicit export tax levied by the foreign exchange surrendering requirement. While in other countries the degree of intervention can be ascertained from an analysis of the policy measures, in Haiti the actual level of Government intervention depends on the interplay of three factors: (i) the Government's legal import-export regime; (ii) the Government's application of the legal regime; and (iii) contraband.

The Legal Import and Export Regime

2.2 The current legal regime resulted from the 1986 trade liberalization program where all quantitative import restrictions were lifted with the exception of seven agricultural products and specific tariffs were replaced by ad-valorem ones. The new tariff structure is comprised of tariff rates mostly in the 0-40% range. Inputs such as fertilizer and seeds are imported tax-free. Importers finance their imports with dollars purchased in the parallel market. Imports are also subject to a 3% consular fee tax, a 1% tax for services rendered by an independent import-value-appraisal firm, a 7 Gourdes specific tax per import application, and a 10% consumption tax (TCA). As taxes are estimated on the valuation of imports at the official exchange rate, a 30% surcharge is applied to the US dollar value of imports in order to compensate for the Gourde's depreciation in the parallel market.^{2/} Specific export taxes were abolished by the 1986 reforms.

Application of the Legal Trade Regime

2.3 Application of the import regime is the responsibility of three separate Government agencies: (i) the Ministry of Commerce, which has the

2/ As a result of these various taxes and the surcharge, an imported good with a nominal 20% tariff pays approximately a 30% tax. For US\$100 CIF import, total taxes with a 20% tariff would be:

20% tariff on G 650 (US\$100 x official exchange rate x 1.30):	G 130.0
1% fee on G 650:	G 6.5
3% consular fee on G 435 (US\$85 FOB value of import x official exchange rate):	G 13.0
Fixed tax per statement:	G 7.0
10% TCA on G 780 (G 650 + G 130):	G <u>78.0</u>

Total taxes: G 234.5

Overall taxes on US\$100 CIF represent (G 234.5/G 750) 31.2% of CIF value. As the value of the specific tax on import applications gets watered down as the import value increases, total taxes per US\$100 imports are somewhat lower.

power to grant licenses and some tax exemptions; (ii) the Ministry of Economics and Finance, entitled to grant tariff and TCA exemptions for imports; and (iii) the Customs Service, which is supposed to control contraband, ensure that licensing requirements are met, and collect import duties. Coordination among these agencies has been non-existent; the overall operation of the import regime has been non-transparent. Tax exemptions and import licenses have become rent transfer instruments, and were used as such by the Government agencies. The relative price structure has been affected by these discretionary instruments and by contraband which have undermined the price signals which the tariff structure should have provided.

Contraband

2.4 Contraband surged at a massive scale following the 1986 opening-up of provincial ports, previously closed for political reasons, and the weakening of Haiti's administrative structure that followed the 1986 change in Government. It was estimated at the time of this review that contraband encompassed as much as 50% of total trade. Contraband is closely related to the enforcement of the import regime. It appears that a large part of contraband takes place within the legal system by way of underinvoicing.^{8/}

B. Agriculture's Trade Regime and Pricing Policies

Import Substituting Sector

2.5 The agricultural sector was largely insulated from the 1986 trade liberalization process. In contrast to an overall tariff reform that decreased the country's average tariff level from roughly 40% to 20%, agriculture's major commodities were granted special protection. Imports of maize, sorghum, rice, and beans were subjected to 50% tariffs and import licensing requirements. Licenses and 40% tariffs were also introduced for importing meat parts (pork and chicken) and sugar, while flour imports remained under monopolistic conditions and subjected to a 50% tariff.

2.6 Import licenses are granted by the Ministry of Commerce, supposedly following consultation with the Ministry of Agriculture (MARNDR). The relevance of import licenses as a protection instrument--given the existing tariffs--is highly suspect given that tariff rates for licensed-protected goods are sufficiently high to make licensed imports uncompetitive.^{9/} Accordingly, licenses have an economic value as long as they are accompanied by some form of tax evasion, be it underinvoicing or tax exemptions granted by the Ministry of Economics and Finance. In fact, import licenses are granted on a small scale, and there is a very small demand for them, the exception being sugar, where import licenses carry automatic tax exemptions. Given

8/ Underinvoicing in rice licensed imports can be assessed when comparing the "declared" licensed rice import price (US\$224/ton, Table 2.1) with the market price (US \$388/ton, Table 2.3).

9/ The estimated nominal protection coefficients for licensed agricultural imports vary between 30%-50%. Thus, licensed imports paying the full tariff (50%) and other taxes would be priced out of the market.

these considerations, import licenses serve basically as a rent redistribution instrument to those, who having obtained them, can also circumvent taxation.

Table 2.1: IMPORT LICENSES GRANTED, JANUARY-SEPTEMBER 1990 a/

	Rice	Sugar (raw)	Sugar (refined)
<u>Quantity</u> (ton)	1,706	31,002	24,399
<u>Value</u> (US\$ '000)	383.2	12,201	10,356
<u>Unit Price</u> (US\$/ton)	224.6	393.4	431.8

a/ Import licenses have not been granted for sorghum or meat imports, licenses for maize are negligible.

Source: Ministry of Commerce and Industry.

2.7 Agricultural products are contraband's most important commodities, a direct consequence of being relatively highly protected. Table 2.2 below provides a measurement of contraband activity in agricultural commodities. In 1989 United States' agricultural exports to Haiti were roughly 60% above Haiti's total official agricultural imports. Assuming the United State's share of Haiti's agricultural imports today were the same as in 1985 (the last pre-generalized contraband year), today's "true" annual agricultural imports would amount to US\$126 million. This estimate, which does not include contraband originating from the Dominican Republic, implies that as much as US\$60 million (50% of imports) is likely to be contraband.

**Table 2.2: HAITI'S AGRICULTURAL IMPORTS, 1985-89
(in US\$ million)**

	1985	1986	1987	1988	1989
BRH <u>a/</u>	85.9	69.3	72.1	69.8	65.0
USDA <u>b/</u>	72.0	74.5	99.4	100.6	105.6

a/ Total agricultural imports. Data corresponds to Fiscal Year.

b/ United States agricultural exports to Haiti.

Sources: Banque de la Republique d' Haiti and USDA.

2.8 Until September 1990 contraband was largely comprised of rice, wheat flour (both imported from the United States), and sugar. The value of United States' exports of wheat flour and rice to Haiti reached over US\$40 million in 1989 (Table 2.3 below), mostly imported as contraband. According to Haitian customs data, during the first eight months of FY 1989, "official" flour imports amounted to only US\$426,000, while United State's flour exports

to Haiti amounted to over US\$9 million. By the same token, during the first nine months of 1990, licenses were granted to import 1,706 ton of rice (Table 2.1) while United State's rice exports to Haiti surpassed 65,000 ton during the same period. According to sugar industry sources, total annual sugar imports (contraband and legal) are estimated at roughly US\$25 million.

Table 2.3: UNITED STATES' EXPORTS OF RICE AND WHEAT FLOUR TO HAITI, 1986-90

	1986	1987	1988	1989	1990 <u>a/</u>
Rice					
Quantity ('000 ton)	24.6	100.1	54.5	79.4	65.2
Value (US\$ million)	9.5	27.8	23.1	31.2	25.3
Unit Price (US\$/ton)	385	277	423	393	388
Flour					
Quantity ('000 ton)	--	14.6	35.5	33.4	33.2
Value (US\$ million)	--	3.8	10.6	9.3	9.8
Unit Price (US\$/100 lb)	--	11.8	13.5	12.6	13.3

a/ Corresponds to the period January-August 1990.

Source: USDA.

2.9 Although contraband benefits the economy by narrowing domestic and international prices,^{10/} its role in correcting relative price distortions should not be overstated since:

- (a) its incidence is not uniform across commodities. Bulk grain or commodities that require container transport are harder or more expensive to smuggle into the country since they must enter through the Port-au-Prince ports;^{11/}
- (b) transaction costs exist when the law is bypassed. These costs have the same protective effect of a tariff but different implications in terms of revenue; and
- (c) the organized big-scale contraband behavior is non-competitive because of entry restrictions. Accordingly, even in the absence of

^{10/} If the contraband industry were competitive and there were no transaction costs to contraband, domestic prices would equal border prices.

^{11/} Port-au-Prince's port is the only port which can handle containers. The Minoterie's port is the only one which can load/unload bulk grain.

transaction costs, domestic prices would still be above border prices as the contraband cartel would exercise its market power.^{12/}

Effect of Trade and Pricing Policies on Import Substitute Prices

2.10 Rice. Although contraband rice imports represent approximately 40% of total domestic consumption and rice's price is not distorted with respect to border prices by domestic marketing regulations or taxes (other than the widely evaded TCA), in 1990, rice's estimated nominal protection coefficient was still relatively high at roughly 1.34. Contraband has nevertheless played an important role in reducing domestic consumer and producer prices since 1985 (the last pre-contraband year) when, according to mission estimates, the estimated nominal protection coefficient was 1.80.

2.11 Maize and Sorghum. Approximately 30% of marketed maize and sorghum is destined for industrial use, i.e., animal feed. Domestic prices tend to vary because of supply variability, weather conditions and lack of storage facilities.^{13/} Consequently, domestic prices can, at times, be competitive with international prices, yet they can also differ significantly. Contraband does not occur in these commodities because: (i) a stable demand for contraband imports does not appear to exist; and (ii) most international trade in these products is non-packaged bulk which cannot be unloaded in the loosely supervised provincial ports. Nominal protection coefficient estimates for maize ranged from 1.06 (October 1989), to 1.50 (June 1990), and 2.31 (September 1990). Sorghum's coefficient estimates are slightly lower, 1.45 (June 1990).

^{12/} The cartel faces an excess demand for imports and optimizes its profits by restricting imports to the point where the marginal revenue of contraband sales equals the marginal cost of imports.

^{13/} The effect of production variability on the market supply is probably magnified by the fact that farmer's elasticity of demand for self-consumption is probably very low.

Table 2.4: NOMINAL PROTECTION COEFFICIENT OF SELECTED PRODUCTS, 1982 and 1990
(ratio of domestic to border prices) a/

	1982	1990 <u>b/</u>
Coffee	0.74	--
Cocoa	0.71	--
Maize	1.25	1.50
Rice	1.20	1.34
Sorghum	1.35	1.45
Wheat Flour	1.25	1.49
Sugar (raw)	2.40	1.49

a/ Nominal protection coefficients are not strictly comparable over time because of different methodologies utilized in the estimates.

b/ Domestic border prices were calculated using the parallel exchange rate of G 7.5/US\$1.

Source: World Bank, Haiti: Agricultural Sector Study, 1982 estimates; and mission estimates.

2.12 Sugar. The sugar market is probably the most distorted market in Haiti. Over the past three years, the three operating mills have produced an average of 30,000 ton per annum of raw sugar, equivalent to about 30% of total consumption. A quota on imports exists, and the Government negotiates with the mills the ex-factory price of G 190/100 lb (roughly US\$0.25/lb as of September, 1990) and the import quota. Although the estimated nominal protection coefficient for domestic sugar is at least 1.49,^{14/} the industry allegedly cannot break even on its domestic production. In response, the Government had transferred to the mills (from the Central Bank) the exclusive monopoly on raw sugar imports and a sizable portion (52% during January-September 1990) of the refined sugar import permits. These import licenses carry with them tax exemptions^{15/}, so effectively all of the import-monopoly rents are captured by the importers. These rents amount to US\$7-11 million (depending on international prices) per annum, equivalent to approximately 12% of current import duty revenues and 4% of total fiscal revenues.

2.13 The mill's domestic market share is approximately 75% (during the first nine months of 1990, 80% of the 55,000 ton of sugar import licenses were granted to the mills). Given the mills' market power, the sugar industry operates as a cartel where contraband imports share 25% of the market and are priced in accordance with the mills' policy. This pricing policy is possible

14/ The estimate was based on a world sugar price of US\$0.15/lb, the highest price in the last 5 years. At the September 1990 price of US\$0.11/lb, the nominal protection coefficient was 1.95.

15/ Raw sugar imports are exempt from import duties and the TCA, refined sugar is exempt from import duties.

since the mills can effectively deter contraband-sugar price competition because of their large amount (44,000 ton) of tax-free imported sugar.

2.14 Haiti also has a small quota--roughly 7,500 ton per annum-- in the U.S. market. The present U.S. preferred price, roughly US\$0.21/lb, is nevertheless lower than Haiti's domestic production cost. Sugar exports to the U.S. market have been a subsidy to the mills, which has been paid by the Haitian Government who has purchased the sugar from the mills at US\$0.25/lb and sold it at US\$0.21/lb to the United States. This subsidy amounts to roughly US\$700,000.

2.15 Wheat Flour. Wheat flour is produced by the State-owned Minoterie, which produces roughly 82,000 ton per year, approximately 70% of domestic consumption. The domestic ex-factory price set by the Ministry of Finance is US\$28.25 (G 141.25) per 100 lb bag.^{16/} Consumer prices vary between G 155 and G 168/100 lb. Contraband flour^{17/} sells slightly below at G 150 per 100 lb. The nominal protection coefficient was estimated at 1.49.^{18/} The Minoterie did not break even with these prices. The September 1990 import liberalization will exacerbate the mill's financial difficulties as export prices could be expected to fall to G 102/100 lb.

Export Sector

2.16 From the standpoint of specific export-oriented policies, the export sector faces only the issue of the implicit 13% surrendering requirement tax. Nevertheless, agriculture's exports (US\$46 million in 1989) are additionally being taxed because of protective subsidies granted to import-competing crops.

2.17 Concerns have also been raised with respect to Haiti's inordinately high port costs and their impact on hindering local export competitiveness.^{19/} According to local maritime industry sources, the handling costs of a container (US\$400 per 40 ft container-outbound) in Port-au-Prince exceeds by approximately three times handling costs in Costa

^{16/} The ex-factory price of US\$28.25 is determined by the sum of: US\$25.60 (the Minoterie's net price), US\$2.56 (TCA tax), US\$0.04 (excise tax), US\$0.05 (APN tax). These prices are quoted in "Haitian dollars", i.e., the US dollar converted at the official exchange rate.

^{17/} Flour contraband is expected to diminish as a result of the liberalization. In the past, the pricing of contraband flour closely resembled that of sugar.

^{18/} Based on large wholesale purchases at the FOB price of US\$9.20/100 lb. Small wholesale purchases command a price up to US\$13/100 lb.

^{19/} The agricultural sector bears a significant part of the high sea-transport costs given that the nature of its freight makes air transportation an unlikely alternative.

Rica or the Dominican Republic.^{20/} This would nevertheless imply that port-handling costs represent a very small proportion of the commodities' FOB price (approximately 0.5% for coffee, and 0.7% for mangoes). Consequently, the high port costs' implicit export tax is not high enough to significantly affect the competitiveness of domestic exports.

Non-Traditional Exports

2.18 Non traditional exports--comprised of tropical and ethnic^{21/} fruits and vegetables--have not escaped the stagnation of the sector. In spite of mango's alleged comparative advantage^{22/}, its exports have remained basically constant during the past five years, and there has not been any development of other export crops. The lack of a more dynamic export-oriented sector can be traced to agriculture's protectionist policies, the implicit export tax and to an economic and political climate that is not well suited for investment. There has been no evidence that new capital is moving into the development of a non-traditional export sector.

Table 2.5: AGRICULTURAL EXPORTS, 1985-89
(in US\$ million)

	1985	1987	1988	1989
<u>Total Exports</u> <u>a/</u>	66.6	51.7	46.6	46.2
Coffee <u>a/</u>	49.9	36.5	32.5	36.4
Mangoes <u>b/</u>	3.9	4.5	4.0	5.2
Fruits and vegetables excluding mangoes <u>b/</u>	1.0	0.6	0.6	0.9

a/ Corresponds to fiscal year.

b/ Corresponds to calendar year exports to the United States market.

Sources: BRH, USDA.

^{20/} See A. Yeats, "Do Caribbean Exporters Pay Higher Costs?", World Bank Discussion Paper #62, 1989. Port handling charges for non-containerized freight in Haiti are 3.1 times higher than Costa Rica's and as much as ten times higher than the Caribbean's less expensive ports.

^{21/} The main ethnic products are: Thai and Chinese eggplants, Chinese okra, long beans, fuzzy squash and bitter melon.

^{22/} Mangoes grow during ten months of the year. By contrast, Mexico, the main exporter to the United States, only grows them during four months.

The Coffee Sector

2.19 Coffee is Haiti's most important export crop, representing roughly 70% to 80% of the country's agricultural exports. Coffee is also important for equity (it is mostly grown in the country's very poor mountainous areas) and environmental considerations. The 1986 reforms envisaged a boost to the coffee sector through the elimination of the export tax.

2.20 A key concern has been whether the elimination of the tax resulted in higher producer prices or whether the intermediaries and/or the coffee exporters have accrued all the benefits. The presumption that producers would not benefit from the elimination of the tax stemmed from the perception that coffee exporters operate as oligopsonists and as such they can capture all rents accruing to the elimination of the export tax. Thus, the elimination of the tax would only result in a rent transfer from the Central Government to the exporters, without any positive consequence for coffee producers. That could only happen if the supply of coffee for exports was perfectly inelastic, with growers willing to sell the same amount regardless of price. There is ample evidence that this is not the case as: (i) growers can sell to the domestic market; (ii) there is the potential of contraband to the Dominican Republic; and (iii) growers can--and will--switch to produce other crops.

Table 2.6: THE COFFEE SECTOR, 1980-89

	FY80-84 <u>a/</u>	FY87	FY88	FY89
Production	603	505	630	600
Exports	319	200	294	225
('000 of 60 kg bags)				
Export Price	164.8	164.6	142.6	153.9
(US\$/60 kg bag)				
Distribution of export price (%)				
-- Producer price	51.0	50.1	61.6	58.9
-- Export tax	25.6	9.4	--	--
-- Intermediaries	23.4	40.5	38.4	41.1
Export tax rate (%)	26.0	10.0	--	--

a/ Corresponds to the average during the period.

Source: Mission estimates based on BRH and IMF data.

2.21 Since coffee-grower's production is responsive to prices, they will receive at least part of the benefits of the tax reduction in the form of increased producer prices regardless of whether a coffee-buyers cartel exists.

Moreover, their accrued benefits (price increase) will equal their previous losses, i.e., the proportion of the tax they were previously paying (which will depend on supply and demand elasticities). In fact, the elimination of the export tax has brought an increase in the producer's share of the FOB export price.

C. Conclusions

2.22 Despite the comprehensive economic reform that was introduced in 1986, the sector's allocation of resources continues to be distorted in favor of import substituting crops. Exportables are implicitly taxed through:

- (a) protection granted to import-substituting crops. In spite of the massive contraband of rice, flour and sugar--estimated at US\$60 million per annum, roughly 50% of total agricultural imports--tariff protection and import licenses have generated production subsidies to domestic producers of rice, maize, sorghum, sugar and flour. In 1990, the nominal protection coefficient for these products was roughly: 1.3 for rice, 1.5 for maize, 1.5 for sorghum, 1.5 for flour, and a lower bound of 1.5 for sugar. Although contraband has played a role in correcting these relative price distortions, its impact has been limited because its incidence has not been uniform across products. There are transaction costs involved in bypassing the law, and organized large-scale contraband industry behavior has been non-competitive because of entry restrictions; and
- (b) the implicit export tax levied by the requirement that 40% of an exporter's foreign exchange proceeds be exchanged into Gourdes at the official exchange rate, instead of at the market determined rate. During 1990, this surrendering requirement was roughly equivalent to a 13% tax on exports.

2.23 These policies have exacerbated the difficulties faced by the exportable sector. Coffee producers face severe problems because the relative price of coffee with respect to competing crops (i.e., maize and sorghum) has not improved--in spite of the elimination of the export tax--because of the fall in the world price of coffee. These difficulties have been compounded by coffee tree's rust disease (para. 6.20). Despite its promising prospects, mango exports have remained constant during the past five years because new investments needed to increase output have not been undertaken. Other export crops have not been developed.

2.24 Sugar has been the most distorted commodity in the economy. Despite a high nominal protection, the industry allegedly cannot break even. To help the mills, the Government transferred them the exclusive monopoly on raw sugar imports and over 50% of the refined sugar import permits. These licenses included tax exemptions--all the import-monopoly rents were therefore captured by the importers. With ex-mill prices exceeding international prices by US\$0.10-0.14/lb, these rents have amounted to US\$7-11 million per year, equivalent to roughly 12% of import duty revenues and 4% of total fiscal revenues.

2.25 Protectionist policies have been detrimental to: (i) consumers (especially urban consumers) who must pay higher prices; (ii) the Government and all the beneficiaries of public goods--as the economic rents generated by import constraints have been appropriated by the contraband industry and the sugar mills; (iii) the agricultural export sector; (iv) the environment--since the protected import-substituting commodities are annual crops whose production in the hillsides hastens the erosion process; and (v) to the overall economy as resources have not been destined to their most efficient use.

2.26 Commercial policy should be neutral for the economy to achieve an efficient allocation resources. Moreover, given Haiti's lack of institutions, the trade regime should contain as little administrative discretionality as possible and the level of protection should be sufficiently low so as to make contraband unprofitable. Thus, it is recommended that: (i) all quantitative import restrictions be eliminated, except for those related to the reasonable application of health regulations; (ii) agricultural commodities' tariffs be set at a 5% uniform level, and all imports be subject to the consumption (TCA) tax. This uniform tariff should be consistent with that applied to the rest of the economy; (iii) protection to the sugar industry should be decreased; and (iv) the surrendering requirement be eliminated.

2.27 The newly elected Government of Haiti has designed a strategy setting priorities for Government involvement in agriculture. The strategy would be implemented within a policy framework consistent with that proposed in this report. The plan foresees an important role of the State in the areas of: (i) land tenure; (ii) agricultural research and extension; (iii) rural infrastructure (e.g., irrigation); and (iv) soil management. The strategy also calls for Government participation--albeit not in a leading role--in the development of rural financial markets, provision of information to assist the marketing of agricultural produces, the development of livestock, fisheries and aquaculture, and facilitating farmers' access to tools and machinery.

III. AGRICULTURAL CREDIT

3.1 One of the salient characteristics of Haiti's agricultural sector is the exceedingly small proportion of farmers with access to the formal credit market. In the past, specialized Government banks operated with subsidized direct credit lines for agriculture. Currently the sole remaining such bank does not have access to funds and is practically inactive. Commercial banks have some agroindustrial clients who receive loans and in turn extend credit to their suppliers (farmers). There are also a small number of credit unions (cooperative savings and loans institutions) operating in rural areas. In general, however, the majority of farmers only have access to the informal credit market. Since interest rates in this market are generally above 100% per annum (at least 80% in real terms) most of these loans are destined to finance consumption as there are few investments that would generate such rates of return.

A. Government Credit

3.2 Haiti has had a succession of specialized Government institutions which have channeled directed credit to farmers at subsidized interest rates. The last of these institutions were the Banque Nationale de Developpement Agricole et Industriel (BNDAL) and the Bureau de Credit Agricole (BCA, a decentralized agency of the MARNDR). BNDAL was formally closed down in 1989 and is in the process of liquidation. BCA remains open but does not have access to resources other than rapidly dwindling loan recoveries.

BCA

3.3 The BCA was established in 1959 with the mandate to channel credit to small farmers with up to 5 carreaux (1 carreau = 1.29 ha) of land. It is headquartered in Port-au-Prince and has five regional offices with a total of 85 employees. It lends primarily to farmer groups as well as some individual farmers. The nominal annual interest rates charged are 12% for groups and 15% for individual farmers (real interest rates in both cases are negative) and no collateral is required.^{23/} Loan terms range from six months to one year and loan proceeds are supposedly used to finance working capital. In 1989, the average size of a loan for an individual farmer was G 1,400, about US\$187.

3.4 Outstanding loans as of September 1990 amounted to about G 31 million (US\$4.1 million). New lending peaked in FY 1984/85 at G 20.4 million, but has since fallen steadily. In FY 1988/89 it amounted to G 6 million in FY 1988/89 because of a drop in loan recoveries and BCA's lack of access to new sources of funds. In the past, BCA's main source of funds was the Haitian Government, at times with financing from bilateral and multilateral sources. A small amount of funds have been mobilized through saving's deposits. Given these trends, it appears that BCA will cease operating de facto, even if a formal closure does not take place.

B. Commercial Banks

3.5 The core of Haiti's formal banking sector consists of the Central Bank (Banque de la Republique d'Haiti, BRH) and nine commercial banks, two of which are Government-owned and four are foreign banks' branches. In addition there are two mortgage banks and several development and special purpose financial institutions, including the Haitian Financial Corporation for Development (SOFIHDES). Most commercial bank credit extended is short term, although there are considerable rollovers. The main recipients are the manufacturing, trade, services and construction sectors. SOFIHDES is limited by charter to provide medium-term credit. A second-tier rediscounting facility exists, the Fonds de Developpement Industriel, which is attached to the BRH. Commercial banks and SOFIHDES can have access to this facility for medium and long-term lending to the industrial sector.

^{23/} Commercial banks' "official" annual lending rates vary between 18-22% (the implicit real interest rate is close to 0%). In practice, the lending rates are higher.

3.6 Direct bank lending to agriculture is practically non-existent. According to Central Bank statistics, as of June 30, 1988, only 0.8% of total outstanding credit from banking institutions had been channelled to agriculture, mostly from BNDAI. With the closure of BNDAI, agricultural credit outstanding is much lower.

3.7 Banking institutions, however, engage in indirect lending to agriculture since some of the banks' clients are agroindustrial firms which extend credit to farmers. Although there is no available data on amounts, such credit spans a variety of agroindustrial activities and associated primary production. Examples of loans are: manufacturing of tomato paste (to tomato producers); essential oils (to producers of primary ingredients, including vetiver roots); distilleries (to sugarcane producers); broilers (to maize producers); coffee processing/exporting (to producers of green coffee).

3.8 The extremely limited role of commercial banks in Haiti's agricultural sector is not surprising given the country's farm size distribution. World experience shows that commercial banks seldom lend to small farmers because: (i) the transaction costs of lending to small farmers are quite high; (ii) even if farmers were willing to pay very high interest rates, banks require collateral which farmers are unable to provide; and (iii) interest rate cap policies promote credit rationing that discriminate against small farmers since riskier or more costly to service borrowers cannot compensate for their costs by paying higher interest rates.

3.9 In Haiti, commercial bank lending to small farmers is precluded because: (i) the transaction costs of dealing with small farmers are quite high; (ii) land cannot be used as collateral since few farmers have legal land titles, and in any case, the 1963 Rural Code (Article 27) prohibits the establishment of mortgages on farmland; and (iii) a 22% cap on lending rates exists.^{24/}

C. Credit Unions^{25/}

3.10 There is a dispersed credit union movement serving both urban and rural areas. It comprises about 100 entities ("caisse populaires") with a combined membership of more than 60,000. These unions are organized as member-owned financial cooperatives and are regulated by cooperative legislation, first drafted in 1939. Their development has been promoted by the private sector, with limited Government involvement. The latter has been channeled through the National Cooperative Council (CNC), an institution with extremely limited resources. The CNC also acts as the regulatory agency for credit unions. However, credit unions' operations are basically unregulated.

^{24/} Large farmers apparently do not have access to credit either because of interest rate caps and the impossibility of using land as collateral.

^{25/} See the 1989 USAID report, "Haiti Financial Sector Assessment-Part II: Credit Union Development".

3.11 Credit unions are rudimentary financial institutions serving mostly lower to medium income urban based groups. Recently, some of the credit unions located in small towns have been enrolling farmers as members. However, less than 1% of farmers are credit union members.

3.12 Office facilities are precarious, often lacking safes, counters and even tellers. Their financial resources consist of shares purchased by the members and their savings deposits, all deposited in commercial banks. The financial services provided by credit unions basically comprise provision of: (i) safekeeping for savings; (ii) investment opportunity rewarded with annual dividends; and (iii) provision of small personal loans used primarily for consumption.

Constraints to Credit Union Development

3.13 Credit unions face a number of important constraints:

- (a) human resources. Over 1,000 credit union volunteers are involved as members of boards of directors and committees. However, they are not provided with organized training programs or educational materials on credit union services;
- (b) inadequate accounting, operating procedures and controls. Credit unions lack proper standardized accounting systems and operating procedures, and have inadequate internal controls;
- (c) constraints on resource mobilization. To augment their resource mobilization, credit unions need to eliminate the existing legal constraint on interest rates and pay competitive interest rates on savings deposits;
- (d) constraints to making investment loans. Most credit unions lack appropriate credit management procedures and operational guidelines to evaluate investment loan applications. Credit unions also need to achieve a better balance between personal consumer loans and investment loans;
- (e) absence of institutional support. The credit union movement is hampered by the absence of an overall coordinating body. Resources and experiences remain isolated, and individual credit unions have no access to central financial services; and
- (f) inadequate legal and regulatory framework. Only a third of all credit unions are legally registered under the current governing legislation. The procedures for registration are long and complicated. Registered credit unions do not appear to benefit from protection under the law, especially in the collection of unpaid loans.

D. Informal Credit

3.14 The main modalities of informal credit in rural areas are:

- (a) advance sale of crops. The farmer receives an advance payment from the prospective buyer against a certain share of his expected output to be delivered after harvesting;
- (b) input credit. Peasants who do not own land can enter into a sharecropping arrangement where the landowner provides credit to the sharecropper. Following the harvest, the value of the loan and interest are deducted from the value of the crop, and the remainder split (usually 50/50);
- (c) retailer credit. Many retailers sell merchandise (mostly foodstuffs) on credit to their regular clients;
- (d) pawnshops. These are private moneylenders who lend cash against taking possession of a saleable object. Upon maturity of the loan, if the loan is not repaid, the lender will sell the object and retain the amount of the loan plus interest;
- (e) loans from friends and family. It is very common in rural Haiti to borrow from friends and family members to cover consumption emergencies. These loans usually carry no interest, but there is an expectation of reciprocity;
- (f) loans from wholesale buyers of crops. Coffee processors/exporters provide credit to wholesale buyers, who in turn provide credit to coffee growers, who agree to sell them their output; and
- (g) ordinary moneylenders. These are private individuals who lend cash, usually without collateral. Some of them operate with Government licenses. For others, this activity is carried out in addition to their main business (e.g., traders). These loans are typically for small amounts and short term.

General Considerations Regarding Informal Credit

3.15 Real interest rates on informal loans are quite high, generally over 80% per year. However, high interest rates do not necessarily imply high rates of return on capital. Lenders are probably earning a normal return on their capital plus the opportunity cost of their own labor. While repaid loans are very profitable at the high interest rates, many loans do not get repaid and the lenders have to absorb the losses. Moreover, it is in the nature of the business that moneylenders have to remain very liquid, which requires them to keep a large part of their capital in the form of cash or non-interest bearing bank deposits. Given these considerations, policy interventions would not lead to lower interest rates.

3.16 While most informal sector lending finances consumption, funds are sometimes borrowed to finance investments when the opportunity cost of not doing so is exceedingly high. This takes place when farmers need to hire labor or purchase key inputs, such as seeds. Farmers do not borrow in the

informal markets to finance investments in the adoption of a new, intensified technological mode, or in a change in cropping pattern (e.g., planting tree crops). Returns on such investments will generally not justify paying informal sector interest rates. Therefore, lack of access to the formal credit markets poses a major constraint to the modernization of agriculture.

E. Conclusions

3.17 Farmers have been limited in their activities by lack of access to the formal credit market. Agricultural growth and the improvement of the rural population's welfare require that the Government and the international community take steps towards fostering the development of financial institutions serving the rural areas.

3.18 In recent years suggestions calling for a new "Government agricultural development bank" have been made. However, Haiti's experience would indicate that this option should not be pursued. Government banks, unlike private commercial banks, have no incentive to discriminate among good and bad credit-risk farmers. Moreover, they have found it impossible to prevent the politicization of decisions and to control administrative costs. As a result, the banks have been subjected to large scale defaults and decapitalization, and have become a fiscal burden and a source of untargeted subsidies devoid of any rationale. The Government should refrain from engaging in direct channeling of credit and other financial services.

3.19 The Government has an important role to play in the development of financial institutions dealing in agriculture by providing prudential regulations and adequate supervision. To facilitate farmers access to institutional credit, the Government would need to: (i) eliminate the 22% legal cap on commercial bank lending rates; (ii) eliminate the prohibition that precludes the use of land as collateral; (iii) eliminate the fixed 12% interest rate on credit union loans; and (iv) develop a suitable regulatory and supervisory framework for credit unions.

3.20 Among formal sector institutions, credit unions are the most likely to operate with small farmers on a significant scale. These institutions face severe management constraints and could benefit from external assistance. The possibility of establishing a private foundation (with external assistance) should be considered. Support should take the form of technical assistance and training, and capital grants for equipment. Establishing a second-tier national level credit union institution to pool funds and risks on a nationwide basis should also be considered. This is necessary to alleviate potential risk diversification and cash-flow problems facing individual rural credit unions.

IV. LAND TENURE

4.1 Given Haiti's economic stagnation, it is not surprising that issues of land tenure and land use lie at the forefront of its development. Land tenure characteristics in a private property system play an important role in the determination of agricultural productivity and growth by affecting the

amount of investment farmers are willing to undertake, farmers access to capital markets, and the rate of adoption of new technologies.

A. Land Tenure Patterns and Characteristics

Land Distribution

4.2 Haiti's land distribution is characterized by small farms (Table 1.1). The origins of this structure of land ownership can be traced to land distributions which followed the country's independence and to inheritance customs that allocate land to each of the deceased's children. A typical small farmer will own more than one (non-contiguous) plot of land, which may be farmed by himself, or under sharecropping or rental agreements. According to the 1971 census, the average number of plots per landholder was 1.8, and the average plot size was roughly 0.75 ha. All evidence appears to indicate that the land fragmentation process has continued.^{26/}

Table 4.1: FARM AND PARCEL SIZE PER DEPARTMENT, 1971

Department	Farms (number)	Plots (number)	Plots/Farm	Average Plot Size (ha)
Nord	106,400	200,400	1.9	0.85
Nord Ouest	30,100	53,450	1.8	1.25
Artibonite	140,000	246,600	1.8	0.55
Ouest	177,060	312,100	1.8	0.65
Sud	<u>163,150</u>	<u>305,700</u>	<u>1.9</u>	<u>0.75</u>
Total	616,710	1,118,230	1.8 <u>a/</u>	0.75 <u>a/</u>

a/ Weighted average.

Source: George Anglade, op. cit.

Public Lands

4.3 The State is Haiti's largest single landowner. Although there is no reliable information regarding the extent of its holdings, all evidence^{27/} points to the fact that the State owns between 5% and 11% of total cultivable land (excluding forestry reserves). In 1989, according to the Direction General des Impôts (DGI, the institution in charge of administering these lands), the State owned roughly 35,000 farms representing approximately 6.3% of total farms and 11% of Haiti's cultivable land (Table 4.2).

26/ In the Artibonite the average parcel size has decreased to 0.5 ha. Recent studies in Foscave and Les Anglais show that the average plot size has been reduced to 0.14 and 0.47 ha, respectively.

27/ See the 1950 and 1971 census, and 1989 data from the DGI.

Table 4.2: STATE-OWNED LAND, 1989

Department	<u>Number of Landholdings</u>		<u>Size in Hectares</u>	
	State	% of Total	State	% of Total
Artibonite	5,578	5.0	13,142	4.8
Center	3,341	n.a.	16,997	n.a.
Great Anse	4,257	4.8	13,776	9.2
North	2,363	3.6	4,728	5.0
North East	4,190	12.6	28,149	49.4
North West	2,391	5.4	4,827	5.7
West	2,717	n.a.	25,570	n.a.
South	2,612	3.9	6,224	6.6
South East	<u>7,507</u>	<u>12.1</u>	<u>24,473</u>	<u>24.3</u>
Total	34,956	6.1 <u>a/</u>	137,886	11.1 <u>a/</u>

a/ Based on the seven Departments for which all information is available; does not include the Center and West Departments.

Source: BREDA and IRAM "Etude des Possibilites D'Augmentation du Loyer des Terres Rurales de L'Etat", 1989.

4.4 The State is not engaged in farming but leases its land to individuals who either farm the land themselves or--as seems to be the most prevalent case--sublease it. Lease contracts do not expire as long as the rent is paid. Moreover, contracts can be passed on as inheritance within the original lessee's family. Because of the contract's length and the fact that lease-rights can be inherited, ownership of a state-land lease contract is somewhat similar to ownership of the land except that the land is non-transferable, preventing its use as collateral for credit.^{28/}

4.5 Current annual lease fees were set in 1964, to represent 6% of the land's value, but revenues are very low. Fee rates have not been adjusted nor, for all purposes, collected. In fact, the State does not have adequate records of how much land it owns and supposedly leases. During 1988-89, the average annual lease fee^{29/} was roughly US\$5.50/ha, and lease revenues accounted for only 0.6% of total fiscal revenues (Table 4.3).^{30/}

28/ As rent payments are well below market values, if lease-contracts were transferable, the contract could be used as collateral. However, this is precluded by the contract's non-transferability.

29/ The ratio between fee collections and State-leased hectares.

30/ In 1966, State land lease fees accounted for roughly 2% of fiscal revenues. Even in the Artibonite, where the highest fees are collected, the annual fee of two barrels of rice per hectare (equivalent to US\$67), represents only 3% of the land's market value.

Table 4.3: STATE LAND LEASE REVENUES, 1967-89

	Average Annual Revenue (In Gourdes million)	Lease Revenues Percentage of Total Fiscal Revenues
1967-75	1.05	1.74
1976-80	1.61	0.93
1981-85	2.34	0.42
1986-89	2.92	0.41

Source: Breda and Iram op. cit., DGI.

Land's Exclusive Rights and Use

4.6 There is no evidence of state or private communal lands in Haiti. Some case studies, however, show that family plots may be used for common grazing during fallow periods.^{31/} The most readily data--the 1970 survey and case studies where the unit of analysis is the parcel--show that roughly 55% to 60% of parcels are owner-operated, with renting and sharecropping agreements accounting for the remaining 40% of land use (Table 4.4).

^{31/} Peter Bloch et al, "Land tenure Issues in Haiti: Review of the Evidence", Land Tenure Center, Research Paper 64, U. of Wisconsin.

Table 4.4: LAND TENURE AND LAND USE
(in percentage)

	<u>Nation-Wide Studies a/</u>			<u>Case Studies b/</u>		
	1950	1970	1980	Foscave	L.Anglais	G.Ravine
Owner	66.6	60.2	72.3	35.0	55.3	56.7
Renting (from State)	2.2	3.8	2.8			
Renting (private)	2.6	10.5	10.5	17.5 _{c/}	19.7 _{c/}	17.1 _{c/}
Sharecropping	3.5	14.4	12.7	47.5	16.7	21.7
Other	25.1	11.1	1.8	--	8.3	4.6
Sample size	--	--	--	40	132	1,098

a/ 1950 estimates based on household census data, 1970 estimates on survey parcel data, and 1980 estimates on survey data per hectare.

b/ The studies on Foscave, Les Anglais and Grand Ravine du Sud are based on data per parcel.

c/ No distinction of type of rent (state or private) is made.

Sources: Zuvekas, Clarence "Land Tenure in Haiti and its Policy Implications: A Survey of the Literature, Social and Economic Studies, vol 28, 1983; and McLain, R. and Stienbarger, D. "Land Tenure and Land Use in Southern Haiti" LTC Research Paper No.95, U. of Wisconsin, 1988.

B. Land Titling and Tenure Security

Land Titling and Land Security

4.7 Haiti's land titling system remains disorganized and the amount of titled land complying with all legal requirements is exceedingly small.^{32/} Nevertheless, individual property rights on land exist. While inherited land is informally divided within a family, the descendants of the titled owners generally have the security of the master deed--which is recognized by the courts as proof of land rights. Land purchasers have some legal document (usually a notarized certificate) to prove their rights. Therefore, compliance within the legal framework has been replaced by an informal system, based on partial compliance with the law.

4.8 This informal system provides some security with respect to land tenure as long as conflicts can be resolved through the existing--albeit

^{32/} According to G. F. Murray, when it comes to inheritance (the most common way to acquire land), "formal inheritance procedures are followed in fewer than one out of hundred cases"; and regarding purchased land, "fewer than one out of ten land transactions occurring in rural Haiti now involve a surveyor". See Murray, G. F. "Land Tenure, Land Insecurity, and Planned Agricultural Development among Haitian Peasants", USAID, 1978.

limited--legal documentation and local customs. This provides a powerful explanation of why almost all land transactions (including sale, rent, and sharecropping) tend to occur mostly inside a closed community circle, at the core of which is the family. Land tenure is secure as long as the community does not challenge its own informal arrangements, or face the challenge from outsiders. It is therefore not surprising that Haiti's legislation prohibits foreigners from owning land (except for residential purposes) and that land cannot be used as collateral for credit.^{33/}

The Supply and Demand of Land Titling

4.9 Since the value of land is directly related to: (i) the ability to prevent others from using it; (ii) the degree of certainty regarding the appropriation of all future returns from it; and (iii) the ability to carry out transactions (sell, rent, etc.), there will be a demand for titling, i.e., individuals are willing to spend resources in titling since that will enhance the property's value.

4.10 Formal titles are supplied by the State and enforced through the judicial and police system. There are diverse degrees of informal titling, enforced partly by the State and partly by individuals or communities. Individuals will determine the type of titling by comparing the marginal costs and benefits of different alternatives:

- (a) Formal titling is expensive. The estimated cost of formal titling varies between 15% and 30% of the property's value. There is no justifiable reason for such high costs other than the exercising of monopoly power by the local notaries and surveyors.^{34/}
- (b) The benefits of formal titling are suspect. As a consequence of past land expropriations carried out by the State or others, farmers perceive that the formal titled land's security is not "risk-free".^{35/}

^{33/} Informal land titling does not prevent the operation of an active land market. Yet, under informal arrangements individuals' behavior will be affected because the market will tend to be limited by the community's boundaries and by uncertainties even if transactions are carried within the community/family.

^{34/} In the Artibonite Valley the titling cost of an hectare is US\$350, roughly 15% of the land's value, while according to the Office National du Cadastre (ONACA), the average cost of surveying and titling does not exceed US\$50 per hectare. Moreover, notary fees are a proportion of the land's value. This is indicative of price discrimination since the marginal cost of granting the document should be independent of the land value.

^{35/} The degree of suspicion on public institutions has been evident when the Government has offered to grant formal titles free of charge--the demand for titles has been extremely low. See Hague, Anne. "Factors in Irrigation Management in Haiti and the Potential of Water Users Associations", USAID 1984.

National Cadastre

4.11 Haitian Governments have not made serious efforts to establish a cadastre for reasons that vary, from the lack of desire to upset the status quo, to an interest in maintaining the power to arbitrarily obtain lands. In theory, the DGI is in charge of filing all documents related to land transactions, yet in practice it is unable of even keeping adequate records of the State's own land. In recent years, several physical cadastres^{36/} have been established, sponsored by externally financed irrigation rehabilitation projects. During the 1970s, cadastres were established in Gonaives (2,700 ha) and Delmas (920 ha), while most recently, a cadastre in the Artibonite Valley has covered 10,000 ha.

4.12 In 1984, ONACA was created as an autonomous unit of the Ministry of the Interior and Defense with the mandate to establish a national cadastre. Currently its operations are limited to partial cadastres in Port-Au-Prince, Gonaives and the Artibonite. Although they appear technically efficient, very little support from the Government is received.

C. Land Tenure and Economic Performance

4.13 From an economic perspective, the main issues in land tenure revolve around the relationship between land ownership characteristics and resource efficiency in production. Ownership characteristics can impact on efficiency and growth by affecting investment, access to credit, and the rate of adoption of new technologies.

Tenure Security and Desired Investment

4.14 The likelihood of property rights being contested increases with the value of land. In that context, landowners with relatively ill-defined property rights could be reluctant to engage in investments, even if the return on such investments would seem to justify them.^{37/} Land-specific investments are particularly sensitive to tenure security. This is consistent with frequently heard stories in Haiti of the disincentive to improve one's land because of "outsiders" laying claim to land once it has been improved.

4.15 It has been hypothesized that to a large degree Haiti's chronic land erosion is the result of land tenure insecurity. Case studies and surveys conducted at Les Anglais by the University of Wisconsin's Land Tenure Center support the hypothesis that tree planting (a land-specific investment) occurs more frequently in purchased as opposed to inherited land (Table 4.5). Purchased land ownership is generally deemed more secure than inherited land

^{36/} Physical cadastres verify the parcel's boundaries and occupancy and not its ownership.

^{37/} See Chalamwong, Y. and Feder G., "The Impact of Landownership Security: Theory and Evidence from Thailand". The World Bank Economic Review, Vol2, No2., 1988.

since the latter's informal allocation among siblings is subject to more disputes and communal decisions.^{38/}

Table 4.5: TREE PLANTING AND TENURE AT LES ANGLAIS

	Plant	Does not Plant	Sample
<u>Owner Operated</u>			
Purchased	72%	28%	N= 81
Pre-inheritance Grant	38%	62%	N= 37
Inherited	45%	55%	N=394
<u>Non-owner Operated</u>			
Rent	9%	91%	N=188
Sharecrop	8%	92%	N=238

Source: McLain, R. and Stienbarger, D. op. cit.

Access to Credit

4.16 Land collateral is generally a prerequisite for accessing the formal credit system for medium and long-term loans. However, the present titling system which largely prevents the use of land as collateral is another barrier for rural formal credit markets. This is a contributing factor both to the lack of land-specific investments and improved production technologies.

Land Tenure Patterns and Productivity

4.17 It is commonly believed that Haiti's pattern of farming several non-contiguous very small plots of land contributes to the sector's stagnation by not allowing for exploitation of economies of scale. This argument is unsubstantiated as world-wide evidence (particularly from Asia) has shown that certain crops such as rice and cereals can be efficiently grown in very small

^{38/} Some case studies show that all recorded land hillside sales/purchases have involved land with low-to-moderate erosion levels. From a sample of 7 owner-operated purchased properties, 5 were deemed as slightly eroded and none worse than moderately eroded. In contrast, among 20 informally inherited properties there was a continuum of erosion levels, ranging from 8 being slightly eroded to 4 being severely eroded. Since a priori there is no reason for the absence of a sales market for a continuum of different land qualities, it can be inferred that land transfers are taking place in the less eroded land because land whose property rights are well-defined enough to be transferable have been subjected to investment.

plots of land of up to 0.5 ha. Current plot sizes in Haiti are generally not smaller than 0.5 ha.

Land Tenure, Tenancy and Production Decisions

4.18 Over 40% of Haiti's parcels are being farmed under tenancy arrangements--be it sharecropping or rent. Both sharecropping and rent contracts can be an efficient alternative to owner-operated farming making ownership patterns immaterial in terms of production efficiency.^{39/} However, crop choices may be affected by the type of tenancy arrangements, particularly for crops whose maturity/life length differs from that of the tenancy contract (e.g., coffee, trees). In those cases a conflict will arise as the tenant's optimal rate of exploitation of the resource will be higher than the owner's (higher also than the socially optimal rate).^{40/} For that reason, tenancy arrangements will not be beneficial for growing such products^{41/}. Case studies indicate that tree planting rarely takes place in non-owner operated farms (Table 4.5).

4.19 In State lands, tenancy agreements are the only alternative to owner-operated farming since the land is non-transferable. Thus, contractual agreements are biased toward growing annual crops. This implies that market constraints favoring the adoption of tenancy will also create further environmental (erosion) problems.^{42/}

D. Conclusions

4.20 The informal system of land titling and ensuing security has contributed to a disincentive for on-farm improvements (e.g., soil conservation, establishment of trees, fencing). In addition, the absence of a well defined/enforced titling system prevents access to formal financial markets, hindering investment potential further. While the advantages of a formal titling system are enormous, the dangers are great in attempting such a reform without having in place a well functioning land administration/legal process which preserves the rights of those who have traditionally farmed the land and to prevent land grabbing.

4.21 Rather than attempt a compulsory national titling program, which at Haiti's current stage of development would not be feasible to implement effectively, the Government should establish the legislative and

^{39/} See Binswanger, H. and Rosenzweig, M., "Production Relations in Agriculture", Journal of Development Studies, Vol.22, No.3, 1986.

^{40/} See Binswanger H. and Rozenzweig M., op cit.

^{41/} The case studies show that, in the hillsides, most non-eroded land (where trees and coffee are planted) is owner-managed, while the most eroded land (where annual crops are grown) is mostly rented or sharecropped.

^{42/} The most severe cases of erosion have taken place in State-owned hillside lands.

administrative framework which would permit the issuance of titles at a pace consistent with their demand. Land titling services provided by ONACA could be provided at subsidized rates--for a limited period--to encourage land registration once appropriate procedures are in place. Steps should be undertaken to facilitate the process of land registration which at present is controlled by a few notaries. Complementary measures that ensure that acquired titled rights do not carry restrictions regarding land transferability should be undertaken. Legislation preventing foreigners from acquiring land, and legislation preventing land from being used as collateral should be abolished.

4.22 The State should divest most of its land. As a matter of principle there is no reason for the Government to be engaged in the real estate business, much less so when such an activity serves primarily as an unclear and untargeted rent transfer mechanism with negative efficiency implications. Caution should be exercised to prevent land grabbing by wealthy and well connected individuals at prices below real value.

V. THE IRRIGATION SUBSECTOR

5.1 Given Haiti's scarce water basins and rainfall fluctuations, irrigation has traditionally been an important factor in agricultural development. The tropical-humid weather, is characterized by strong and irregular rains, a consequence of the country's mountainous terrain and exposure to strong sea-winds. Although rainfall in over 80% of the country's territory surpasses 1,000 millimeters per annum, the irregularity of rainfall leads to drought periods that prevent use of intensive agricultural methods.

A. General Background

5.2 Haiti's estimated potential irrigable land is between 150,000 and 190,000 ha. Of these, 70,000-90,000 ha are currently being irrigated. They are divided into 128 inventoried systems: (i) the Artibonite Valley system with approximately 30,000 ha; (ii) twelve medium-sized systems (from 1,000 ha to 9,000 ha each) which total roughly 35,000 ha; and (iii) 100 small systems with a total irrigated area of 20,000 ha. The majority of irrigated land is fed by water diversion systems using a diversion structure and an intake. The remaining irrigated areas are fed by either water-catchment systems or pumped from underground. The rivers' water flows are characterized by large seasonal fluctuations, partly because of rainfall irregularity and erosion and deforestation of catchments.

5.3 Most public irrigation systems have deteriorated over time because of poor maintenance. Roughly 90% of the irrigation systems are under the administrative control of the Ministry of Agriculture's Service des Irrigations et du Genie Rural (SIGR). However, because of the Ministry's financial constraints, all rehabilitation and maintenance operations are taking place under the auspices of other autonomous agencies operating with donor support: (i) the Organisme de Developpement de la Valle de l'Artibonite (ODVA), which has rehabilitated 3,600 ha and is presently engaged in the rehabilitation of 5,400 ha with IDB financing; (ii) the Organisme de Developpement de la Plaine des Gonaives (ODPG), financed by the German

Government; (iii) the Organisme de Developpement du Nord (ODN), which is rehabilitating roughly 1,000 ha with financing from several institutions, including The World Bank; (iv) the Riviere Blanche Project in the Cul de Sac area is rehabilitating 3,200 ha with IDB financing; and (v) the l'Arcahaie Project, financed by the Caisse Centrale de Cooperation Economique (France).

B. Design and Effectiveness of Rehabilitated Irrigation Systems^{43/}

Design and Maintenance

5.4 Rehabilitated irrigation systems have serious design deficiencies^{44/} arising from: (i) inadequate attention being given to water availability; and (ii) lack of provision for subsequent maintenance. The major deficiencies are:

- (a) Water gates and distribution mechanisms are often rudimentary and unable to measure and control water output. This is because of simple designs or because control mechanisms have been deemed too costly at the design stage and have been eliminated;
- (b) solid deposit control mechanisms are non-existent or insufficient;
- (c) silting-up of the canals is common because protection against flooding is generally underestimated;
- (d) drainage systems have not been taken into account in the designs, particularly in the rice growing areas of the Artibonite where drainage is a major problem; and
- (e) water loss is serious in a number of systems because of the absence of lining, particularly in the Gonaive's irrigation system.

5.5 Lack of maintenance is prevalent in all systems administered by the MARNDR, some of which have been abandoned for lack of resources. Even in autonomously administered projects (financed with external resources), maintenance is insufficient. An example of this is the Artibonite Project where the canal and drains cannot be cleaned because of lack of spare parts.

Effectiveness of Irrigation Systems

5.6 Cropping intensity has increased significantly in the gravity rehabilitated projects (Table 5.1). The same cannot be said for the pumping systems where the water supply is often unavailable because of lack of resources to repair machinery and the unreliability of electricity supply.

^{43/} The mission focused its efforts in the rehabilitated systems, since they are the only ones for which information is available.

^{44/} The rehabilitated area in L'Arcahaie appears to be the only area where attempts are being made to improve technical deficiencies.

Table 5.1: CROPPING INTENSITY IN REHABILITATED PROJECTS

Project	Cropping Intensity ^{a/}	Irrigation Method
<u>GONAIVES</u>	1.6 + fruit trees irrigated by drainage water	Pumping
<u>GRISON GARDE</u>	2 - 2.5 1.38	Gravity Rehabilitated Non-rehabilitated
<u>St. RAPHAEL</u>	1.89 0.94	Gravity Rehabilitated Non-rehabilitated
<u>ARTIBONITE</u>		Gravity
Grand Systeme	1.8 - 1.9	Rehabilitated
Petit Systeme	3.0	Rehabilitated
<u>RIVIERE BLANCHE</u>		
Zone Amont	2.5	Gravity Rehab.
Zone Intermediere	1.2	Non-rehabilitated
Zone Aval	1.5	Pumping Rehab.

^{a/} Corresponds to the weighted (by hectare) average of crops per year.
Cropping intensity is defined as the number of crops per year.

Source: Mission estimates.

5.7 While the impact of irrigation on yield improvements cannot be accurately determined with the available data, yields have increased significantly in the rehabilitated areas (Table 5.2). Nevertheless, the improvements still fall short of the projects' objectives (i.e., generally expected yields of 3.5 ton/ha for maize and sorghum, 4.5 ton/ha for rice and 1.5 ton/ha for beans) because supporting technology is not available, nor is there an effective extension service (para. 6.39).

Table 5.2: SELECTIVE CROP YIELDS UNDER ALTERNATIVE IRRIGATION SYSTEMS (ton/ha)

Commodity	Non Irrigated <u>a/</u>	Irrigated	
		Pre-Rehabilitated	Rehabilitated
Maize	0.84	0.88	1.78 <u>b/</u>
Sorghum	0.95	1.75	2.75 <u>c/</u>
Rice	1.30	1.77	2.83 <u>d/</u>
Beans	0.55	0.55	1.55 <u>e/</u>

a/ Monoculture cultivation in non-irrigated plains.

b/ Average yields of Riviere Blanche, Jacmel and Debreuil systems.

c/ Average yields of Riviere Blanche system.

d/ Average yields of Grison Garde, St. Raphael and Artibonite systems.

e/ Average yields of Riviere Blanche system.

Source: "Estimation des Rendements des Cultures" (MARNDP) - Projet d'Appui en Developpement Agricole ADS II- USAID, August 1990.

C. Water Pricing and Water Charges

5.8 Since water fees have not been adjusted for several years, current fees are well below those necessary to recover the systems' operational and maintenance (O & M) costs. Moreover, there is evidence that water fees are not being paid. In 1989, only 42% of billed amounts were collected at the Artibonite, and in St. Raphael only 13.5% of the billings were collected. This situation is also evident at the most recently rehabilitated projects: no fee has yet been established in Grison Garde, while for the Riviere Blanche scheme, collection of fees has been awaiting the approval from the MARNDP.^{45/}

Gravity Systems

5.9 Current fees and collection rates have resulted from the Government's unwillingness to set and enforce an adequate pricing policy. The equilibrium annual water fees^{46/} in the rehabilitated zones--where data is available--indicate that they represent only between 1% and 3% of the farmer's annual income and are therefore within the farmers' capacity to pay:

^{45/} Water users at Grison Garde either do not pay at all (if water is fed by gravity), or in the case of pumped water, pay a fee which is equivalent to 30% of the electricity costs.

^{46/} The fees required to fully cover operational and maintenance costs.

- (a) in the Artibonite^{47/}, the equilibrium water fee of G 605 per annum^{48/}, represents less than 5% of the farmer's income per hectare. In the rehabilitated zones, where yields are higher, the fee represents less than 3% of a farmer's annual gross income;
- (b) in St. Raphael, where high quality rice is produced, the G 125 per annum fee represents slightly over 1% of a farmer's estimated annual gross income^{49/}; and
- (c) in Arcahaie, for one sorghum and bean crop per annum, the G 160 fee represents roughly 2% of a farmer's annual gross income.

Table 5.3: WATER PRICING IN GRAVITY SYSTEMS
(Gourdes/ha/year)

	Current Water Fee	Equilibrium Fee <u>a/</u>	Expected Cost Recovery
Artibonite	55	605	3.8% <u>b/</u>
Arcahaie	13	160	n.a.
St. Raphael	75	125	8.1% <u>b/</u>

a/ Fee that would cover O & M costs.

b/ O & M cost recovery based on actual water fees and payment evasion.

Source: Artibonite, Arcahaie and St. Raphael Projects.

Pumping Systems

5.10 The pumping systems' estimated operational costs are roughly G 60/hr for an output of 35-40 l/sec. This implies, that for an average crop requiring 3,000 m³ of water per ha, water costs would reach G 1,400/crop/ha. These costs are too high to be supported by any of the traditional low-value crops under feasible cropping intensities and yields.

47/ The maintenance and operation cost of the Artibonite system is significantly higher than that of medium sized systems because it requires maintenance of main canals.

48/ Rice producer price of G 8.7/marmite (1 marmite = approximately 6 lb), non-rehabilitated zone yield of 2 ton/ha of rice, and two crops per year.

49/ Estimation based on conservative producer price of rice of G 10/marmite, yield of 1.7 ton/ha, and two crops per year.

D. Subsector Strategy and Program

5.11 The MARNDR's Service des Irrigations et du Genie Rural (SIG), is responsible for the supervision, appraisal, execution and operations of all public irrigation systems. However, for lack of funds, it is paralyzed and unable to perform its functions. All actions are currently being undertaken by ad-hoc agencies created to administer foreign-financed projects. This inefficient administration does not permit setting priorities for public investment, nor does it lead to sustained improvements.

E. Conclusions

5.12 Haiti's public irrigation systems have deteriorated considerably due to poor maintenance. At the core of this continuing problem is the fact that user's contribution to cover operation and maintenance costs are minimal. Maintenance problems are extensive even in the autonomously administered public irrigation projects for which there is external financing. Nevertheless, in all the rehabilitated gravity schemes visited by the mission there have been significant increases in cropping intensities and yields.

5.13 A number of rehabilitation projects are currently being carried out with donor support. Rehabilitation efforts should continue provided that: (i) the choice of projects is conditioned on it being feasible to put in place adequate cost recovery mechanisms to cover O & M costs. Priority should be given to gravity systems where O & M costs are within farmers' capacity to pay; (ii) the Government puts into effect mechanisms to charge and collect adequate water fees; (iii) design standards are upgraded to enhance the system's reliability and limit siltation in the canals. This requires more complete studies of water availability; and (iv) catchment protection becomes a part of all water resource development projects.

5.14 The severity of institutional weakness in the MARNDR precludes its ability to effectively participate in irrigation development. This problem has been perpetuated by funding agencies' tendency to work with local authorities in an effort to achieve results within a very weak institutional environment. The downside effect has been the perpetuation of Government's inability to provide supporting services, including technology development and transfer, and insufficient attention on environmental issues. Greater attention is needed to strengthen the MARNDR's role in irrigation development, provision of supporting services and the establishment of water users associations to administer irrigation schemes. To date, there has been little progress in the identification or formation of such associations.

VI. AGRICULTURE PRODUCTION, TECHNOLOGY GENERATION AND DISSEMINATION

A. Assessment of the Current Situation

Rice

6.1 Lack of reliable statistical information on crop production makes it difficult to measure technological progress. Advances in this area--the

introduction and expansion of improved high-yielding rice varieties and rehabilitation of irrigation infrastructure--have taken place in major irrigation schemes (e.g., the ODVA Project) but have not been reflected in official production statistics. Recent surveys^{50/} have reported rice production at 195,000 ton on 86,700 ha (Table A.12 Statistical Appendix), with average yields of only 2.2 ton/ha.

6.2 In rice cultivation, the major technological advance, directed exclusively to irrigated conditions, has been the replacement of low yielding, tall genotypes such as Ti Fidele and Madame Gougousse with improved, high yielding, semi-dwarf varieties. In the ODVA Project, improved genotypes currently cover about 75% of the area, where the most recent introduction, CICA 8 variety, now covers 30% of the area. Extension of the cultivar appears to have been carried out amongst farmers as no organized seed production program has been available. Few other technological improvements have occurred during the last decade. Farmers continue to prepare land, transplant, weed, harvest and thresh manually. Use of inputs such as fertilizers is minimal and far below optimal levels.

6.3 Extension personnel assigned by the MARNDR to the rice-growing irrigation projects have had very little impact. A concerted effort to disseminate available technology is necessary: fertilization practices need to be demonstrated and measures to address the increasing problem of zinc deficiency need to be taken. Farmers need to be shown the value of high quality seeds and improved management practices.

Maize

6.4 Maize is Haiti's most important crop on a volume basis. Information provided by USAID ADS II Project surveys show that its production levels are far greater than those reported by Governmental agencies and may exceed 370,000 ton (Table A.13 in Statistical Appendix) cultivated on approximately 448,000 ha. Both Governmental statistics and the on-farm surveys report maize yields to be extremely low (800-900 kg/ha).

6.5 Maize production technology has been limited by major environmental constraints brought about by declining chemical and physical properties of soil. Improved production technologies have not been developed. Consequently, production methods have not changed during the last two decades. Input usage has been minimal as a consequence of the lack of significant yield responses in highly eroded soils using traditional cultivars. Improved seeds that yield more than 3 ton/ha in favored areas (e.g., Plaine des Cayes) have been identified and released, the most recent being La Maquina 7827 seed. However, improved maize varieties seldom out-yield local produced chicken-corn under more stressful conditions.

6.6 There has been no evidence of organized extension campaigns for maize. The only existing activities have been isolated community efforts where local NGOs have attempted to increase fertilizer use. The national extension agency of the MARNDR has only been superficially involved in

^{50/} USAID, ADS-II 1988, and USAID, ADS-II 1990.

transfer programs with most of the extension efforts being programmed and executed by CIMMYT/CRDA research staff.

Sorghum

6.7 Sorghum is a subsistence grain consumed by the poorest in the rural areas. Survey data from USAID studies indicate that it is grown on about 230,000 ha with an annual production of 174,000 ton and a mean yield of 0.73 ton/ha (Table A.14 in Statistical Appendix). No major increases in production have taken place in the last 15 years.

6.8 Extremely low yields result from the absence of improved production technologies. Only limited germplasm is available. The variety M 5009 was introduced by Texas A & M University as part of an USAID project; however, it has not been used. The bulk of sorghum is produced on hillsides using traditional varieties, often grown along with maize, beans and tubers. Improved technologies for this difficult and complex production system are not available. More recently, sorghum is being grown during the dry season in some of the minor irrigation schemes. Several short stature varieties are available and, with adequate inputs and management, yields of 2-3 ton/ha could be obtained.

6.9 There have been no extension activities directed exclusively to sorghum production. Some NGOs and USAID projects have focused on the entire farming system in which sorghum is a major component, with activities having been limited to increase fertilizer use and reduce storage losses.

Grain Legumes

6.10 Production information on grain legumes is difficult to analyze. A range of grain legumes are cultivated but in official reports all pulse crops have been referred to as "beans"--which in turn is used interchangeably with common dry beans (Phaseolus vulgaris). Data from MARNDR and FAO give information only for beans--supposedly Phaseolus vulgaris. According to these sources, annual bean production has been stagnant for the last 15 years at approximately 50,000 ton harvested from 90,000 ha. Data from USAID surveys show that production of pigeon pea and black beans has been equally, if not more important than red beans.

6.11 No major technological improvements in pulse production has taken place over the last decade. This can partially be attributed to lack of focus on the appropriate legumes to be grown. The only substantial advance has been the release and promotion of an improved black bean cultivar--Tamazulapa--by the USAID ADS-II Project. In project areas of Jacmel and Les Cayes, the new variety out-yielded local black beans by approximately 35%.

6.12 Extension activities directed to improve pulse production have been limited to special donor projects. Efforts by the MARNDR and NGOs have been minimal. There are currently several research projects in their initial

phases, but they are limited to red-seeded Phaseolus vulgaris and propose only a minor extension component.^{51/}

Other Food Crops

6.13 A diverse group of minor food crops are cultivated in Haiti. Although these crops individually are of minor significance, collectively, they contribute up to 25% of the energy and protein intake in the rural areas. Additionally, many of these crops, especially vegetables and fruits, account for a major portion of the cash intake for the small farmer.

6.14 Vegetable production is concentrated in the highland regions near population centers. A sizeable production area is located around Kenscoff serving Port-au-Prince. An impressive aspect of vegetable farming are the conservation practices used to reduce soil erosion on the steep hillsides, in contrast with that of grain farmers. Production data is not available.

6.15 There is no research directed toward vegetables. Seeds are distributed farmer to farmer with new varieties being introduced from the United States by NGOs. Extension activities are non-existent with the exception of minor, localized NGO activities promoting the use of improved varieties and inputs.

6.16 Root and tuber crops are grown mainly for on-farm consumption. Total production has been estimated to be 500,000 - 600,000 ton/year. According to MARNDR staff, production has been stagnant for many years. Irish potatoes, sweet potatoes, and cassava are the most important roots and tubers. No research and extension has been taking place. Currently, the International Potato Center (CIP) is in the initial phases of developing a sweet potato program by including Haiti into a regional program (PROCDEPA). CIP scientists believe that sweet potatoes yields can be increased 2-3 fold. By contrast, increasing productivity of Irish potatoes is more difficult. Seed production is rudimentary causing serious disease problems (e.g., bacterial wilt). Research on cassava has been limited to the testing of improved varieties particularly from CIAT in Colombia. In the early 1980s the CNC40 was introduced from Brazil for production in the northern zone. The rate of adoption of CNC40 has not been documented nor is there evidence of activities promoting it even though it out-yielded traditional varieties by 10 ton/ha in several yield trials.

6.17 Fruit crops could become increasingly important because of their export potential. According to USAID surveys, the most important fruits are: banana (210,000 ton/year), mango (90,000 ton/year), avocado (50,000 ton/year), lime (7,000 ton/year) and other citrus 33,000 (ton/year). Only 10%-20% of the annual harvest is marketed while the remainder is consumed locally.

6.18 The MARNDR does not consider fruit crops as part of its mandate. Consequently, there is no organized research and extension effort on these

^{51/} The technology transfer agency of the MARNDR has been omitted in these new projects and the extension component will be carried out by the research group.

crops from either the Government or the donor community. However, considerable improvements have taken place in the production of citrus and mangoes. Improved varieties are frequently introduced from neighboring islands and Florida. The principal agencies involved are the Haiti Citrus Corporation and several fruit exporters.

6.19 Plantains are seldom mentioned as an important food source (there is the added difficulty that they are frequently listed as bananas). In terms of total production, plantains represent one of the largest crops at more than 300,000 ton/year. In spite of their importance, research, extension and development projects exclude them. Plantains have potential for a greater role in domestic consumption and exports. The crop requires a low maintenance production system with few inputs and has no major biotic constraints. Being a perennial, it is also suitable for areas susceptible to soil erosion.

Non-Food Crops

6.20 Coffee. Production has remained fairly stable at about 35,000 ton/year from an area of approximately 135,000 ha, on roughly 250,000 farms. Productivity has been very poor at 250-300 kg/ha and is expected to decline further as plantations continue to degenerate. Production problems are numerous and severe. These include exhausted soils, excessive populations from dropped berries, physiologically stressed plants with no regeneration capacity, and deficient pruning techniques. Degraded, older plantations, which cover most of the coffee area, cannot be rehabilitated successfully and control of the recently detected rust disease is critical. Production will decline as unproductive plants are replaced with food crops.

6.21 No organized research or extension programs have been introduced. The Coopératives Caféières d'Haiti and other cooperatives have provided limited extension and services. Despite this gloomy assessment, in 1990 IICA initiated a rehabilitation project with USAID support. The project is designed to impact 1,668 ha in the pilot areas of Beaumont and Jacmel by year 1995 through the introduction, validation and transfer of technology packages using modern, high-yielding, rust susceptible varieties. Credit, inputs and training of local extension agents are included. The project is budgeted at US\$4,300/ha. It is unclear how the project, if successful, could be extended to cover the remaining 99% of Haiti's coffee area.

6.22 Sugarcane. Sugarcane and sucrose production were fairly stable into the 1980s but have crashed in the last five years. The harvested area has declined slowly and productivity is declining at a more rapid pace. Low world prices, inefficient production, erosion of the U.S. protected market share, and contraband imports has led the sugar mills to reduce operations or cease them altogether. Cane is largely consumed by guildives, traditional artisanal alcohol factories. There is no organized research or extension on any aspect of sugarcane production.

Other Non-Basic Crops

6.23 In addition to coffee and sugar, Haiti produces other non-basic food crops including tobacco, sisal, cotton, essential oils, and cocoa. The harvest value of all these commodities is stagnant or declining, except for

cocoa, which is minimally important. None of these commodities enjoys any measure of organized research or extension. There is no new production technology available and production problems are poorly understood.

Livestock Production

6.24 Goats, pigs and cattle production constitute an important component of Haiti's integrated farming system. With the exception of the collapse in swine population designed to control the African swine disease, production has been stagnant for several years. Repopulation of pigs was performed, but discontinuation of USAID sponsored projects has halted this effort.

6.25 No formal livestock production system exists. Animals roam and scavenge for food. This has contributed to soil erosion, especially from goats grazing on the hillsides. The traditional low-maintenance animal care has restricted successful swine repopulation as the newly introduced pigs are modern, fast-growing breeds that require more attention and better feeds than the creole types. There is limited reintroduction of creole swine from neighboring islands, principally Guadeloupe. Current pig production is reported to be greater now than before the swine eradication program.

6.26 Research and extension activities on livestock are essentially non-existent. Feed is the primary constraint to increased production. The MARNDR and FAO have several project proposals for improving animal feed using residues from fruits. However, no activities to transfer existing technologies for livestock improvement are currently taking place.

B. Organization of Research and Extension Activities

6.27 Haiti has long been supported with large amounts of financial and technical assistance from the international donor community and NGOs. In 1989, according to USAID, there were more than 80 international donor assisted activities. Many of these projects had or have research and/or extension components, yet few have been developed to focus primarily on strengthening research and extension capabilities.

Varietal Development

6.28 The International Agriculture Research Centers (IARCs) are the principal agencies involved in the introduction and identification of improved varieties of grain crops. CRDA is the principal collaborating Government agency. IICA provides the administrative support for CIAT in beans and rice. CIAT's bean activities in Haiti are funded by the Swiss Government and are part of a regional program (PROFRIJOL). CIAT is dependent upon CRDA for program implementation.

6.29 Improved rice germplasm has been introduced and tested through a Canadian supported network--CRIN (Caribbean Rice Improvement Network). CIAT is the principal managing agency. Introduced varieties are tested in collaboration with ODVA staff at the Artibonite research station. The CRIN varietal improvement program is managed by ODVA personnel assisted by CIAT staff stationed in the Dominican Republic. New varieties have yet to be

released but several promising lines have been identified and will soon be tested in multilocation trials in the ODVA Project area.

6.30 Canadian funds have also supported CIMMYT in maize improvement and a full-time CIMMYT staff member is stationed at Les Cayes where a new cultivar (La Maquina) has been released. In addition, seven improved varieties have been identified and are currently undergoing testing in country-wide yield trials. All research has been conducted in mono-cropped situations using high levels of fertilizers, insecticide protection and, if required, irrigation.

6.31 Introduction of fruit and vegetable germplasm has been undertaken mainly by grower organizations (e.g., Haiti Citrus Association and NGOs). Most of the currently grown varieties were introduced and distributed without formal testing. A new coffee germplasm is being introduced by IICA as part of the coffee rehabilitation program.

Crop Management

6.32 Crop management activities are essentially non-existent although many proposals have been developed as part of CRDA's national crop programs, (e.g., PRONATHAR and PRONATMA). These programs have yet to be implemented and the activities have not been clearly defined. In the short term, yields could increase by 15% if these proposals are successfully implemented.

6.33 Neither the Government nor international donors are addressing agronomic problems. Rice agronomy has been neglected and high yielding varieties are producing only 50% of their potential because of poor crop management--particularly water control. According to CRIN staff, rice agronomy will receive major attention, focusing on fertilizer applications to correct zinc deficiency and the use of clean seeds.

Fertilizer and Pesticide Use

6.34 Overall fertilizer use in Haiti is less than 7 kg/ha, as compared to 90 kg/ha in Asia and more than 120 kg/ha in the industrialized world. Little attention has been made to facilitate the efficient use of inputs. Few fertilizer-responsive varieties have been distributed (with the exception of rice) and the subsistence farmer has little capital or access to credit to purchase inputs.

6.35 Rice fertilizer recommendations provided by CRDA are based solely upon soil chemical analyses and have not been complemented by crop response data. Recommendations are provided only for the major elements and far exceed applications normally required for irrigated rice. Minor elements (i.e., zinc) have been totally neglected. Few farmers follow the recommended fertilizer applications and extension activities are minimal. Maize fertilizer recommendations are based upon mono-cropped conditions for the more fertile plains. Research on fertility requirements for intercropped conditions on the hillsides--where over 70% of maize is produced--has not been conducted. The nutrient requirements for the major grain legumes are not understood.

6.36 The use of pesticides is minimal and generally restricted to rice. Insecticides are frequently used in rice mainly for the control of stink bugs

during grain filling. CRIN/ODVA are currently conducting research to refine the economic thresholds for stink bugs to ascertain levels justifying insecticide applications.

Seed Production

6.37 Seed production is the most promising area in terms of research and extension to improve the use of inputs. FAO, in collaboration with CRDA, is the principal agency providing organizational and technical assistance. A program for improving rice seed production has been implemented with FAO's technical assistance and financed by the UNDP and IDB in the Artibonite Valley. However, it is disturbing that the supply of quality seeds already exceeds farmer demand. The project is apparently constrained by the absence of an extension component to educate farmers on the value of quality seeds.

6.38 Proposals for producing maize and bean seeds have also been prepared by FAO. The maize project will be implemented in collaboration with CRDA and CIMMYT. The bean project will focus only on Phaseolus vulgaris, and its approach is similar to that of maize. The project is dependent upon the identification of improved genotypes and will work in collaboration with INRA/MCAC--a French supported research group. As in the rice project, little attention is given to extension.

Research, Extension and Irrigation

6.39 Research and extension activities designed to increase crop productivity in irrigated areas have been grossly neglected. No research has been conducted to determine the water use efficiency of rice or to examine the production of less water demanding crops (e.g., maize) in areas where drainage facilities are available. Similarly, extension programs have not been addressing the problem of on-farm water management.

6.40 Significant gains in production and yields could be achieved by improving the irrigation systems and introducing new technologies. In the short-term, rice production in the Artibonite Valley could increase by improving water management and introducing higher yielding seeds:

- (a) Roughly 10,000 ha receive adequate water flows. Current rice yields and cropping intensities average 4.5 ton/ha and 1.8 crops/year respectively. With improved water management techniques these averages could be increased to 6 ton/ha on 2.5 crops/year. Adoption of these techniques would increase these farmers' average net annual income^{22/} by at least 60%, from G 29,500/ha to G 47,000/ha.^{23/} These improvements would not need an increased use of other inputs.

^{22/} Based on a G 10/marmite producer price.

^{23/} This is based on the assumption that the farmgate price of rice would be reduced from G 10/marmite to G 8.7/marmite (1 marmite = 6.125 lb) following a further liberalization of rice imports.

- (b) Approximately 20,000 ha do not have reliable access to water. Current rice yields and cropping intensities average 3 ton/ha and 1.5 crops per year. Increased production would need rehabilitation of the irrigation system. Under those conditions, the annual average gross income per hectare could more than double from G 21,600 to G 47,000. The estimated cost of rehabilitating the system is G 7,500/ha.
- (c) Roughly 30,000 ha suffer from serious irrigation problems because of the lack of drainage. Yields are extremely low, 2 ton/ha, and only one crop per year can be produced. Productivity gains could be achieved if the irrigation system is rehabilitated--at an estimated cost of G 22,500/ha. Ideally, the gross annual income per hectare could increase from G 7,000 to G 47,000.

C. Institutional Arrangements

6.41 The MARNDR has national responsibility for planning, coordinating and implementing research and extension activities, and has divided research and extension into two agencies with different organizational structures.

Research

6.42 CRDA is responsible for all research activities within the public sector. Its present structure dates from 1987 when the MARNDR integrated CRDA with the Faculty of Agronomy and Veterinary Medicine (FAMV) at the State University of Haiti. The current system attempts to decentralize on a regional basis. The country has been divided into nine departmental research units which have been subsequently divided into subunits based upon geographic considerations and available infrastructure.

6.43 As a result of insufficient staff to accommodate the numerous departments and sub-programs created by the decentralization, only partial implementation has taken place. Furthermore, frequent changes at the MARNDR and political instability have resulted in little attention being given to CRDA's organizational problems. CRDA currently lists 35 full-time professionals; 5 with Ph.D., 20 with an M.S. and 10 with B.S. degrees. An additional 20 agronomists are employed by the IARCs in the cooperative programs. CRDA also has 15 part-time professionals from the FAMV. This should be an adequate technical staff to address key research constraints confronting production of the major food crops, if the operational budget is sufficient and sustainable.

Extension

6.44 The MARNDR's extension program is organized in the Rural Development Unit. This is a loosely organized unit that has decentralized most of its activities by assigning its staff to regional development programs. There are approximately 148 technical staff in the national extension service. However, no information is available regarding the precise location or functions of these technicians. Extension, as well as research, activities are not documented in annual progress reports, and therefore no means of evaluating the public sector extension activities are available.

6.45 In addition to MARNDR's limited extension services, several NGOs are involved in technology transfer. Commendable progress achieved in the agro-forestry projects utilizing NGOs, has resulted in the perception that NGOs should assume full responsibility for extension and that the MARNDR extension service could be eliminated. However, a detailed analysis of the NGOs reveals considerable weaknesses that limit their capabilities to assume major responsibilities for technology transfer: (i) although there are about 330-400 NGOs in Haiti, less than 15 are firmly established in the rural community and are capable of conducting extension activities; (ii) NGOs, being mostly religious organizations, have not been traditionally involved in agriculture--having become involved during the past five years. They lack trained staff and have limited managerial capabilities; (iii) most NGOs are localized, serving small communities, usually near roads, leaving vast areas in the country unattended; and (iv) they have no secure financial resources for extension activities, consequently, most NGOs depend upon external resources for the continuation of their programs.

6.46 Absence of a strong public sector extension institution and a decentralized group of untrained NGOs has resulted in an extremely weak national extension services. As a result, numerous ill-conceived projects (often with duplicating activities) have taken place.

D. Conclusions

6.47 Productivity changes and production gains could be quite rapidly achieved in agriculture provided that properly designed research and sustained extension programs are implemented. Until now, research and extension results have been disappointing. According to FAO estimates, between 1975 and 1989 the annual production of major grain crops (rice, maize and sorghum) increased by only 34,000 ton.^{54/} This marginal increase is mostly the result of increases in rice production. Stagnant production is the result of extremely poor yields that may be declining because of soil degradation. Food grain production technology, except for rice, has largely failed.

6.48 An examination of Government institutions, international agencies, NGOs and farmers' organizations reveals serious problems in the direction, coordination and cooperation among the agencies involved in technology generation and dissemination. There is no single agency/institution capable of assuming responsibility for research and extension. Collectively, however, there are more than sufficient human and financial resources available to accelerate technology improvements.

6.49 A unified program of research and extension should be concentrated on a few promising crops. With such an approach, the production system should be viewed in its entirety. Crop-specific action programs should assist in coordinating research, extension, input supplies, and resource management. It is critical that farmers support this initiative. They not only should assist in transferring technology but should also contribute to sustaining the program without requiring large amounts of external assistance.

^{54/} 1989 production has been estimated at 489,000 ton, while that of 1975 was estimated at 455,000 ton.

6.50 From a production perspective, the largest impact could be achieved in:

- (a) rice. Its productivity is the easiest to impact as technology and inputs are available and most farmers are already growing improved genotypes. Extension efforts should focus on educating the farmer on the value of improved seeds ^{22/} and the use of fertilizer. The most promising area encompasses the 10,000 ha in the ODVA that have adequate water distribution controls. With improved water management techniques current yields and cropping intensities could be increased to 6 ton/ha on 2.5 crops/year. This would increase these farmers' average net annual income by at least 60%, from G 19,500/ha to G 47,000/ha. Approximately 20,000 ha in the ODVA do not have reliable access to water yet do not suffer from drainage problems. Current rice yields and cropping intensities average 3 ton/ha and 1.5 crops per year. Increased production would need rehabilitation of the irrigation system. Under those conditions, the annual average gross income per hectare could more than double from G 21,600 to G 47,000. The estimated cost of rehabilitating the system is G 7,500/ha. There are also roughly 30,000 ha in the Artibonite which suffer from serious drainage problems. Yields are extremely low, 2 ton/ha, and only one crop per year can be produced. Productivity gains could be achieved if the irrigation system is rehabilitated--at an estimated cost of G 22,500/ha. The gross annual income per hectare could increase from G 7,000 to G 47,000;
- (b) maize production in the agro-forestry areas. Improved genotypes have already been identified and FAO would, if funded, develop a seed production program. A 15% yield increase could be achieved in the short run with adequate crop management extension programs;
- (c) pigeon peas are very adaptable to Haiti's conditions, but research on this crop is currently neglected. Studies should be initiated with ICRISAT to evaluate the potential for pigeon peas. It is doubtful that progress will be forthcoming in dry beans. The crop is very sensitive to stress and improvements have been minimal in many countries after several years of research and extension efforts; and
- (d) plantains as an alternative to coffee production. Plantains are well suited for an agro-forestry production system.

6.51 Institutional building per se should be avoided. Decentralization of research and extension has only resulted in the transfer of poorly conceived, unproductive programs to regional agencies. There is no evidence that the regional agencies have been more efficient at research and extension than the national institutions. The development and implementation of a unified research and extension program involving all the current uncoordinated

55/ The FAO/IDB/ODVA seed production program would need to accelerate production of improved seeds.

participants would result in stronger, more productive institutions at all levels.

VII. THE FORESTRY SUBSECTOR

A. Forestry and The Environment

7.1 Few countries face a worse degree of environmental degradation than Haiti. Its once abundant forest resources have diminished to a remnant. Natural pine or hardwood forests are estimated to cover only 1,070 km², roughly 4% of Haiti's area. The bulk of the country's timber resources are scattered on land used for agriculture. A third of the country's lumber currently comes from fruit trees (mango, avocado, grapefruit), while hardwood (mahogany, cedar, oak, and others) is steadily diminishing.

7.2 The current environmental situation is the consequence of: (i) pressure to increase food production expanded cultivated areas into marginal lands including steep hills, the removal of trees, and the shortening of the fallow period; (ii) use of trees and shrubs for firewood and charcoal; and (iii) lack of well defined land property rights has led to reduced land-related investments.

B. The Renewable Energy Sector

7.3 Domestic firewood and charcoal are the country's most important energy source, providing 76% of Haiti's annual energy consumption. Fuelwood is consumed largely by residential households in the cities and rural areas. Current levels of fuelwood use, estimated ^{56/} at 5.0 million m³/yr, are well beyond the sustainable level (1.6 million m³) given the country's forest stock.

7.4 While the Government has enacted several policies aimed at relieving woodfuel demand, these policies have not been effective because of lack of enforcement or impracticability.^{57/} For example, heavy taxation of imported petroleum fuel and high electricity tariffs contribute to the use of wood as the main energy source.

C. Agro-Forestry Activities

7.5 Reforestation projects are the most significant activity currently taking place in Haiti's agricultural sector. These projects not only have an

^{56/} BDPA-SCETAGRI: Gestion des Ressources Naturelles en Vue d'un Developpement Durable en Haiti, Rapport Final Fevrier, 1990.

^{57/} In 1987, cutting of trees without authorization was forbidden by law. The same law also allowed a maximum six months for wood-burning industries to change their energy source.

important impact in improving the ecological situation but also carry a positive externality to agricultural production because of soil improvements.^{58/} USAID is the main agency involved in agro-forestry, although other organizations, especially the World Bank, are expanding activities in this area. These activities are implemented using NGOs that are administered under two major organizations--the Pan American Development Foundation (PADF) and CARE.

7.6 In 1989, more than 6.9 million trees involving 71 species were distributed to nearly 50,000 farmers. Since 1982, approximately 40 million trees have been distributed to 200,000 farmers. Seedling survival rate, which had been a serious problem during the program's early phases, has increased to 50%-60% as a result of extension efforts and better farmer selection. PADF has also successfully established a seed center for collecting and evaluating tropical trees. Unfortunately, improved crop production has not been integrated into agro-forestry projects. This shortcoming may be the consequence of relying upon NGOs for project implementation, circumventing the MARNDR where most crop improvement activities are concentrated.

D. The Government's Institutional Responsibilities and Constraints

7.7 Although Haiti has enacted numerous laws and regulations to protect natural resources, the Government lacks the financial and human resources to enforce them. Two national parks, one forest reserve and several nature sites have been created by decree, but their delimitation, inventory, and protection is neither complete nor effectively carried out.

7.8 The Government has not had a strategy for the development of the natural resource and household energy sectors. Programs have been influenced by external donors. This represents a piecemeal approach that relies on unsustainable ad-hoc arrangements. Currently the MARNDR has issued a policy statement listing its objectives and strategy for natural resource management. The objectives are to protect natural forest resources, increase forestry and agro-forestry production, and ensure the preservation of rare and endangered species.

E. Conclusions

7.9 The continuing degradation of Haiti's natural resources needs to be arrested. The Government needs to develop adequate safeguards aimed at: (i) protecting the remaining forests and vital ecosystems from further destruction; (ii) increasing wood production through the management of State forest lands and through the promotion of agro-forestry by farmers; and

^{58/} USAID's interest in agro-forestry developed following failed experiences with traditional approaches to increase food production. After numerous projects involving varietal improvement, crop management, fertilizer use, and the like, USAID concluded that little impact could be achieved without improvements in soil properties. This led to efforts to reduce erosion and improve soil fertility through agro-forestry.

(iii) reducing the pressure on the country's vegetation through conservation measures and by substituting mineral fuels, to the extent feasible, for fuelwood over the medium term. The closing of open access to fuelwood is likely to increase the price of wood, making other sources of energy more competitive. Tree farming may become profitable in this circumstance.

7.10 The Government should: (i) increase forested areas by transferring State land to the MARNDR to be rezoned as "public domain" for environmental protection; (ii) improve forest management through the inventorying, surveying and demarcation of forest areas that will identify the location and use of forest areas. Establish adequate control systems (forest and park rangers) to prevent illegal forest use; and (iii) strengthen the legal and institutional framework that regulates forestry and environmental issues by updating the Forestry Code, increasing the technical and administrative capability of the protective services, revitalizing and ensuring sustainability of forestry research; and proposing a basic environmental law.

HAITI
AGRICULTURAL SECTOR REVIEW
Policy Matrix

<u>Policy Issues</u>	<u>Objective</u>	<u>Proposed Measures</u>
I. <u>Agricultural Import Regime</u>		
Import licensing requirements exist for seven products accounting for at least 40% of the sector's value added.	To eliminate price distortions induced by the trade regime	1. Eliminate licensing requirements.
Tariffs on imports currently range up to 50%. Inputs are exonerated.		2. Set unified tariff rate at 5%. This rate should be consistent with that of the rest of the economy. Eliminate exonerations.
Foreign exchange surrendering requirements constitute an implicit export tax which discourages exports.		3. Eliminate surrendering requirements.
II. <u>Sugar Industry</u>		
Domestic prices, currently well in excess of border prices, are set by Government in agreement with the industry. Sugar mills allegedly cannot "break even" at these prices. Economic rents are accrued by the mills because of the sugar import monopoly.	Rationalize and phase out the subsidy.	4. Conduct an independent study to determine the industry's production costs and potential. On that basis determine a more rational pricing and import regime. If in the longer-term the industry cannot produce at a cost lower than the US import price the export subsidies should be phased out.
Exports to the preferred United States market include a Government subsidy to the domestic industry as the domestic producer price is currently higher than US import prices.		
III. <u>Agricultural Credit</u>		
Farmers lack access to institutional credit. Less than 1% of commercial banks' credit goes to agriculture. Operation of credit unions in rural areas are minimal.	Eliminate artificial barriers that limit farmers' access to institutional credit.	5. Eliminate 22% interest rate cap on commercial bank loans.
		6. Eliminate legal prohibition that precludes use of land as collateral.
		7. Adopt measures to support formal land titling.
	Enhance credit unions' potential by introducing adequate regulations and support.	8. Eliminate 12% interest rate cap on credit union loans.
		9. Develop a suitable regulatory and supervisory framework for credit unions.

<u>Policy Issues</u>	<u>Objective</u>	<u>Proposed Measures</u>
IV. <u>Land Tenure and Titling</u>		
Land tenure insecurity reduces desired investments and limits access to institutional credit. Land tenure insecurity also reduces scope for market transactions, hindering modernization and growth. Legal restrictions on the ownership of land by foreigners exist.	To enhance land tenure security.	10. Create a foundation to provide technical assistance to credit unions; promote the creation of a second-tier credit union institution to pool funds and risks on a nationwide basis.
State owned lands are rented at below market rates. Contracts are non-transferrable preventing use of land as collateral. Subleasing of land promotes annual crop production in hillsides.	Rationalize the use of State owned land.	11. Increase support to ONACA in providing subsidized formal titling. 12. Eliminate monopolistic practices by notaries and surveyors; facilitate entry into these activities. 13. Enforce property rights by improving the functioning of the justice system. Allow foreigners to own land.
V. <u>Irrigation</u>		
Public irrigation systems are in disrepair. Rehabilitated and non-rehabilitated systems face severe maintenance problems. Users' fees represent a negligible percentage of required operational and maintenance (O&M) costs.	Rationalize the operation and financing of public irrigation systems.	14. Divest State land to private sector, and/or land transfer to MARNDR for use as forest reserves.
Design standards of rehabilitated projects do not meet water supply requirements.	Improve rehabilitation projects designs.	15. Rehabilitation projects should be undertaken in areas where farmers have capacity to finance O&M costs. 16. Government should determine and enforce a tariff structure that will cover O&M costs. Water users should be gradually involved in systems administration.
VI. <u>Research and Extension</u>		
Research and extension efforts are extremely weak. Production, yields and technology have stagnated.	Increase agricultural production and productivity.	17. Undertake hydrological, meteorological and hydrogeological studies prior to projects' design. Projects should include water-catchment component. 18. Concentrate research and extension on a series of crops-specific actions in selected crops. 19. Involve farmer organizations in facilitating transfer of technology and sustainability of programs.

<u>Policy Issues</u>	<u>Objective</u>	<u>Proposed Measures</u>
VII. Forestry The forestry sector has been grossly neglected by Government. Remaining forests have practically disappeared, contributing to soil erosion.	Protect remaining forests and safeguard ecosystems from further destruction. Promote reforestation in suitable areas.	20. Increase forest areas through transfer of State land to MARNDR to become protected public domain (this is written up).
	Strengthen legal and institutional regulatory framework to address forestry and environmental issues.	21. Improve forest management through: (i) inventory, survey and demarcation of public forest areas; and (ii) establishment of a control system that prevents illegal logging and uncontrolled public forest use. 22. Update the Forestry Code. Propose basic environmental law. Increase technical and administrative capacity of the protective services.

APPENDIX 2

HAITI

AGRICULTURAL SECTOR REVIEW

Statistical Appendix

A.1	Gross Domestic Product by Sector of Origin, 1970-89	55
A.2	Value Added of Agricultural Commodities, 1976-1985	56
A.3	Coffee Export Price and Distribution of Revenues, 1970-89 . . .	57
A.4	Volume, Unit Price and Values of Exports of Major Agricultural Products, 1970-89	58
A.5	Production of Major Agricultural Commodities, 1970-88	59
A.6	Factors of Production in Agriculture, 1970-87	60
A.7	Composition of Tax Revenues, 1971-89	61
A.8	Average Retail Price of Selected Food Products, 1971-1989 . . .	62
A.9	Index of Selected Relative Prices, 1971-1989	63
A.10	International Price of Selected Commodities	64
A.11	Agriculture's Tariff Rate Structure, 1989	65
A.12	Annual Rice Production Estimates	66
A.13	Annual Maize Production Estimates	67
A.14	Annual Sorghum (millet) Production Estimates	68
A.15	Annual Black Beans Production Estimates	69

Table A.1: HAITI--GROSS DOMESTIC PRODUCT BY SECTOR OF ORIGIN, 1970-89
(In millions of 1976 Gourdes)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
GDP at Factor Cost	3161	3382	3420	3584	3848	3906	4210	4262	4437	4764	5108	4961	4652	4656	4673	4620	4646	4658	4616	4589
Agriculture	1482	1528	1523	1559	1597	1658	1676	1575	1604	1709	1723	1699	1627	1566	1621	1629	1671	1666	1635	1602
Mining	72	84	72	83	88	62	83	81	72	70	67	57	70	5	5	6	5	5	5	5
Manufacturing	439	502	539	536	606	556	664	738	778	864	970	856	843	888	836	812	789	773	767	779
Construction	88	100	117	154	197	205	226	234	254	280	288	298	269	286	291	328	308	317	320	323
Utilities	10	11	13	15	17	19	23	25	30	33	36	38	41	42	45	44	47	46	50	52
Transport & Communications	59	67	73	70	74	80	88	110	104	101	99	103	97	106	92	86	88	99	105	108
Commerce	545	599	591	633	661	669	763	779	806	877	963	904	864	906	877	885	868	890	872	846
Financial Services	4	5	6	6	7	8	9	10	11	12	13	14	15	16	16	9	10	10	10	9
Restaurants & Hotels	--	--	--	--	--	--	--	--	--	--	35	32	32	31	28	29	23	29	24	21
Housing	205	208	211	216	223	232	233	237	241	245	250	254	259	264	269	274	280	285	291	292
Government	158	173	166	207	274	302	327	345	407	429	149	167	143	161	188	195	202	177	176	177
Other (Personal Services)	98	105	109	105	104	115	118	128	130	144	515	539	392	385	405	323	355	361	361	375
Net indirect Taxes	204	201	196	205	161	147	185	181	184	198	234	235	366	400	398	461	467	433	397	395
GDP at Market Prices	3365	3583	3616	3789	4009	4053	4395	4440	4621	4962	5342	5196	5018	5056	5071	5081	5113	5091	5013	4984
GDP Percentage Change	--	6.4	0.9	4.7	5.8	1.1	8.4	1.0	4.1	7.4	7.7	-2.7	-3.4	0.8	0.3	0.2	0.6	0.4	-1.5	-0.6
Agricultural Percentage Change	--	3.1	-0.3	2.4	2.4	3.8	1.1	-6.0	1.8	6.5	0.8	-1.4	-4.2	-3.7	3.5	0.5	2.6	-0.3	-1.8	-2.0

Source: Haitian Institute of Statistics.

Table A.2: HAITI--VALUE ADDED OF AGRICULTURAL COMMODITIES, 1976-85
(In millions of 1976 Gourdes)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Corn	104.14	96.60	92.58	105.03	105.23	102.93	101.20	101.15	106.95	96.03
Rice	300.80	276.36	332.76	312.08	312.08	364.72	387.28	342.16	376.00	319.60
Millet/Sorghum	78.40	88.80	80.00	98.40	98.40	96.00	94.40	85.60	97.60	92.80
Beans	196.48	200.75	196.48	222.11	222.11	217.84	213.57	200.75	234.93	217.84
Bananas	209.25	154.94	183.66	193.40	193.40	178.25	210.10	157.84	190.63	189.05
Cassava	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75	93.75
Sweet Potatoes	165.00	184.80	201.96	177.40	177.40	186.12	206.58	228.36	231.00	231.00
Yam/Malanga	169.88	169.88	169.88	169.88	169.88	169.88	169.88	169.88	169.88	169.88
Coffee	217.00	234.00	195.58	251.04	251.04	233.10	225.75	252.00	260.75	252.00
Cocoa	5.86	3.64	5.84	5.80	5.80	5.17	9.04	9.26	9.48	10.18
Essential Oils	41.25	32.87	38.87	35.12	35.12	24.00	29.25	41.87	26.37	19.25
Mangoes (Exports)	0.46	1.69	1.28	1.18	1.18	2.57	3.80	5.62	6.14	6.14
Sugar Cane	95.00	90.00	105.00	115.00	110.00	80.00	100.00	75.00	110.00	105.00
Cotton	2.75	1.55	2.30	2.79	2.79	4.13	1.90	2.56	3.08	3.08
Sisal	13.60	13.20	16.40	9.20	9.20	3.60	10.00	1.06	1.37	2.88
Tobacco	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	8.93	8.93
Mangoes	105.40	105.40	105.40	105.40	105.40	105.40	105.40	105.40	105.40	105.40
Oranges/Grapefruit	102.48	102.48	102.48	102.48	102.48	102.48	102.48	102.48	102.48	102.48
Other	333.77	280.81	292.67	306.05	334.12	307.68	320.60	310.24	331.42	280.68
Total	2,245.10	2,131.32	2,226.72	2,316.11	2,339.21	2,287.43	2,394.78	2,294.79	2,466.13	2,305.95
Percentage Change (%)	--	-5.1	4.5	4.0	1.0	-2.2	4.7	-4.2	7.4	-6.5

Source: Laurent and Levitt, Draft, 1986 (as it appears in Ronco Consulting Corp; Agricultural Sector Assessment).

Table A.3: HAITI--COFFEE EXPORT PRICE AND DISTRIBUTION OF REVENUE, 1970-89
(In US\$/60 kg bag)

	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Export price	56.4	62.4	218.5	147.1	147.7	133.0	177.9	181.8	208.1	164.6	142.6	153.9
Producer Price	27.6	25.0	109.2	63.6	74.3	72.6	99.1	89.1	132.1	90.0	103.2	104.4
Intermed. Margins	12.4	21.2	53.4	45.7	36.0	25.3	35.2	48.7	35.7	57.8	39.4	49.5
Taxes	16.4	16.2	55.9	35.8	37.4	35.1	43.6	44.0	40.2	16.8	0.0	0.0

Source: Haitian Institute of Statistics; IMF.

Table A.4: HAITI--VOLUME, UNIT PRICE AND VALUES OF EXPORTS OF MAJOR AGRICULTURAL PRODUCTS, 1970-89
(Volume in '000 m tons; unit price in '000 US\$/m tons; value in US\$ million)

	1970	1972	1974	1976	1978	1980	1982	1984	1986	1988	1989
COFFEE											
Volume	16.19	18.64	18.77	26.82	19.14	25.00	14.60	23.40	16.60	14.30	13.60
Unit Price	0.94	0.84	1.28	0.98	1.95	3.64	2.46	1.96	3.47	2.27	2.54
Value	15.20	15.71	23.97	44.00	62.30	90.90	35.90	45.80	57.50	32.50	34.70
COCOA											
Volume	1.07	0.46	1.22	2.50	2.70	2.30	1.50	3.60	2.80	2.70	2.80
Unit Price	0.63	0.30	1.01	0.84	2.56	1.96	1.47	1.25	1.79	1.48	1.06
Value	1.07	0.01	1.24	2.10	6.00	4.50	2.20	4.50	5.00	4.00	3.00
ESSENTIAL OILS											
Volume	0.21	0.32	0.39	0.30	0.30	0.20	0.20	0.20	0.20	0.10	0.10
Unit Price	12.41	10.50	16.53	24.51	31.14	27.00	28.50	28.00	21.50	32.00	36.00
Value	2.66	3.32	6.52	8.20	9.40	5.40	5.70	5.60	4.30	3.20	3.60
SUGAR											
Volume	18.03	20.68	7.74	7.10	5.30	19.20	n.a.	15.20	11.00	7.10	6.90
Unit Price	0.16	0.16	0.23	0.25	0.44	0.33	n.a.	0.42	0.37	0.41	0.42
Value	2.84	3.40	1.76	1.80	2.30	6.40	n.a.	6.40	4.10	2.90	2.90
SISAL											
Volume	16.67	4.03	12.22	3.00	4.20	3.30	2.50	0.00	1.40	6.70	6.50
Unit Price	0.11	0.13	0.38	0.48	0.39	0.42	0.68	n.a.	0.57	0.66	0.77
Value	1.83	0.53	4.63	1.50	1.60	1.40	1.70	0.00	0.80	4.40	5.00

Source: Haitian Customs Yearbook, BRH and IMF.

Table A.5: HAITI--PRODUCTION OF MAJOR AGRICULTURAL COMMODITIES, 1970-88
(In '000 of m tons)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
FOOD COMMODITIES																			
Rice	74	73	73	85	119	108	92	90	114	122	124	120	116	113	122	124	129	124	121
Corn	235	240	252	257	204	204	251	168	161	183	186	179	176	171	186	186	196	206	205
Sorghum	195	210	211	215	134	134	100	111	100	123	125	121	118	107	118	121	119	135	136
Beans	40	42	43	44	41	44	46	47	46	52	53	51	50	47	47	48	48	49	55
EXPORT COMMODITIES																			
Coffee	24	32	33	33	35	35	26	25	29	23	43	33	32	36	37	37	38	30	38
Sugarcane	4,230	4,350	4,440	4,443	4,380	4,300	4,300	4,533	4,240	5,552	5,641	5,443	5,440	5,674	5,700	5,727	5,772	4,543	5,460
Cotton	4.0	4.0	4.0	4.0	3.2	3.2	3.3	3.6	4.9	5.8	5.9	5.7	5.4	6.0	6.0	n.a.	n.a.	n.a.	n.a.
Cocoa	3.7	3.1	3.1	3.1	3.5	3.5	3.5	1.6	3.5	11.6	3.4	2.2	4.5	4.6	4.7	5.1	5.6	5.19	2.96

Source: MARNDR.

-59-

Table A.6: HAITI--FACTORS OF PRODUCTION IN AGRICULTURE, 1970-87

	1970	1975	1980	1987
LAND ('000 ha)				
Cultivated Land	870	930	960	978
Pasture	635	560	508	496
Forest	68	63	58	52
LABOR ('000)	1,730	1,736	1,732	1,828 <u>a/</u>
- as % of labor force	74.3	72.2	70.0	65.0
REQUISITES (Imports US\$ '000)				
Fertilizers	12	127	1,020	700
Pesticides	167	430	1,283	2,300
Machinery	277	2,372	3,719	5,300

a/ Corresponds to 1988.

Source: FAO

Table A.7: HAITI--COMPOSITION OF TAX REVENUES, 1971-89
(In percentages)

	1971	1975	1980	1985	1989
Total Taxes	100.0	100.0	100.0	100.0	100.0
Import Duties	41.7	35.9	34.6	21.7	18.6
Coffee Export Taxes	12.3	9.7	16.8	5.4	-
Excise Taxes on Flour and Sugar	13.0	6.4	3.0	3.1	1.1

Source: Ministry of Economics and Finance.

Table A.8: HAITI--AVERAGE RETAIL PRICE OF SELECTED FOOD PRODUCTS, 1971-89

	Rice (G/lb)	Maize (G/lb)	Coffee (Producer Price) US\$/60 kg	Flour (G/lb)	Sugar <u>a</u> / (G/lb)
1971	0.55	0.2	19.8	0.66	0.44
1976	1.22	0.48	61.2	0.99	0.94
1977	1.45	0.67	131.4	0.99	1.09
1978	1.21	0.49	93.6	0.99	1.10
1979	1.68	0.54	88.8	0.99	1.10
1980	1.91	0.71	109.2	1.02	1.37
1981	2.36	1.02	63.6	1.21	1.76
1982	2.25	0.68	74.3	1.24	1.84
1983	2.40	1.10	72.6	1.29	1.89
1984	2.40	1.30	99.1	1.34	1.88
1985	2.60	1.30	89.1	1.48	1.90
1986	2.80	1.60	132.1	1.43	1.88
1987	1.80	1.20	90.0	1.25	1.81
1988	2.19	1.19	103.2	1.24	1.81
1989	2.40	1.29	104.4	1.43	1.91

a/ Refined sugar.

Source: Haitian Institute of Statistics.

Table A.9: HAITI--INDEX OF SELECTED RELATIVE PRICES, 1971-89

Year	<u>Rice</u> Maize	<u>Coffee</u> Maize	<u>Rice</u> Flour	<u>Rice</u> Sugar
1971	102.2	64.4	44.5	89.7
1976	94.5	82.9	65.8	93.1
1977	80.4	127.5	78.2	95.4
1978	91.8	124.2	65.3	78.9
1979	115.6	106.9	90.6	109.6
1980	100.0	100.0	100.0	100.0
1981	86.0	40.5	104.2	96.2
1982	123.0	71.0	96.9	87.7
1983	81.1	42.9	99.4	91.1
1984	68.6	49.6	95.6	91.6
1985	74.3	44.6	93.8	98.2
1986	65.1	53.7	104.6	106.8
1987	55.8	48.8	76.9	71.3
1988	68.4	56.4	94.3	86.8
1989	69.2	52.6	89.6	90.1

Source: Mission estimates based on Haitian Institute of Statistics and IMF data.

Table A.10: HAITI--INTERNATIONAL PRICE OF SELECTED COMMODITIES

Year	Coffee (US\$/lb) <u>a/</u>	Maize (US\$/bu) <u>b/</u>	Rice (US\$/m ton) <u>c/</u>	Sorghum (US\$/m ton) <u>d/</u>	Sugar (US\$/lb) <u>e/</u>
1970	50.5	1.48	189.6	51.8	3.76
1975	72.4	3.04	418.9	111.9	20.56
1976	141.9	2.85	308.6	105.2	11.56
1977	229.0	2.42	332.9	88.5	8.11
1978	155.0	2.56	399.0	93.8	7.83
1979	169.5	2.94	381.4	108.1	9.66
1980	150.7	3.19	496.0	128.9	28.67
1981	115.8	3.32	565.5	126.5	16.89
1982	125.6	2.75	366.7	108.4	8.41
1983	127.9	3.45	378.5	128.4	8.47
1984	141.2	3.45	379.7	118.2	5.20
1985	133.4	2.85	382.5	102.9	4.05
1986	170.2	2.23	342.8	82.4	6.05
1987	107.3	1.92	323.5	72.8	6.76
1988	115.1	2.72	429.9	98.5	10.19
1989	91.3	2.83	409.2	105.98	12.80

a/ Corresponds to all coffee (New York).

b/ United States (US Gulf Ports).

c/ United States (New Orleans).

d/ United States (US Gulf Ports).

e/ Caribbean (New York).

Source: International Financial Statistics.

Table A.11: HAITI--AGRICULTURE'S TARIFF RATE STRUCTURE, 1989

Classification	Most Frequent Tariff Rates (%)				
Animale	0	5			
Meat & Offal			20		40
Fish, Shellfish			10		
Milk, diary		5	10	20	
Other Animal Products			20		
Plants, flowers					40
Vegetable, food plants			20	30	40
Edible fruits				30	
Coffee, tea, spices			10		
Cereals, maize, rice					50
Flour-mill products					50
Seeds	0		20		
Raw materials plants			10		
Materials to be processed			10		
Oilseeds and Oil			10	20	
Meat & Fish Preparations			20		
Sugar, Sweets					40
Cocoa & Cocoa Preparations			20	30	
Cereal & Flour Preparations			10	20	30
Vegetable Preparations			20	30	
Misc. Food Preparations			20	30	
Drinks, vinegar			20	30	
Food Industry Scraps	0		10	20	30

Source: Ministry of Economics and Finance

Table A.12: HAITI--ANNUAL RICE PRODUCTION ESTIMATES BASED ON-FARM SURVEYS 1/

Department	Area ('000 ha)	Yield (m ton/ha)	Production ('000 m ton)
Sud	13.0	1.67	21.7
Grand-Anse	6.8	1.42	9.7
Sud-Est	0.1	-	
L'Ouest	9.8	2.13	20.9
Centre	3.0	1.30	3.9
Artibonite	41.9	3.00	125.7
Nord-Est	7.9	1.32	10.4
Nord	4.2	0.63	2.6
Nord-Ouest	0	0	0
TOTAL	86.7	2.25	194.9

1/ Area planted in 1988 and on-farm yields in 1990.

Source: Area Data: Summary Report, Agricultural Development Support
Project II - Haiti, USAID, 1988.

Yield Data: Estimation des Rendements des Cultures.
MARNDR - ADSII, USAID, 1990.

Table A.13: HAITI--ANNUAL MAIZE PRODUCTION ESTIMATES BASED ON-FARM SURVEYS 1/

DEPARTMENT	AREA ('000 ha)	YIELD (m ton/ha)	PRODUCTION ('000 m ton)
Sud	75.2	1.23	92.5
Grand-Anse	92.7	0.92	85.3
Sud-Est	28.4	0.39	11.1
l.-Ouest	25.0	0.50	12.5
Centre	74.1	1.00	74.1
Artibonite	71.2	0.49	34.9
Nord-Est	19.3	0.65	12.5
Nord	36.4	0.71	25.8
Nord-Ouest	25.7	0.84	21.6
TOTAL	448.0	0.83	370.3

1/ Area planted in 1988 and on-farm yields in 1990.

Source: Area Data: Summary Report, Agricultural Development Support
Project II - Haiti, USAID, 1988.

Yield Data: Estimation des Rendements des Cultures.
MARNDR - ADSII, USAID, 1990.

Table A.14: HAITI--ANNUAL SORGHUM PRODUCTION ESTIMATES BASED ON-FARM SURVEYS 1/

DEPARTMENT	AREA ('000 ha)	YIELD (m ton/ha)	PRODUCTION ('000 m ton)
Sud	63.1	0.73	46.1
Grand-Anse	36.8	0.46	16.9
Sud-Est	10.1	0.78	7.9
L-Ouest	22.4	0.62	13.9
Centre	32.2	1.10	35.4
Artibonite	58.8	0.70	41.2
Nord-Est	0.3	0.17	0.1
Nord	11.6	0.90	10.4
Nord-Ouest	2.3	0.88	2.0
TOTAL	237.6	0.73	173.9

1/ Area planted in 1988 and on-farm yields in 1990.

Source: Area Data: Summary Report, Agricultural Development Support Project II - Haiti, USAID, 1988.

Yield Data: Estimation des Rendements des Cultures.
MARNDR - ADSII, USAID, 1990.

Table A.15: HAITI--ANNUAL BLACK BEAN PRODUCTION ESTIMATES BASED ON FARM SURVEYS 1/

DEPARTMENT	AREA ('000, ha)	YIELD (m ton/ha)	PRODUCTION ('000, m ton)
Sud	14.0	1.15	16.1
Grand-Anse	29.8	1.06	31.6
Sud-Est	6.8	0.62	4.2
L-Ouest	1.0	0.72	0.7
Centre	14.2	0.67	9.5
Artibonite	0.7	0.52	0.4
Nord-Est	0.2	0.51	0.1
Nord	0.7	0.52	0.4
Nord-Ouest	0.5	0.56	0.3
TOTAL	67.9	0.93	63.3

1/ Area planted in 1988 and on-farm yields in 1990.

Source: Area Data: Summary Report, Agricultural Development Support
Project II - Haiti, USAID, 1988

Yield Data: Estimation des Rendements des Cultures.
MARNDP - ADSII, USAID, 1990.

MAP SECTION

