DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

HAITÍ

AGRICULTURAL INTENSIFICATION PROGRAM

(HA-0016)

LOAN PROPOSAL

This document was prepared by the project team consisting of: Juan Carlos Paez (COF/CHA); Sergio Mora (COF/CDR-CHA); John Horton (COF/CUR); Diego Arias (RE2/EN2); Maristella Aldana (LEG/OPR2); Paul Trapido, Team Leader (RE2/EN2); and Eliana Smith (RE2/EN2) who collaborated in the editing of the document.

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For basic socioeconomic data, including public debt information please refer to the following address:

http://www.iadb.org/RES/index.cfm?fuseaction=externallinks.countrydata

INFORMATION AVAILABLE IN THE FILES OF RE2

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Note: All of these annexes were utilized during the preparation and form a vital part of the materials for project execution.

ABBREVIATIONS

AP	Annual Plan
BCP	*Bureau de Coordination du Projet (*PIA Coordinating Office*)*
COP	*Comitee de Pilotage*
CP	Country Paper
CRDA	Centre de Recherche et Développement Agricole
DDA	Direction Départementale d'Agriculture
DPCE	Planning and Economic Cooperation Unit
DEAP	Department of Agriculture Infrastructures of the MARNDR
EDH	Electricity Power Company
ESIR	Environmental and Social Impact Report
ESMP	Environmental and Social Management Plan
FAO	United Nations Food and Agriculture Organization
IICA	Inter-American Institute for Cooperation on Agriculture
IFAD	International Fund for Agricultural Development
ILO	International Labor Organization
INARA	National Agrarian Reform Institute
IRR	Internal rate of return
MARNDR	Ministry of Agriculture, Natural Resources and Rural Development
MM	Millimeters
NGOs	Non-governmental organizations
ODVA	*Organization du Developement de la Vallee de l'Artibonite*
ONACA	*Office National du Cadastre (National Cadastre Agency)*
OR	Operating Regulations
PIA	Agricultural Intensification Program
PIDA	Sustainable Agricultural Intensification Program
PIP	Program Implementation Plan
SIG	Irrigation Service
SNRE	National Water Resource Service
STUG	Support Teams to User Groups

TSR	Transition Strategy for Reengagement
USAID	United States Agency for International Development
UE	European Union
VAT	Value added taxation
WUST	Water User Support Teams

Inter-American Development Bank
Regional Operations Support Office
Operational Information Unit

Haiti

Tentative Lending Program

2003

Project Number	Project Name	IDB US$ Millions	Status
HA0016	Agricultural Intensification	37.0	
HA0079	Local Development Program	65.0	
HA0093	Program for Rehabilitation of Basic Economic Infraestructure	70.0	
HA0092	Public Finance Reform	25.0	
	Total - A : 4 Projects	**197.0**	
	TOTAL 2003 : 4 Projects	**197.0**	

2004

Project Number	Project Name	IDB US$ Millions	Status
HA0082	Institutional Strengthening Executive Branch	5.0	
HA0017	Vocational Education	22.0	
HA1001	Government Financial Accountability and Governance	25.0	
HA0087	Road Rehabilitation Program	35.0	
HA1002	Nouveaux Cité Soleil	50.0	
	Total - A : 5 Projects	**137.0**	
HA1003	Rural Economy Development Program	30.0	
	Total - B : 1 Projects	**30.0**	
	TOTAL - 2004 : 6 Projects	**167.0**	
	Total Private Sector 2003 - 2004	**0.0**	
	Total Regular Program 2003 - 2004	**364.0**	

*** Private Sector Project**

HAITI

IDB LOANS

APPROVED AS OF AUGUST 31, 2003

	US$Thousand	Percent
TOTAL APPROVED	**748,636**	
DISBURSED	586,535	78.34 %
UNDISBURSED BALANCE	162,102	21.65 %
CANCELATIONS	29,146	3.89 %
PRINCIPAL COLLECTED	129,523	17.30 %
APPROVED BY FUND		
ORDINARY CAPITAL	0	0.00 %
FUND FOR SPECIAL OPERATIONS	742,304	99.15 %
OTHER FUNDS	6,332	0.84 %
OUSTANDING DEBT BALANCE	**457,012**	
ORDINARY CAPITAL	0	0.00 %
FUND FOR SPECIAL OPERATIONS	456,592	99.90 %
OTHER FUNDS	420	0.09 %
APPROVED BY SECTOR		
AGRICULTURE AND FISHERY	55,608	7.42 %
INDUSTRY, TOURISM, SCIENCE AND TECHNOLOGY	22,882	3.05 %
ENERGY	0	0.00 %
TRANSPORTATION AND COMMUNICATIONS	211,162	28.20 %
EDUCATION	53,979	7.21 %
HEALTH AND SANITATION	189,405	25.29 %
ENVIRONMENT	0	0.00 %
URBAN DEVELOPMENT	0	0.00 %
SOCIAL INVESTMENT AND MICROENTERPRISE	154,462	20.63 %
REFORM AND PUBLIC SECTOR MODERNIZATION	50,642	6.76 %
EXPORT FINANCING	3,117	0.41 %
PREINVESTMENT AND OTHER	7,380	0.98 %

* Net of cancellations with monetary adjustments and export financing loan collections.

INTERAMERICAN DEVELOPMENT BANK
ITS/ITC

HAITI

STATUS OF LOANS IN EXECUTION

AS OF AUGUST 31, 2003

(Amount in US$ thousands)

APPROVAL PERIOD	NUMBER OF PROYECTS	AMOUNT APPROVED*	AMOUNT DISBURSED	% DISBURSED
REGULAR PROGRAM				
Before 1997	**2**	**77,000**	**60,915**	**79.11 %**
1997 - 1998	**4**	**145,900**	**0**	**0.00 %**
TOTAL	**6**	**$222,900**	**$60,915**	**27.33 %**

* Net of cancellations. Excludes export financing loans.

AGRICULTURAL INTENSIFICATION PROGRAM

(HA-0016)

EXECUTIVE SUMMARY

Borrower:	The Republic of Haiti	
Executing agency:	Ministry of Agriculture, Natural Resources and Rural Development (MARNDR)	
Amount and source:	IDB: (FSO)	US$41.94 million
	Government contribution:	US$ 4.66 million
	Total:	US$46.60 million
Financial terms and conditions:	Amortization Period:	40 years
	Grace Period:	10 years
	Disbursement Period:	6 years
	Interest Rate:	1% during the first 10 years and 2% thereafter
	Supervision and Inspection:	1%
	Credit Fee:	0.5%

Objectives: The Program aims to increase the income of Haitian farmers in the Artibonite Valley through a process of agricultural intensification by increasing the efficiency and sustainability of water used for irrigation. **Sub-Program A** focuses on the institutional strengthening of the water management authorities (*Organization du Developement de la Vallee de l'Artibonite* (ODVA) and the MARNDR) and the organization of water users, providing technical assistance for agricultural intensification and diversification, and support for better managing water resources for agriculture and improved land tenure security. **Sub-Program B** aims at protecting, repairing, rehabilitating, and expanding irrigation and drainage infrastructure, to improve water use efficiency in the valley.

Description: **Sub-Program A**: The sub-program aims at providing the necessary support and assistance to ensure the sustainability of the Artibonite Valley irrigation system, serving as complimentary to the physical infrastructure investments in Sub-program B. The three components of the Sub-Program A are:

1. The component will provide **support for the organization of water user groups (US$4.5 million)**, as well as establishing a *Comite de Pilotage* for the Artibonite Valley that would include the participation of representatives of water user groups and provide a platform for joint management of the overall irrigation and drainage system with the irrigation water

authority. Support will also be provided to increase land tenure security, including implementing a farm level cadastre with an analysis of the corresponding tenancy arrangements.

2. The component will provide **support for agricultural intensification and market linkages (US$4 million)** engaging producers initially by concentrating on their most pressing needs with regard to agricultural production. This entails assistance with regard to seed varieties, cropping patterns, pest and disease control, and improved soil management.
3. The component will provide **institutional strengthening (US$3.5 million)** through technical assistance in the public domain essential to intensification in the *Artibonite Valley*. Assistance will be provided to the MARNDR for: (i) hydrological data collection and modeling ; (ii) analysis and dissemination services; and (iii) institutional support for the ODVA for a better management of the irrigation and drainage system of the valley.

Sub-Program B: The sub-program aims at the protection, repair, rehabilitation, and expansion of irrigation and drainage infrastructure in the *Artibonite Valley*. The nine components of the sub-program are:

1. The component will finance the **repair and protection of broken embankments (US$1.5 million)**, providing protection from flooding for approximately 10,000 hectares.
2. This component will finance the **restoration of drainage capacity (US$3.41 million)** providing increased protection from flooding and improving agricultural yields for more than 6,000 hectares as well as the rebuilding of eight access bridges in crossings constantly affected by flooding.
3. This component will finance **flood control measures (US$0.22 million)** to avoid the constant overflowing of the Artibonite River into these minor streams, protecting approximately 1,000 hectares of cultivated land from flooding.
4. This component will finance the **improvement of floodway capacity (US$2.88 million)** to withstand 600 m^3/sec flows over 5.4 km by raising and reinforcing embankments and building one access bridge.
5. This component will finance the **capacity expansion of the main channel, Artibonite Sud (US$5.7 million)** by improving its hydrological characteristics for 31.6 km of channel length in order to ensure the improvement of the water user efficiency of 5,000 hectares of irrigated lands.

6. This component will finance the **rehabilitation of primary channels of the Artibonite Valley system (US$1.8 million)** by recalibrating certain channels and introducing a tele-surveillance system that will allow a better coordination of water use throughout the system by providing a real-time management of the resource.
7. This component will finance the **rehabilitation of secondary irrigation and drainage systems (US$2.7 million)** providing enough irrigation water and drainage for 5,000 hectares of cultivated land.
8. This component will finance **irrigation and drainage infrastructure for the *Rive Droite* of Estère (US$4.95 million)** by constructing a primary and secondary irrigation and drainage system, which will supply water to 1,120 hectares.
9. This component will finance the **construction of tertiary irrigation and drainage systems (US$3.0 million)** increasing water delivery and drainage efficiency for approximately 10,000 hectares of the project area.

Bank's country and sector strategy:

The present operation fits closely with the emphasis of the Bank's Transition Strategy for Re-engagement (TSR) on the importance of strengthening the agricultural sector as part of an effort to overcome the process of decapitalization and to establish the basis for sustainable growth. The TSR envisions the promotion of agriculture and rural production investments and exports through intensified efforts to revive agriculture production and productivity and through essential rural infrastructure and services, and laying the basis for linking future investments to key reforms in agriculture, central features of this Program. The TSR also foresees strengthening key sectoral institutions.

The Bank and the Government have concluded that the resources should concentrate on the Artibonite Valley, based on the extensive feasibility studies undertaken within the framework of the *Artibonite Valley* Master Plan (see Par. 1.36) and the government priority on the agricultural sector to achieve sustainable intensification. The types of direct public investment required include primary and secondary irrigation and drainage infrastructure, strengthening the institutional framework, technical assistance for agricultural intensification and diversification, and improved land tenure security. These public investments lay the foundation for increased private investments at the level of farmers, buyers and input suppliers to maintain the intensified level of production indefinitely.

Environmental/:

The PIA Environmental and Social Management Plan (ESMP)

social review: addresses the full range issue-areas identified during the preparation of the project. (Par. 4.16-4.24.) There are no negative aspects to the PIA that have not been noted, with the corresponding corrective actions identified in the ESMP. In general the PIA design derives in large measure from the conviction that for any agricultural intensification effort to succeed in fulfilling its objective to increase small-farmer income, it must mobilize widespread social participation and link productivity gains to protection and efficient use of the natural resources. The PIA design has internalized these fundamental prerequisites throughout.

The Program intends to generate a series of benefits for the region and the environment, including flood prevention and control, improved food availability and household income, a heightened social cohesion and efficient and sustainable use of the natural resource base. The approach also includes an agreement with the Electricity Power Company (EDH) to provide for inter-sectoral water resource management.

Benefits: The Program will increase household income substantially in the project zone, accounting for approximately 170,000 persons, of which some 29,000-core beneficiaries are projected to at least a 200% income increase per hectare of cultivated land over a 10-year period. The increased supply of high value horticultural products will also increase exports and therefore hard currency receipts. Related off-farm economic component will gain from the increased need for product handling, transport and processing of outputs as well as increased demand for goods and services as inputs to production.

Improved water supply, drainage, and soil fertility, constitute important long-term benefits of the Program. The Program will also improve the long-term efficiency and management of irrigated perimeters. Reinforcement of the public capacity to monitor and analyze hydrological data, as well as to coordinate the use of hydrological resources across institutions, will contribute to the long-term sustainability of the benefits of intensification.

Risks: **Water Users Groups.** The process of organizing water user groups will require that producers invest their time and income to pay for water. The PIA will introduce mechanisms for the users to participate and have oversight of the operation and maintenance of infrastructure and cost recovery for the works.

Operations and Maintenance of Irrigation and Drainage. The past record of the ODVA and its institutional weaknesses will be mitigated by the PIA by providing support for strengthening the ODVA in order to improve its management capacity. The Bank will monitor closely ODVA's performance and during the annual

meetings with the COP to discuss the PIP, recommend corrective actions to support the achievement of the project's objectives.

Disruptions in Inputs and Access to Credit. Should major disruptions occur in the input delivery system or availability (seeds, fertilizer), productivity gains will not be achieved to the degree expected. Sensitivity analysis shows the program can sustain such a delay for up to two years. The PIA will rely on existing programs to assure supply. Similarly, if there are future distortions in credit markets (for example due to deteriorating macroeconomic conditions) or distortions in the labor supply market (for example due to labor-intensive works projects in the vicinity of the project area), this would adversely affect the achievement of project objectives

Commodity Price Level and Variations. Domestic food prices exceed international commodity prices for agricultural products produced in the project area. The foregoing analysis incorporated the risk that producers would not receive these higher prices by utilizing the international price levels as reference prices. The sensitivity analysis performed indicated that these variations did not significantly affect the economic viability of the project. Similarly, if there is an increase in food aid programs, this may undermine the market for agricultural products produced in the project area.

Political or Social Upheaval. Significant political or social upheaval would seriously undermine the viability of the Program. The resulting delays in addressing the need for infrastructure rehabilitation, land tenure security and agricultural intensification will diminish the long-term prospects for success.

Natural disasters. The engineering techniques required to execute the works present few technical risks for the national and international contractors. Additional natural disasters would however substantially disrupt completion of the works within the projected time frame and jeopardize achieving the expected results.

Special contractual clauses:

Prior to the first disbursement, the MARNDR shall present evidence satisfactory to the Bank that:

a. a *Comité de Pilotage* (COP) has been created through a MARNDR memorandum, with the functions described in paragraph 3.2 , and is integrated by: (i) the Minister of Agriculture, Natural Resources and Rural Development; (ii) the Departmental Director of the Artibonite of the MARNDR (DDA); (iii) a delegate of the MARNDR in charge of agriculture infrastructure; (iv) the General Director of ODVA; and (v) two representatives of the water user groups;

b. the creation of the *Bureau de Coordination du Projet* (BCP) at the MARNDR has been formalized, its manager and assistant manager have been confirmed in their positions or alternate candidates and a Specialist Accountant have been hired; ,
c. an Operating Regulations (OR), satisfactory to the Bank, and which includes guidelines consistent with the ESMP (see paragraph 3.2), the logical framework, and the PIP with the sequencing of investment components and the actions required to assure their feasibility, has been approved by the *Comité de Pilotage* (COP) and the MARNDR and is in effect;
d. an operational framework between the ODVA and the EDH has been agreed upon for the management of the hydrological resources of the Artibonite Valley system; and
e. the MARNDR shall have established the special bank accounts to receive the resources of the financing and the local counterpart.

Notwithstanding the conditions to the first disbursement above, once the Borrower has fulfilled the general conditions prior to the first disbursement, as shall be established in the General Norms of the Loan Agreement. The Bank may disburse up to US$450,000 to permit the fulfillment of conditions prior to first disbursement set forth above.

Poverty-targeting and social equity classification:

The Program qualifies as a poverty-targeted investment according to the Bank's Eighth Replenishment agreement (document AB-1704, as amended by document GN-1964-3 of June 3, 1997), since over 50% of the population affected is below the poverty threshold, applying either head-count or geographic criteria. The primary direct beneficiaries are all small-holders and laborers whose income falls well below the poverty threshold.

Coordination with other official development finance institutions:

International development institutions have been active in Haiti's agricultural sector, however this assistance is currently limited to grants and in many cases is executed through by non governmental organizations. A Map of Investments for the Agricultural Sector, developed by the Country Office in Haiti in 2002 was used to establish the coordination with other donor groups that were working in the project area (the Artibonite Valley) as well as the rest of the country.

This georeferenced data base facilitated discussions with other international organizations to ensure that the PIA would be complementary to their projects in Haiti including: USAID (hillside agricultural project), FAO (Marmelade Rural Development Project), IFAD (agricultural intensification and irrigation and drainage activities); Inter-America Institute for Cooperation on Agriculture (IICA) (technical assistance and

extension projects), the Taiwanese Mission (development of new varieties of rice project) and UE (Rural Development Project). On going coordination of the PIA's activities with other donors will be maintained during the project's execution. A technical annex was prepared (see Annex V of the technical files) identifying the areas and activities of these donors and is available in the project files.

Exceptions to Bank policy: A special disbursement to facilitate compliance with conditions prior to first disbursement is proposed, prior to compliance with the conditions set forth in article 4.01 (c) and (d) of the general norms of the loan contract.

Procurement: Contracting of works and acquisition of goods and services will be ruled by the Bank's procurement policies and procedures. International competitive bidding will be used to award contracts to purchase consulting services in excess of US$200,000, goods and services also in excess of US$200,000, and civil works in excess of US$1.0 million. Under this threshold, Haiti's procurement regulations will be applied in view of particular needs of the program, the Government of Haiti and the Bank may mutually establish specific conditions and procedures, provided that they are consistent with the Bank policies and procedures. The detailed procurement plan is presented in Annex II.

I. FRAME OF REFERENCE

A. Economic and demographic context of the agricultural sector

1.1 The demographic pressure in rural Haiti has already surpassed the sustainable carrying capacity of the land given existing agricultural production techniques. Haiti has a population density of roughly 5 persons per hectare. Although farm size varies with agro-ecological conditions, the vast majority of farmers are small holders and a substantial proportion of families cultivate less acreage than required to sustain themselves. Over-stretched resources will be strained further as the population growth rates continue to exceed 2% annually, even after adjusting for substantial emigration.

1.2 An estimated 70% of Haiti's population lives in rural areas. Discounting those who are in rural communes (counties) on the edge of urban areas, the rural population still accounts for 60% of all Haitians. While the vast majority of these consider themselves farmers, recent surveys of the rural population indicate that the average rural family derives less than half of its income from farming. Their survival strategies depend on remittances from family members abroad or in the capital, on the sale of their labor to works projects or seasonal labor opportunities elsewhere in the country and on petty commerce. These sources collectively constitute roughly 60% of household income.

1.3 Data on the nutritional status of the rural population combined with the available income estimates amply demonstrate the inadequacy of the current agricultural productive capacity both in terms of generating cash and food. The United Nations Food and Agriculture Organization (FAO)'s estimates of total food supplies since 1960, combining purchased and produced foodstuff for the entire Haitian population, suggest severe chronic inadequacies. Supplies further deteriorated during the late 1980's, and plummeted during the 1991-94 commercial embargo. They have recovered somewhat, but remain at only 80% of the recommended per capita caloric levels.

1.4 The frontier for land extension has generally been exhausted throughout Haiti. Stagnant production technologies and scarcity of alternative employment opportunities have left little outlet for the demographic growth other than out-migration. A series of disasters have aggravated this vulnerable situation over the past decade, including Hurricane Georges, political upheavals, destruction of the traditional swine population and the onset of the coffee rust disease, all in addition to the embargo. These emergencies, along with the lack of maintenance and ownership of public infrastructure, have drained producers' meager savings, damaged the agricultural resource endowment and run down the scant infrastructure.

1.5 Long-term solutions to this situation must address population issues directly and must include substantially enhanced off-farm employment opportunities. However, for those who remain on the land, the only option is agricultural intensification in areas where increases in production and farmer income can be achieved in ways compatible with the preservation of the natural resource base.

1.6 **The Artibonite Valley:** The Artibonite Valley has a population of over 285,000 people living in about 700 villages, most of whom currently live in conditions of extreme

poverty, in part because of the highly atomized pattern of land distribution. The valley is the principal rice growing region of Haiti because of the irrigation system established following the construction of the Peligre Dam in 1950. There are currently about 35,000 hectares of land equipped with full or partial irrigation and drainage works. A very high percentage of the soils are classified as I or II under the Holdridge system, indicating excellent characteristics for agricultural production. The establishment of the irrigation system in the 1950's also brought land conflicts. However, in recent years, the national agrarian reform agency, INARA, has had some success in improving land tenure security in the region. Nevertheless, future political developments may have an impact on the efforts of the INARA to regularize land tenure in the area.

1.7 **Hurricane Georges:** On September 22, 1998, Hurricane Georges struck Haiti causing widespread damage. Though the mountainous topography considerably attenuated the winds, the protracted deluge resulted in flood levels, which reached 1600 cubic meters per second (m3/sec) in areas of the Artibonite River along dikes built for no more than 700 m3/sec. The infrastructure has suffered substantial damage from which it has not since recovered its functional capacity. Emergency repairs to the principal irrigation and drainage system serving small-scale perimeters across the Artibonite Valley have not been undertaken.

B. Sector policy and economic incentives

1.8 Haitian macro-economic and sector policies since the return of the Constitutional Government in 1994 have established an economic environment relatively free of direct policy distortions, which discourage economic activity in general, and agricultural production in particular. The Government has eliminated all quantitative restrictions, export taxes and taxes on agricultural inputs. The most significant constraints to sustainable agricultural intensification derive from past chronic low levels of investment in the sector, the weakness or nonexistence of public services in support of the sector, the dilapidation of physical infrastructure for marketing and trade, and the weakness of the institutional and legal infrastructure needed to create an attractive investment environment.

1.9 **Macro-economic and trade policy.** The Government's tight fiscal and monetary policies since the end of the embargo in November 1994 contributed to exchange rate stability and relatively low inflation through the end of the nineties. The elimination of all price and quantity controls has contributed to open markets for all agricultural products in the country. Private actors compete for trade across all segments of marketing. Major imported food staples do face border taxes, which protect an array of basic products. Combined, these taxes add 15-35% to domestic prices, thereby distorting incentives in favor of traditional (local) food crops, which are import substitutes. Export crops receive no direct taxes nor subsidies.

1.10 **Agricultural Input Policy.** There is a government sponsored agricultural input program for fertilizers, but it suffers from weak policy coordination, numerous interruptions, disparate regional coverage and lack of a bona fide exit strategy. Although the price of the fertilizer sold in the local market is as high as the price obtained in the international market, commercial input suppliers will not build up their inventories and distribution

networks until they perceive that they will not be undercut by the Government fertilizer programs. Meanwhile, demand for inputs remains limited because farmers are unfamiliar with and skeptical about the cost-effectiveness and dependability of purchased inputs.

1.11 **Water Policy.** A second input that has been subsidized in the *Artibonite Valley* is water for irrigation. The subsidy is almost 100% of the cost of delivering water. Currently there is a water tariff set by the *Organization de la Vallee de l'Artibonite (ODVA)* of 55 gourdes per hectare (US$1.4/ha) that has been fixed since 1982. The current collection rate of the tariff is approximately 10%, so effectively, the ODVA is able to collect only 5.5 gourdes per hectare (US$0.14/ha), while the actual operation and maintenance costs are approximately 1670 gourdes per hectare (US$45/ha).

1.12 **Land Policy.** Numerous land tenure problems thwart rational utilization of this scarce resource in many areas. The gamut ranges from excessive fragmentation of holdings, to absenteeism and rental relationships leading to unsustainable cultivation practices, to poorly utilized State lands, to lack of identification documents and birth certificates, to conflicting claims and even multiple titles provoking considerable insecurity and sometimes violent disputes. The 1987 Constitution mandated the establishment of the National Agrarian Reform Institute (INARA) to begin to resolve these issues.

1.13 INARA embarked on this task with modest resources in 1996. Launched initially with grants from the IDB and the FAO, INARA has begun a process of data collection, public consultation and policy formulation. However, despite the high priority accorded agrarian reform, little budgetary support has materialized. Practical measures to enhance land security are expected in the coming years but the enormity and complexity of the problems means that until this occurs, localities, which continue to suffer from land tenure insecurity, will have diminished incentives to invest in measures to intensify agricultural production.

1.14 **Water Resource and Forestry Policy.** Dense occupation of fragile lands in upper watersheds creates significant negative externalities for farmers and other consumers of water downstream. Forestry conservation policies and procedures have proven unenforceable since the mid-1980s. Prospects for linking downstream beneficiaries to upstream watershed management hinge in good measure on the willingness of the Government to increase local fiscal autonomy of water-user groups. As has been demonstrated in the Archaïe region where the MARNDR sanctioned some increased autonomy, water-user groups have increased their investments in maintaining and protecting the works and the water resource.

1.15 **Rural Infrastructure Policy.** Taxation of imported vehicles and parts, and excise taxes on hydrocarbons provide an important source of fiscal revenue. However, these taxes raise truck transport costs by almost 40%. This impact strongly penalizes commercial agriculture. Severe decapitalization and under-investment in road infrastructure also exacts a heavy toll in terms of both vehicle operating costs and crop damage in transport, particularly to the more perishable commodities. In the short run, these costs will force producers to concentrate on non-perishable products and robust handling techniques. In the long run, the on-going ambitious program of national road construction and repair should help to expand areas with potential for intensification.

1.16 Currently the Bank is preparing a project geared towards the rehabilitation of basic infrastructure (HA-0093). Through the establishment of an investment fund, various actions would be undertaken that will have an impact in rural areas: (i) rehabilitation and improvement of transport and communication infrastructure (ports, airports, passenger and cargo terminals, bridges, quarantine stations, and roads); (ii) urban and municipal infrastructure (slaughter houses, market places, industrial parks); (iii) electrical infrastructure; (iv) potable water, sewerage, and solid waste management systems; rural development works (hydraulic management, irrigation channels); etc. The works to be financed will be medium in scale, between US$200,000 and US$1,500,000 and will allow to recuperate or improve the functionality of deteriorated infrastructure.

1.17 **Rural Finance Policy.** The dearth of financial institutions capable of providing access to dispersed small borrowers means that the rural sector will continue to suffer from credit constraints throughout the project life. The former public agricultural credit bank exists nominally but remains largely inactive. The slow process underway to strengthen the legal and institutional framework for all financial institutions will eventually improve access to formal lending. In the mean time, two strategies exist to augment traditional sources of credit to farmers. The first is to mobilize savings through rural credit unions. Several projects have already demonstrated success of some schemes in a number of areas, including the zone where the project will begin. The second credit source arises where market linkages can be established to existing buyer groups particularly for export. Already, some input distributors and produce buyers have demonstrated willingness to offer short-term supplier credit and even limited working capital to growers of high-valued horticultural products.

C. The Bank's strategy and rationale for involvement

1.18 The Bank's Transition Strategy for Reengagement (TSR) emphasizes the importance of strengthening the agricultural sector as part of an effort to reverse the process of decapitalization and to establish the basis for sustainable growth. The TSR envisions the promotion of agriculture and rural production investments and exports through intensified efforts to revive agriculture production and productivity and through essential rural infrastructure and services, and laying the basis for linking future investments to key reforms in agriculture. In addition to the present agricultural investment operation, the Bank has spearheaded the support for basic infrastructure rehabilitation and road rehabilitation, which will provide assistance with the rehabilitation of dilapidated infrastructure and improving access to basic services. The important Bank-supported potable water policy reform and investment program will further facilitate the process of dialogue between the sectors with competing demands for water.

1.19 Taking stock of the lessons learned from the Bank's experience in Haiti with irrigation investments, the Country Office (COF) has led the effort to formulate proposed investments in the Artibonite Valley (ATN/SF-2145-HA). A consortium of leading international firms has completed its assistance to the MARNDR to develop a Master Plan, and subsequent engineering studies, for the development of the Artibonite Valley, which emphasizes the increased participation, and responsibility of farmers for the management of works (see Annex III and IV of the technical files). Such strategy resulted in a proposal presented by the MARNDR to the Bank, which included the most

urgent irrigation infrastructure rehabilitation, and drainage works necessary to reactivate the agricultural production of the Artibonite Valley.

1.20 At the current juncture, the approach agreed upon by the Bank and the GOH is to concentrate in rehabilitation and expansion of current irrigation and drainage infrastructure and complementary agricultural technical assistance in the Artibonite Valley. This investment would bring immediate benefits for agricultural productivity, while strengthening the institutional framework in which this infrastructure and water resources are managed. The Government of Haiti (GHO) has indicated that in the future it would be interested in preparing a new operation similar to the PIA design to be implemented in another region of the country.

D. Lessons learned

1.21 **Past Bank experience in the sector:** In 1976 the Bank approved loan 473/SF-HA (US$5.0 million) to finance a first phase of a global program called Artibonite Stage I. The objective was to increase rice production in the Valley of the Artibonite by upgrading the irrigation system and helping farmers to increase productivity. The Artibonite Valley is the most important area for agricultural production in Haiti, however, it was clear that small farmers in the region would not be able to expand output without significant intervention.

1.22 In 1982 a Second Stage began with loan 690/SF-HA (US$17.60 million) and ATN/SF-2152-HA. It was meant to complete works left incomplete by the First Stage and expanded the coverage. However, due to incomplete infrastructure designs, political upheaval, cost overruns and execution difficulties it was not possible to complete the Second Stage without supplementary financing. Subsequently, in 1990, Loan 845/SF-HA (US$11.55 million) was approved to not only complete the components started with 690/SF but to improve the executing agency's capacity to manage the system.

1.23 These projects (phases I and II) are one of the few programs financed by the Bank that spanned the full spectrum of Haiti's recent political history. The political context has been tremendously important for these projects, both for determining the basic design of the program and for its direct impact on the timeliness and efficiency of project execution. They have been a success in terms of providing the necessary infrastructure. However the broader economic and social development objectives were not fully attained as issues such as the sustainability of operation and maintenance of the works, land tenure security, crop diversification and agricultural intensification were never properly addressed. Key lessons learned from these projects can be summarized as follows: (i) projects should not depend on parallel financing or activities to be successful; (ii) activities regarding the promotion of the project's objectives should be conducted before the initiation of construction, otherwise the projects tend to be driven by the more "tangible" infrastructure components, (iii) sustainability issues have to be addressed during the design of projects, to insure that ownership of the project by its beneficiaries, and (iv) care must be given to design procedures or trigger mechanisms to assist in determining what actions the Bank should take to support projects when it becomes evident that achievement of the development objectives is doubtful.

1.24 **Past worldwide experience:** While the Bank and many donors have financed numerous irrigation investments in Haiti, efforts to synthesize the experience from intensification operations elsewhere in the world have yielded the following five lessons learned: (i) farmers must perceive high financial returns to induce them to assume the additional costs and risks of intensification; (ii) intensification programs must incorporate more than irrigation to succeed; (iii) local water-user organizations must assume increasing responsibility for efficient management of infrastructure; (iv) in erosion-prone environments, upstream protection of watersheds are necessary to justify agricultural investments downstream; and (v) export-led strategies tend to bring more dynamic change to the sector than import-substitution strategies.

1.25 **Do's and Don'ts of Irrigation:** Building on past experience, the project team applied six major principles to design the program with regard to irrigation. (i) Concentrate on small-scale irrigated perimeters ("PPI") first, while building experience and technical feasibility for eventual medium-scale perimeters (over 500 hectares). (ii) Utilize a participatory design process throughout. (iii) Anticipate a progressive transfer of management responsibility to the user groups and nascent water-user associations. (iv) Contract the construction of works out to private engineering firms to the extent possible, while insisting on farmers contributing labor for on-farm tertiary works. (v) Do not proceed with irrigation investments until identifying a feasible market-driven production intensification scheme. (vi) Link any irrigation construction to specific watershed and reservoir maintenance measures in order to protect the physical works against sedimentation and assure continued ample water supply.

E. Institutional framework

1.26 The MARNDR is responsible for, among other institutions and among other tasks, undertaking and facilitating public and private interventions in rural areas for the diversification and increase of sources of revenue, for establishment of Government policy for the management of natural resources, including the conservation and exploitation of soil and water, and for encouraging the organization of user groups of irrigation systems for a more rational and efficient use of water resources. The MARNDR also coordinates the technical and financial assistance to governmental and non governmental entities in the agricultural sector.

1.27 The *Artibonite Valley Development Organization* (ODVA) is an autonomous decentralized entity, created in 1960 and restructured in 1971 under the *tutelage* control of the MARNDR. The ODVA has the technical, administrative, financial and all other responsibility over the works constructed or to be constructed in the Artibonite Valley. The ODVA has authority to execute, directly or through third parties, construction, administration or management contracts for the development of the *Artibonite Valley* and for the maintenance and usage of finished works. The ODVA is also charged with the mission of encouraging the formation of associations and cooperatives for the production, transformation and commercialization of their products.

1.28 The ODVA has executed various Bank loans[1] in the *Artibonite Valley* with significant difficulties. The Project Completion Report (PCR), currently under the review of the Bank, and current institutional analysis have confirmed that the regular operations of the ODVA have been weak in the areas of financial management, and operations and maintenance of the irrigation and drainage perimeter, so that water users and farmers are not satisfied with the quality of service received from the ODVA. However, in September 2003, a new General Manager was appointed with the objective of improving the ODVA's management performance.

F. Coordination with other official development finance institutions

1.29 International development institutions have been active in Haiti's agricultural sector. However, most of their financial assistance is currently being provided through grants and some of the projects are executed only through non governmental organizations. Their activities have been concentrated in the following regions: USAID in the Artibonite, the North West and the South departments; IFAD in the Central Plateau, North West, and in the Artibonite Valley; Canadian International Development Agency (CIDA) in Grand Anse, and in the West departments; EU in the Center, South and Artibonite; IICA all over the country; FAO in Marmelade and small projects that are all over the country. A Map of Investments for the Agricultural Sector, developed by the Country Office in Haiti in 2002, was used to establish the coordination with other donor groups that were working in the project area (the Artibonite Valley).

1.30 This georeferenced data base provided the information that led to a close working relationship with USAID (hillside agricultural project, Agricultural component of the Development Agricultural Project), FAO (Marmelade Rural Development Project), IICA (technical assistance and extension projects), the Taiwanese Mission (development of new varieties of rice project) and UE (Rural Development Project) that supported the design of the PIA, while taking into account on their past and current experiences. On going coordination of the PIA's activities with other donors will be maintained during the project's execution. A technical annex was prepared (see Annex V of the technical files) identifying the areas and activities of these donors and is available in the project files.

G. Conceptual approach of the program

1.31 Innumerable efforts at agricultural development and rural environmental protection have floundered in Haiti due to the lack of ownership and institutional capacity of the investments in land and water conservation by farmers, which lead to accelerated deterioration of the infrastructure and a further decrease of farmer's income. Thus, any intervention must consider the involvement of the producers into an institutional structure that can assure the ownership and sustainability of the investments.

1.32 Agricultural intensification and diversification (or agricultural competitiveness) translates into income gains for producers which arises from increases in their profit margins and/or volume of goods sold due to a better organization of their input and output markets. In the Artibonite Valley, these conditions will not be met unless there is: (i) a better

[1] The mentioned Bank loans include: 473SF/-HA; ATN/SF 1467-HA; 690/SF-HA; 845/SF-HA; and ATN/SF 2152-HA.

management of the hydraulic system (primary, secondary and tertiary irrigation and drainage networks); (ii) an operation and maintenance scheme of irrigation infrastructure managed by irrigation water users; (iii) agricultural technical assistance and extension services; (iv) improvements in land tenure security; and (v) better access to input-output markets.

1.33 The Agricultural Intensification Program (PIA) concentrates on the rehabilitation of primary irrigation infrastructure in the Artibonite Valley; on the institutional strengthening necessary to efficiently manage the irrigation infrastructure and water use; and the complementary agricultural intensification technical assistance. The approach will not take hold and should not be applied without respecting all the elements for success as embodied in the PIA design.

H. Methodological design of the program

1.34 Baseline conditions in Artibonite Valley offer substantial opportunity for improvements in the near term. The project area has qualities to generate the potential gains from the investment: (i) initial establishment of commercial links between producers and buyers or agro-industries; (ii) current crop patterns allowing substantial benefits from better water use and diversification; (iii) access to appropriate technologies and extension services; and (iv) disposition to organize users to better manage their production infrastructure. Currently, even where perimeters or their remnants exist, irrigation is unreliable. This further limits crop choices and the number of harvests per year. Farmers remain largely incapable of responding to the demands of the market due to high perceived risks. However, to achieve these benefits, it will be necessary to repair infrastructure damaged by Hurricane Georges, and undertake necessary maintenance of the irrigation and drainage infrastructure. Detailed yield and income projections completed during analysis of the Artibonite Valley show the initial results of the improvement of the hydrological system can yield dramatic results for producers in the form of increased output that will generate both farmer working capital and confidence to proceed with subsequent stages of investment.

1.35 To achieve these benefits it will be necessary to address: (i) institutional strengthening and reform; (ii) the organization of the management of the irrigation system and its users with regards to infrastructure investments as well as the operation and maintenance; (iii) improve land tenure security, agricultural intensification and diversification; and (iv) physical rehabilitation and improvement of the irrigation and drainage system.

1.36 The need for repair and rehabilitation of irrigation and drainage infrastructure, organization of water user groups, the institutional strengthening of the water and irrigation management authority (ODVA and MARNDR), and the coordination and the establishment of incipient financial mechanisms for recovering operation and maintenance costs between them will take priority within the PIA. Therefore, activities to support the formation of water users groups will be undertaken in parallel with the preparation of rehabilitation works of the irrigation and drainage infrastructure, and prior to the expansion of the irrigated areas. The PIA will also provide the technical assistance needed to accompany the irrigation infrastructure investments that would yield a greater

agricultural intensification and diversification, moving the Haitian agricultural sector towards a more competitive position.

1.37 During design of the Program the Bank financed studies on specific irrigation and drainage infrastructure rehabilitation investments as part of the Master Plan of the Artibonite Valley prepared by a consortium of international firms (GOPA/SCL/LGL – see Annex III of the technical files) and the complementary engineering studies prepared by HYDROPLAN (see Annex IV of the technical files). These investments and components were selected as the highest priority based on: (i) their impact on the improvement of the main hydrological system; (ii) on the protection of strategic sites of the system; (iii) on their potential to increase drainage capacity of the perimeter; (iv) the intensification and diversification of cropping patterns to maximize the economic returns to the investment; and (v) on their capacity to effectively initiate the institutional reform of the water management authority as well as the coordination of water users into associations.

II. THE PROGRAM

A. Objectives

2.1 The Program aims to increase the income of Haitian farmers in the Artibonite Valley through a process of agricultural intensification by increasing the efficiency and sustainability of water used for irrigation. **Sub-Program A** focuses on the institutional strengthening of the water management authorities (ODVA and MARNDR) and the organization of water users, providing technical assistance for agricultural intensification and diversification, and support for better managing water resources for agriculture with improved land tenure security. **Sub-Program B** aims to protect, rehabilitate, repair and expand irrigation and drainage infrastructure, improving water use efficiency in the valley.

B. Selection of the project zone

2.2 After the damage caused by Hurricane Georges in the Artibonite Valley in 1998 it is still necessary to repair and protect the affected irrigation infrastructure and restore drainage capacity in the area in order to increase the efficiency of the hydrological system. Thus, as a function of the field observations, and as the highest priority components and works identified in the Artibonite Valley Master Plan, and of the GOH's priorities for the hydro-agricultural sector, as stated in the Economic and Social Program 2001-2006 (see Technical Annex XIV), the MARNDR has requested financing from the Bank for protection, rehabilitation and expansion of irrigation and drainage infrastructure in the Artibonite Valley.

2.3 The Artibonite Valley Master Plan (see Annex III of the technical files) yielded a proposal for intervention in the area of which the MARNDR has selected specific interventions as the priority for this investment program. Thus, the area was selected due to: (i) the importance of the Artibonite Valley in the agricultural GDP; (ii) the priority of the GOH of focusing on the increase of agricultural intensification and improvement of national agricultural production; (iii) the priority of the MARNDR for water resource management for agricultural intensification; and (iv) the availability of other programs and disposition of funds by other donor in complementary areas (see Annex V of the technical files for a detail list of complimentary programs and donors).

2.4 The Artibonite Valley posses the necessary qualities that justify the implementation of an agricultural intensification program. The downstream portion of the valley covers a total area of 45,000 hectares out of which 35,000 are irrigable land. The soil is appropriate for agricultural components based on recent alluvial sedimentation. The soil classification[2] of the project area is as follows: 76% class I, 10% class II, 24% class III, 8% class IV, and 4% class V. The Artibonite River and the Estère River compose the main hydrological resources. The water resources of the Valley are regulated upstream by the Péligre dam, which protects the valley from flooding and stores water for irrigation and energy production. The dam was built to provide $45m^3/s$ for irrigation, but the

[2] Soil classification is: I (good soils), II (soils recently upgraded by sedimentation), III (soils with slow drainage), IV (soils with bad drainage) and V (soils affected by salt).

degradation of the upper watershed has been reducing the volume of water destined for irrigation purposes. The agricultural producers of the Artibonite Valley have an acceptable level of technical knowledge for certain crops (rice, staple crops and fresh produce). However, current yields are low due to the inefficiency in the delivery of certain services such as inputs, technical assistance, and financial services. Rice is the dominant crop with very little diversification experience in part due to the lack of formal tests for the identification of new crops as well as to the lack of knowledge and research (specially regarding the seeds) of alternative crops. In the Artibonite Valley, land is used as follows: 33% fallow, 66% rice, and 3% other crops (beans, onions, eggplant, maize and sweet potatoes). In the project zone, the land is currently used as follows: 41% fallow, 58% rice, and 1% other crops.

2.5 More than half of the agricultural land in the valley is under formal tenure, however due to the absence of cadastre 40-45%[3] of the agricultural land is under some sort of informal arrangement which weakens the incentives to invest, intensify and/or diversify their agricultural production. Such hydrological, agronomic, and land tenure constraints produce a lack of access to financial instruments, both formal and informal. This scenario, or vicious circle, produces a downward spiral leading to an accelerated decapitalization of agricultural land, a decrease in agricultural productivity and a general absence of private investment. Improving the tenure situation will be part of the assistance provided to water user groups in the valley in order to improve resource use efficiency and promote private investment in the area.

C. Sub-Program A: Technical assistance, institutional strenthening and establishment of water user groups (US$12 million)

2.6 This Sub-program aims at providing the necessary support and assistance to ensure the sustainability of the Artibonite Valley irrigation system. This Sub-program will also be complementary to the physical infrastructure investments in Sub-program B, resulting in an integrated approach towards agricultural intensification through improving the overall efficiency of the management of water resources for irrigation in the Artibonite Valley.

2.7 The sequence of components in this Sub-Program will begin the first two years of execution with the area of 5,400 hectares known as Artibonite II, where there are an estimated 10,000 farmers on individual plots of 0.5 hectares or less. The Bank financed the cadastre of this area (loan 845/SF-HA), so that there is a good basis for proceeding with the three aspects of: (i) land tenure regularization, (ii) formation of water user groups, and (iii) agricultural intensification. Subsequently, in the third year, the PIA will undertake these same components in a second area of an additional 4,600 hectares, known as Artibonite I and Fabias. Finally, in the fourth year, the PIA will provide support to the same tenure security, water user group and agricultural intensification components in the areas known as the *5eme Section* and *Rive Droite de L'Estère.*

2.8 In each case, these components will be implemented by a combination of firms and MARNDR staff, under the Coordination of the BCP. It is therefore intended in the PIA that these three areas, covering approximately 17,500 hectares, and 30,000 farmers, will

[3] Results obtained by FAO from a survey undertaken in Dessaux in 1996-97.

have been integrated into water user groups and receive technical assistance for agricultural intensification (Sub-Program A) in coordination with the completion and before the commitment of funds for specific infrastructure rehabilitation and construction components that would expand irrigated areas (Sub-Program B). **The detailed sequencing of the execution of activities in components Sub-Program A and B will be addressed in the OR and PIP; a special condition for loan eligibility.**

1. Support for the organization of water user groups (US$4.5 million)

2.9 In order to ensure the sustainability of the investments in the irrigation and drainage infrastructure of the Artibonite Valley, the institutional as well as the organizational aspects of the delivery of water for irrigation needs to be strengthened or, in some cases, created. It is crucial to initiate and strengthen the process of moving towards an efficient and sustainable cost-recovery system where the public service of delivering water for irrigation is paid for by the users of the resource. To achieve such objective, not only the institutional aspects regarding the overall management of the irrigation system needs to be strengthened, but the organizational structure at the local level (secondary and tertiary irrigation and drainage systems) needs to be put in place so that the users can participate in the decision making of the investments, but also so that they assume the responsibility for maintaining and managing their own irrigation and drainage infrastructure. This component will benefit from the past and current experience of the country in the regions of Archaie and Ennery, where such water user groups have been established, cost recovery occurs, and they are currently self sufficient in operating and maintaining the irrigation and drainage infrastructure for their perimeters.

2.10 The objective of this component is to support the process of creation and/or legal establishment of water user groups. The support would extend to establishing a representative body for the Artibonite Valley of such water user groups within the framework of the *Comitée de Pilotage* (COP) and provide a platform for the future joint management of the overall irrigation and drainage system with the irrigation water authority (MARNDR and/or ODVA). The objective of creating such local and regional organizations is to restructure the incentives for the delivery of water for irrigation, transferring secondary and tertiary irrigation and drainage infrastructure to management units, such as water user groups, to ensure the operation and maintenance of the systems as well as providing efficient and sustainable cost recovery mechanisms.

2.11 Financing will also be provided for information, *sensibilization and mobilization* (outreach) campaigns that will set the base for the organization of users into water user groups. These components will be carried out along with complimentary components of which these organizational schemes could benefit from, such as management and accounting of water user fees and construction of tertiary channels. These cost recovery mechanisms and water user fees will be detailed in the Operating Regulations (OR) of this operation.

2.12 The organization of water user groups faces significant constraints in the Artibonite Valley due to the lack of land tenure security and a past history of land conflicts in the region dating back to the original establishment of the irrigation and drainage perimeter in the 1950's. Therefore, this component will also finance measures to improve land

tenure security in the project area including: (i) public awareness campaign to promote the objectives and benefits of activities regarding land tenure, in order to obtain the cooperation and participation of the population, (ii) updating of the existing cadastre of 5,400 hectares, which was done within the framework of loan HA-0078; (iii) expanding the cadastre to include an additional 12,000 hectares, and (iv) in the entire project area, completion of a land tenure inventory that will determine the physical boundaries of parcels, the current tenants and the legal status of their occupation. This information will be the basis for the organization of water user groups and the collection of water user fees. This component will be implemented by the INARA, in coordination with the National Cadastre Agency (ONACA). For this purpose, INARA and ONACA will sign a memorandum of understanding establishing the modalities to update the cadastre

2. Support for agricultural intensification and market linkage (US$4.0 million)

2.13 The process of assisting producers to form or consolidate water user groups provides the participatory basis for the assessment of the opportunities to enhance agricultural intensification and market linkage within a specific irrigated perimeter. The program will engage producers initially by concentrating on their most pressing needs with regard to agricultural production. This entails agronomic assistance with regard to crop varieties, pest and disease control, rotations and fertility, among others. Building confidence in this way allows for expansion of higher-value crops in the rotation pattern.

2.14 In the absence of a viable private seed industry, local organizations with support from major international organizations have entered into some multiplication, selection and distribution of improved seeds. These supplies remain limited and the demand latent. The program will phase in seeds with tested germination rates, selected and treated against diseases, and will assist in coordinating the supply of available inputs. As seed adoption rates progress, the technical assistance will progressively increase the producers' involvement and responsibility for estimating seed requirements, placing orders and arranging for payment of these inputs. The technical assistance team will cultivate a relationship with the producers, specially with groups of women, which will progressively introduce notions and means to move on to higher revenue crop production at whatever pace proves feasible.

2.15 "High value" crops envisioned under the PIA refer primarily to crops with which Artibonite farmers are already familiar. Those sites which today possess sufficient infrastructure and water supply and drainage to practice double cropping consistently already grow corps which generate revenue higher than current rice crops. Onions, shallots, hot peppers, tomatoes and eggplant fall into this category. Under the PIA farmers are expected to increase the area planted with non-rice crops from 1% of the area to more than 5%. The success of crop diversification depends largely on improving market access to food distribution channels, and the selection of alternative crops that are suitable to the climate and limited infrastructure for post-harvest care in the area.

2.16 As producer experience and confidence grows, and as the effective irrigated area expands, the program will promote the intensification of high revenue crops. Haitian packing house have for over a decade shipped an array of products known to small-holders and offering profitable new opportunities for export. Conforming to the

specifications of new buyers often requires adapting to varietal changes or planting and post-harvest techniques new to growers. The project will help producers to get started with several forms of assistance to adapt to the new demands: (i) access to planting materials; (ii) on-farm field trials and extension support; (iii) technical assistance for increased mechanization; (iv) support for agro-processing; and (v) hand-on guidance to diminish post collection for marketing at higher prices. Once technical and financial viability has been demonstrated, farmers will continue on a strictly commercial basis.

3. Institutional strengthening (US$3.5 million)

2.17 The public services needed to support agricultural development cover a broad spectrum, yet few can fulfill their mandates effectively. The present program will concentrate on technical services in the public domain essential to agricultural intensification in the Artibonite Valley. These are support to the MARNDR for: (i) hydrological data collection and modeling; (ii) analysis and publication of data series; and (iii) institutional support for the ODVA for a better management of the irrigation system of the valley.

2.18 The approach taken to reinforce the MARNDR emphasizes delivery of water to the Artibonite Valley. In order to improve delivery in the field, certain central services must also improve, yet the priority will remain developing the capacity in conjunction with the program investments. The results of this program of assistance will then provide the MARNDR, the Bank and other donors with the basis to progress on to subsequent zones and to expand the capacity of these institutions nation-wide.

a) MARNDR – Collection and Processing of Data Related to Hydrological Resources (US$0.5 million)

2.19 The PIA will assist the MARNDR, to fulfill its institutional role regarding collection and processing of data related to Haiti's water resources. That role encompasses the provision of hydrological information vital for planning, designing and operating agricultural as well as major civil engineering projects. Donors have been awaiting a strategic action plan for the future, in line with the Government's financial capacity to ensure its long-term sustainability. Data collected in the past, has been reviewed and processed using various statistical programs. However, there is a complete lack of long term up-to-date data series. These are needed to allow proper forecasting and statistical trend analyses. Assistance may also be provided to institutionalize the National Resource Water Service (SNRE) which at present operates in the MARNDR but which has not been incorporated in its organic law.

2.20 The Program will thus intervene at the Project Zone (Artibonite Valley), by financing the: (i) re-initiation of the collection of hydrological data necessary for the design and management of the irrigation and drainage investments (both small and medium scale); (ii) necessary components and mechanisms to ensure that these data can be collected throughout the project lifespan and there-after; and (iii) preparation and operation of a water balance model for the entire Artibonite Valley.

b) Organization for the Development of the Artibonite Valley (ODVA) (US$3 million)

2.21 To fulfill its normative, supervisory and coordinating mandate for managing the irrigation and drainage infrastructure of the Artibonite Valley, the ODVA needs to strengthen its planning, programming, and operational capacity. Technical assistance will be provided from the start of the Program to train ODVA managers in operations planning, to write management procedures, to define the tasks of each group of employees and propose productivity standards for the execution of works. This assistance will be provided by a consulting firm or agency. Support will also be given to increase the capacity of the ODVA to operate and maintain the new irrigation and drainage investments, by providing additional machinery and technology to manage its infrastructure.

D. Sub-Program B: Rehabilitation, Protection and Expansion of Irrigation and Drainage Infrastructure (US$26.15 million)

2.22 The local population in the portion of the Artibonite Valley hardest hit by the effects of Hurricane Georges has been assisted by emergency programs, such as PURE II (Economic Rehabilitation Emergency Program), for the clean-up ("curage") of irrigation and drainage canals soon after the Hurricane. However, no larger scale repairs nor long-term protection of weak links in the Artibonite system have been undertaken and the system is still most vulnerable to future high waters.

2.23 To achieve long-term improvements to what is the most significant water resource system in Haiti will require a global vision of the Artibonite Valley. The Bank-supported Artibonite Valley Master Plan, has provided part of such a strategic vision. Thus, Sub-Program B will finance protection, repair and rehabilitation efforts, coupled with structural improvements in the irrigation and drainage system based on the final designs of the Master Plan and the engineering studies; as well as on the support for the expansion of secondary and tertiary irrigation and drainage systems. However, the implementation of the expansion of irrigation and drainage infrastructure would only proceed if it is determined, after completion of the repair, rehabilitation and protection efforts, that there is adequate water availability to support such expansion and that this investment is economically viable.

1. Repair and protection of broken embankments (US$1.5 million)

2.24 This component will finance the reinforcement of broken levees and dikes in the two most critically damaged areas of the Artibonite River system, Malè Pandyé and Ti Mango, where the river embankments are a few meters away from the main channel *rive droite*. This will provide protection from flooding for approximately 10,000 hectares currently under cultivation and will entail the installation of a mixture of concrete walls and thick metal sheets known as *paroi belinoise* measuring one meter wide and either six or eight meters tall. As a key preventive measure in case of future disasters, the program will install flood gates in four strategic locations.

2. Restoration of drainage capacity (US$3.41 million)

2.25 Back-up of flood waters caused much of the extensive destruction to the infrastructure. The component will finance the restoration of the water evacuation capacity by targeting the Dessalines and Fossé Cheval drainages. This entails installing culverts, restoring drainage embankments and clearing blockages in the Brisard, Grandrac, and Pelissier irrigation supply system. This component will finance the components to increase the drainage capacity of the irrigation perimeter providing increased protection from flooding and improving agricultural yields for more than 6,000 hectares. Within the efforts of increasing drainage capacity in the Brisard, Grandrac and Pelissier area, this component will finance the improvement of the irrigation water supply system efficiency and will also rebuild eight access bridges in crossings constantly affected by flooding.

3. Flood control measures (US$0.22 million)

2.26 In the upstream section of the perimeter, the Artibonite River receives inflows from minor water streams (natural streams or drainage) in areas with high population density. Before these mentioned streams discharge into the Artibonite River, they pass underneath main canals through underground passages. To avoid the constant overflowing of the Artibonite River into these minor streams, this component will install sluice gates at the exit of the underground passages at the intersection with the main channels at Petite Rivière, Gros Chaudière, Desjardins and Dodard. This flood control measure will protect approximately 1,000 hectares of cultivated land from flooding.

4. Improvement of floodway capacity (US$2.88 million)

2.27 The Salée Floodway acts as a primary release for flood waters overflow in an area of the lower Artibonite, yet it did not and cannot withstand volumes of the sort experienced by the heaviest rains experienced every few years, thereby provoking additional damage over a wide area upstream. The component will finance the increase the capacity of the floodway to withstand 600 m^3/sec flows over 5.4 km by raising and reinforcing embankments. These works will improve drainage capacity and raising yields of at least 1,000 hectares under cultivation. The component will also finance the construction of an access bridge that will connect the 5^{th} communal section of St. Marc with the market of Pont Sondé improving communications and lowering transaction costs for an area of 5,000 hectares.

5. Capacity expansion of the main channel, Artibonite Sud (US$5.7 million)

2.28 The Artibonite Channel serves approximately 5,000 hectares and has significant number of sharp bends and meanders. In the course of time, due to the long distance the water flows, at a very little inclination, the result is sedimentation with consequent problems for land and water management. This component will finance the re-calibration of the channel and the improvement of its hydrological characteristics for 31.6 km of channel length in order to ensure the improvement of the water user efficiency of 5,000 hectares of irrigated lands.

6. Rehabilitation of primary channels of the Artibonite Valley system (US$1.8 million)

2.29 This component includes the rehabilitation and improvement of the hydrological characteristics of the master channels of Canal Dessalines, Canal Artibonite Sud, and Canal Villart. The Canal Villart and Canal Artibonite Sud receive water from the Drouet hydroelectrical plant and transports it to the *5ème Section* and Canal Dessalines to supply an area of over 9,000 hectares. In order for the irrigation system not to depend from the production of electricity from the hydro electrical plant, this component will finance the rehabilitation of by-pass systems allowing water to flow directly to the Canal Villart and Canal Artibonite Sud in case energy production levels are low due to plant malfunctioning. Such improvements in resource availability will not only benefit the areas already receiving water, but it will also allow water to reach the perimeter of Fabias (800 hectares) currently deprived of water but with a secondary irrigation and drainage system already in place.

2.30 The management of the water resources of the primary system will be dependant upon the success of Sub-program A in providing technical assistance and organizing water user groups so that a program is in place whereas water quotas can be allocated at the secondary channel level. This component will introduce a tele-surveillance system that will allow a better coordination of water use throughout the system providing a real-time management of the resource.

7. Rehabilitation of secondary irrigation and drainage systems (US$2.7 million)

2.31 This component will finance the rehabilitation of the secondary irrigation and drainage system of the 5ème section, which, in addition to the improvement of floodway capacity and the capacity expansion of the Canal Artibonite Sud (components 4 and 5), will provide enough irrigation water and drainage for 5,000 hectares of cultivated land. The rehabilitation and improvement of the secondary irrigation and drainage system will be dependent upon technical viability analysis that is to be undertaken. Such technical analysis will be conducted based on the improvements and water availability obtained after the investments made in the primary channels and upstream components encompassed in Sub-program A and components 5 and 6 of Sub-program B.

8. Irrigation and drainage of the *Rive Droite* of Estère (US$4.95 million)

2.32 Technical studies are being undertaken for the construction of the primary and secondary irrigation and drainage system that will provide water to 1,120 hectares of the *rive droite* of *Estère*. In addition to the construction of the primary and secondary irrigation and drainage system, this component will finance the conclusion of the construction of the second pumping station (the Mapou-Lagon pumping station), which will supply water to 455 hectares of the perimeter. This component will be dependent upon the viability results of the technical studies, which are in their final preparation phase, and would be submitted to the Bank for review prior to approval of disbursements.

9. Construction of tertiary irrigation and drainage systems (US$3 million)

2.33 Existing technical studies will be finalized to design the construction of tertiary irrigation and drainage systems that will be linked to the secondary channels within the existing irrigation perimeter. If these studies demonstrate the viability of the engineering, economic, financial and environmental analysis, the component will finance the expansion of the secondary channels to tertiary works. Before the actual works will be financed and contracted, the Bank will require that water user groups be established for the given perimeter, as has occurred in other irrigation districts in Haiti. Therefore, before the actual investment in the construction of the tertiary systems occurs, an agreement between the water user groups benefiting for the investment must be reached with the ODVA where the first one assumes full responsibility for operating and maintaining the infrastructure to be built. This component therefore would provide financing to conduct the studies and to construct tertiary irrigation and drainage systems for approximately 10,000 hectares of the project area.

E. Technical Studies

2.34 The detailed engineering designs are to be undertaken as part of the PIA and shall include an EIA, current hydrological studies confirming water availability, and current socio-economic and financial analysis, as identified in the annual plans. These studies shall be completed and presented to the Bank for its non objection prior to the acquisition of any goods, services or works related to the respective investments.

F. Cost and financing

2.35 The PIA will cost a total of US$46.60 million, of which the Bank will finance US$41.94 million entirely from the Fund for Special Operations (FSO). The Government of Haiti (GOH) will finance the remaining US$4.66 million through its own resources. The table below summarizes the cost breakdown and detailed in Technical Annex I. This FSO loan will carry the following conditions:

Term of loan:	40 years
Grace period:	10 years
Interest rate:	1% the first 10 years, 2% thereafter
Credit fee:	0.5% of undisbursed balance
Inspection fee:	1%

Cost Summary Table (In US$ million)				
	IDB	**LOCAL[1]/**	**TOTAL**	**%**
Sub-Program A				
1. Support of Water User Groups	4.05	0.45	4.50	10%
1.1 Organization of water user groups	2.70	0.30	3.00	6%
1.2 Land tenure regularization	1.35	0.15	1.50	3%
2. Agricultural Intensification Technical Assistance	3.60	0.40	4.00	9%
3. Institutional strengthening	3.15	0.35	3.50	8%
2.1 National Water Resource Service (SNRE)	0.45	0.05	0.50	1%
2.2 Organization de la Vallee d'Artibonite (ODVA)	2.70	0.30	3.00	6%
Subtotal Sub-program A	**10.80**	**1.20**	**12.00**	**26%**
Sub-Program B				
4. Repair and protection of broken embankments	1.35	0.15	1.50	3%
4.1 Embankment of Male Pandye	0.67	0.08	0.75	2%
4.2 Embankment of Ti Mango	0.68	0.07	0.75	2%
5. Restoration of drainage capacity	3.06	0.35	3.41	7%
5.1 Increase drainage capacity	2.38	0.27	2.65	6%
5.2 Construction of 8 access bridges	0.68	0.08	0.76	2%
6. Flood control measures (sluice gates)	0.20	0.02	0.22	0%
7. Improvement of floodway capacity	2.59	0.29	2.88	6%
7.1 Salee Floodway re-calibration and protection	1.80	0.20	2.00	4%
7.2 Access bridge	0.79	0.09	0.88	2%
8. Capacity expansion of the main channel, Artibonite Sud	5.12	0.57	5.69	12%
9. Rehabilitation of the primary Channels of the system	1.62	0.18	1.80	4%
10. Rehabilitation of secondary irrigation system of the 5eme section	2.43	0.27	2.70	6%
11. Irrigation of the Rive Droite of Estere	4.45	0.50	4.95	11%
11.1 Pumping Station (Mapou-Limite)	0.22	0.03	0.25	1%
11.2 Secondary irrigation system	4.23	0.47	4.70	10%
12. Construction of tertiary irrigation and drainage systems	2.70	0.30	3.00	6%
Subtotal Sub-program B[2/]	**23.52**	**2.63**	**26.15**	**56%**
Administrative Costs (BCP)	**1.51**	**0.42**	**1.93**	**4%**
Supervision, Monitoring and Evaluation	**0.30**	**0**	**0.30**	**1%**
Financial Costs	**5.81**	**0.41**	**6.22**	**13%**
13. Interest	1.28	0.00	1.28	3%
14. Credit commission	0.00	0.41	0.41	1%
15. Inspection fee	0.42	0.00	0.42	1%
16. Contingencies and Escalation Costs	4.11	0.00	4.11	9%
Total Program Costs	**41.94**	**4.66**	**46.60**	**100%**
Percentage distribution	90%	10%	100%	

1/ Local counterpart maybe partially cover with taxes imposed on goods and services finance by the Program

2/ Supervision cost are included in the Budget

III. PROGRAM IMPLEMENTATION

A. Borrower and Execution Agency

3.1 The Borrower will be the Republic of Haiti. The Republic of Haiti will implement the Program and perform its obligations under the loan agreement through the MARNDR.

B. Project management and coordination structures

3.2 A Monitoring Committee (*Comite de Pilotage*/COP) will be created through a MARNDR memorandum and bring together the different entities with a role in the PIA to coordinate their activities, determine the manner in which they shall exercise their functions with respect to the PIA, supervise the execution of the PIA, verify if the objectives are met, review the progress of the various components of the PIA and approve the PIP and its annual updates submitted by the BCP. Chaired by the Minister of MARNDR, the *Comite de Pilotage* (COP) will also include the Director General of ODVA, the Director General of INARA, the Manager of the Artibonite Valley (DDA), a delegate of the MARNDR in charge of agriculture infrastructure, and two representatives of the water users. The COP will meet quarterly and more often if special circumstances justify its intervention. **Creation of the COP, through a MARNDR memorandum, and presentation to the Bank of the Operating Regulations will be a special condition for loan eligibility.**

3.3 The BCP will be responsible for the execution of the PIA and provide the interface between the MARNDR, the Bank and the project components. The BCP will report directly to the Minister of MARNDR. It will be staffed by specialists hired through national competition and according to the procedures of the Bank and conditions defined in the loan agreement. This team will include: (i) one Manager, a professional with proven experience in the execution of large projects and familiar with the policies and procedures of the Bank; (ii) one deputy-manager, with the experience required in the terms of reference; (iii) one civil engineer, charged with oversight of the investments in physical infrastructure (Sub-Program B); (iv) one Specialist in procurement and contracting procedures; (v) one specialist in rural development projects; (vi) one accountant with proven experience in electronic accounting systems; and (vii) one assistant accountant and the support staff. **As a special condition prior to first disbursement, the creation of the BCP shall be formalized, its manager and assistant manager have been confirmed[4] in their positions or alternate candidates and a Specialist Accountant have been hired.**

3.4 The BCP, as executing unit of the PIA will be responsible for the execution of all components of this Program pursuant to the OR and the reporting of the financial and technical progress of the components of the PIA to the Bank and the COP. The rehabilitation work will be executed by private companies contracted according to the Bank procedures.

3.5 Once the Loan Contract enter into force and the general conditions prior to first disbursement are met. The Bank may authorize a special disbursement of up to

[4] The manager and deputy manager have been hired with resources of ATN/SF-7229-HA

US$450.000 to assist the MARNDR in fulfilling the remaining conditions for first disbursement and for Project start up. Those, during the first year of PIA execution the BCP may receive assistance from experts to design the accounting plan, prepare the critical path for project execution included in the PIP, write a model for call of tenders, write the terms of reference for the studies and technical assistance to be executed during the first two years of the PIA and train the BCP personnel in going through all phases of a contract execution from pre-qualification of firms to submission to the Bank of disbursement request.

3.6 Coordination between ODVA, users committee and contractors: The BCP will invite the main stakeholders in the PIA to monthly meetings where information about the progress of each participant will be discussed in order to optimize the benefits of the PIA through a good cooperation between all the partners.

3.7 The BCP will prepare the PIA Project Implementation General Plan (PIP-GP) and also the Annual Plan (PIP-AP) for the period comprise between Loan signature and the following 31st of December. These plans that shall be approved by the COP before their presentation to the Bank for its non-objection. The PIP-GP will include the information of initial report, a plan of acquisitions, a budget, as well as the general chronogram of execution of the PIA including the calendar for execution of each component. Thereafter, no later than November 15 of each year, the MARNDR shall present to the Bank, for its non-objection, an updated annual PIP-AP approved by the Comité de Pilotage for the next calendar year. Submittal of the annual PIP will cover two sections: a) a first relating to all components geared at technical assistance, institutional strengthening and at the starting up of water user groups; and b) a second relating to the BCP's components. These plans will include for each component: (i) clear objectives; (ii) execution strategy; (iii) resources required; (iv) the identification of technical feasibility studies; (v) implementation timetable; (vi) acquisition plan; (vii) counterpart financing; (viii) project monitoring; (ix) outputs and outcomes; and (x) equipment program. **The PIP-GP, the logical framework, and the subsequent annual plans will be a fundamental part of the OR to be approved by the COP and submitted to the Bank for no-objection prior to loan eligibility (condition c), and each year thereafter.**

C. Accountability and transfer of funds

3.8 The MARNDR, in collaboration with the Ministry of Economy and Finance will open two separate and special accounts with the Central Bank (one in US$ and one in Gourdes) to receive and manage the resources of the IDB financing and one special account denominated in local currency for the local counterpart funds. To ensure that the Borrower has timely access to funds for Program Execution, it is recommended that a revolving fund of up to 5% of the total loan amount be advanced to the BCP for eligible expenses to be paid by it. The BCP, which will report directly to the Minister of MARNDR, will be responsible for maintaining complete financial information for this set of accounts and support documentation for all expenses in conformity with the standard accounting procedures of the Bank**. The opening of the special bank accounts shall be a special condition prior to first disbursement.**

3.9 **Auditing**. In accordance with article 7.03 of the General Contractual Conditions, the external operational and financial audit of the Program will be carried out by an independent audit firm acceptable to the Bank and in accordance with the terms of reference previously approved by the Bank. The audit will extend to all Program's activities including those involving INARA and ONACA. The external audit will present two annual reports: (i) a consolidated semi-annual report presented 60 days after the end of the first semester of each year; and (ii) one annual consolidated audit report presented 120 days after the end of the financial year. These reports will be presented during the execution of the Program. The cost of the audit will be included and covered with the Bank loan.

D. Execution

3.10 **Sub-Program A.** The bank-financed project preparation unit, in collaboration with their MARNDR counterparts, has elaborated plans of execution for each respective components summarized below and cross-referenced to the corresponding RE2/EN2 technical annexes.

1. Support for the organization of water user groups and the provision of technical assistance

3.11 **Mobilize water users groups**: A specialist in communication in cooperation with a specialist in community development will, as the first component of Program execution, organize an information campaign oriented towards the population of the Artibonite Valley. The objective of this campaign is to inform all stakeholders about the objectives, the components and the implementation timetable of the PIA, the organization of its execution with emphasis on the mandate of the water users at each level of execution and monitoring. Immediately after the campaign, the BCP will hire firms (Water User Support Teams: (WUST) to work with clusters of communities in the areas of: (i) formation of user groups; (ii) identifying and providing technical assistance to support agricultural intensification; and (iii) work with the agrarian reform institution (INARA) to undertake the land tenure regularization components (see Technical Annex XII for detail land tenure regularization activities).

3.12 **Complete inventory and clarify obligations:** After the campaign, the WUSTs will help with the formation of water user committees, the election of the board of each committee, the approval of the statute and the user fee structure as well as the commitment of the members to respect a management contract to operate and maintain the works in their perimeter. The WUSTs will also train the members of the board in collecting and accounting for the water user fees. A percentage of the fees collected will be kept by the committee to cover the cost of collecting the fees and of maintaining small infrastructures in their territory. The balance will be transferred to ODVA to cover the operation and maintenance costs of the primary channels and other infrastructures benefiting to all users in the Valley. The structure and organization of these water user committees will be patterned on similar existing entities in other parts of the country.

3.13 **Facilitate transition:** WUST staff will continue to strengthen user committees as they will assume full responsibility under the terms of the COP management contract and once

the infrastructure works of sub-program B have begun. The organization of a regional water user association to represent the various water users of the *Artibonite Valley* will be a priority component of PIA due to its' important role on the COP, with oversight for the rehabilitation of the irrigation and drainage works.

3.14 The execution steps will be as follows: (i) **Prepare tenders**: The terms of reference to implement this component will be prepared by the technical assistance provided to the BCP and the resources will partially be provided by the technical cooperation under execution (ATN/SF-7229-HA). Within the framework of the preliminary analysis, methodology and budget for the organization of water user groups, the consultants will meet the local population, WUSTs working with the water users committee and the ODVA to develop a detailed plan. (ii) **Contract specialized entities**: The BCP will contract firms or NGOs. (iii) **Approve annual plans:** The contracted firms/NGOs will meet with the local population and draw up detailed annual plans.

2. Institutional Strengthening

3.15 **Sub-component a): MARNDR.** The BCP and the MARNDR, with the no-objection from the Bank, will mobilize a team of two specialists to carry out the strategic action plan for the provision of hydrological data services and to institutionalize the SNRE. This action plan will then be discussed during a round table with all donors which are involved in supporting such services and the institutionalization of the SNRE. During this round table the utilization of the PIA funds for equipment and training will be specified and endorsed by the Government. Regarding the specific components in the Artibonite Valley, the PIA team will assist the MARNDR to train enumerators or meter readers in the area at nominal expense to enable local water-user groups to eventually assume part or all of the responsibility.

3.16 **Sub-component b): ODVA**. At the very beginning of the Program execution the BCP will contract a firm to supply technical assistance (TA) to ODVA to improve its capacity to manage and operate the irrigation and drainage system. The main components of this TA will be the training of the managers in planning and programming the operation and maintenance (O&M) components, the writing of the policies and procedures of the institution, the definition of tasks of the main groups of employees and the writing of productivity standards for the tasks to be executed by ODVA in the scope of its mandate. The plan foresees no additional long-term personnel besides those employed by the ODVA currently or in the future as the operation and maintenance of the whole irrigation systems in the Artibonite Valley will be transferred to the federation of users committee as soon as this new structure has the competence to receive this responsibility.

3.17 **Sub-Program B.** Technical Annex IV summarizes the Irrigation and Drainage Rehabilitation Works. The consultant attached to the BCP will be charged with the bidding, contracting and supervision and coordination of the rehabilitation works, utilizing consultant engineering firms to provide direct monitoring.

E. Procurement

3.18 Contracting of works and acquisition of goods and services will be ruled by the Bank's procurement policies and procedures. International competitive bidding will be used to award contracts to purchase consulting services in excess of US$200,000, goods and services also in excess of US$200,000, and civil works in excess of US$1.0 million. Under this threshold, Haiti's procurement regulations will be applied in view of particular needs of the program, the Government of Haiti and the Bank may mutually establish specific conditions and procedures, provided that they are consistent with the Bank policies and procedures. The detailed procurement plan is presented in Annex II.

F. Time schedule for implementation

3.19 The Program will extend over a five year period from the date the Loan Contract is in effect. The process and approximate schedule by which the components will progress is detailed in Technical Annex IX. The timetable for disbursements is the following:

Disbursement by financing source (thousand of US$)						
	Years					
Source	1	2	3	4	5	Total
FOE	3,880	9,546	17,700	6,943	3,830	41,904
Counterpart	431	1,061	1,967	771	426	4,656
Total	**4,311**	**10,606**	**19,667**	**7,715**	**4,256**	**46,560**
Percentaje	9%	23%	42%	17%	9%	100.00%

3.20 Institutional strengthening components will commence in the respective organizations in year one, each following its projected plan of components, as revised according to the annual plans to be approved by the BCP. (See Annex VI of the technical files for SNRE/MARNDR, Annex XII for land tenure, Annex XIII for the ODVA, and Annex II for the MARNDR units).

G. Monitoring, reporting and evaluation

3.21 The COP will monitor and evaluate all components undertaken during the Program execution. It will use the annual PIP, presented by the BCP and approved by the COP, as a quantitative tool to measure the progress and identify delays in implementation. Monthly coordination meetings of the users committees, the ODVA manager, the contractors executing the works and the BCP will serve as a monitoring tool of day-to-day components.

3.22 The BCP will prepare and submit to the Bank, within 60 days following each calendar semester and calendar year, semi-annual and annual reports approved by the COP including the activities in the PIP-AP. Semi-annual reports will at least include the following information: (i) the general status of the project, including a comparison between actual, planned components and results as indicated by annual control indicators; (ii) an analysis of the main difficulties encountered; (iii) an evaluation of the components carried out by the specialized agencies and sub-contracting companies or organizations involved in the project; (iv) an analysis of the availability of national budget resources for

the project, and whether these were provided on time; (v) the results of the external audits; and (vi) a comparison between actual and expected expenditures.

3.23 The COP, the BCP and the Bank will meet before the last quarter of each year following the second semi-annual report of each year in order to: (i) measure the progress of each project components as gauged by the indicators provided in the logical framework, the PIP-GP, and the PIP-APs; (ii) trouble-shoot critical problems; and (iii) propose adjustments for the following year. The semi-annual reports and this annual meeting will be the basis for the preparation of the PIP-AP for the following year. During project execution, there will be two or more administration missions per year, as requested by the Country Office (COF). These missions will evaluate the progress of the PIA and verify the existence and acceptability of the necessary feasibility analysis required for the execution of components within the PIP, in addition to reviewing the overall development impact of the PIA. They will also analyze the manner in which recommendations made at the annual meetings and the midterm evaluation are being implemented and will formulate technical recommendations to the Bank and the MARNDR.

3.24 Two major MARNDR-IDB evaluations will also be required. These evaluations shall be conducted by an external firm, acceptable to the Bank. The first will occur after 30% of the resources have been committed. This first analysis should establish a project baseline in the first year of execution, as well as develop a economic model to optimize water use in the PIA area of the Artibonite Valley. This global evaluation will utilize the indicators identified in the logical framework and in the annual PIP in order to recommend adjustments needed during the remainder of the Program. The firm will also conduct a final evaluation once 90% of the resources have been committed, in order to measure achievement of the results of the entire project.

3.25 The evaluation will use the data from the baseline established during the first year, as well as the monitoring reports and other relevant project documents. The PIA will finance the design, field implementation and analysis of household surveys of a representative group of farmers in the project area. The surveys will be repeated with the same household groups three times during the project, at the beginning (baseline), for the mid-term evaluation, and at the end of the project. In particular, the focus of the surveys will be on the following areas:

a. **Economic Impact:** The economic impact of the project should be in increased economic component at the farm level and will be measured by the increase in overall household income, value of production, and crop yields, with respect to the baseline.

b. **Social Impact:** The social impact of the project will be measured by the effect of the project on the income of particular sets of households, with special reference to impacts on women and children, and the distribution of income (equity considerations) among households in the area, with respect to the baseline.

c. **Environmental impact:** The environmental impact will be measured through revision of the three ecological assessments done in each round of data collection as well as analysis of the data on land use patterns with respect to the baseline.

d. **Sustainability:** The sustainability of the project will examine two aspects. First, the sustainability of the economic components promoted by the program. The measurement of the household income should provide the basis for the analysis of the agricultural intensification of the area. Second, the sustainability of the institutional aspects of the program including payments by water user groups for operation and maintenance of the irrigation and drainage works. The monitoring reports, mid-term evaluation and final data collection components will provide the necessary inputs to determine the viability of the institutional structures created, the manner in which they operate and the likelihood they will continue to function beyond the project period.

IV. FEASIBILITY AND RISKS

A. Economic and financial viability

4.1 The macro-economic and sector policies in place today in Haiti create an environment relatively free of major policy distortions that discourage agricultural growth. The country's monetary and fiscal authorities have pursued policies largely neutral to agriculture for many years, though inefficient public enterprises remain a burden to competitiveness particularly for those export or value-added segments most dependent on power and telecommunications utilities and port facilities. The most notable sector policy issues creating risks for agricultural intensification arise from intermittent interventions in agricultural input markets, especially fertilizer and seeds, that undermine the emergence of commercially viable and competitive input supply businesses. The dearth of viable financial institutions serving rural areas constrains growth, though these limitations do not derive primarily from national policy decisions.

4.2 The fundamental problem country-wide is rather the lack of attractive income-earning potential for the majority of the population living in rural areas. Meanwhile those farming in areas which do possess potential, earn relatively little revenue due to lack of investment in agricultural, natural resource and human capital. Moreover the lack of remunerative jobs off-farm and in secondary cities deprives those areas with real production potential of a broader domestic market with ample purchasing power.

4.3 Operating within the existing policy environment, the proposed investments demonstrate both economic and financial viability. Financial modeling of crop budgets reveals that producer beneficiaries can indeed generate attractive rates of return through improved access to irrigation and drainage improvements, provided these investments are combined with agricultural intensification measures.

4.4 Intensified production due to a more efficient water delivery and drainage will indeed require farmers to mobilize some additional credit or savings. Financial modeling of farm budgets reveals however that the high returns to farmers generated by the PIA package, particularly starting from the current low productivity baseline, means that they will only have to come up with minimal additional resources. Thus, despite the dearth of decentralized financial institutions, between informal sector resources, the incipient rural credit union movement, as well as the prospects for supplier or buyer credit, the PIA has financial viability at the farmer level.

4.5 The baseline scenarios for minimally acceptable rates of return depend on achieving yield increases in the current predominantly rice-based system, by assuring adequate water application. The models clearly demonstrate that the most attractive rates of return depend on increasing the proportion of the high-value dry-season crops they currently grow in relatively limited areas due to inadequate or undependable irrigation and drainage. Addressing both the rice yield risk and expanding the areas planted in higher-value fresh produce requires the incorporation of the complementary investments in a full intensification package. Within each irrigated perimeter this entails assistance to assure that landholding arrangements are settled and that water-user groups are organized and

ready to manage tertiary systems. It also includes assistance to improve market-linkage and to gain timely access to fertilizer and improved seeds to achieve yield targets.

4.6 The economic analysis of the proposed investments in Sub-Program A and components 1 through 4 of Sub-Program B demonstrates a positive return on investment if considered over a ten-year period (see Technical Annex VIII, Economic Analysis). The economic break-even point occurs in Year 7, showing a global internal rate of return (IRR) of 69% when calculated over ten years. The financial return to the farmer is still higher in each case. These calculations utilized conservative price assumptions, and yield rates already achieved in the Artibonite Valley under on-farm conditions. The economic and financial analysis of investments of components 5 through 9 of Sub-Program B, which depend on water availability due to improved management by the ODVA and the water user groups will be undertaken and reviewed by the Bank during project execution.

4.7 Various sensitivity analyses demonstrate furthermore that the PIA economic rates of return are acceptable under scenarios of delays in implementation, increases in costs, or less than expected crop yield levels. When subjected to any of the following scenarios the global IRR remains steadily above 29%: (i) 10% and 20% crop yield reduction drops the IRR to 60% and 55%; (ii) 10% and 20% project investment cost increase also drops the IRR to 61% and 55%; (iii) no change in the current land tenure situation lowers the IRR to 29%; and (iv) a one-year delay in benefit streams only lowers the IRR to the 44% range. A two- year delay in generating benefits would lower the IRR to the 29% range.

4.8 Some of the significant benefit streams set in motion by the PIA are hardest to quantify. These include the value restored to the land and water resource, prevention of natural disasters such as flooding, increased sanitation and improved health, as well as the institutional strengthening and organization of water user groups to assure the sustainability of the efficiency gains on the use of the resource. Moreover, the distribution of labor needs over the year will be improved through the increase in production in off-season periods.

4.9 The economic and financial analysis of the project on crop mixes and returns indicate that there will be sufficient capacity to pay from producers for water tariffs: Currently, the water tariff of 55 gourdes/ha represents 4% of average producers' profits (1,400 GDS/ha), while after the 10-year period with project, the water tariff of 1,670 gourdes/ha required to cover O&M costs would represent 8% of average producers' profits (22,000 GDS/ha). This would be a proportional increase producers should be willing to make compared to the increase in profit levels that they would be experiencing.

4.10 The most fundamental direct benefit of the PIA will be the increase in household income. The PIA will increase household income substantially in the Artibonite Valley, accounting for approximately 29,600 direct beneficiaries with an average income increase of over 200% per hectare over a 10-year period. The projected project income increase will result in the direct project beneficiaries, on average, at least surpassing the extreme poverty line of US$1/day. The increase in employment equivalent taking into account the minimum agricultural salary required by law would be at least 5,000 new

jobs[5].This will result not only in direct immediate improvements to family welfare but permit enhancing the longer term household well-being. For this reason it is noteworthy that rural Haitian families demonstrate a willingness to sacrifice substantially in order to finance school dues. Increases in rural disposable income tend to improve the basic health and education of children who in turn can engage in a broader and more remunerative range of productive components.

B. Technical viability

4.11 The highly uneven performance of irrigation schemes in the Artibonite Valley reveals a failure to inculcate a sense of ownership and establish an economic stake which guarantees sustainability. The feasibility of mastering the actual irrigation and drainage techniques and coordination has however been established in various perimeters. Haitian farmers in fact show a remarkable willingness to experiment at the margin of their production. Their deep-seated and well founded risk aversion however represents a significant constraint to adopting innovations at a rate beyond a point which they perceive might imperil them. Thus, the PIA methodology calls for gradually introducing increased diversification to higher-value crops as each water user group demonstrates increased its capacity to manage the perimeter and engage in intensification.

C. Institutional viability

4.12 The risks of institutional malfunctions and financial interruptions at the broader level of project implementation determined the design to provide for a technical assistance to ODVA at the very beginning of the PIA implementation. As there is a very high correlation between the willingness and the capacity to pay by the users and the services they receive from the water manager, the improvement of the capabilities of ODVA will have an impact both on the financial and the institutional viability of the project.

4.13 As the water user committees will be responsible for the collection of user fees and as they will keep a percentage of the amounts collected for their own collective use, they should maximize the cost recovery and thus improve the financial viability of the project.

4.14 At the same time, it should be noted that the fiscal impact analysis suggests that under the current tax policy and administration, the PIA is not likely to result in a net fiscal surplus to the public sector over the life of the loan. However, the direct government investment in the project, if accompanied by future changes in tax policy and administration, could present a positive value to the government. Furthermore, by the end of the project, improved cost recovery for the operation and maintenance of the irrigation and drainage system should reduce pressure on the national budget to finance these activities.

4.15 The institutional viability of the Program will be improved by the involvement of the users not only in the COP but also through the coordination of all stakeholders. Moreover, these committees will be responsible for the O&M of the whole irrigation system as soon as they have the competence to do it, they will seek action by the ODVA

[5] Note that in the project area it is found that labor is usually paid less than the minimum agricultural salary requirement, making equivalent employment generation larger.

to make sure that the infrastructures that they will manage in the future are well maintained.

D. Environmental and social viability

4.16 The Environmental and Social Impact Report (ESIR) presented as Annex VII of the technical files thoroughly addresses the baseline situation in the Artibonite Valley, the environmental and social risks and the monitoring and mitigation measures required to maximize the Program's viability.

4.17 The PIA design derives in large measure from the conviction that for any agricultural intensification effort to succeed in fulfilling its objective to increase small-farmer income, it must mobilize widespread social participation and link productivity gains to protection and efficient use of the natural resources. The PIA design has internalized these fundamental prerequisites throughout. The PIA approach to irrigation rehabilitation investments systematically builds on this commitment in the formation of water user groups to ensure the necessary financial and institutional mechanisms to increase the efficiency of the use of the water resources in a sustainable manner.

4.18 The PIA intends to generate a series of benefits for the region and the environment, including improved food and household income, a heightened social cohesion and efficient and sustainable use of the natural resource base. The ESIR highlights the fact that the environmental and social benefits from the project clearly outweigh the potential risks. The primary environmental risks highlighted in the ESIR relates to the availability of water to allow intensification and the downstream impacts of increased use of agricultural inputs. The main social risk concerns whether the project benefits will remain available to all segments of the community, most notably women. Other issues such as use of agrochemicals, water related diseases, collection and disposal of solid waste by producers, salinization problems, potable water and sewage in the irrigation area, and estuary pollution are addressed in Technical Annex VII.

4.19 A number of measures have been incorporated into the PIA to address these risks and to mitigate negative environmental and social impacts. The manner in which actual investments proceed will be governed by procedures, which actively promote social and environmental soundness are contained within the Environmental and Social Management Plan (ESMP) (Technical Annex VII). **As conditions prior to first disbursement of the loan: (i) the ODVA will enter into an agreement with EDH, the power company, for the management and coordination of the use of the water resources of the Artibonite Valley (condition d); and (ii) the MARNDR will formally adopt guidelines consistent with the ESMP (condition c).**

4.20 The BCP will apply the ESMP guidelines adopted for the overall program, including oversight of those Environmental Impact Assessments (EIA) required for any specific infrastructure work. The environmental and social operational norms to be adopted and followed during Program implementation shall apply the principles embodied in the ESMP in the following key areas: (i) community outreach; (ii) extension and training regarding irrigation water usage; (iii) land access security and land management dispute

resolution; (iv) irrigation environmental and social issues; (v) monitoring and evaluation requirements.

4.21 Sub Program A: In addition to the extensive project preparation already completed to address the project risks, the strengthening of the SNRE will allow hydrological monitoring and modeling in order to gauge more precisely the impact of upstream vs. downstream water utilization in the Artibonite Valley. This will improve the decision making efficiency of the irrigation water authority (ODVA and MARNDR) as well as providing a more accurate system to monitor the impacts on the environment.

4.22 Sub-Program B: Components 1 through 4 are themselves an effort to mitigate the disastrous impact caused to the population and the environment primarily by the flooding, and to take structural measures to protect against floods in the future. For components 5 through 9 of Sub-Program B, the technical studies shall include an EIA, and their respective ESIR, which will need to be acceptable to the Bank, following Bank's procedures[6], in order to proceed with such expansion of irrigation and drainage infrastructure.

4.23 While the MARNDR will bear the responsibility for execution of the PIA under the terms of the loan contract, the Ministry of Environment's mandate does mean that it oversees the promulgation of environmental norms. As a relatively new Ministry with a weak institutional base, it has a limited ability to fulfill its mandate. As the Bank and other donors collaborate to strengthen the Ministry, the PIA, through the BCP, will actively pursue coordination with it in matters pertaining to environmental guidelines as foreseen in the ESMP.

4.24 The PIA also includes a full complement of monitoring and evaluation measures to be set up at project inception as presented at length in the ESIR. These are to be financed within the components for strengthening of the SNRE and include: (i) continuous hydrological monitoring; (ii) establishment of a watershed model; and (iii) establishment of a water and soil quality baseline.

E. Project risks

4.25 **Water Users Groups.** The process of organizing water user groups will require that producers invest their time and income paying for water. To induce producers with potential to invest more (time and resources) into water user groups will require institutional and financial mechanisms to ensure operation and maintenance of infrastructure and cost recovery in the project area. In addition to providing resources to address this concern, the PIA will nevertheless have to face the numerous risks and provide for the eventualities during project execution.

4.26 **Operations and Maintenance of Irrigation and Drainage.** The past record of the ODVA and its institutional weaknesses are an important issue, which have been discussed with Haitian government authorities during project design. The PIA will

[6] Bank procedures include, among others, to make the EIA available to the public at least 120 days before the beginning date of the infrastructure works.

support strengthening the ODVA in order to improve its capacity to provide for the operation and maintenance of the irrigation and drainage system in the Artibonite Valley, while other project components will be implemented by outsourcing to private firms. The Bank will monitor closely ODVA's performance and during the annual meetings with the Ejecutor to discuss the PIP, recommend corrective actions to support the achievement of the project's objectives.

4.27 **Disruptions in Inputs and Access to Credit.** Should major disruptions occur in the input delivery system or availability (seeds, fertilizer), productivity gains will not be achieved to the degree expected. Sensitivity analysis shows the program can sustain such a delay for up to two years. The PIA will rely on existing programs to assure supply. Similarly, if there are future distortions in credit markets (for example due to deteriorating macroeconomic conditions) or distortions in the labor supply market (for example due to labor-intensive works projects in the vicinity of the project area), this would adversely affect the achievement of project objectives.

4.28 **Commodity Price Level and Variations.** Domestic food prices exceed international commodity prices for many items in Haiti. The foregoing analysis incorporated the risk that producers would not receive these higher prices by utilizing the international price levels as reference prices. The sensitivity analysis performed indicated that these variations did not significantly affect the economic viability of the project. Similarly, if there is an increase in food aid programs, this may undermine the market for agricultural products produced in the project area.

4.29 **Political or Social Upheaval.** Significant political or social upheaval would seriously undermine the viability of the Program. The resulting delays in addressing the need for infrastructure rehabilitation, land tenure security and agricultural intensification could diminish the long-term prospects for success.

4.30 **Natural disasters.** The engineering techniques required to execute the works present few technical risks for the national and international contractors. Additional natural disasters would however substantially disrupt completion of the works within the projected time frame and jeopardize achieving the expected results.

V. EXCEPTIONS TO BANK POLICY

5.1 A special disbursement to facilitate compliance with conditions prior to first disbursement is proposed, prior to compliance with the conditions set forth in article 4.01 (c) and (d) of the general norms of the loan contract.

LOGICAL FRAMEWORK
AGRICULTURAL INTENSIFICATION PROGRAM

(HA-0016)

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS/RISKS
GOAL			
Increase the income of farmers in the Artibonite Valley through a process of agricultural intensification.	• By the end of year 5, project zone socio-economic indicators will increase: income per hectare (100%), on-farm employment (50%), and crop production (100%).	• ODVA statistical service baseline and reports to PIA BCP. • Surveys of water user groups collected in the project zone.	• Assistance not be interrupted by significant political unrest or economic upheaval. • Input and output farm-gate price levels remain relatively stable. • Neither natural disasters nor devastated plant or animal health outbreak will significantly undermine the intensification process.
PURPOSE			
Enable producers to intensify agricultural production in ways, which are sustainable both commercially and in terms of sustainable water use.	• By the end of year 5, the value of production will increase by 100% with regard to the baseline conditions of the project (using value at constant prices, to be determined at project initiation). • By the end of year 5, the area cultivated in non-rice crops to increased at least to 5 %	• ODVA on-going data collection and reports to PIA BCP • PIA socioeconomic survey data.	• Neither labor-intensive works projects in the vicinity nor food aid programs significantly undermine the supply of labor nor the market for agricultural products. • Major social or political upheavals, especially regarding land conflicts do not arise in the selected project zone. • Local population demonstrates commitment to join water user groups and increased degree of management of the small-scale works. • Availability of formal or informal credit for production.
SUBPROGRAM A: ACTIVITIES			
1. Support for the organization of water user groups	• Demonstrated organization of user-groups, agreement on fee structure	• User group records and observed levels of organization in the project	

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS/RISKS
*Organize water users groups and implement cost recovery mechanisms for operation and maintenance. *Improve land tenure security for the better management of resources by water user groups.	and increased scope of local management responsibility achieved during the following time line: 10,000 farmers by the 2nd year, 9,000 farmers by the 3rd year, 8,000 farmers by the 4th year, and 2,500 farmers by 5th year. • By the end of year 2 the water tariff per hectare per year is established at US$ 5 and thereafter it is increased in US$ 5 per year until a final price of US$45 per hectare. • By the end of year 5 the collection ratio is at least 50%.	evaluation plan reports by BCP • PIA socio-economic baseline survey and monitoring records	
2. Support for agricultural intensification and market linkage * Improve staple crop seeds and agricultural input delivery. * Expand high revenue crops and market linkage.	• By the end of year 5, increase to average yield of rice to 4 tons/ha in project area. • By the end of year 5, the area cultivated of high value crops (other than rice) has increased in 5% with respect to the baseline conditions • By the end of year 5, increase in gross revenue in 100% with regard to the baseline conditions of the project (using value at constant prices, to be determined at project initiation.	• Annual extension agents' reports on crop production to BCP • Reports of origin of product from shippers/ processors/ exporters.	
3. Institutional Strengthening * Strengthening SNRE. * Strengthening ODVA.	• Starting the second year, one monthly up-dated hydrological report (rainfall, evapo-transpiration rates, discharge and correlations) for project zones. • hydrological stations (Canneau dam, Pont Sondé bridge, and 5th section area) are in place and working by the end of year 2. • By the end of 2nd year and thereafter the entire network of canals is cleaned	• Periodic hydrology reports disseminated by MARNDR, and reports of WMO technical assistance supervision. • Site visits and engineer's report • Workshop monthly work orders reports • ODVA Project evaluation plan reports by the BCP and mid term evaluation report.	

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS/RISKS
	at least once per year. • Preventive maintenance for the equipment is performed according to the provider maintenance manual. • By the end of every year, the number of complaints of bad service is reduced in 10% per year with respect to the baseline.		
SUBPROGRAM B: ACTIVITIES			
1. Repair and protection of broken embankments *Protection from flooding at the Male Pandye and Ti Mango embankments	• Completion of infrastructure works • Reduction of erosion of river embankment	• Project evaluation plan reports by the BCP • Minutes of final reception of the works	
2. Restoration of drainage capacity *Restoration of water evacuation capacity at the Dessalines and Fosse Cheval drainages	• Completion of infrastructure works • Six months after the completion of the infrastructure works, the area of stagnated water in the perimeters is reduced to practically zero. • One year after the completion of the infrastructure works, the agricultural production in the 6,000 hectares increased by 50% in constant terms.	• Project evaluation plan reports by the BCP • Minutes of final reception of the works • Field visits	
3. Flood control measures *Installation of sluice gates	• Completion of infrastructure works. • After the completion of the infrastructure works, the amount of flooding over the upstream area of the lower Artibonite River is reduced to practically zero.	• Project evaluation plan reports by the BCP • Minutes of final reception of the works • Feld visits • ODVA reports	
4. Improvement of floodway capacity *Improvement of the capacity of the Salee Floodway	• Completion of infrastructure works. • Increased capacity of the floodway to withstand 600 m3/sec. • One year after the completion of the	• Project evaluation plan reports by the BCP • Minutes of final reception of the works	

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS/RISKS
	infrastructure works, production for the 5th Section affected by the investment increased by 50% in constant terms.	• ODAV reports	
5. Capacity expansion of the main channel *Expansion of the water flow of the Artibonite Channel	• Completion of infrastructure works. • Improvement of the 31.6 km of channel length to increase water flow to an additional 5000 hectares. • One year after the completion of the infrastructure works, production for 5000 hectares affected by the investment increased by 50% in constant terms..	• Project evaluation plan reports by the BCP. • Minutes of final reception of the works • ODVA Reports	•
6. Rehabilitation of primary channels of the Artibonite Valley system *Rehabilitation and improvement of the hydrology of primary channels. *Implementation of a tele-surveillance system for real-time management of water resources	• Completion of infrastructure works • Improvement of the hydrology of primary channels in the Artibonite Valley system • Water availability for additional 800 hectares • One year after the completion of the infrastructure works, production for 9000 hectares affected by the investment increased by 50% in constant terms.	• Hydrological measurements and efficiency calculations in the periodic hydrology reports by MARNDR or agency contracted for hydrological monitoring • Project evaluation plan reports by the BCP • Minutes of final reception of the works	
7. Rehabilitation of secondary irrigation and drainage system Rehabilitation of the secondary irrigation and drainage system of the 5eme section	• Completion of infrastructure works • Increase in the efficiency of water delivery and drainage in the secondary I&D system by at least 20% after the completion of the infrastructure works • One year after the completion of the infrastructure works, production for 5000 hectares affected by the investment increased by 50% in constant terms.	• Minutes of final reception of the works • Project evaluation plan reports by the BCP • PIA socio-economic baseline survey and monitoring records • Hydrological measurements and efficiency calculations in the periodic hydrology reports by MARNDR or agency contracted for hydrological monitoring	

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS/RISKS
8. Irrigation and drainage of the Rive Droite of Estere *Construction of the primary and secondary irrigation and drainage system of the Rive Droite of Estere	• Completion of infrastructure works • Construction of irrigation and drainage system for 1100 hectares. • Availability of irrigated water to the Rive Droite of Estere after completion of infrastructure works • One year after the completion of the infrastructure works, the agricultural production for 1100 hectares affected by the investment increased by 50% in constant terms.	• Hydrological measurements and efficiency calculations in the periodic hydrology reports by MARNDR or agency contracted for hydrological monitoring. • Minutes of final reception of the works • Project evaluation plan reports by the BCP	
9. Construction of tertiary irrigation systems	• Completion of infrastructure works • Increase water delivery efficiency after completion of infrastructure works by at least 20% for project areas from primary and secondary channel up to the parcel level. • One year after the completion of the tertiary system, agricultural production increase by 50% in constant terms.	• Minutes of final reception of the works • Project evaluation plan reports by the BCP • Hydrological measurements and efficiency calculations in the periodic hydrology reports by MARNDR or agency contracted for hydrological monitoring.	
Sub Program	**Budget (US$ millions)** A 12.00 B 26.15 ---------- **TOTAL** 38.15	• Program's execution budget records	• Resources are available and disbursed in a timely manner • Institutional stability exists

PROCUREMENT PLAN: AGRICULTURAL INTENSIFICATION PROGRAM (HA-0016)

Principal Project Procurement	Financing source		Procurement Method 1/	Prequa-lification	Specific Procurement Notice	Status 2/
	BID (%)	Local / Other (%)		Yes / No	Tentative Publication Date	
1 GOODS						
Lot 1 Equipment for the SNRE Approximately cost US $275	90	10	ICB	YES	II/2004	Pending
Lot 2 Equipment and spair parts for the ODVA Approximately cost US $1,894	90	10	ICB	YES	II/2004	Pending
Lot 3 Equipment for Agricultural Intensification Approximately cost US $277	90	10	ICB	YES	II/2004	Pending
2 WORKS						
Lot 1 Re-profiling of Canal Artibonite Sud Repair of secondary network Approximate cost US $7,360	90	10	ICB	YES	I/2005	Pending
Lot 2 Protection Spillway of Salée Flood Way Re-profiling of canal Salée Flood Way Construction of bridge Approximate cost US $2,592	90	10	ICB	YES	II/2004	Pending
Lot 3 Repairment of Pale Mandye and Ti Mango Approximate cost US $1,350	90	10	ICB	YES	II/2004	Pending
Lot 4 Re-profiling of Dessalines drain Re-profiling of Fossé Cheval drain Reconstruction of bridges Installation of anti-retour gates Approximate cost US $3,263	90	10	ICB	YES	II/2004	Pending
Lot 5 Re-profiling of Dessalines Canal Approximate cost US $1.420	90	10	ICB	YES	I/2005	Pending
Lot 6 Irrigation in right bank of l'Estere Approximate cost US $4,550	90	10	ICB	YES	II/2004	Pending
Lot 7 Tertiary canals Artibonite I, II, Fabias, 5th Section Approximate cost US $2,500	90	10	ICB	YES	II/2007	Pending
3 CONSULTING SERVICES						
Supervision Lot 1 Re-profiling of Canal Artibonite Sud Repair of secondary network Approximate cost US $840	90	10	ICB	YES	I/2005	Pending

Principal Project Procurement	Financing source		Procurement Method 1/	Prequa-lification	Specific Procurement Notice	Status 2/
	BID (%)	Local / Other (%)		Yes / No	Tentative Publication Date	
Supervision Lot 2 Protection Spillway of Salée Flood Way Re-profiling of canal Salée Flood Way Supervision of Construction of bridge Approximate cost US $288	90	10	ICB	YES	II/2004	Pending
Supervision Lot 3 Repairment of Pale Mandye and Ti Mango Approximate cost US $150	90	10	NCB	YES	II/2004	Pending
Supervision Lot 4 Re-profiling of Dessalines drain Re-profiling of Fossé Cheval drain Reconstruction of bridges Installation of anti-retour gates Approximate cost US $362	90	10	ICB	YES	II/2004	Pending
Supervision Lot 5 Re-profiling of Dessalines drain Approximate cost US $180	90	10	NCB	YES	I/2005	Pending
Supervision Lot 6 Irrigation in right bank of l'Estere Approximate cost US $495	90	10	ICB	YES	II/2004	Pending
Supervision Lot 7 Tertiary canals Artibonite I, II, Fabias, 5th Section Approximate cost US $300	90	10	ICB	YES	II/2007	Pending
Studies Group 1 Repair of secondary network Re-profiling of Dessalines canal Approximate cost US $400	90	10	ICB	YES	II/2004	Pending
Studies Group 2 Land tenure inventory Approximate cost US $1,350	90	10	ICB	YES	II/2004	Pending
Studies Group 3 Tertiary canals Artibonite I, II, Fabias, 5th Section Approximate cost US $200	90	10	ICB	YES	II/2006	Pending
Consultancy 1 Strengthening of the SNRE Approximate cost US $225	90	10	ICB	YES	II/2004	Pending
Consultancy 2 Strengthening of the ODVA Approximate cost US $825	90	10	ICB	YES	II/2004	Pending

1/ **ICB**: International Competitive Bidding **NCB:** National Competitive Bidding **LIB**: Limites International Bidding
CD: Direct Contracting **ILS:** International / Local Shopping **FA**: Force Account

2/ Terminology to be used: Pending / Awarded / Cancelled

FIGURE I

AGRICULTURAL INTENSIFICATION PROGRAM

Institutional Organization Chart