DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

HAITI

NATURAL DISASTER MITIGATION PROGRAM II
(HA-L1097)

CLIMATE PROOFING OF AGRICULTURE IN THE CENTRE-ARTIBONITE LOOP AREA
(HA-G1031)

GRANT PROPOSAL

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REQUIRED

1. Pluri-annual Execution Plan / Annual Operation Plan
2. Monitoring and Evaluation Arrangements
3. Environmental and Social Management Report
4. Procurement Plan

OPTIONAL

1. Technical Summary about watershed prioritization
2. Deforestation and erosion in Haiti's watershed
3. PPCR summary
4. USAID. 2007. Environmental vulnerability in Haiti. Findings and recommendations.
5. Project cost-benefit analysis (CBA)
6. Ex-post CBA of downstream watershed protection infrastructure financed in the framework of 2187/GR-HA grant agreement (AECOM)
7. Ex-post CBA of upstream watershed protection infrastructure financed in the framework of 2187/GR-HA grant agreement (IDB)
8. Final evaluation of ATN/MD-13623-HA and analysis of Early Warning Systems in Haiti
9. Identification and prioritization of watershed protection infrastructure for HA-L1097 operation (AECOM)
10. Structural evaluation of the Faculty of Agronomics and Veterinary Medicine.
11. Index of Governance and Public Policy in Disaster Risk Management (iGOPP): Haiti.
12. Agriculture and Climate Change diagnosis of St Michel de l'Attalaye and St Raphaël
13. Technical References
14. Preliminary dimensioning of the Faculty of Agronomics and Veterinary Medicine
15. Operations manual of the Natural Disaster Mitigation Program I (HA-L1041)

ABBREVIATIONS	
AOP	Annual Operations Plan
BRH	*Banque de la République d'Haïti*
CC	Climate Change
CIAT	Technical Secretariat of the Inter-Ministerial Land Planning Committee
CIF	Climate Investment Funds
CNIGS	National Geospatial Information Center
DPC	Civil Protection Directorate
DRM	Disaster Risk Management
EA	Executing Agency
ESMR	Environmental and Social Management Report
ESS	Environmental and Social Strategy
EWS	Early Warning System
FAMV	Faculty of Agronomy and Veterinary Medicine
FAO	Food and Agriculture Organization
GCI-9	Ninth General Increase in Resources of the IDB
GDP	Gross Domestic Product
GoH	Government of Haiti
IA	Implementing Agency
IDB	Inter-American Development Bank
IGOPP	Index of Governance and Public Policy for Disaster Risk Management
IHSI	*Institut Haïtien de Statistique et d'Informatique*
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LAC	Latin America and the Caribbean
MARNDR	Ministry of Agriculture, Natural Resources and Rural Development
MDE	Ministry of Environment
MICT	Ministry of Interior and Territorial Collectivities
MOU	Memorandum of Understanding
NAPA	National Plan for Adaptation to Climate Change
ND-GAIN	University of Notre Dame Global Adaptation Index
NGO	Non-Governmental Organization
NPV	Net Present Value
OM	Operations Manual
PCR	Project Completion Report
PMDN	Natural Disaster Mitigation Program in Priority Watersheds
POD	Proposal for Operation Development
PPCR	Pilot Program for Climate Resilience
PR	Progress Report
SC	Steering Committee
SCX	IDB Strategic Climate Fund
SPCR	Strategic Program for Climate Resilience
SPF	Safeguard Policy Filter
SSF	Safeguard Screening Form
TORs	Terms of Reference

UCLBP	Unit for Construction of Housing and Public Building
UEP	Studies and Programming Unit of MARNDR
UNDP	United Nations Development Program
UNISDR	United Nations International Strategy for Disaster Reduction
UPMP	MARNDR's Procurement Unit
USAID	United States Agency for International Development
WB	World Bank

PROJECT SUMMARY
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Financial Terms and Conditions				
Beneficiary: Republic of Haiti			**Amortization Period:**	N/A
Executing Agency: Ministry of Agriculture, Natural Resources and Rural Development (MARNDR)			**Disbursement Period:**	60 months
Source	**Amount (US$ million)**	**%**	**Grace Period:**	N/A
IDB Grant Facility (HA-L1097):	42.00	88	**Supervision and Inspection Fee:**	N/A
IDB Strategic Climate Fund (SCX) Grant HA-G1031:	4.50	10	**Interest rate:**	N/A
Local:	0.75	2	**Credit Fee:**	N/A
Total:	47.25	100	**Currency of Approval:**	US Dollars

Project at a Glance

Project Objective/Description: The project objective is to reduce rural economic losses through the improvement of climate risk management in selected watersheds. The specific objectives are to: (i) increase capacities for adaptation to climate change and disaster risk management (DRM) in the agriculture sector; (ii) improve water and sediment conservation in selected gullies of priority watersheds; (iii) reduce the risk of rural economic losses due to floods in targeted watersheds; and (iv) restore the educational capacity of the Faculty of Agronomy and Veterinary Medicine (FAMV) campus.

Special Contractual Clauses prior to first disbursement: the Executing Agency (EA) shall, to the satisfaction of the Bank: (i) adopt an Operations Manual (OM) of the project which shall include, among others: (a) the role of each participant and collaborating institution for the implementation of the project; (b) a code of ethics section; (c) an annex describing the procedure and timeframe applicable to the MARNDR's internal and external approval process for procurement contracts; (d) a model of Environmental and Social Management Plan (ESMP) for works; (e) the Monitoring and Evaluation Plan; (f) procedures for the administration of goods and fixed assets and the safeguard of financial information; and (g) a chart of accounts (¶3.8); and (ii) contract or appoint the coordinator and an administrator assigned to the project (¶3.2).

Special Execution Clauses to be fulfilled by the Beneficiary: the EA shall, to the satisfaction of the Bank: (i) present, prior to the execution of activity (ii) of Component 2, a copy of a valid Memorandum of Understanding (MOU) signed between MARNDR and the Ministry of Interior and Territorial Collectivities (MICT), establishing the terms of collaboration between MARNDR and the Civil Protection Directorate of MICT for the execution of said activity (¶3.4); (ii) present, before launching the procurement processes of the works of Component 3 (FAMV campus), a copy of a valid MOU signed among MARNDR, FAMV and the Unit for Construction of Housing and Public Building (UCLBP) establishing the terms of the collaboration of UCLBP in the reconstruction phase of the FAMV campus (¶3.6); and (iii) present, prior to beginning the works of Component 3, a compensation and action plan for the temporarily displaced on-campus students during the reconstruction of the student housing facilities (¶2.2).

Environmental and Social Clauses: The beneficiary shall comply with the environmental, social, health and safety and labor requirements set forth in the Environmental and Social Management Report (ESMR), including its section 6(iii,) and provide evidence of such compliance (¶2.2).

Special disbursement: To enable the EA to fulfill the conditions prior to first disbursement an initial disbursement of up to US$150,000 will be made to the extent the Beneficiary fulfills, to the Bank's satisfaction, all the standard general conditions prior to first disbursement set forth in the grant agreement (¶3.11) (see ¶4.8 of Annex III).

Exceptions to Bank Policies: None

The project qualifies for: SV ☑ PE ☑ CC ☑ CI ☐

I. DESCRIPTION AND RESULTS MONITORING

A. Background, Problem Addressed, Justification

1.1 Haiti is one of the countries with the highest natural disaster risk index in the world[1] (WB, 2005; UNDP, 2004), including climate hazards (Kreft et al., 2015), and with the lowest adaptation capacity. This high climate related risk is the result of its geographic location (hurricane belt of the Caribbean basin), physical features and its economic reliance on activities closely linked to climate factors.

1.2 Agriculture plays a critical role in Haiti's economy and concentrates the risk of losses associated with climate hazards. This sector contributes 25% of Gross Domestic Product (GDP), 5.9% of total exports value (BRH, 2014), 47% of overall employment, 71% of employment in rural areas, and 75% of employment in low income rural households (WB/IHSI, 2012). In addition, 52% of the population lives in rural areas (WB/IHSI, 2012), with an average monthly income of US$49, 69% of this rural population are considered chronically poor, suffering from revenue instability mainly due to climate variability and its impacts on agricultural production (Herrera et al., 2014; WB/IHSI, 2012). Particularly vulnerable are female-headed households which account for 38% of rural households. In the last 50 years, the country has suffered over 40 harmful climatic events, one internationally-recognized catastrophe every two years, and a major catastrophe every four to six years (UNDP, 2004). In 2008 two storms and two hurricanes left at least 1,100 casualties and an estimated damage of more than US$900 million (15% of GDP), being the agriculture sector the most affected (US$200 million).[2] In August 2012, two hurricanes (Isaac and Sandy) ravaged the agricultural sector, affecting production in more than 80,000 ha of agricultural land and causing losses of over US$104 million, while leaving 19 dead and more than 18,000 damaged houses[3] in the South. The country, and especially the agricultural sector, is also affected by droughts. Bayard (2011) and Bellande (2012) observe that more than a third of the agricultural land is affected by drought every five to seven years and that planting is regularly delayed due to lack of rainfall at the beginning of the rainy season. In this setting there exists persistent and high pressure on land and natural resources to produce staple foods, which itself contributes to deforestation and to local effects of hydro-meteorological borne disasters (MARNDR/FAO, 2009).

1.3 The high risk of natural disasters in the agriculture sector will be exacerbated by climate change in two ways: first, through the likely increase in weather and climate hazardous events, and secondly through increases in the vulnerability of communities to natural hazards (IPCC, 2014). Climate change projections for the Caribbean region, including Haiti, indicate a rise in temperature from 1.2ºC to 2.3ºC and an annual precipitation decrease of 5 – 6% by the end of the 21st century (Nurse et al., 2014). As a result, under current agronomic and natural

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1 "Natural disaster risk" refers to "the probability of harmful consequences or expected losses resulting from interactions between natural or human-induced hazards and vulnerable conditions" (GN-2354-11). "Climate risk" refers to the part of natural disaster risk associated with existing and future climate hazards, including those deriving from climate change.

2 Post-disaster needs assessment. 2008, Gov. of Haiti, World Bank, United Nations System and European Commission.

3 MARNDR (2012) and United Nations Office for the Coordination of Humanitarian Affairs, 2012.

resources management conditions, it is estimated that physical yields of important crops may fall by up to 70% (Eitzinger et al., 2013),[4] and economic and human losses in rural areas of Haiti may increase (IPCC, 2014).

1.4 The high risk of disasters in Haiti's agriculture sector is therefore the result of the characteristics of the hazards, including projected effects of climate change (FAO, 2013), and the vulnerabilities which increase the susceptibility to the impact of hazards.[5] These vulnerabilities include: (i) physical vulnerabilities in priority watersheds; and (ii) institutional vulnerabilities, particularly low governance of disaster risk management (DRM) and lack of capacities for risk identification and agricultural innovation services.

1.5 **Physical vulnerabilities in priority watersheds.** The vulnerability to floods at watershed level is determined by Haiti's physical features: 80% of the country is mountainous, with 30 main watersheds and scarce arable land (only 28%) concentrated in irrigated valleys affected by recurrent floods (IDB, 2011). Haiti's watersheds are characterized by severe soil erosion risk and upper part lands deforested at an average of 50%. This deforestation, partly due to inadequate rural farming practices, can increase river flows by 25% and contribute to increase erosion rates by six times, producing river silting, which in turn intensifies overflows (optional link 2).

1.6 The vulnerability analysis carried out by USAID (2007) classifies Haiti's watersheds physical vulnerabilities based on factors like topography, climate, ecological importance, productive infrastructure, and settlement location and density. This study identifies twelve highly vulnerable watersheds which can be grouped in four homogeneous areas: Area 1 (A1): the Northern Corridor, which includes Grande Rivière du Nord; Area 2 (A2), which includes the lower part of Artibonite watershed; Area 3 (A3), which includes Port Au Prince; and Area 4 (A4), which includes Les Cayes city. The aggregation in homogeneous areas was carried out considering groups of watersheds with high vulnerability that drain to the same floodplains (optional link 1). A technical analysis was carried out to identify which of those highly vulnerable watersheds concentrate most of the flood risk for agriculture and opportunities to invest in risk mitigation. The qualitative and quantitative criteria applied for the analysis were: (i) focus on predominantly agricultural and rural areas; (ii) level of exposure to floods; and (iii) synergies with existing programs. Through the combination of these criteria, Grande Rivière du Nord (in Area 1), Artibonite (in Area 2), and Cavaillon and Les Cayes (which include the sub-basins of Acul Dubreuil and Ravine du Sud, (in Area 4) were identified.

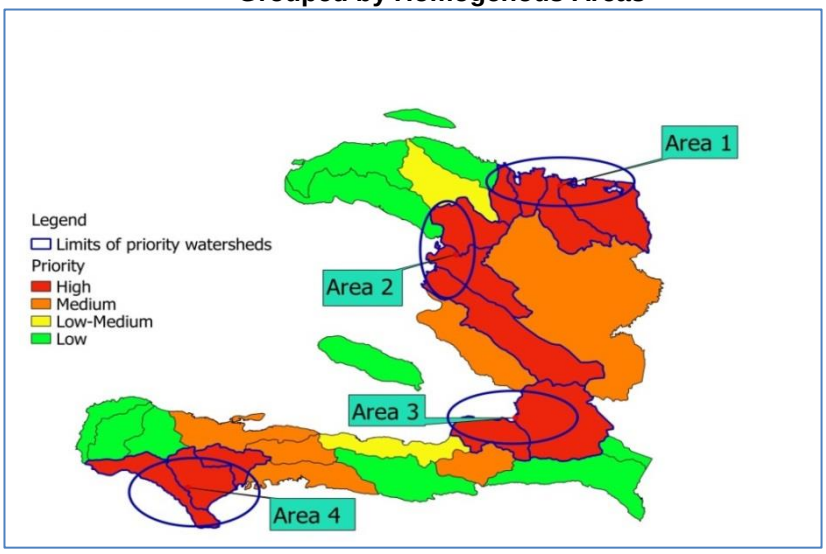
1.7 All these priority watersheds are characterized by the following problems: severe risk of erosion, deforestation around 50% in the upper part, which increases floods, and significant concentration of flood risk in the lower part, with a total estimated value of annual expected losses for the five watersheds at US$28 million. In addition to flood vulnerability in the lower part of the watersheds, as a result of deforestation and inappropriate farming techniques,

[4] For example, given the rise in temperatures, the common bean could lose 70% of its production in Haiti by 2050 if no adaptation measures are implemented.

[5] GN-2354-11: Disaster Risk Management Policy Guidelines.

farmers upstream are exposed to superficial landslides, loss of soil fertility due to water-driven erosion, and their production is particularly affected during extended and seasonal drought periods because soils have lost their capacity to retain humidity for extended periods of time (optional link 7).

Figure1. Composite Map of Vulnerability from USAID (2007)
Grouped by Homogenous Areas



1.8 **Low DRM governance.** DRM governance is critical to reduce vulnerability of local populations and the economy to climate risks (UNISDR, 2015). The Bank developed the Index of Governance and Public Policy for Disaster Risk Management (IGOPP) to assess the level of countries DRM governance.[6] Its application in 2013 ranked Haiti as having the lowest DRM governance of 13 countries in Latin America and the Caribbean (LAC), with a score of 7%. In the same sense, Haiti's ND-GAIN (University of Notre Dame Global Adaptation Index) Governance Readiness sub-index score is very low (0.283), which overall places it as one of the globally least ready countries to respond to climate change and climate-related disasters. Some of the variables of the IGOPP related to the agriculture sector identify weaknesses in the legal and institutional framework for planning post-disaster recovery, for which responsibilities have not been explicitly established. In addition, this sector does not have financial protection mechanisms based on loss exceedance curves, which is considered an international best practice (IDB, 2015). At the community level, weak Early Warning Systems (EWS) affect rural populations' abilities to prepare for impending disasters, thus increasing probability of human and economic losses (¶1.16).

1.9 **Lack of risk identification and agriculture research and innovation services for climate resilient practices.** According to the IGOPP, the governance conditions in Haiti for risk identification and knowledge are extremely low, with a rating of 9%, while LAC average is 32%. Another recent study of the Technical Secretariat of the Inter-Ministerial Land Planning Committee (CIAT) and World Bank (Fountaine and Bertil, 2015) observed that, although some

[6] The IGOPP assesses the existing legal, institutional and budgetary conditions for a comprehensive DRM public policy in a country.

government or non-governmental organization (NGO) led initiatives exist, investment in climate risk analysis is very low and related methodologies need to be improved. For instance, the study highlights that the MARNDR, which by mandate is in charge of mitigating climate related risk in the agriculture sector, does not prioritize investments according to risk study and cost-benefit analysis. In the same sense, a diagnosis of the flood early warning system in Haiti, which is a key tool for climate risk analysis and response, showed that there are still important limitations related to system maintenance, forecast accuracy and organization of the evacuation.

1.10 Agricultural research, innovation and extension services are limited, especially those that serve small hillside farmers, limiting their capacity to adapt to climate related phenomena and disasters. With the decline of MARNDR budgetary resources in the late 1980s, agricultural research and innovation services have been severely weakened,[7] and therefore impeded the generation of cost-effective farming practices that could promote soil conservation and adaptation to climate change. According to the 2009 agricultural census, only 2.6% of farmers have received some technical and/or occasional agricultural training, 7% declared to have used some mechanical equipment, and 43% identify the lack of research and extension services as a constraint to their development. As a consequence, most farmers in Haiti are confined to stagnant technologies.

1.11 In this context, the Faculty of Agronomy and Veterinary Medicine (FAMV) is a central institution for the generation of innovation and capacities in Haiti in agriculture, natural resources management and rural engineering, which are key fields for natural disasters management and climate change adaptation. However, the 2010 earthquake severely affected its teaching, research and services capacities, after having destroyed 90% of its facilities. A recent structural evaluation of the remaining buildings warns on the high risk of collapsing in case of minor seism, which could provoke major casualties among Faculty's students and teachers. The FAMV trains an average of 85 agronomists each year (approx. 90% of the agronomists graduated each year in Haiti) and provides key scientific services for the sector, such as the only soil laboratory of the country which cannot cope with demand with diminished facilities. FAMV is also involved in several research projects related to climate risks and agriculture, and dedicates approximately 16%[8] of its annual budget to research in these matters. FAMV publishes an average of 25 scientific articles every year, of which a fourth are related to natural resources and watershed management. FAMV is also an important repository of knowledge through its library and national herbarium, which due to the infrastructure damages are currently hardly accessible to students and the public.

1.12 **Lessons learned.** With the Bank's support, the Government of Haiti (GoH) has implemented several projects in the field of natural disaster risk mitigation.[9] The main lessons learned are presented in Table 1.

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7 Lessons learned and studies include: (i) *Les centres de services régionaux: Etat des lieux, perspectives*. WB/ Damais, 2005; (ii) Ibid, USAID/ OFDA, 2010; and (iii) *Consortium de Recherche pour le Développement Agricole*, IICA, 2011

8 Approximately US$250,000 per year.

9 Since 2005, the Bank approved six operations with watershed management and/or DRM components. Two Technical Cooperations (ATN/MD-11565-HA and ATN/MD-13623-HA) for US$1.4 million; and four grants (2389/GR-HA, 2187/GR-HA, 2562/GR-HA, and 3093/GR-HA) for US$100 million.

Table 1. Lessons Learned

Lessons learned	Reflected in the project design
Prioritization of downstream mitigation works should be based on rigorous flood risk analysis.	A flood risk analysis has been developed to identify and prioritize the main downstream works to be constructed (Link 9). More advanced probabilistic modeling will be developed (Component 1), considering climate change scenarios, in order to improve the prioritization of future works and support the calibration of the early warning systems (EWS).
The ex post evaluation of 2187/GR-HA demonstrated that better results in upstream investments are obtained when combining infrastructure and improvement of farming practices (Brochet and Clossy, 2010), when the capacity to store water and fertile silts allows crop diversification and intensification.	The project will continue developing such approach related to watershed management, where producers should derive economic benefit in the short term from the improvement of cropping systems. Based on a multi-criterion analysis (hydro-morphology, land use, productive potential and severity of erosion) upstream investments were prioritized in the project. In addition, a complementary program financed by the Bank (Grant agreement 2562/GR-HA) will provide incentives to farmers to promote sustainable farming practices in selected watersheds.
In order to ensure sustainability and community empowerment, the EWS should be simple and community based rather than high-tech, and the Civil Protection Directorate (DPC) should be involved in the implementation of related activities.*	The EWS will be technologically simple and community-based. A memorandum of understanding (MOU) will be signed between MARNDR and DPC in order to ensure DPC involvement.
Investments have to be coupled with governance reforms in order to foster sustainability and increase public spending efficiency (IDB, 2011).	Part of present project design was based on a DRM governance diagnosis (IGOPP index) which allowed identifying key actions.
Disaster Risk Management policy reforms contribute to catalyze and improve public investment in risk reduction.	Best practices of disaster risk management policy reforms (identified through IGOPP) will be promoted by the program.

*2389/GR-HA Project Completion Report (PCR)

1.13 **Project conceptualization.** The proposed project builds on the lessons learned of past projects and has been designed as a continuation of the "Natural Disaster Mitigation Program in Priority Watersheds I (PMDN I, 2187/GR-HA), with comparable objectives and activities, which is scheduled to end in 2015. The PMDN I intervened in Grande Rivière du Nord, Artibonite, Ravine du Sud and Cavaillon watersheds and included three components: (i) investments in upstream and downstream mitigation works; (ii) promotion of sustainable farming practices in agriculture; and (iii) institutional strengthening for watershed management. Among other products, the PMDN I financed the construction of four major downstream river-bank protection works, two hundred upstream small-scale water and soil conservation infrastructures, and supported the increase of agroforestry practices of 7,125 farmers. The ex post cost-benefit analysis (Link 6 and Link 7) confirmed the validity of the approach and showed that investments in downstream watershed protection infrastructure and water and soil conservation infrastructure generated a positive internal rate of return (IRR) and net present value (NPV). Crop diversification and intensification, as a result of increased capacity to store water and access to fertile silt in the upstream parts of check dams, are the main drivers of the positive results in the upper parts of the watersheds.

1.14 The project also derives from Haiti's Strategic Plan for Climate Resilience (SPCR), which identifies the Centre-Artibonite upper watershed as a priority area for the adaption of agriculture to climate change (CC) and which will be implemented through the Pilot Program for Climate Resilience (PPCR) with financing from the Climate Investment Funds (CIF). The project design is also based on technical studies and diagnosis related to the prioritized watershed, DRM governance in Haiti, early warning systems and FAMV reconstruction. The study of identification and prioritization of watershed protection infrastructure used an innovative methodology in Haiti and included: (i) an estimation of economic and human losses due to floods, using international best practices of vulnerability functions and loss exceedance curves; (ii) identification of efficient flood control investments based on a cost benefit analysis; and (iii) multi-criteria prioritization of areas for the small-scale upstream investments.

1.15 In this framework, the project aims to reduce economic losses and increase agricultural production through the improvement of climate risk management in selected watersheds through: (i) capacity-building and governance strengthening in disaster risk management considering climate change scenarios in agriculture through technical studies, applied research, development of decision-making tools and training; and (ii) investments in climate related disaster risk reduction for agriculture and rural areas in selected watersheds, including the combination of downstream flood mitigation works and upstream small-scale water and soil conservation infrastructures, together with community-based flood EWS. The project includes rebuilding the Faculty of Agronomics and Veterinary Medicine, described in ¶1.11. Since natural disaster management is closely linked to climate change adaptation, the project includes co-financing from the CIF through the PPCR window, which will be channeled through the IDB Strategic Climate Fund (SCX) Grant, for activities related to the adaption of agriculture to CC in the Boucle Centre-Artibonite. The project maintains the integrated approach of watershed management promoted in 2187/GR-HA, with the combination of infrastructure and promotion of sustainable farming practices. However the latest will be covered by a complementary program financed by the Bank (Grant agreement 2562/GR-HA) which will provide incentives to farmers to adopt sustainable cropping practices in the selected watersheds, promoting reforestation.

1.16 Project conceptual design is aligned with the "Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation" (IPCC 2012), which establishes that climate related disaster risk is the principal expression of climate change at local level. International agreements, including the recently approved Senday Framework for Disaster Risk Reduction (2015-2030), and empirical evidence establish that: (i) "policies and practices for disaster risk management should be based on an understanding of disaster risk" (UNISDR, 2015); (ii) "probabilistic risk models are a rigorous methodology for assessing potential losses for adverse events before they occur and provide information for effective decision making on DRM" (Yamin & al 2013); (iii) "generating and disseminating information of disaster risk shows benefit-cost ratios above 15" (WB, 2010); and (iv) investing in risk mitigation and prevention is much more efficient than doing so in disaster response (Moench, et al., 2007)

with average benefit/cost ratios for flood mitigation works around four (Godschalk, et al., 2009) and with benefits exceeding 10 times the cost for EWS (Rogers and Tsirkunov, 2010). Regarding the impact of improving disaster risk governance, an analysis carried out in Colombia showed that national policy reforms, guided by IGOPP, contributed to local reforms in Bogotá which generated risk reduction investments in EWS, mitigation works and improved land use planning with a NPV of US$150 million.

1.17 **Consistency with government sector strategy and donors' coordination.** The proposed project is consistent with the different policies and initiatives developed by the GoH to address natural disaster risks, agriculture and CC issues at different levels, including: (i) the National Disaster Risk Management Plan; (ii) the 2011-2016 National Agricultural Investment Plan and 2013-2016 Three-Year Agricultural Recovery Program; (iii) the 2006 National Plan for Adaptation to Climate Change (NAPA); (iv) the 2012 Strategic Plan for Climate Resilience (SPCR); and (v) the Disaster Risk Management Program financed by the World Bank, among others. The project was prepared in close coordination with other donors (World Bank, UNDP, and the European Commission) and stakeholders involved in DRM in the agriculture sector. Active donor coordination will be ensured during project implementation through sectorial round-tables, both on agriculture and DRM.

1.18 **Consistency with the Country Strategy, Sector Strategy and Ninth General Increase in the Resources of the Inter-American Development Bank (GCI-9).** The project is aligned with the Bank's Country Strategy with Haiti for 2011-2015 (GN-2646), which sets agriculture as a priority sector of intervention, and is included in the 2015 Country Program Document (GN-2805). The program will contribute to the lending program priorities of the GCI-9 (AB-2764): (i) support to small and vulnerable countries; (ii) poverty reduction and equity enhancement, as beneficiaries will be low income rural households; and (iii) lending to support climate change initiatives, sustainable energy, and environmental sustainability, as the project will promote adaptation to CC and improve management of natural resources. It will also contribute to the Regional Development Goals "Protecting the environment, responding to climate change, promoting renewable energy, and enhancing food security, and particularly the indicators "Annual growth rate of agricultural GDP," "Annual economic losses from natural disasters," as well as "Countries with planning capacity in mitigation and adaptation of climate change." The project will contribute to the product "Farmers given access to improved agricultural services and investments," as defined in the Results Framework. The project is consistent with the "Agriculture and Natural Resources Management Sector Framework Document" (GN-2709-2) and its dimensions of success and lines of actions, the "Sustainable Infrastructure for Competitiveness and Inclusive Growth, IDB Infrastructure Strategy" (GN-2710-5), the Bank's Integrated Strategy for Climate Change Adaptation and Mitigation and Sustainable Renewable Energy (GN-2609-1) and Action Plan (GN-2609-3), as well as the Bank's Disaster Risk Management Policy (OP-704). The project is part of the Bank's overall support to the agricultural sector, which seeks to strengthen the quality of public sector services through institutional reforms and improve sector productivity, especially that of small farmers. In that context, the project will have and develop synergies with several other Bank interventions in the country related to natural resources

management and productive development,[10] particularly the Agricultural Technology Transfer Program (2562/GR-HA), as well as the Land Tenure Security Program in Rural Areas (2720/GR-HA).

B. Objective, Components and Cost

1.19 **Objective.** The project objective is to reduce rural economic losses through the improvement of climate risk management in selected watersheds. The specific objectives are to: (i) increase capacities for adaptation to climate change and disaster risk management (DRM) in the agriculture sector; (ii) improve water and sediment conservation in selected gullies of priority watersheds; (iii) reduce the risk of rural economic losses due to floods and erosion in targeted watersheds; and (iv) restore the educational capacity of the FAMV campus. The project will directly benefit approximately 72,702 households, 910 from the applied research in agriculture, 567 from the upstream soil and water conservation small-scale infrastructure (109 of whom will also benefit from the applied research program in agriculture), 45,255 from the downstream river-bank protection, 25,829 from the EWS and 250 from the reconstruction of the FAMV (excluding future generations of students). It is projected that approximately 52% of the households in the target area are poor and 38% women-headed.

1.20 **Component 1: Capacity building to reduce climate risk (US$5.3 million).** This component aims at strengthening capacities to manage natural disasters and climate change risks in the agriculture sector. The following activities will be financed: (i) Studies based on probabilistic assessments of natural disasters risks and watershed modelling methodologies. These studies will increase the knowledge of climate related risk and support the identification of investments to reduce climate risk of agricultural activities and rural communities in targeted watersheds,[11] taking into consideration CC scenarios for Haiti. These studies will improve the capacity of MARNDR and other stakeholders to prioritize risk mitigation measures (particularly flood mitigation infrastructure) according to detailed risk and cost-benefit analysis. The activities will be developed by MARNDR in cooperation with the National Geospatial Information Center (CNIGS), the Technical Secretariat of CIAT, private firms and universities such as FAMV. (ii) Research programs in agriculture, climate change and watershed management. In particular, the project will finance a major research initiative implemented in Haiti related to watershed dynamics and management (Cavaillon watershed),[12] as well as a research program on CC resilient agricultural crop systems in the Centre-Artibonite upper watershed (¶1.14 and ¶1.15). This research program will systematize existing CC adaptation practices developed by farmers, as well as develop new techniques (improvement of agroforestry systems, CC resilient crops, sustainable farming practices, etc.), that will be integrated in and disseminated through MARNDR's technological transfer program (such as 2562/GR-HA). The activities will be developed by international and national research centers, including FAMV. The research programs will pay

[10] In the North Corridor: operations 2562/GR-HA, 3132/GR-HA; in Artibonite watershed: operations 3089/GR-HA, 1296/OP-HA, 2349/GR-HA; in the South Corridor: operations GRT/FM-11803-HA, GRT/HR-13930-HA, 2720/GR-HA.

[11] In particular, the CNIGS recently developed high-resolution maps and a digital elevation model for the whole country, which represents a significant input for watershed and flood modeling.

[12] CariWatNet: Strengthening the Caribbean Scientific Community in Natural Resources Management and Developing Integrated Watershed Management, financed by the European Commission from 2011 to 2013. This project has been financed by 2187/GR-HA after 2013.

special attention to farming practices developed by rural female-headed households. (iii) Training and knowledge dissemination**.** In order to strengthen capacities to analyze and manage natural disasters and climate change risks in the agriculture sector, two training programs will be developed together with the stakeholders involved in activities (i) and (ii) of the present component (including FAMV, CNIGS and other universities); one for students in agriculture, natural resources management and rural engineering of national universities, and the other for public officials and academia with activities are related to DRM and climate change adaptation in the agriculture sector and rural areas. The training program will contribute to mainstream these subjects in FAMV and other universities' curricula. Additionally, all the knowledge generated will be systematized in a risk web-based information system accessible to the public and oriented to agricultural and disaster risk specialists. (iv) Strengthening DRM governance. Following IGOPP diagnosis, the project will contribute to strengthen DRM governance in the sector by developing the national emergency and recovery plan for extreme climate events in the agricultural sector, together with a training program on damage assessment in agriculture. The project will contribute to strengthen local governance through the establishment and/or strengthening of watershed management committees.

1.21 **Component 2: Climate risk reduction (US$26.2 million).** This component aims at reducing rural households exposure to risks related to climate events. On the basis of previous (MARNDR/AECOM, 2015) and future studies,[13] the following activities will be financed: (i) Construction of mitigation works (downstream river-bank protection and upstream soil and water conservation small-scale infrastructure) in targeted watersheds, in order to reduce the exposure to disaster risk of agricultural areas, economic infrastructure and rural population, as well as to increase agricultural productivity. On the basis of cost-benefit analysis (MARNDR/AECOM, 2015), the MARNDR has already prioritized a series of down and upstream infrastructure to be built in the framework of the present component. In the Centre-Artibonite upper watershed (PPCR priority area), such works will be financed by the CIF resources. The modeling tools and studies of Component 1 will provide further analysis and develop the capacity to make more informed decisions for future investments. The component also includes the costs of the environmental and social impact mitigation measures related to the construction works. (ii) Development of simple community-based early warning-systems in watersheds most threatened by recurrent flooding. These systems, to be developed with the Civil Protection Directorate, will target the areas and population most vulnerable to flood in the selected watersheds and will be based on community involvement and low-cost technologies. The risk study to be carried out in Component 1 will target the beneficiaries and fine-tune the systems' technical features (i.e. levels of alert, evacuation paths).

1.22 **Component 3: Reconstruction of FAMV campus (US$10 million)** This component will finance the supervision and execution of reconstruction costs of FAMV campus, including class rooms, laboratories, administration offices, cafeteria, student housing facilities and other complementary elements, enabling to increase the hosting capacity from 440 to 635 students (optional link 14). The

[13] Studies based on probabilistic assessments of natural disasters risks and modern watershed modelling methodologies, to be developed in Component 1.

component also includes financial compensation for the on-campus students that will be temporarily displaced during the reconstruction of the residencies (¶2.3). The detailed technical design will be available during the first semester 2016 and is financed with resources from the French Development Agency and IDB.

1.23 **Other project costs (US$5.75 million).** Other activities to be financed include: (i) project management (consultants, travel, equipment, operational costs, audits, etc.); (ii) monitoring and evaluation; and (iii) contingencies.

C. Key Results Indicators

1.24 Table 2 lists the key indicators, measurement periods and selection rationale (see results matrix).

Table 2. Key Indicators, Measurement Periods and Selection Rationale

KEY INDICATOR	PERIOD	SELECTION RATIONALE
Impact		
Difference in average annual gross value added per plot in selected gullies between beneficiaries of check-dams and control group	Y5	Measures the impact on agricultural productivity
Difference in average annual gross value added per farm in selected areas between beneficiaries of research program and control group	Y5	
Reduction of losses caused by a one year return period flood event in the targeted watersheds	Y5	Measures the reduction of economic losses
Selected Outcome Indicators		
Component 1: Share of MARNDR mitigation works design based on climate risk analysis information system in the selected watersheds	Y5	Measures the increased capacity for climate risk management in the targeted watersheds
Component 1: Climate-proof agricultural techniques adoption rate among farmers	Y5	Measures the increased capacity of farmers to manage climate risk
Component 1: IGOPP-Recovery Planning sub-index	Y5	Measures the capacity of MARNDR to cope with natural disasters in the sector
Component 2: Total volume of water contained by check-dams that is available during the dry season	Y5	Measures the reduction of climate risks in the targeted watersheds
Component 2: Reduction of expected average annual economic losses due to floods and erosion in targeted watersheds (two indicators)	Y5	
Component 2: Community based early warning systems functioning in targeted watersheds	Y5	
Component 3: Annual number of research papers published by FAMV on disaster risk management, and climate-proof agriculture	Y5	Measures the recovery of the educational and research capacity of FAMV
Component 3: Reduction of expected loss of human lives due to collapse of FAMV buildings	Y5	Measure the reduction of risk of collapse of FAMV buildings

1.25 A cost-benefit analysis was conducted to assess the project's economic viability. The main economic benefits were: (i) increase in value added obtained by beneficiary farmers due the construction of upstream soil and water conservation infrastructure and the application of climate-resilient agricultural practices;

(ii) decrease in expected losses due to the construction of flood and erosion mitigation works and the establishment of EWS; and (iii) benefits obtained from the reconstruction of FAMV campus. Project costs considered in the analysis include both investment and recurring costs. The analysis envisions a time horizon that depends on the different benefits quantified, but applies a 12% discount rate. The project is considered economically viable as its estimated IRR is 39.2% and NPV is US$86 million. Despite the fact that the economic analysis is based on reasonably conservative assumptions, a broad sensitivity analysis was conducted to confirm the results reliability.

II. FINANCING STRUCTURE AND MAIN RISKS

A. Financing Instruments

2.1 The total project amount is estimated at US$47,250,000; financed by the IDB Grant Facility for up to the amount of US$42,000,000; CIF resources channeled through the IDB Strategic Climate Fund (SCX) Grant for up to the amount of US$4,500,000; and the national counterpart for up to the amount of US$750,000. The disbursement period will be 60 months. Table 3 provides the estimated budget by investment categories and components (see detailed budget per output). The national counterpart will finance part of recurring costs (see Annex III).

Table 3. Estimated Budget (US$ in millions)

Investment categories	IDB	SCX	Local	Total
I. Components				
Capacity building to reduce climate risk	2.3	2.4	0.60	**5.30**
Climate risk reduction	24.1	2.1	-	**26.20**
Reconstruction of FAMV	10.0	-	-	**10.00**
II. Other project costs				
Project Management	4.2	-	0.15	**4.35**
Audit	0.3	-	-	**0.30**
Monitoring – Evaluation	0.6	-	-	**0.60**
Contingencies	0.5	-	-	**0.50**
TOTAL	**42.0**	**4.5**	**0.75**	**47.25**

B. Environmental and Social Safeguard Risks

2.2 According to OP-703, the project was classified as Category B. The expected negative impacts are considered to be minor to moderate and likely to be mostly local and short term. During project preparation, an Environmental Assessment and an Environmental and Social Management Plan (ESMP) were prepared. Mitigation measures have been integrated and budgeted in project activities. Key project impacts and risks include: (i) social and environmental impacts of civil works, such as river turbidity increase, extraction of raw materials, safety risk in construction sites and possible limited household displacement and/or land loss.[14] These will be mitigated through the implementation of site-specific ESMP for each construction works, including compensation for displacements and loss of livelihood; (ii) false perception by the population to be fully protected from

[14] Limited displacements means less than five households per major downstream watershed protection infrastructure (four are foreseen to be built). Such displacements will depend on the sites and may not be necessary. If they appear to be necessary, the Involuntary Resettlement Policy (OP-710) will apply and the Bank will supervise its adequate application.

flooding after works execution. To mitigate this risk, local flood EWS will be developed to keep the population prepared with regards to the existing risk; and (iii) temporary displacement of FAMV on-campus students before launching the reconstruction works. Since damages to FAMV results from a natural disaster and displacement will be temporary, OP-710 does not apply; however individual financial compensation for alternative housing will be provided to the students residing on campus during the reconstruction of the student housing facilities that are too severely damaged and will not be able to host students during the works**.** Prior to beginning the works of Component 3, the Executing Agency (EA) shall present a compensation and an action plan for the temporarily displaced on-campus students during the reconstruction of the student housing facilities. The beneficiary shall comply with the environmental, social, health and safety and labor requirements set forth in the Environmental and Social Management Report (ESMR), including its Section 6(iii), and provide evidence of such compliance.

C. Fiduciary Risk

2.3 The financial risk of the proposed project is evaluated as medium since the Executing Unit of the Natural Disaster Mitigation Program (PMDN), which will be responsible for project implementation, has demonstrated satisfactory administrative and financial management capacities, according to the latest assessment performed by the Bank in July 2015. Risk rating can be further improved with: (i) updating and implementation of an OM (¶3.9) to include activities foreseen in the present project, as well as a section on a code of ethics; (ii) the updating of the current accounting system to include a module for budget preparation and monitoring; (iii) preparation of procedures for the administration of goods and fixed assets and the safeguard of financial information; and (iv) a chart of accounts. During the first year of the project, the Bank's fiduciary staff will conduct inspection visits every four months and on a semi-annual basis the following years (Annex III) to review the execution of the financial plan, the preparation of financial reports and to review project expenses and documentation. All costs associated with mitigation measures are included in the project budget.

2.4 The procurement risk is evaluated as being medium to low, based on the findings of supervision visits conducted by the Bank's Procurement Team. The MARNDR's Procurement Unit (UPMP) is operational since early 2014 and has proved to possess a strong technical capacity in procurement and to be a reliable structure. However, the increased number of projects that are being handled by this unit as well as the Ministry's lengthy procedure for contract approval may have an impact on procurement timing. The following mitigation measures are recommended: (i) hiring or appointment of a procurement specialist to support the additional workload; (ii) submission by the EA of an annex describing the procedure and timeframe applicable to the MARNDR's internal and external approval process for procurement contracts; and (iii) consolidation by the UPMP of all procurement plans executed by the MARNDR in order to improve its planning capacity. The ex ante review method will apply to major procurement activities. Ex post review will be conducted over specific low risk activities as detailed under Annex III. During the project's disbursement period, the Bank will conduct at least one procurement inspection visit per year.

D. Other Key Issues and Risks

2.5 The general risk classification is medium. Key risks include: (i) delays or interruption of execution of some activities due to lack of dialogue with involved institutions and stakeholders. Both risks will be mitigated by socio-environmental management plans for each investment, as well as by the creation of a Steering Committee; (ii) poor sustainability of infrastructure and public services developed. This risk will be mitigated by the mobilization of local counterpart resources, the design of low maintenance cost infrastructure and services, and the elaboration of operation and maintenance plan; (iii) delays or interruption of the execution of works due to extreme climate events, which will be mitigated by planning works according to cyclone seasons; and (iv) difficulties to monitor and evaluate program results due to the lack of primary meteorological data. This risk will be mitigated by contributing to promote the modernization of hydro-meteorological services, currently supported by the Word Meteorology Organization and World Bank in the framework of SPCR.

III. IMPLEMENTATION AND MANAGEMENT PLAN

A. Summary of Implementation Arrangements

3.1 The beneficiary of the project will be the Republic of Haiti, and the EA will be the MARNDR through: (i) the technical and administrative team of PMDN; and (ii) the Procurement Unit of MARNDR (UPMP). The EA will be responsible for the overall administration of the project, including: planning and reporting technical and fiduciary aspects; execution of procurement activities; supervision of firms and service providers; financial and accounting management; risk management; monitoring and evaluation; supervision and execution of the environmental and social management plan.

3.2 The technical team will consist of, at least, a coordinator, a rural engineer, a natural resources specialist as well as a monitoring and evaluation specialist from the Ministry of Environment (MDE), since the MDE has been involved in 2187/GR-HA to monitor environmental aspects and will continue to do so. The fiduciary teams will consist of, at least, an administrator, an accountant and an administrative assistant, as well as a procurement specialist. **Prior to the first disbursement, the EA shall, to the satisfaction of the Bank contract or appoint the coordinator and an administrator assigned to the project.** MARNDR and the MDE will sign a MOU to establish the terms of their collaboration for the monitoring and evaluation of the project.

3.3 A Steering Committee (SC) will be created after the project start-up workshop to ensure strategic overall guidance and coordination among the different institutions involved in project implementation. The SC will meet twice a year in order to discuss strategic issues, as well as to approve the multi-year execution plan, annual operation plans and progress reports. This committee will be chaired by MARNDR's General Director and will include a representative of MDE, the Technical Secretariat of CIAT, FAMV and DPC.

3.4 The Ministry of Interior and Territorial Collectivities, through the Civil Protection Directorate (MICT/DPC), is the national entity in charge of developing and managing part of natural disaster mitigation measures, particularly flood EWS. It will collaborate with MARNDR to implement the activities related to the development of flood early warning systems (activity (ii) of Component 2). The EA shall, to the satisfaction of the Bank, present, prior to the execution of activity (ii) of Component 2, a copy of a valid MOU signed between MARNDR and MICT, establishing the terms of the collaboration between MARNDR and the Civil Protection Directorate of MICT for the execution of said activity.

3.5 Agreements will be signed between the different participants (including universities, National Geospatial Information Center [CNIGS]) involved in the implementation of activities (i) and (ii) of Component 1. CNIGS is the national public office in charge of managing and providing geospatial information on the country, in several topics such as geography and natural resources.

3.6 The Unit for Construction of Housing and Public Building (UCLBP), which is the national public office in charge of supervising public buildings construction, will collaborate in the reconstruction phase of the FAMV campus. The EA shall, to the satisfaction of the Bank, present, before launching the procurement processes of the works of Component 3 (FAMV campus), a copy of a valid MOU signed among MARNDR, FAMV and UCLBP establishing the terms of the collaboration of UCLBP in the reconstruction phase of the FAMV campus.

3.7 The Technical Secretariat of CIAT, which is in charge of land planning management, will be responsible for the monitoring and evaluation of PPCR related activities of the project (¶1.20 and ¶1.21) in collaboration with MARNDR, in accordance with its role as PPCR focal point. The Technical Secretariat of CIAT will monitor and report on the progress of the core mandatory indicators of PPCR Results Framework (see monitoring and evaluation plan).

3.8 In addition to the general conditions **prior to the first disbursement, the EA shall adopt, to the satisfaction of the Bank, an Operations Manual (OM)[15] of the project which shall include, among others: (i) the role of each participant and collaborating institution for the implementation of the project; (ii) a code of ethics section; (iii) an annex describing the procedure and timeframe applicable to the MARNDR's internal and external approval process for procurement contracts; (iv) a model of ESMP for works; (v) the Monitoring and Evaluation Plan; (vi) procedures for the administration of goods and fixed assets and the safeguard of financial information; and (vii) a chart of accounts** (see Annex III).

3.9 Procurement activities will be conducted as detailed in Annex III. The UPMP will manage all procurement processes for works, goods and services. All procurement activities will be performed in accordance with Bank rules and procedures, with no exceptions to the application of the Policies for the Procurement of Goods and Works (GN-2349-9) and the Policies for the Selection and Recruitment of Consulting Services (GN-2350-9). The project will also be

[15] The operations manual of 2187/GR-HA in optional link 15 will be used as a basis to be updated as condition prior to first disbursement.

subject to the special provisions for procurement activities in Haiti (GN-2654), for as long as such provisions are in effect.

3.10 Project financial management will be conducted as detailed in Annex III. Advance of funds methodology will be used for the disbursement of project funds and for an amount equivalent to four months funding needs or as agreed upon between the Bank and the EA.

3.11 **Special disbursement.** To enable the EA to fulfill the conditions prior to first disbursement an initial disbursement of up to US$150,000 will be made to the extent the Beneficiary fulfills, to the Bank's satisfaction, all the standard general conditions prior to first disbursement set forth in the grant agreement (see ¶4.8 of Annex III).

3.12 **Special audit and financial reporting requirements.** PMDN will be responsible for the recruitment of external auditors eligible to the Bank to perform the audit of the program as follows: (i) annual financial audit of the program to be submitted within 120 days after the closure of each Haitian fiscal year; and (ii) a final financial audit of the program to be submitted within 120 days after the date of the last disbursement. Audit may include audit of procurement processes under ex post modality (to be confirmed in the TORs of the audit firm).

B. Summary of Arrangements for Monitoring Results

3.13 **Planning and Monitoring.** As specified in the Monitoring and Evaluation Plan, during the grant disbursement period, the EA will submit AOPs no later than 30 days before the end of each calendar year; and semiannual PRs no later than 30 days after the end of the calendar semester. The AOPs and PRs will be prepared following a template agreed upon with the Bank, and consistent with the Bank's "Project Monitoring Report." The AOPs will include target indicators, an annual work plan for the calendar year, updated procurement and risk mitigation plans, a disbursement forecast, and a maintenance plan for the infrastructures and equipment financed by the project. The PRs will indicate, among others, the level of fulfillment of the project's output and outcome indicators planned in the AOPs; explanations of execution gaps and problems encountered; and indicate corrective measures. The PRs will also include a section related to the maintenance of infrastructures and equipment. At the end of the project, the EA will prepare a final report that will summarize all the PRs prepared during the project life. The PMDN will also receive the support of MARNDR's Studies and Programming Unit (UEP) to prepare the AOPs and PRs, as well as to supervise the implementation of the evaluation plan.

3.14 **Evaluation.** The EA will submit to the Bank a midterm independent evaluation report within 90 days after the date on which 50% of the grant proceeds have been committed; and a final independent evaluation report within 90 days after the date on which 90% of the grant proceeds have been disbursed. The final evaluation report will include the results of the project's impact evaluation. The project's outputs and outcomes will be monitored and reported on a regular basis, according to the monitoring and evaluation plan. The reporting will include key PPCR core indicators.

3.15 **Impact Evaluation Plan.** The monitoring and evaluation plan presents the methodology, data collection plan, indicators to be measured, sample design and budget allocated to each activity of the impact evaluation plan. The project's impact on the reduction of economic losses caused by floods will be measured using a reflexive approach (before-after). MARNDR/Artelia (2013) and AECOM (2015) will provide baseline data. At the end of the project, follow-up surveys will be administered to the same 1,500 households surveyed by Artelia and AECOM at baseline. For a flood event with a given return period, the difference between observed post-intervention economic losses and baseline levels will represent the project's impact. On the other hand, an experimental approach will be used to measure the project's impact on agricultural productivity. This approach will consider two treatment groups: (i) farmers who benefit from the construction of small-scale water and soil conservation infrastructures (Component 2); and (ii) farmers who benefit from the construction of small-scale water and soil conservation infrastructures as well as from the applied research program (Component 1). A pool of 417 pre-selected eligible farmers will be randomly assigned to the first treatment group, the second treatment group or the control group. Such a methodology will help measure the differential impact, if any, between these two treatments. Three rounds of surveys will be administered (one baseline and two follow up surveys) and the total number of household surveys for all three rounds is 1,251.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives	**Aligned**		
Lending Program	**-Lending to small and vulnerable countries -Lending for poverty reduction and equity enhancement -Lending to support climate change initiatives, renewable energy and environmental sustainability**		
Regional Development Goals	**-Countries with planning capacity in mitigation and adaptation of climate change -Annual reported economic damages from natural disasters -Annual growth rate of agricultural GDP (%)**		
Bank Output Contribution (as defined in Results Framework of IDB-9)	**-Farmers given access to improved agricultural services and investments**		
2. Country Strategy Development Objectives	**Aligned**		
Country Strategy Results Matrix	**GN-2646**	**Increase agriculture income in targeted areas**	
Country Program Results Matrix	**GN-2805**	**The intervention is included in the 2015 Operational Program.**	
Relevance of this project to country development challenges (If not aligned to country strategy or country program)			
II. Development Outcomes - Evaluability	**Highly Evaluable**	**Weight**	**Maximum Score**
	9.0		**10**
3. Evidence-based Assessment & Solution	**10.0**	**33.33%**	**10**
3.1 Program Diagnosis	**3.0**		
3.2 Proposed Interventions or Solutions	**4.0**		
3.3 Results Matrix Quality	**3.0**		
4. Ex ante Economic Analysis	**7.0**	**33.33%**	**10**
4.1 The program has an ERR/NPV, a Cost-Effectiveness Analysis or a General Economic Analysis	**4.0**		
4.2 Identified and Quantified Benefits	**0.0**		
4.3 Identified and Quantified Costs	**1.5**		
4.4 Reasonable Assumptions	**0.0**		
4.5 Sensitivity Analysis	**1.5**		
5. Monitoring and Evaluation	**10.0**	**33.33%**	**10**
5.1 Monitoring Mechanisms	**2.5**		
5.2 Evaluation Plan	**7.5**		
III. Risks & Mitigation Monitoring Matrix			
Overall risks rate = magnitude of risks*likelihood	**Medium**		
Identified risks have been rated for magnitude and likelihood	**Yes**		
Mitigation measures have been identified for major risks	**Yes**		
Mitigation measures have indicators for tracking their implementation	**Yes**		
Environmental & social risk classification	**B**		
IV. IDB´s Role - Additionality			
The project relies on the use of country systems			
Fiduciary (VPC/FMP Criteria)			
Non-Fiduciary			
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:			
Gender Equality			
Labor	**Yes**	**The program will finance the reconstruction of the FAMV, which will increase the educational profile of the graduates and lead to more productive and sustainable jobs.**	
Environment			
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project			
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan	**Yes**	**In Haiti the scarcity of past applied research experiences in the agricultural sector has led to an absence of evidence on the impact of such programs in the country. The evaluation of this program represents the first attempt to measure the impact of applied agricultural research on productivity in Haiti and will thus contribute to close a major knowledge gap for the country's agricultural sector. An experimental approach will be used to measure the project's impact on agricultural productivity. This approach will consider two treatment groups: (1) farmers who benefit from the construction of small-scale water and soil conservation infrastructures (Component 2); and (2) farmers who benefit from the construction of small-scale water and soil conservation infrastructures as well as from the applied research program (Component 1). A pool of 417 pre-selected eligible farmers will be randomly assigned to the first treatment group, the second treatment group or the control group. Such a methodology will help measure the differential impact, if any, between these two treatments. Three rounds of surveys will be administered (one baseline and two follow up surveys) and the total number of household surveys for all three rounds is 1,251.**	

The objective of the project is to reduce rural economic losses through the improvement of climate risk management in prioritized watersheds. The project will implement three components: i) capacity building to reduce climate risk; ii) climate risk reduction; and iii) the reconstruction of the Faculty of Agronomy and Veterinary Medicine (FAVM). The documentation is well-structured, with a solid diagnosis of the problems faced by the country related to climate change and natural disaster shocks on watersheds, rural areas, the agricultural sector, and the poorer segments of society. The institutional challenges faced by the country to address these shocks, including the low levels of institutional capacity, are also well documented.

The proposed solution is clearly related to the magnitude of the problems identified. The results matrix reflects the objectives of the program and shows a clear vertical logic for each of the components, although the link of component 3 with the rest of the project is not as clearly made. The key top-level indicators have values that are the result of the ex-ante economic analysis and from targets set using information from previous projects or relevant studies. The lower-level indicators reflect the design of the three components. The results matrix includes SMART indicators at the levels of impact, outcomes and outputs with their respective baseline values, targets and the means to gather information. However, the definition of some indicators could have been more precise; indicators of productivity at the plot or farm level should be normalized at the hectares level.

The economic analysis is based on the three components with an emphasis on component 2, for which three sub-analyses are done. This emphasis is warranted, since component 2 has the greatest share of the budget allocated. For components 1 and 2, the benefits are based on a good understanding of the theory of change, as well as ex post evaluations of previous projects implemented in Haiti. The assumptions are reasonable and are based on previous published studies, as well as ex post evaluations. For each set of analysis, sensitivity analyses are done based on key variables that can affect benefits. However, the analysis for component 3 is not based on reasonable assumptions and the results, therefore, cannot be assessed. The economic analysis presents combined results of all components, as well as individual results. The sensitivity analysis for the combined part includes results that exclude the benefits (but include costs) for component 3, and components 1 and 3: the results show an internal return rate (IRR) of 32.15%, and 30.32%, respectively. The report concludes that the most important element in the generation of the ERR for the whole program is component 2, and in fact, this is the only component that is crucial for the project's viability in economic terms. Although the results presented support this finding, it is important to note that the results of the CBA for component 3 alone cannot be assessed given that the approach taken to identify potential benefits rests on flawed assumptions.

The monitoring and evaluation plan proposes a reasonable strategy based on an experimental design with random selection at the household level and with different levels of treatments for micro-dams and one combined with applied research, which can provide important information on the effectiveness of different treatment models. Importantly, there are no rigorous impact evaluations in Haiti for this type of programs. Other components could not be evaluated using experimental or quasi-experimental methods given the nature of the intervention.

RESULTS FRAMEWORK

Objective: The project objective is to reduce rural economic losses through the improvement of climate risk management in selected watersheds.			
Impacts	**Baseline 2015**	**End of Project (EOP)**	**Comments**
IMPACT 1: Increased agricultural productivity in targeted watersheds.			
Indicator 1: In selected gullies, where check-dams are built (upper watershed), difference in average annual gross value-added per plot between beneficiaries of check-dams and control group (in US$)	US$0	US$1,215	Data source for baseline and EoP: Ex Post Economic Analysis of PMDN I (2015). Means of verification: Impact Evaluation Report, based on a randomized selection of beneficiaries in the agro-forestry area. Other comments: Gross value added = Value of Production – Intermediate Consumption. Annual gross value-added will not be calculated by individual crop but at the level of the plot as a whole since farmers in these areas typically implement complex mixed-crop systems.
Indicator 2: In selected areas, difference in average annual gross value-added per farm between beneficiaries of research program and control group (in US$)	US$0	US$1,442	910 direct beneficiaries of research program (25% of which will be women) Data source for EoP: Chand et al. (2012) Means of verification: Same as Impact Indicator 1 above. Other comments: Same as Impact Indicator 1 above.
IMPACT 2: Decreased crop, livestock and infrastructure losses caused by floods in targeted watershed.			
Indicator 3: Reduction of losses caused by a one year return period flood event in the targeted watersheds (in US$)	US$0	US$1,351,414.00	The total estimated losses for the prioritized watersheds for a 1-2 year return period are US$34,429,835 (Aecom, 2015 and Artelia, 2013). Losses include agricultural production, infrastructure and personal property. Baseline values will be recalculated at the beginning of project execution. The reduction of annual losses is a combination of the reduction attributed to mitigation works and EWS. The indicator only considers losses by floods and not erosion because erosion will not impact the irrigation channels before the evaluation. Data source for baseline and EoP: AECOM 2015 / ARTELIA 2013.

			Means of verification: Follow up panel surveys in the lower watersheds (using AECOM and ARTELIA methodologies).
Sector Outcome			
Indicator 1. Beneficiaries of improved management and sustainable use of natural and cultural capital (households)	0	72,702	Data source for baseline and EoP: The project will benefit approximately 72,702 households: 910 from the research program in agriculture, 567 from the upstream soil and water conservation small-scale infrastructure (109 of whom will also benefit from the research program), 45,255 from the downstream river-bank protection, 25,829 from the EWS and 250 from the reconstruction of the FAMV (excluding future generations of students). It is projected that approximately 52% of the households will be poor and 38% women-headed. Means of verification: Field visits and monitoring reports.

Component 1: Capacity Building to Reduce Climate Risk								
	Baseline	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**EOP**	**Comments**
Outcome								
Outcome 1. Increased capacity for adaptation to climate change and DRM in the agriculture sector								
Indicator 1.1. Number of climate-proof agricultural techniques disseminated through MARNDR's technological transfer program.	0	0	0	0	5	5	10	MARNDR's technological transfer programs are programs such as PTTA (HA-L1059), RESEPAG (financed by the World Bank) and other similar ones. Means of verification: Field visits and monitoring reports.
Indicator 1.2. Agricultural techniques adoption rate among farmers.	0	0	75%	75%	75%	75%	75%	This is a core indicator for PPCR This indicator refers to the adoption rate among beneficiaries of the applied research program as well as MARNDR's technological transfer program. It will be disaggregated by gender (75% of the 25% women participants in the research program are expected to adopt the techniques). Data source for EoP: PTTA monitoring document (GAFSP); Impact Evaluation of 2223/BL-BO; Bentley et al. (2011) Means of verification:

								Field visits and monitoring reports. Other comments: This outcome indicator refers to new technologies being promoted.
	Baseline	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**EOP**	**Comments**
Indicator 1.3. iGOPP-FP sub-index.	0.51%	0.51%	0.51%	0.51%	0.51%	3.60%	3.60%	Details on the iGOPP methodology can be found at: https://publications.iadb.org/handle/11319/6717 Data source: Index of Governance and Public Policy in Disaster Risk Management (iGOPP). National Report, Haiti. https://publications.iadb.org/handle/11319/6875 Means of verification: iGOPP endline report.
Indicator 1.4. iGOPP-RC sub-index.	5.00%	5.00%	5.00%	5.00%	5.00%	7.00%	7.00%	Data source: Same as Indicator 1.3 above. Means of verification: iGOPP endline report.
Indicator 1.5. Share of MARNDR mitigation works design based on climate risk analysis information system in the selected watersheds	0	0	0	0	40%	80%	80%	Data source for EoP: Discussion with senior MARNDR management. Means of verification: field visits and monitoring reports.
Indicator 1.6. Queries to the risk information system registered through the web page.	0	0	0	200	300	500	1 000	Data source for EoP: Estimated based on data of other countries where iGOPP is measured. Means of verification: monitoring reports.
Outputs								
	Baseline	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**EOP**	**Comments**
Output 1. Climate risk modelling completed	0	0	4	0	0	0	4	4 models, one in each of the following watersheds: Cavaillon, Artibonite, Ravines du Sud and Grande Rivière du Nord. High resolution risk analyses and climate change projections. Means of verification: field visits & monitoring reports.
Output 2. Agriculture climate	0	0	0	1	0	0	1	Means of verification: field visits and monitoring reports.

risk information system established and disseminated.								
Output 3. Research programs in agriculture, climate change and watershed management completed	0	0	0	0	0	2	2	Research programs will start in Year 1 and continue for the whole project period, but will be completed in Year 5. One research program will focus on climate change resilience (PPCR) whereas the other will focus on watersheds. Means of verification: field visits and monitoring reports.
Output 4. Number of people supported by the applied research program.	0	0	200	500	210	0	910	This is a core indicator for PPCR. 25% of these people will be women. Means of verification: field visits and monitoring reports
Output 5. Training programs on disaster risk management and climate change adaptation in agriculture completed	0	0	0	0	2	0	2	One training program will be addressed to students, whereas the other will be targeted towards public officers and academia. Means of verification: field visits and monitoring reports.
Output 6. Training program on damage assessment in agriculture completed	0	0	1	0	0	0	1	Means of verification: field visits and monitoring reports.
	Baseline	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**EOP**	**Comments**
Output 7. National Emergency and Recovery Plan for Extreme Climate events in the agricultural sector completed and disseminated	0	0	1	0	0	0	1	Means of verification: field visits and monitoring reports.
Output 8. Watershed Management Committees established & trained	0	0	3	0	0	0	3	These Management Committees will be established and trained in the following three watersheds: Grande Rivière du Nord, Cavaillon and Ravine du Sud Means of verification: field visits & monitoring reports.

Component 2: Climate Risk Reduction								
Outcomes								
	Baseline	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**EOP**	**Comments**
Outcome 2. Improved water and sediment conservation in selected gullies of priority watersheds.								
Indicator 2.1.: Total volume of sediment contained by check-dams (in m3)	0 m3	2,800	18,500	28,400	7,000	0	56,700 m3	Data source for baseline and EoP: Estimations are based on PMDN I monitoring data, which show that the average volume of sediments contained by check-dam is 100 m3. Means of verification: field visits and monitoring reports.
Indicator 2.2.: Cultivable area created by check dams in the gullies (in Ha).	0 Ha	14	92.5	142	35	0	283.5 Ha	Data source: Estimations are based on the Ex Post Economic Evaluation of PMDN I, which shows that check-dams create on average an additional 0.5 Ha of cultivable area. Means of verification: field visits and monitoring reports.
Indicator 2.3.: Total volume of water contained by check-dams that is available during the dry season (in m3)	0 m3	297	1,944	2,970	729	0	5,940 m3	Data source for EoP: Estimations are based on PMDN I data which shows that the average volume of check dams' water retention tanks is 13.5 m3. Out of the 567 check dams that are going to be built, 440 are going to be equipped with water retention tanks. Means of verification: field visits and monitoring reports.

Component 2: Climate Risk Reduction								
Outcomes								
	Baseline	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**EOP**	**Comments**
Indicator 2.4.: Farmers who benefit from new cultivable area created by check-dams.	0	28	185	284	70	0	567	This is a core indicator for PPCR. It will be disaggregated by gender. Data source: It corresponds to the number of micro-dams that are going to be built (the hypothesis is that, on average, there is one farmer cultivating one check-dam). Means of verification: field visits and monitoring reports.
Outcome 3. Reduced risk of economic losses due to floods and erosion in targeted watersheds.								
Indicator 3.1. Reduction of expected average annual economic losses due to floods in targeted watersheds (in US$)	US$ 0	0	0	0	1,738,539	1,738,539	US$ 1,738,539	Reduction in economic losses comes from both EWS and infrastructures. Data sources for baseline and EoP: AECOM 2015 and Artelia 2013. The total average loss for the prioritized watersheds between 2 a 100 year return period is US$ 28,575,996 (Aecom, 2015 and Artelia, 2013). Means of verification: Results of climate risk modelling (output 1) considering the effects of the project mitigation works, and final reception report of the mitigation works.
Indicator 3.2. Reduction of expected average annual economic losses due to erosion affecting the irrigation canals in Artibonite (in US$)	US$ 0	0	0	0	13,242,090	13,242,090	US$ 13,242,090	Data sources for baseline and EoP: AECOM 2015 and Artelia 2013. Means of verification: Results of climate risk modelling (output 1) considering the effects of the project mitigation works, and final reception report of the mitigation works.
Indicator 3.3. Community based early warning	0	0	0	0	5	0	5	Early warning systems (EWS) will be installed in the

systems functioning in targeted watersheds								targeted watersheds. The EWS will be considered to be "functioning" if the results of a practical drill are satisfactory. Means of verification: practical drill evaluated by external expert.
Component 2: Climate Risk Reduction								
Output								
	Baseline	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**EOP**	**Comments**
Output 1. Community based early warning systems established in targeted watersheds	0	0	0	5	0	0	5	This includes: • Training and equipment of 4 departmental and 19 local DPC Committees • Installation of flood monitoring system • Installation of communication system Means of verification: field visits and monitoring reports.
Output 2. Small-scale upstream watershed infrastructures built	0	253	1,610	2,534	670	0	5,067	Three types of small-scale upstream watershed infrastructures will be built: • Check-dams with water retention tanks: 440 • Check dams without water retention tanks: 127 • Stone walls: 4,500 Means of verification: field visits and monitoring reports.
Output 3. Downstream watershed infrastructure built	0	0	0	3	1	0	4	More details on these downstream watershed infrastructures are provided in the ex-ante economic analysis. Means of verification: field visits and monitoring reports.
Component 3: Reconstruction of Faculty of Agronomics and Veterinary Medicine (FAMV)								
Outcome								
	Baseline	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**EOP**	**Comments**
Outcome 4. Educational capacity of the FAMV campus restored								
Indicator 4.1.	6	6	6	6	8	12	12	

Annual number of research papers published by FAMV on disaster risk management, and climate-proof agriculture.								Data source for baseline: FAMV Means of verification: field visits and monitoring reports.
Indicator 4.2. Reduction of expected loss of human lives due to collapse of FAMV buildings	0	0	0	0	0	122	122	Data source for baseline: *Structural evaluation of the FAMV* (2015) Means of verification: The Ministry of Public Work (MTPTC) will verify the infrastructure's compliance with the *Code national des bâtiments publics* (2011)
Output								
Output 1. FAMV campus designed and constructed in accordance with national building standards.	0	0	0	0	1	0	1	Data source for baseline: *Structural evaluation of the FAMV* (2015) Means of verification: Same as indicator 4.2 above.

FIDUCIARY ARRANGEMENTS

COUNTRY:	Republic of Haiti
PROJECT N^0:	HA-L1097 / HA-G1031
NAME:	Natural Disaster Mitigation Program II / Climate Proofing of Agriculture in the Centre-Artibonite Loop Area
EXECUTING AGENCY:	The Ministry of Agriculture, Natural Resources and Rural Development (MARNDR)
FIDUCIARY TEAM:	Marise E. Salnave and Romina Kirkagacli (FMP/CHA)

I. EXECUTIVE SUMMARY

1.1 The project objective is to reduce economic losses through the improvement of climate risk management in selected watersheds. The Executing Agency (EA) will be the MARNDR, which will implement all project components through: (i) its Executing Unit named "PMDN," which will ensure project technical and financial management; and (ii) the procurement unit of the MARNDR named "UPMP," which will perform procurement activities. The total project amount is estimated at US$47,250,000; financed by the IDB Grant Facility for up to the amount of US$42,000,000; the CIF resources channeled through the IDB Strategic Climate Fund (SCX) Grant for up to the amount of US$4,500,000; and the national counterpart for up to the amount of US$750,000.

1.2 The latest evaluation of the public financial management systems of the Republic of Haiti is contained in the Public Expenditure and Financial Accountability assessment report conducted in 2011 and published in February 2012. Country financial management systems and external control mechanism would require further improvements prior to conform to levels consistent with their utilization for the fiduciary management of Bank funded projects. As a result, no country systems will be used for project financial management. An evaluation of the National Procurement System was performed in 2013, applying the methodology established by the Organization for Economic Co-operation and Development. The recommendations were identified through an action plan to modernize the national procurement system; however, the implementation plan still needs to be initiated. Based on the current situation and the need to align the national system to international standards and best practices, the Bank's procurement policies will govern procurement activities foreseen under this program. Therefore to mitigate these risks the Bank will continue, in the foreseeable future, to: (i) rely on special project executing units for the execution of all projects while at the same strengthening institutional capacities; and (ii) to implement special fiduciary arrangements for project implementation and to conduct close supervision of project executing units. External control will be performed for all Bank operations by independent audit firms acceptable to the Bank in accordance with the Bank's financial reporting and audit guide.

II. EXECUTING AGENCY´S FIDUCIARY CONTEXT AND COLLABORATION WITH OTHER ENTITIES

2.1 The EA will be responsible for the overall project execution and administration, including: planning and reporting technical and fiduciary aspects; execution of procurement activities; supervision of firms and service providers; financial and accounting management; risk management; monitoring and evaluation; supervision and execution of the environmental

and social management plan. The MARNDR will execute the aforementioned tasks through: (i) its Executing Unit named "PMDN," which will ensure the financial management of the program; and (ii) the procurement unit of the MARNDR named "UPMP," which will perform the procurement activities of the program. The PEU has gained experience in the execution of Bank financed operations over the past five years, during the execution of the Natural Disaster Mitigation Program (2187-GR-HA, PMDN I). The project coordinator will report to MARNDR's General Director. The EA will be responsible for the fiduciary aspects of the program and overall administration including financial reporting.

2.2 The UPMP was created through a Ministerial Decree "M-AIDG/(C-17)09-13:1659 (bis)" on September 17, 2013, and has been operational since early 2014. Based on findings of the technical assistance conducted by the Bank's procurement team, this unit has proved to possess a solid technical knowledge in the application of the Bank's procurement policies and has been handling procurement activities with a high focus on quality of processes and close collaboration with technical teams. As of now, 12 procurement specialists are working in the unit. The UPMP has an organized system to treat purchase requests and conduct procurement processes, and is developing an improved filing system.

2.3 The Ministry of Interior and Territorial Collectivities, through the Civil Protection Directorate (MICT/DPC), is the national entity in charge of developing and managing part of natural disaster mitigation measures, particularly flood early-warning system. It will collaborate with MARNDR to implement the activities related to the development of flood early warning systems (activity (ii) of Component 2).

2.4 The Unit for Construction of Housing and Public Building (UCLBP), which is the national public office in charge of supervising public buildings construction, will collaborate in the reconstruction phase of the FAMV campus.

2.5 The Technical Secretariat of CIAT in collaboration with MARNDR will be responsible for the monitoring and evaluation of PPCR related activities of the project (activities (ii) and (iii) of Component 1 and activity (i) of Component 2), in accordance with its role as PPCR focal point. The Technical Secretariat of CIAT will monitor and report on the progress of the core mandatory indicators of PPCR Results Framework, as stated in the monitoring and evaluation plan.

2.6 A Steering Committee (SC) will be created after project start-up workshops to ensure strategic overall guidance and coordination among the different institutions involved in project implementation. The SC will meet twice a year in order to discuss strategic issues, as well as to approve the multi-year execution plan, annual operation plans and progress reports. This committee will be chaired by MARNDR's General Director and will include a representative of MDE, the Technical Secretariat of CIAT, FAMV and DPC.

2.7 The EA shall adopt, to the satisfaction of the Bank, an operations manual (OM) which shall set out the procedures to be followed by the EA with regard to planning and reporting of activities, financial management, audits, procurement and contracting, risk management, and monitoring and evaluation. The OM shall include, among others: (i) the role of each participant and collaborating institution for the implementation of the project; (ii) a code of ethics section; (iii) an annex describing the procedure and timeframe applicable to the MARNDR's internal and external approval process for procurement contracts; (iv) a model of Environmental and Social Management Plan for works; (v) the Monitoring and

Evaluation Plan; (vi) procedures for the administration of goods and fixed assets and the safeguard of financial information; and (vii) a chart of accounts.

III. FIDUCIARY RISK EVALUATION AND MITIGATION ACTIONS

3.1 In December 2011, the firm Joseph & Associates conducted the institutional capacity assessment of the EA, which indicated a financial management risk of medium to high due to the lack of appropriate financial management systems, weaknesses in internal control particularly in the management of inventory, goods and services and the need to review project's operation manual (2187/GR-HA). An assessment was performed in July 2015 by the Bank and indicated significant improvement in financial management risk rating due to the implementation of an accounting system, the implementation of a register for the monitoring of fixed assets and inventory and the satisfactory implementation of most audit recommendation. **Risk rating is currently assessed as Medium.** Risk rating can be further improved by: (i) updating and the implementation of an operation manual to include activities foreseen in the present project, as well as a section on a code of ethics and project's chart of accounts (¶2.7 above); and (ii) the updating of the current accounting system to include a module for budget preparation and monitoring.

3.2 Given the positive performance of UPMP, assessed through Bank's supervision visits, the **risk level in terms of procurement is considered medium to low**. However, the following risks and mitigation measures have been identified: (i) the workload that is being handled by the UPMP through the procurement execution of several parallel projects, including the present one. Mitigation: Hiring a new procurement specialist or designation of a specific procurement specialist already working with the Unit to support the additional workload; (ii) a lengthy contract approval process at the level of the Ministry, which impacts the project timeframe. Mitigation: The EA will submit an annex describing the procedure and timeframe applicable to the MARNDR's internal and external approval process for procurement contracts; (iii) with a centralized structure, the important number of transactions may also negatively impact on the execution timeframe. Mitigation: The Unit will work on consolidated procurement plans for the Ministry in order to improve its planning capacity and identify recurring purchases so as to reduce transactional costs and achieve best value for money; (iv) the increased number of contracts handled by the Unit may impede timely follow up and management of contracts execution. Mitigation: The UPMP will regularly submit the updated version of the Bank's contract management tool to the Bank; and (v) contract archives are well organized but not yet available in electronic version. Mitigation: the project will support some of UPMP's operational costs which will also be used to support the development of an electronic filing system.

IV. ASPECTS TO BE CONSIDERED IN THE SPECIAL CONTRACTUAL CONDITIONS OF THE GRANT

4.1 **Special Accounts and authorized signatures:** PMDN will open four separate bank accounts at the Haitian Central Bank: (i) two accounts for the management of Bank resources (one in dollars and one in local currency); and (ii) two accounts for the management of the CIF grant resources.

4.2 **Special condition for disbursement of funds related to flood early warning activities.** The EA will present to the Bank satisfaction, prior to the execution of activity (ii) of Component 2, a copy of a valid MOU signed between MARNDR and Ministry of Interior and Territorial Collectivities (MICT), establishing the terms of the collaboration

between MARNDR and the Directorate for Civil Protection of MICT for the execution of said activity.

4.3 **Adoption of project operation manual**. The EA shall adopt, to the satisfaction of the Bank, an operations manual (OM) which shall set out the procedures to be followed by the EA with regard to planning and reporting of activities, financial management, audits, procurement and contracting, risk management, and monitoring and evaluation. The OM shall include, among others: (i) the role of each participant and collaborating institution for the implementation of the project; (ii) a code of ethics section; (iii) an annex describing the procedure and timeframe applicable to the MARNDR's internal and external approval process for procurement contracts; (iv) a model of Environmental and Social Management Plan for works; (v) the Monitoring and Evaluation Plan; (vi) procedures for the administration of goods and fixed assets and the safeguard of financial information; and (vii) a chart of accounts.

4.4 **MOU between FAMV and UCLBP.** The EA shall, to the satisfaction of the Bank, present, before launching the procurement processes of the works of Component 3 (FAMV campus), a copy of a valid MOU signed among MARNDR, FAMV and UCLBP establishing the terms of the collaboration of UCLBP in the reconstruction phase of the FAMV campus.

4.5 **Audit special requirements**: PMDN will be responsible for the recruitment of external auditors eligible to the Bank to perform the audit of the program as follows: (i) annual financial audit of the program to be submitted within 120 days after the closure of each fiscal year for each executing unit; and (ii) a final financial audit of the program to be submitted within 120 days after the date of the last disbursement. Audit may include audit of procurement processes under ex-post modality (this specific activity will be confirmed in the terms of reference of the audit firm).

4.6 **Special disbursement**. To enable the EA to fulfill the conditions prior to first disbursement, an initial disbursement of up to US$150,000 will be made to the extent the Beneficiary fulfills, to the Bank's satisfaction, all the standard general conditions (Article 3.01 of General Conditions) set forth in the grant agreement. Funds will be used to finance the contracting of technical and fiduciary personnel, update the project's OM, prepare the project's chart of accounts and update the current accounting system (¶3.1above).

V. FIDUCIARY ARRANGEMENTS FOR PROCUREMENT EXECUTION

5.1 The procurement fiduciary arrangements establish the conditions applicable to all procurement execution activities in the project.

1. Procurement Execution

5.2 All project related procurement activities will be performed by the MARNDR's Procurement Unit (UPMP) and will be governed by the Bank's Procurement Policies: Policies for the Procurement of Goods and Works financed by the Inter-American Development Bank (GN-2349-9) and Policies for the Selection and Contracting of Consultants financed by the Inter-American Development Bank (GN-2350-9). Special Procurement Provisions for Haiti (GN-2654) will apply for as long as they are in effect.

i. **Procurement of Works, Goods and Non-Consulting Services:** The contracts for Works, Goods, and Non-Consulting Services[1] generated under the project and subject

[1] Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (GN-2349-9) paragraph 1.1: The services different to consulting services have a similar process as procurement of Goods.

to International Competitive Bidding will be executed through the use of the Standard Bidding Documents (SBDs) issued by the Bank. The processes subject to National Competitive Bidding (NCB) will be executed through the use of National Bidding Documents agreed to by the Bank. The technical specifications review during the preparation of the selection process, is responsibility of the project sector specialist.

ii. **Selection and Contracting of Consultants**: The consulting services contracts generated under this project will be executed through the Standard Request for Proposals (SRFPs) issued or agreed to by the Bank. The terms of reference review for the selection of consulting services is the responsibility of the project sector specialist.

- **Selection of Individual Consultants**: The selection will be made in accordance with Bank's procurement rules and procedures and will consist in evaluating the capacity of at least three candidates against set and agreed terms of references.
- **Training:** Some of the research activities will involve a transfer of knowledge to local universities or research entities, such as the Faculty of Agronomics and Veterinary Medicine or others. Each consulting firm which will be hired for the project to support research activities as per the procurement plan will be required through their terms of reference to involve these local entities. MOUs will be signed with these local entities to specify the extent of their involvement.

2. Recurring Expenses

5.3 Certain recurring expenses will be procured using project funds. These procurement activities will be carried out in accordance with administrative procedures of the EA with prior approval from the Bank who will assess and approve the use of these procedures.

3. Main Procurement Activities

Activity	Procurement Method	Estimated Date	Estimated Amount 000'US$
Works			
Works for the protection of downstream watersheds	ICB	Jan 2016	17,487,000
Works for the protection of upstream watersheds	ICB	Feb 2016	4,743,000
Construction of the building for the Faculty of Agriculture and Veterinary Medicine (FAMV)	ICB	March 2016	9,500,000
Firms			
Development of community-based flood early warning system	SBQC	Feb 2016	900,000
Development of agricultural research programs on climate change resilience	SBQC	Feb 2016	2,750,000
Development of climate risk and watershed modelling	SBQC	Feb 2016	800,000
Design and supervision of works for the protection of downstream watersheds	SBQC	Nov 2015	1,943,000
Design and supervision of works for the protection of upstream watersheds	SBQC	Nov 2015	527,000
Supervision of the Construction of the building for the Faculty of Agriculture and Veterinary Medicine (FAMV)	SBQC	Nov 2015	500,000
Individuals			
Consultant to support the development of the EWS	IICQ	Jan 2016	150,000

*To access the 18 month procurement plan, click here

4. Procurement Supervision

5.4 Based on the risks identified under Section II above, the major procurement activities foreseen under this operation will be subject to ex ante review by the Bank. Procurement activities using the shopping method for goods and for works and the recruitment of individual consultants selected under a competitive method will be subject to ex post review. The services carried out by the external audit firm under this operation may include activities to support the ex post review of the Bank on these specific processes.

Threshold for Ex Post Review		
Works	**Goods**	**Consulting Services**
US$1,000,000	US$100,000	N/A

Note: The established threshold amounts for ex post review is applied based on the fiduciary capacity of the EA and can be modified by the Bank, if the level of capacity varies.

5. Records and Files

5.5 The EA will be required to keep files and track records of all procurement related activities financed by the Bank in their office in accordance with the Bank's Procurement Rules and Procedures and to the Project's Operational Rules in such a way that it be available for supervision visit by the fiduciary team. As confirmed by recent inspection visits, the UPMP is provided with an organized archiving system, despite space limitations which will be addressed with the creation of an electronic filing system with support from the Bank. However, it is important to note that currently the national legislation in Haiti does not recognize electronic documents; therefore, until the new law on electronic signature is adopted, electronic archiving should not replace paper files.

VI. FINANCIAL MANAGEMENT

1. Programming and Budget

6.1 PMDN will provide an annual operation plan (AOP), procurement plan and a 12-month detailed financial plan. The financial plans will coincide with the Haitian fiscal year and will respect the budget lines defined in the grant agreement (investment categories). The execution of the program's financial plans will be revised every four months.

2. Accounting and Information Systems

6.2 Financial Management systems used by PMDN will be applied for project financial management. The system generates financial reports of income and expenses by project and funding source, however financial information is exported to Excel for the preparation of financial statements required by bank. The system will updated to allow the automatic tracking of project budget to facilitate the comparison of Actual vs. Budget forecast at the end of each month and the production of, in real time, of trial balance for the preparation of reliable financial reporting system for the project.

3. Disbursements and Funds Flows

6.3 Project financial management may be guided by OP-273-6. PMDN will prepare annual planning of project cash flows to be revised every four months or as otherwise agreed

upon by the Bank and EA. Financial plans will be based on activities derived from the Annual Operation Plan and Procurement Plan and payment terms agreed with suppliers. Advance of funds methodology will be used for the disbursement of project funds. For each new advance, PMDN will need to justify 80% of cumulated advance received. Disbursement Supervision will be ex ante for during the first year. At the end of the first year of execution, the capacity of PMDN will be reassessed to see if disbursement supervision should be ex-post. The national counterpart will be used to finance part of recurring costs, such as those related to infrastructure and equipment maintenance, the development of early warning systems, research activities, support to selected watershed management committees and project management. Exchange rate of the day of transaction will be used to record all expenses made in local currency; the Central Bank of Haiti exchange rate published for that date will be used at the reference rate.

4. Internal Control and Audit

6.4 The internal control environment of the project will be strengthened by: (i) the updating and implementation of an operation manual (¶2.7 above); and (ii) the updating of the current accounting system to include a module for budget preparation and monitoring.

5. External Control and Reporting

6.5 Audits of financial statements will be performed in accordance with Bank's Guidelines for Financial Reports and External Audits as described in Section IV of the Guidelines. Financial audit cost will be financed by IDB grant and estimated at US$300,000, including the audit of procurement aspects. The program financial statements will correspond to the Haitian fiscal year. The audit firm will carry out audit on the basis of specific terms of reference to be agreed between PMDN and the Bank.

6. Financial Supervision Plan

6.6 During the first year of execution, fiduciary personnel of the Bank will perform inspection visits to review the execution of financial plan every four months and on a semi-annual basis for the following years, however the frequency of visits is subject to change based on findings from supervision missions.

7. Execution Mechanism

6.7 PMDN will maintain proper financial management systems and will prepare an AOP and Procurement Plan and a twelve-month financial plan indicating cash flow needs for the execution of project's activities stemming from AOP and procurement plans. Disbursement of advances of funds will be for the equivalent of funding needs required for four months of program execution, or as agreed upon by the Bank and EA. Fund flows will be executed as stated above (¶6.3).

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/15

Haiti. Nonreimbursable Financing ____/GR-HA to the Republic of Haiti
Natural Disaster Mitigation Program II

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, as Administrator of the IDB Grant Facility (hereinafter referred to as the "Account"), to enter into such contract or contracts as may be necessary with the Republic of Haiti, as Beneficiary, for the purpose of granting it a nonreimbursable financing to cooperate in the execution of the Natural Disaster Mitigation Program II. Such nonreimbursable financing will be for an amount of up to US$42,000,000, which form part of the Account, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions in the Project Summary of the Grant Proposal.

(Adopted on __ _____ 2015)

LEG/SGO/CHA/IDBDOCS#39902657
HA-L1097

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-___/15

Haiti. Nonreimbursable Financing GRT/SX-_____-HA to the Republic of Haiti
Climate Proofing of Agriculture in the Centre-Artibonite Loop Area

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, in its capacity as implementing entity of the Strategic Climate Fund, to enter into such contract or contracts as may be necessary with the Republic of Haiti, as Beneficiary, for the purpose of granting it a nonreimbursable financing to cooperate in the execution of the project "Climate Proofing of Agriculture in the Centre-Artibonite Loop Area." Such nonreimbursable financing will be for an amount of up to US$4,500,000 from the resources of the Strategic Climate Fund, of which the Bank is an implementing entity, and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions in the Project Summary of the Grant Proposal.

(Adopted on __ _____ 2015)

LEG/SGO/CHA/IDBDOCS#39902658
HA-G1031