



Sustainable Management of Upper Watersheds of South Western Haiti – Macaya National Park

**(HA-X1002 - GRT/FM-11803-HA;
HA-G1023 - GRT/HR-13930-HA)**

Project Completion Report (PCR)

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Electronic Links

1. [Development Effectiveness Matrix \(DEM\) Summary](#)
2. [Final version of the Progress Monitoring Report \(PMR\)](#)
3. [PCR Checklist](#)

Optional Electronic Links

1. [Minutes of the project's Exit Workshop](#)
2. [Presentation offered during the project's Exit workshop](#)
3. [HA-X1002 – Final evaluation](#)
4. [HA-G1023 - Final evaluation](#)
5. [HA-X1002-HA-G1023 – Ex-post CBA Evaluation](#)

Acronyms and Abbreviations

| | |
|--------|--|
| ANAP | National Agency for Protected Areas |
| ESMR | Environmental and Social Management Report |
| FRH | Haiti Reconstruction Fund |
| GDO | General Development Objective |
| GDP | Gross domestic product |
| GEF | Global Environment Facility |
| GoH | Government of Haiti |
| Ha | Hectare |
| IADB | Inter-American Development Bank |
| IRR | Internal Rate of Return |
| LDD | Last disbursement date |
| MARNDR | Ministry of Agriculture, Natural Resources and Rural Development |
| MOE | Ministry of the Environment |
| M&E | Monitoring and Evaluation |
| NGO | Non-governmental organizations |
| NPV | Net Present Value |
| PCR | Project Completion Report |
| PEU | Project Executing Unit |
| PMDN | Natural Disaster Mitigation Program in Priority Watersheds |
| PMR | Progress Monitoring Report |
| SLFM | Sustainable Land and Forest Management |
| SO | Specific Objective |
| UIS | Update to the Institutional Strategy |
| USD | United States Dollars |

BASIC PROJECT INFORMATION OF HA-X1002

HA-X1002 Sustainable Land Management of the Upper Watersheds of South Western Haiti

| | | | | | |
|--|--|--|---|---|---|
| Country Beneficiary Haiti | Loan Instrument Not Available | Borrower Not Available | Loan(s) GRT/FM-11803-HA | Sector Environment And Natural Disasters | Sub-Sector Environmental Management And Governance |
| Date of Board Approval Sep 23, 2009 | Date of Eligibility for First Disbursement Oct 31, 2012 | Date of Closure (CO) May 10, 2021 | Loan Amount - Original 3,436,364.00 | Loan Amount - Current 3,243,535.87 | Pari Passu 10.43 |
| Total Project Cost 3,836,364.00 | Months In Execution from Approval 140 | Months In Execution from First Disbursement 102 | Original Date of Final Disbursement May 05, 2015 | Actual Date of Final Disbursement Dec 05, 2017 | Cumulative Extension(Months) 31.05 |
| Total Amount Disbursed 3,243,535.87 | Total Percentage of Disbursement 94% | | | | |

^ Ratings of project Performance in PMRs



Has This Project Received Funds from another Project?

☐ Yes ☒ No

Has This Project Sent Funds to Another Project?

☐ Yes ☒ No

Development Effectiveness Classification

Partly unsatisfactory

| No | PMR Date | PMR Stage | Classification | Disbursement Percentage (As of Dec 31) |
|----|--------------|----------------------------|----------------|---|
| 1 | Jul 24, 2014 | Second period Jan-Dec 2013 | Alert | 5% |
| 2 | May 18, 2015 | Second period Jan-Dec 2014 | Alert | 21% |
| 3 | Apr 14, 2016 | Second period Jan-Dec 2015 | Problem | 42% |
| 4 | Apr 05, 2017 | Second period Jan-Dec 2016 | Satisfactory | 56% |
| 5 | Apr 27, 2018 | Second period Jan-Dec 2017 | Alert | 61% |
| 6 | May 15, 2019 | Second period Jan-Dec 2018 | Satisfactory | 81% |
| 7 | May 04, 2020 | Second period Jan-Dec 2019 | Satisfactory | 100% |
| 8 | May 16, 2021 | Second period Jan-Dec 2020 | Satisfactory | 100% |

^ Bank Staff



| Positions | At PCR May 10, 2021 | At Approval Sep 23, 2009 |
|---------------------|-------------------------------|----------------------------------|
| Vice-President VPS | Lopez, Benigno | Levy, Santiago |
| Vice-President VPC | Martinez, Richard | Vellutini, Roberto |
| Country Manager | Quevedo, Fernando (CID/CID) | Aguerre, Jose Agustin (CDH/CDH) |
| Sector Manager | Bonilla, Juan Pablo (CSD/CSD) | Rosa, Alexandre (INE/INE) |
| Division Chief | Martel, Pedro V. (CSD/RND) | Malarin, Hector (INE/RND) |
| Country Rep | Mellinger, Yvon (CID/CHA) | Aguerre, Jose Agustin (CDH/CDH) |
| Project Team Leader | Albaret, Geraud (RND/CHA) | Damaïs, Gilles Georges (RND/CHA) |
| PCR Team Leader | Albaret, Geraud (RND/CHA) | |

^ Staff Time and Cost



| Stage Project Cycle | # of Staff Weeks | USD (including Travel and Consultant Costs) |
|---------------------|------------------|---|
| Preparation | 8.3 | 54,985.36 |
| Supervision | 45.7 | 317,510.34 |
| Total | 54.0 | 372,495.70 |

^ Time



BASIC PROJECT INFORMATION OF HA-G1023

HA-G1023 Sustainable Management Upper Watersheds South Western Haiti-Macaya National Park

| | | | | | |
|---|--|--|---|---|---|
| Country Beneficiary Haiti | Loan Instrument Not Available | Borrower Not Available | Loan(s) GRT/HR-13930- HA | Sector Environment And Natural Disasters | Sub-Sector Integrated Disaster Risk Management |
| Date of Board Approval Jul 31, 2013 | Date of Eligibility for First Disbursement Jun 26, 2014 | Date of Closure (CO) Sep 29, 2021 | Loan Amount - Original 9,000,000.00 | Loan Amount - Current 8,820,557.87 | Parl Passu 0.0 |
| Total Project Cost 9,000,000.00 | Months In Execution from Approval 98 | Months In Execution from First Disbursement 86 | Original Date of Final Disbursement Oct 11, 2017 | Actual Date of Final Disbursement Dec 31, 2019 | Cumulative Extension(Months) 26.64 |
| Total Amount Disbursed 8,820,557.87 | Total Percentage of Disbursement 98% | | | | |

▲ Ratings of project Performance in PMRs



Has This Project Received Funds from
another Project? ☐ Yes ☒ No

Has This Project Sent Funds to Another
Project? ☐ Yes ☒ No

Development Effectiveness Classification Partly unsatisfactory

| No | PMR Date | PMR Stage | Classification | Disbursement Percentage (As of Dec 31) |
|----|-----------------|-------------------------------|----------------|--|
| 1 | Jul 24, 2014 | Second period Jan-Dec 2013 | Alert | 5% |
| 2 | May 18, 2015 | Second period Jan-Dec 2014 | Alert | 21% |
| 3 | Apr 14, 2016 | Second period Jan-Dec 2015 | Problem | 42% |
| 4 | Apr 05, 2017 | Second period Jan-Dec 2016 | Satisfactory | 56% |
| 5 | Apr 27, 2018 | Second period Jan-Dec 2017 | Alert | 61% |
| 6 | May 15, 2019 | Second period Jan-Dec 2018 | Satisfactory | 81% |
| 7 | May 04, 2020 | Second period Jan-Dec 2019 | Satisfactory | 100% |
| 8 | May 16, 2021 | Second period Jan-Dec 2020 | Satisfactory | 100% |

^ Bank Staff



| Positions | At PCR Sep 29, 2021 | At Approval Jul 31, 2013 |
|---------------------|------------------------------|-----------------------------------|
| Vice-President VPS | Lopez, Benigno | Levy,Santiago |
| Vice-President VPC | Martinez, Richard | Vellutini,Roberto |
| Country Manager | Quevedo,Fernando (CID/CID) | Aguerre,Jose Agustin (CDH/CDH) |
| Sector Manager | Bonilla,Juan Pablo (CSD/CSD) | Rosa, Alexandre (INE/INE) |
| Division Chief | Martel,Pedro V. (CSD/RND) | Malarin, Hector (INE/RND) |
| Country Rep | Mellinger,Yvon (CID/CHA) | Almeida,Eduardo Marques (CDH/CHA) |
| Project Team Leader | Albaret,Geraud (RND/CHA) | Jacquet,Bruno (RND/CHA) |
| PCR Team Leader | Albaret, Geraud (RND/CHA) | |

^ Staff Time and Cost



| Stage Project Cycle | # of Staff Weeks | USD (including Travel and Consultant Costs) |
|---------------------|------------------|---|
| Preparation | 27.2 | 72,720.43 |
| Supervision | 17.6 | 75,123.35 |
| Total | 44.9 | 147,843.78 |

^ Time



STATEMENT OF THE DEVELOPMENT OBJECTIVES OF THE PROGRAM:

The general objective of the Program was to contain the rapid environmental degradation in the upper watershed of the southwestern part of Haiti. The Program had one specific objective: to integrate sustainable land and forest management (SLFM) practices at the watershed level.

I. INTRODUCTION

- 1.1 Haiti is one of the richest countries in the Caribbean in terms of biological as well as flora diversity.¹ However, as of 2008, Haiti had an annual per capital gross domestic product (GDP) of US\$791, the lowest in the western hemisphere.²³ This, combined with slow economic growth and rapid population growth, increased pressure on forests, soils, and water resources. Demand for fuel wood, for instance, exceeded new forest growth by an estimated 60%, thus threatening ecosystem services upon which many Haitians depended on directly for their livelihoods, and exacerbating the impact of natural disasters.⁴
- 1.2 Indeed, located in the hurricane belt of the Caribbean basin, Haiti is also highly vulnerable to natural disasters caused by hydro-meteorological events. The 2004 Report of the United Nations Program for Development on Disaster Risk Reduction ranked Haiti among those countries with the highest risk rates in the world. According to this report, over the previous 50 years, Haiti had been affected by approximately 40 hydro-meteorological events, a disaster every two years and a major catastrophe every four to six years.³⁵
- 1.3 Some of the watersheds most affected by soil erosion, land degradation and floods are in Haiti's Southwestern peninsula. The upper part of the Massif de la Hotte and its forests, including Macaya Peak, the Massif's highest point, serve as the headwaters for all watersheds in this region and has been declared a National Bioreserve (Macaya Park).³ As of 2008, the Park and its zone of influence (or buffer zone) covered an area of 7,500 hectares (Ha)⁶, and faced similar environmental challenges as the rest of the country such as: (i) low land productivity and inadequate land use practices; and (ii) open-access to natural resources, causing significant losses in terms of soil fertility, biodiversity and water retention capacity.
- 1.4 As of 2008, about 5,000 households (equivalent to an estimated 25,000 to 30,000 people) were depending on the Park's natural resources for their subsistence. Inappropriate land use practices such as extensive tree cutting, overgrazing and lack of soil conservation practices, exacerbated by intensive rainfall, had led to rapid environmental deterioration. As of 2009, in the Park, there was approximately 3,448 Ha of remaining dense forest cover, and 912 Ha of remaining open forest.³
- 1.5 At the time, the protection of the Park and of its area of influence was weakened primarily by the absence of (i) legally/physically defined Park limits as well as (ii) clear management and surveillance framework. Park limits were not included in the decree creating the Park published in 1983⁷. This prevented the appropriation of the Park's limits by local communities, since those were neither clearly defined, nor materialized. This situation was further complicated by uncertain and complex land tenure practices in the Park area and in downstream watersheds. As of 2008, private owners, generally living outside the area,

¹ [Convention on Biological Diversity](#)

² World Economic Outlook, April 2009

³ According to the World Bank, between 2008 and 2021, the GDP per capita in Haiti decreased by 4.95% in real terms.

⁴ Grant proposals of [HA-X1002](#) and [HA-G1023](#).

⁵ According to the [2022 Global Assessment Report on Disaster Risk Reduction](#) and its INFORM Natural Hazard Risk Index, Haiti is still ranked among the top 20 countries facing the highest disaster risks in the world.

⁶ When the Macaya National Park was declared in 1983, its area was 2000 ha. A new presidential decree in 2013 set its boundaries at 8726 ha. Finally, in 2014, another presidential decree merged the park with the Grande Colline National Natural Park for a total of 13,559 ha.

⁷ Decree of 4 April 1983, declaring the areas surrounding the Morne La Visite of La Selle's Massif and the Morne Macaya, surrounding the Pic Macaya, Le Moniteur, N.41, June 1983

in urban centers, owned an estimated 31% of the land in the area within and around the Park, and were renting out land to tenants on a sharecrop or rental basis. The absence of any legal control also left the door open to State-owned land squatting. Land tenure was subject to local conflicts and mostly regulated by local customary schemes. The lack of clarity regarding Park's limits undermined the commitments of the 10 communes (or municipalities) over which the park extends to engage regulation processes (land use regulation, in particular), while, at the same time, the lack of land tenure security undermined farmers' incentives to invest in conservation.

- 1.6 With respect to the management and surveillance framework, the history of Macaya Park had suffered from a prolonged absence of the State and local authorities, and a trend of fragmentary and discontinuous project interventions. Since the end of the World Bank-financed Forest and Park Protection Project (ATPPF) in 2001, the State and local authorities had indeed been absent from the decision-making process regarding the management of Macaya Park. In 2008, the Ministry of the Environment (MOE) appointed 10 environmental surveillance agents to the park. But their capacity remained very limited in the absence of a formal management and surveillance framework (including cooperation agreements as well as monitoring and management plans) and because of the lack of resources and equipment.⁸
- 1.7 As of 2008, the local government also lacked the capacity to plan, support and enforce integrated land use planning and SLFM practices. Failures to involve local stakeholders in co-management as well as to integrate conservation and income generating activities in SLFM had negatively impacted previous projects/interventions. And so did the limited local as well as national capacity for land use monitoring and soil fertility analysis, land use changes governance, and carbon stocks and emissions monitoring.⁹
- 1.8 In 2009, to support the Government of Haiti (GoH) in its strategy to address the key bottlenecks mentioned above, the Bank and the Global Environment Facility (GEF) approved a grant of US\$3,436,364 for a four (4) years period (HA-X1002). Disrupted by the devastating earthquake that hit Haiti in January 2010, operation HA-X1002 only reached eligibility in October 2012. HA-X1002 was designed as a complementary intervention to the Natural Disaster Mitigation Program in Priority Watersheds (PMDN, for its French acronym; [HA-L1041](#)), another Bank-financed operation. While PMDN would finance investments in public infrastructures for protection against flood and landslide, support to sustainable agriculture and institutional strengthening for watershed management in Macaya's downstream watersheds, HA-X1002 would focus its interventions on the upper watersheds.
- 1.9 In the aftermath of the 2010 earthquake, another intervention (HA-G1023) was designed to provide additional resources to the park area, also over a four (4) years period, financed with a US\$ 9 million grant from the newly created Haiti Reconstruction Fund (FRH, for its French acronym). HA-G1023 was approved in July 2013 and reached eligibility in June 2014. HA-X1002 reached its last disbursement date (LDD) on December 5th, 2017, and HA-G1023 reached its LDD on December 31st, 2019. Both operations were to be executed and supervised as one, henceforth referred to as the Macaya Program, based on a common Results Matrix. This Program was to be executed by a single and dedicated Project Executing Unit (PEU) from the MOE.
- 1.10 The general development objective (GDO) of the Macaya Program was to contain the rapid environmental degradation in the upper watershed of the southwestern part of Haiti,

⁸ Grant proposals of HA-X1002 and HA-G1023.

⁹ Grant proposals of HA-X1002 and HA-G1023.

through the following Specific Objective (SO): to integrate Sustainable Land and Forest Management (SLFM) practices at the watershed level.

- 1.11 This Project Completion Report (PCR) presents the results and achievements of the Macaya Program, but also the challenges that it faced and the lessons that have been learnt as part of its execution.

II. CORE CRITERIA. PROJECT PERFORMANCE

II.1 Relevance

a. Alignment with country development needs

- 2.1 Haiti's development needs were set out in several key policy documents. In Haiti's [Strategic Development Plan](#) (2012; PSDH, for its French acronym), programs 1.1 "plan/organize and develop territories" and 1.2 "manage the environment" emphasized the need to strengthen the protection of natural parks (including Macaya Park), to protect watersheds in the Massif de la Hotte, and to elaborate a rural development plan for the communes where the Park is located. In the [National Action Plan Against Desertification](#) (2015; PAN-LCD, for its French acronym), three main strategic objectives are set out: (i) to improve livelihoods of population affected by desertification (including land degradation); (ii) to improve the state of ecosystems; and (iii) to contribute to biodiversity preservation, the sustainable use of natural resources and climate change mitigation. Similar diagnoses and investment proposals were made in the GoH's [National Action Plan for the Environment](#) (1999; PNAE, for its French acronym), [National Mitigation Plan](#) (2006; PANA, for its French acronym), [National Strategy for Growth and Poverty Reduction](#) (2007), [National Plan for Disaster and Risk Management](#) (2001; updated in 2009), [post-2010 earthquake Action Plan for National Recovery and Development of Haiti](#) (2010) and [post-hurricane Matthews Needs Assessment](#) (2016). Finally, the projects contributed to the Sustainable Development Goals 6 "Clean Water and Sanitation" and 15 "Life on Land".
- 2.2 The Macaya Program's specific objective and design were fully aligned with the development needs and priorities set out in these policy documents, at the time of both approvals (2009 for HA-X1002 and 2013 for HA-G1023), during the entire implementation, and at the time of closure (2020).

b. Strategic Alignment

- 2.3 At the time of approval and during execution, the Program was aligned with the Bank's Country Strategy with Haiti for 2007-2011 and for [2011-2015](#). In the latter, environmental degradation, which aggravated the impact of natural disasters, was considered to be one of the main root causes of Haiti's economic stagnation. The Macaya Program's specific objective would significantly contribute to the Bank's strategic objective set out in this document, which is "to protect the environment, respond to climate change and improve food security".
- 2.4 The Program's specific objectives would also contribute to three of the Bank's outputs under the ["Protecting the environment, responding to climate change, promoting renewable energy and enhancing food security"](#) strategic priority of the Bank for 2012-2015, established by the Ninth General Increase in the Resources of the IADB (IDB-9): (i) "climate change pilot projects in agriculture, energy, health, water and sanitation, transport, and housing"; (ii) "number of projects with components contributing to improved management of terrestrial and marine protected areas"; and (iii) "farmers given access to improved agricultural services and investments".

- 2.5 The Macaya Program would also contribute to the Bank's [Biodiversity and Ecosystems Services Program](#) (2013). More specifically, the Program would align with three of this program's four priority themes of action: (i) "mainstreaming biodiversity in economic sectors and accounting for the value of ecosystems"; (ii) maintaining the biodiversity endowment"; and (iii) improving governance and the policy framework".
- 2.6 In addition, the Program was consistent with the [Update to the Institutional Strategy \(UIS\) 2010-2020](#) of the Bank, approved in 2015, as it was aligned with the cross-cutting issue of "climate change and environmental sustainability".
- 2.7 At the time of closure, the Program's specific objective was aligned with the [Bank's Country Strategy with Haiti for 2017-2021](#). It was aligned with the cross-cutting themes "resilience to climate change" and "protection of the natural environment", but also contributed to one of the Strategy's two pillars, increasing productivity, by improving watershed management.

c. Relevance of Design

- 2.8 **Figures 1 and 2** illustrate the vertical logic of operations HA-X1002 and HA-G1023, respectively, at approval (i.e., as it appears in their Grant proposals). The GDO and the SO of both operations were equivalent, despite a slightly different choice of words. The GDO of the Macaya Program could thus be formulated as follows: **to contain the rapid environmental degradation in the upper watershed of the southwestern part of Haiti**. And its SO could be expressed as follows: to integrate sustainable land and forest management (SLFM) practices at the watershed level. The following paragraphs describe in more details how the Program's Results Matrix evolved between approval and completion (a detailed visual description of this evolution can also be found [in this annex](#)). Significant changes were made, notably between approval and the startup plan.
- 2.9 As illustrated in **Figure 1**, at approval, HA-X1002 was structured around four components. As part of Component 1, "Institutional and Local Governance Strengthening and Park Management Structures", operation HA-X1002 sought to finance the following outputs: (i) the creation of an Inter-municipal "Massif de Macaya" Committee between the 10 communes where the Park is located to integrate and legalize the land planning process and allow for coordination and complementarities between communes sharing the same concern over environmental degradation processes hindering local economic development (**P*1.2**); (ii) the participatory elaboration of the communal (or municipal) land planning/use schemes (**P*1.1**), which would allow for consensus on communal land planning and utilization, including Park limits, zoning and use regulations (**P*1.3**), and the elaboration of the Park Management Plan (**P*1.4**); (iii) the design and implementation of a local co-management scheme for the Park involving communes and local non-governmental organizations (NGOs) in the conservation and control of different Park zones through a communal corps (**P*1.5**) and the improvement of the Park guards' capacity to enforce Park and land use regulations (**P*1.6**). These interventions were identified and prioritized at approval by means of a diagnosis of the Park's existing institutional context, which entailed consultations with a variety of local stakeholders.¹⁰ According to operation HA-X1002's theory of change, these interventions would strengthen municipal capacity in land use planning as well as the Park co-management structures. Overall, this would facilitate the effective management of the Macaya Park,

¹⁰ [Composante du renforcement des capacités de gestion des collectivités pour la mise en œuvre des plans de gestion des bassins versants, incluant le plan de gestion du Parc National Macaya](#). Glenn R. Smucker. May 2009.

which, in turn, would lead to an increase in the number of Ha under SLFM in the upper watershed basin area (R*.1.1).

- 2.10 As part of Component 2, “Adoption of Sustainable Land and Forest Management Technologies”, operation HA-X1002 sought to finance the following outputs: (i) the promotion of lumber and fruit-tree production through seedling production (50,000 lumber seedlings) and tree grafting techniques (15,000 grafted trees and 20,000 grafted fruit seedlings) (P*2.1); (ii) the co-financing of a coffee-washing center to support the coffee-producing associations on the northern border area of the Park (studies conducted prior to approval had shown potential for high-value shaded coffee production in this area) (P*2.2); (iii) the construction of 10 rainwater harvesting structures for vegetable and tree nurseries (P*2.3); and (iv) the intensification of sheep-breeding based on forage cultivation, as a substitute to the open grazing of cows, which was occurring in the Park at the time of approval (P*2.4). According to operation HA-X1002’s theory of change, these interventions would provide local producers with the capacities (both in terms of knowledge and inputs/equipment) for the adoption, outside the park (in line with communal land planning schemes elaborated as part of Component 1), of technologies that contribute to carbon sequestration (R*.2.1) and, more generally, of SLFM practices (R*.2.2). At the time of approval, these interventions were identified through a rigorous field assessment of then-current land use practices within and around the park, and prioritized based on available evidence of their effectiveness, the Program’s objectives and their feasibility within the Program’s timeframe.¹¹
- 2.11 As part of Component 3, “Local Land Tenure Framework Strengthening”, operation HA-X1002 sought to finance the following outputs: (i) the design of a physical cadastre of private and State-owned land, which would start with an information campaign and end with a participatory-established mapping of private properties in the Park area and a first design of Park limits (covering all of its 7,500 Ha) (P*3.1); (ii) the establishment of a Conflict Resolution Committee (P*3.2) and of a new land tenure regulatory framework in each of the 10 communes where the Park is located and the strengthening of the local institutions involved (judges, police and the tax administration (DGI, for its French acronym), among others) (P*3.4 and P*3.5); and (iii) a proposal for a legal definition of Park limits and of its physical demarcation on the ground (P*3.3). According to operation HA-X1002’s theory of change, these interventions would contribute to clarify the complex land tenure situation within and around the borders of the park, and thus improve land tenure security in the area (R*.3.1). This would, in turn, enhance investments in SLFM supported by Component 2.
- 2.12 As part of Component 4, “Land Use, GHG Emission and Carbon Stock Monitoring”, operation HA-X1002 sought to finance the following outputs: (i) the monitoring of the Park’s seven land use classes (P*4.1); (ii) the monitoring of the Park’s above and below-ground biomass carbon stock (P*4.2); (iii) the training of eight (8) staff members from the MOE and the Ministry of agriculture (MARNDP, for its French acronym) to conduct carbon monitoring (P*4.3); and (iv) the monitoring of GHG emissions (including fossil fuel and nitrogen fertilizer emissions) (P*4.4). According to operation HA-X1002’s theory of change, these interventions would provide Haiti with the technical capacity and equipment to conduct carbon monitoring.

¹¹ [*Mode d'exploitation du milieu et propositions d'interventions pour une agriculture durable et rentable dans l'aire du Parc Macaya*](#). Alex Bellande. March 2009.

- 2.13 Taken together, operation HA-X1002's outputs would contribute to integrate SLFM practices at the watershed level (SO). As illustrated in **Figure 1**, HA-X1002 had no impact indicators.
- 2.14 HA-G1023 was designed as a complementary operation to HA-X1002 to respond to the environmental challenges faced by the Macaya Park, especially: (i) inadequate exploitation of natural resources which provoke losses in soil fertility, biodiversity and water retention capacity; (ii) severe flooding and waterways silting due to reduction of water retention capacity of upper watersheds; and (iii) open-access characteristic of natural resources due to inadequate land use management. In this sense, two main activities were designed under the HA-G1023, aligned with components 1 and 2 of the HA-X1002: (i) build local capacity and promote behavior changes regarding natural resources management, by implementing environmental education activities and strengthening park surveillance corps and management infrastructure; and (ii) contribute to the restoration of critical ecosystem services provided by the Macaya area, by financing reforestation of the park's core area as well as critical watershed protection infrastructure. As illustrated in **Figure 2**, HA-G1023 was structured around two components. Component 1, "Institutional and Local Governance Strengthening", on the one hand, would finance the natural resources and land use management training of 10,000 people from the local population, producers' organizations, and schools (**P**1.1**), the equipment, training, and mobilization of 25 Park surveillance guards (**P**1.2**), and the construction of five (5) Park unit and control points (**P**1.3**). The latter was not included in operation HA-X1002, while the first two outputs would provide additional resources to outputs already included in HA-X1002's Component 1 (output **P*1.6** in particular, but also **P*1.1**, **P*1.2** and **P*1.4**). HA-G1023's Component 2, "Enhancement and Restoration of Ecosystem Services", on the other hand, would finance the restoration of some of the Park's degraded forest through reforestation (the planting of 1,500,000 trees) and the natural re-vegetation of an estimated 1,500 Ha (**P**2.1**). It would also finance 517 additional watershed protection infrastructures aiming at reducing soil erosion and flooding as well as enhancing water storage and retention capacity (water-tanks, check-dams and riverbank protection walls), and the installation of a hydro-meteorological and flood monitoring system in the Park's main watersheds (**P**2.2**). These interventions would complement HA-X1002's Component 2 (outputs **P*2.1** and **P*2.3**, in particular). At the time of approval, the existing literature supported the relationship between watershed protection infrastructures and soil conservation. In the Loess plateau of China for instance, Xu (Xu et al. 2004) had shown that the construction of check dams, for instance, was one of the most effective means of soil conservation.¹² On average, it estimated that the sediment reduction ratio could reach up to 60%. In Haiti, similar interventions had taken place, in the particular through the work of the French NGO "SOS Enfants Sans Frontières" in Gros Morne. Soil conservation structures and practices such as sills, terraces and contour canals were also listed, second only to maintenance of vegetative cover, in a Ministry of Agriculture in Haiti's reference manual on soil conservation practices (MARNDP, 1999)¹³. According to operation HA-G1023's theory of change, Component 1 would improve the effective environmental control of the Macaya area, an outcome aligned, though narrower in scope (surveillance being only one of several SLFM tools), with the one associated with HA-X1002's Component 1 (**R*1.1**; the number of Ha under SLFM in the upper watershed basin area). Component 2, on the other hand, would increase the protection of areas vulnerable to soil erosion, land degradation and flooding, using indicators (**R**2.1** "incremental areas

¹² [Development of check-dam systems in gullies on the Loess Plateau, China](#). Environ. Sci. Policy. 2004.

¹³ [Manuel pratique de conservation des sols d'Haïti](#), Régis Guito, Ministère de l'Agriculture, des ressources naturelles et du développement rural d'Haïti, 1999.

protected from flooding” and **R**.2.2** “extension of vulnerable areas protected from soil erosion and land degradation”) complementary, but also more “specific” and, possibly, more “measurable” than those associated with HA-X1002’s Component 2 (**R*.2.1**, in particular; the share of land, outside the Park, under SLFM).

- 2.15 As illustrated in **Figure 2**, HA-G1023 introduced two impacts to measure the achievement of the GDO. HA-G1023 aimed at increasing the area with permanent forest cover in the Macaya National Park (**Impact **1**) through a more effective environmental control of the area (Component 1), and at decreasing the probability of flooding (**Impact **2**) through watershed protection infrastructures and the installation of a hydro-meteorological and flood monitoring system (Component 2).
- 2.16 **Table 1** presents the Results Matrix of both HA-X1002 and HA-G1023 at approval (i.e., as they appear in their Grant proposals), startup plan (i.e. as it appears 60 days after HA-G1023’s eligibility: “Second period Jan-Dec 2014” in Convergence) and at completion. As described above, both operations were to be executed and supervised as one: the Macaya Program. As such, during execution, the Program had a single Progress Monitoring Report (PMR) on Convergence for both operations. As illustrated in **Table 1**, between approval and the startup plan, virtually all, but one outcome indicator, were eliminated or replaced (**R*.4.1** in the Grant proposal of HA-X1002 became **R.2.1** at startup plan and until completion; this outcome indicator, however, was not appropriate as it was identical to **P4.1**, its associated output), despite the absence of any formal Program reformulation. These changes were approved by the Program’s steering committee in the aftermath of the approbation of operation HA-G1023, in August 2013, and did not aim at modifying the Program’s GDO and SO.¹⁴ The first, and main, driver of these changes was the need to improve the Program’s Results Matrix.¹² It contained, on the one hand, several indicators that were not specific (or well defined) and measurable, did not have rigorous baseline values and had over-ambitious targets, such as **R*.1.1**, **R*.2.2**, **R**.1.1** and **R**.1.2**. Similarly, outcomes **R**.2.1** and **R**.2.2** in the Grant proposal of HA-G1023 were not specific enough and measurable, and were thus replaced by proxy indicators **R.4.1**, **R.4.2** and **R.4.3** at startup plan and until completion. In addition, it was judged that some indicators had not been properly classified: the increase in carbon stocks (**R*.2.1** in the Grant proposal of HA-X1002) became an impact (**Impact 2**) at startup plan and until completion, while the natural re-vegetation of an estimated 1,500 Ha (output **P**2.1** in the Grant proposal of HA-G1023) became an outcome indicator (**R.3.1**) at startup plan and until completion. The second driver of these changes in outcome indicators between approval and the startup plan was a recognition that HA-X1002’s Component 3, and its associated outcome indicator (**R*.3.1**), was likely to fail because of the weakness of local authorities and of the legal framework in place.¹² This indicator was thus dropped.
- 2.17 Between approval and the startup plan, the outcome associated with HA-X1002’s Component 1 was replaced by “Open the Park to public and regulate”. Its two associated indicators (**R.1.0** and **R.1.1**), however, focus only on the Park’s visibility and attractiveness, and seem, as a result, too narrow in scope to be able to fully capture the range of expected results of the component to which they are associated (in **Figure 3**, Component 1 “Strengthening Local Governance”).
- 2.18 As illustrated in **Figure 3**, between approval and the startup plan, changes were also made at the impact and output levels. HA-G1023’s impact indicators, described above, never made it to Convergence. Instead, it was decided at startup plan that the Program’s GDO

¹⁴ *Évaluation finale du programme de protection durable des terres des hauts bassins versants du Sud-Ouest d’Haïti / PNN Macaya – GEF – HA-X1002*. BRL. June 2018.

would be measured in terms of carbon stock increase (**Impact 2**; previously an outcome (**R*.2.1**) in the Grant proposal of HA-X1002) and farmers' median agricultural net income increase (**Impact 1**). It is worth noting, however, that the two indicators associated with **Impact 2** (**I2.1** and **I2.2**) are not appropriate, since they measure the number of carbon stock assessments conducted (which is an outcome), instead of carbon stock levels (one of the Program's impacts). At the output level, the structure adopted at the startup plan was simplified and largely matches that of operation HA-X1002 at approval. Some outputs were reformulated/reorganized. Others focusing on the land tenure framework were formally dropped (**P*3.1**, **P*3.2**, **P*3.4** and **P*3.5**) since such interventions laid outside the scope of the MOE's mandate and because in 2012, the Bank started financing a new operation focusing specifically on the issue of land tenure (the [Land Tenure Security Program in Rural Areas](#); HA-L1056). Finally, some were added primarily to reflect new local needs and priorities identified at the start of the Program and during the elaboration of the Park's management plan: **P1.2**, **P1.6**, **P2.3**, **P2.4** and **P3.3**.

2.19 All these changes between approval and the startup plan did not, however, significantly affect the Program's vertical logic. From approval to completion, the GDO remained the same: to contain the rapid environmental degradation in the upper watershed, through the integration of SLFM practices at the watershed level (SO). The latter would be achieved through four (4) channels (or components): (i) strengthening Park surveillance, its management unit, and the co-management framework at the local level (local governance) to ensure the effective operation **of the Park**; (ii) reforest priority areas **within the Park** and incentivize the adoption of agroforestry practices **in the buffer zone** by enhancing their productivity through better access to inputs, knowledge, and water as well as better accessibility, among other factors; (iii) clarify the land tenure situation **within the Park** and around its borders to incentivize the 10 communes where the Park is located to engage in land use planning and regulation, and its enforcement in the area; and (iv) monitor **the Park's** carbon stock and GHG emissions to estimate the contribution of the SO to the achievement of the GDO. The integration of SLFM practices in the buffer zone, in the form of agroforestry practices (in **Figure 3**, Component 2), would improve living conditions in the area (**Impact 1**). On the other hand, the integration of SLFM practices within the park, through reforestation, surveillance, and land use planning enforcement (in **Figure 3**, Components 1, 2 and 3), would ensure the protection of the Park's resources and their capacity to stock carbon (**Impact 2**). The Program's Results Matrix, however, fails to show, or capture, one crucial link within the Program's theory of change: the expected incentive that better living conditions in the buffer zone, combined with improved surveillance within the Park, would have (i) on communities living in the buffer zone to reduce their use of the Park's natural resources, and (ii) on communities living within the Park to migrate, voluntarily, to the buffer zone, in search of better living conditions.

2.20 There was no change (including reformulation) in the Results Matrix between startup plan and completion. **The PCR will thus report on all indicators as they appear in the startup plan in 2014.**

The Program's specific objective and vertical logic are aligned with country development needs and priorities (IDB country strategy) both at the time of approval and closure. However, despite improvements brought about at startup plan, the vertical logic of the Program is not satisfactory. The Program's vertical logic is often not robust (see paragraph 2.17), clear (see paragraph 2.19), complete (see paragraph 2.26 in "Effectiveness") or even well structured (see paragraph 2.18; see also paragraph 2.25 in "Effectiveness"), which negatively affected its relevance. Overall, the Program's relevance can be considered partly unsatisfactory.

Figure 1. Vertical Logic of the Program at approval (HA-X1002)

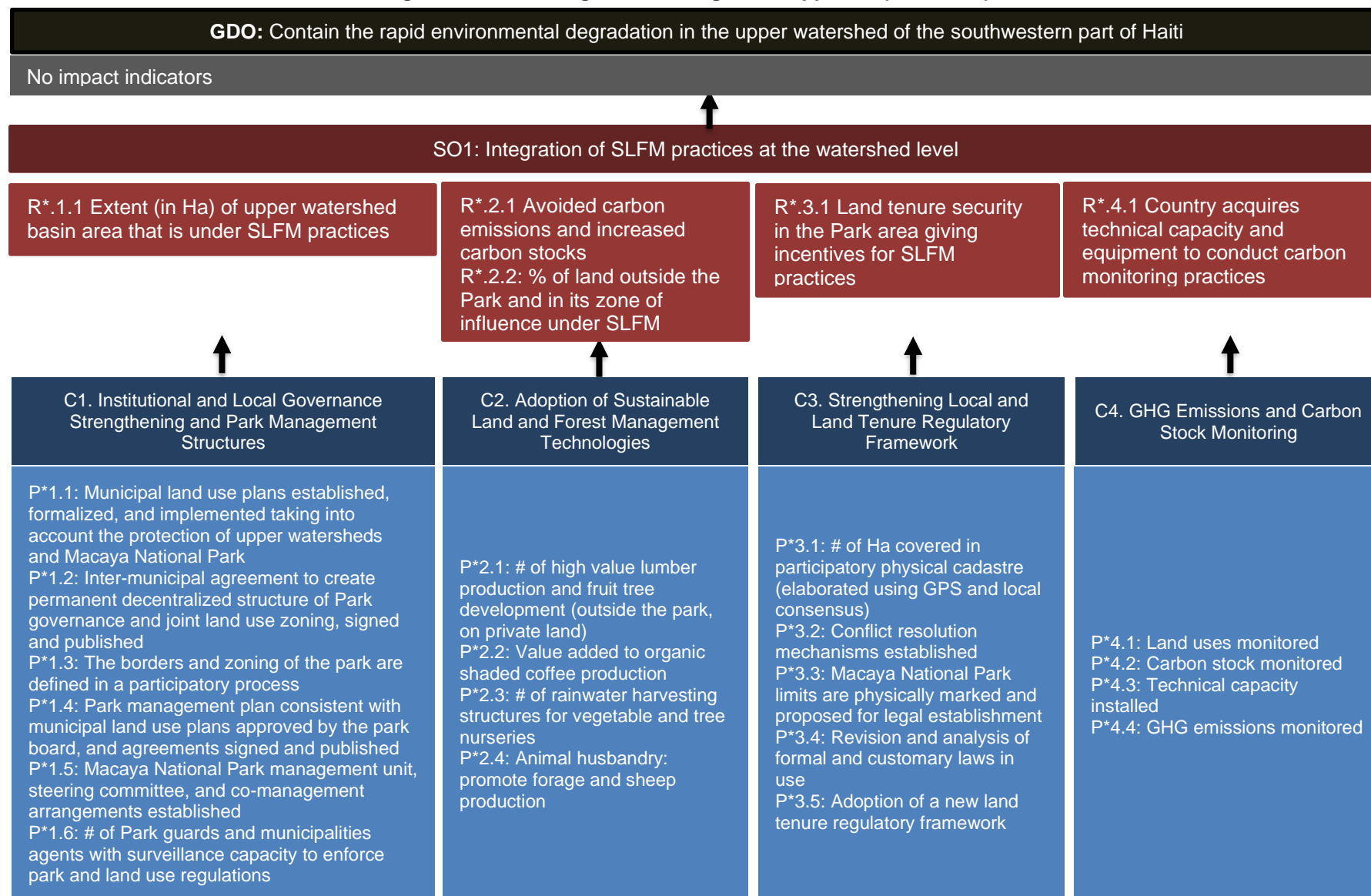


Figure 2. Vertical Logic of the Program at approval (HA-G1023)

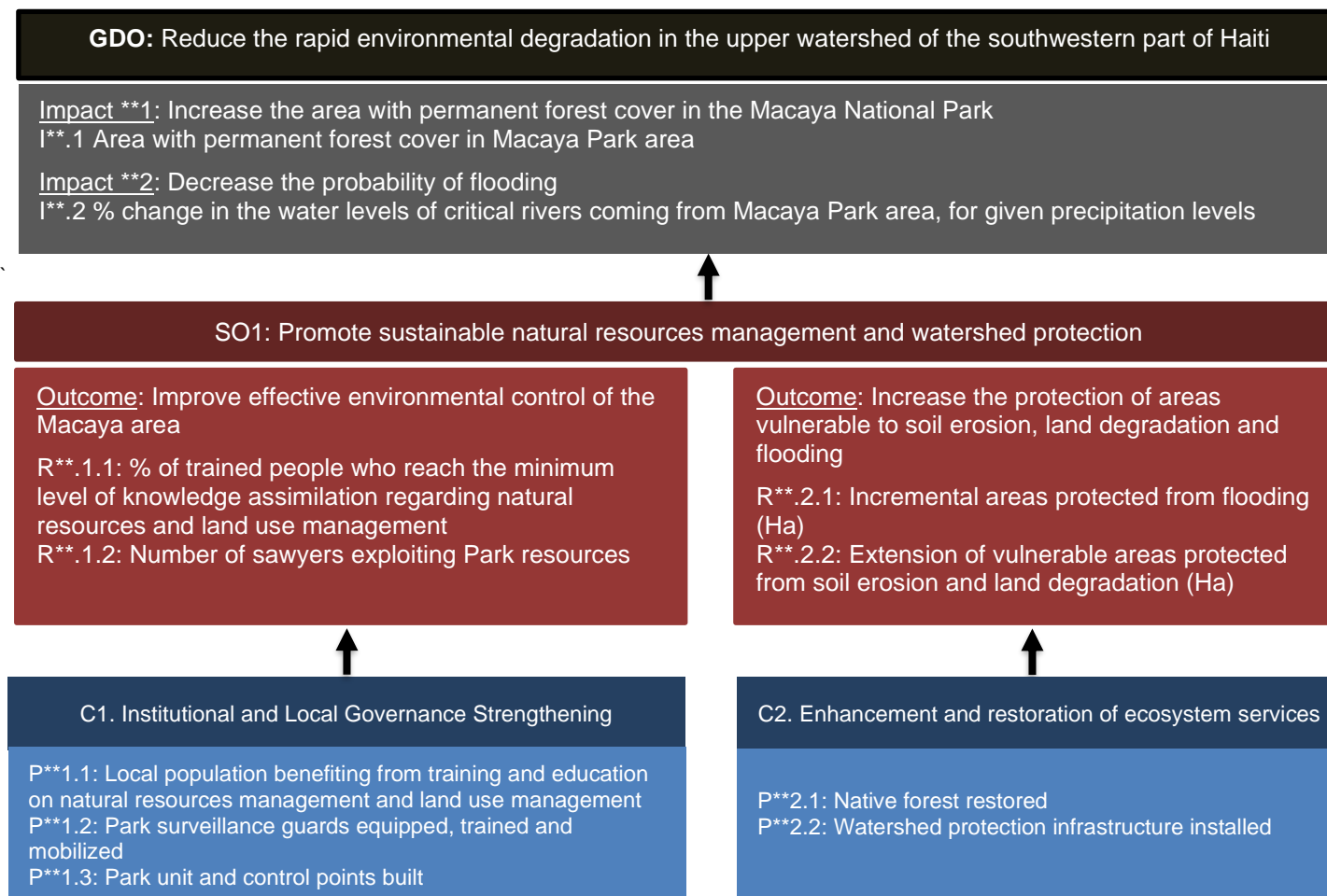


Table 1. Results Matrix (@ approval, Startup plan and @exit)

| Indicators | At approval | | | | | | Startup plan ¹⁵ | | | At project completion (PCR) | | | Comments |
|---|------------------------|-------------|--|------------------------|-----------|---------|----------------------------|-----------|---------|-----------------------------|-----------|---------|----------|
| | HA-X1002 ¹⁶ | | | HA-G1023 ¹⁷ | | | | | | | | | |
| | Unit of measure | Baseline | EOP (P) | Unit of measure | Base line | EOP (P) | Unit of measure | Base line | EOP (P) | Unit of measure | Base line | EOP (A) | |
| Specific Objective 1: Integrate sustainable land and forest management (SLFM) practices at the watershed level | | | | | | | | | | | | | |
| R*.1.1 Extent (in ha) of upper watershed basin area that is under SLFM practices | Ha | 0 | 7,500 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| R*.2.1 Avoided carbon emissions and increased carbon stocks | T CO2 eq. | 225,000 | 250,000 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| R*.2.2 % of land outside the Park in its zone of influence under SLFM | % | 0 | 70% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| R*.3.1 Land tenure security in the park area giving incentives for SLFM practices | | No security | No disputes; 80% physically demarcated | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| R*.4.1 Country acquires technical capacity and equipment to conduct carbon monitoring | National capacity | 0 | 1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| R**.1.1 % of trained people who reach the minimum level of knowledge assimilation regarding natural resources and land use management | N/A | N/A | N/A | % | 0 | 60% | N/A | N/A | N/A | N/A | N/A | N/A | |
| R**.1.2 # of sawyers exploiting Park resources | N/A | N/A | N/A | Sawyers | 500 | 250 | N/A | N/A | N/A | N/A | N/A | N/A | |

¹⁵ Data source: PMR "2nd period Jan-Dec 2014" in Convergence.

¹⁶ Data source: Grant proposal of HA-X1002.

¹⁷ Data source: Grant proposal of HA-G1023.

| Indicators | At approval | | | | | | Startup plan | | | At project completion (PCR) | | | Comments |
|--|-----------------|-----------|---------|-----------------|-----------|---------|-------------------|-----------|---------------------|-----------------------------|-----------|---------|----------|
| | HA-X1002 | | | HA-G1023 | | | | | | | | | |
| | Unit of measure | Base line | EOP (P) | Unit of measure | Base line | EOP (P) | Unit of measure | Baseli ne | EOP (P) | Unit of measure | Baseli ne | EOP (A) | |
| Specific Objective 1: Integrate sustainable land and forest management (SLFM) practices at the watershed level | | | | | | | | | | | | | |
| R**.2.1 Incremental areas protected from flooding (ha) | N/A | N/A | N/A | Ha | 0 | 2,800 | N/A | N/A | N/A | N/A | N/A | N/A | |
| R**.2.2 Extension of vulnerable areas protected from soil erosion and land degradation | N/A | N/A | N/A | Ha | 0 | 500 | N/A | N/A | N/A | N/A | N/A | N/A | |
| R.1.0 # of visitor's authorizations given | N/A | N/A | N/A | N/A | N/A | N/A | Authorizat. | 0 | 22 ¹⁸ | Authorizat. | 0 | 14 | |
| R.1.1 # of authorizations of research missions given | N/A | N/A | N/A | N/A | N/A | N/A | Authorizat. | 0 | 9 ¹⁹ | Authorizat. | 0 | 10 | |
| R.2.1 Carbon stock and GHG emissions monitoring system established and operational | N/A | N/A | N/A | N/A | N/A | N/A | Monitoring system | 0 | 1 | Monitoring system | 0 | 0 | |
| R.3.1 Area with additional permanent vegetable cover in the buffer zone | N/A | N/A | N/A | N/A | N/A | N/A | Ha | 0 | 1,500 | Ha | 0 | 1,507 | |
| R.4.1 Total volume of sediment contained by check-dams | N/A | N/A | N/A | N/A | N/A | N/A | m3 | 0 | 5,250 ²⁰ | m3 | 0 | 6,600 | |
| R.4.2 Total annual volume of water stored by water retention tanks | N/A | N/A | N/A | N/A | N/A | N/A | m3 | 0 | 4,500 ²¹ | m3 | 0 | 1,650 | |
| R.4.3 Market gardens created in gullies | N/A | N/A | N/A | N/A | N/A | N/A | Ha | 0 | 75 ²² | Ha | 0 | 46 | |

¹⁸ "P" value is not shown in Convergence. Value provided in the table corresponds to "P(a)".

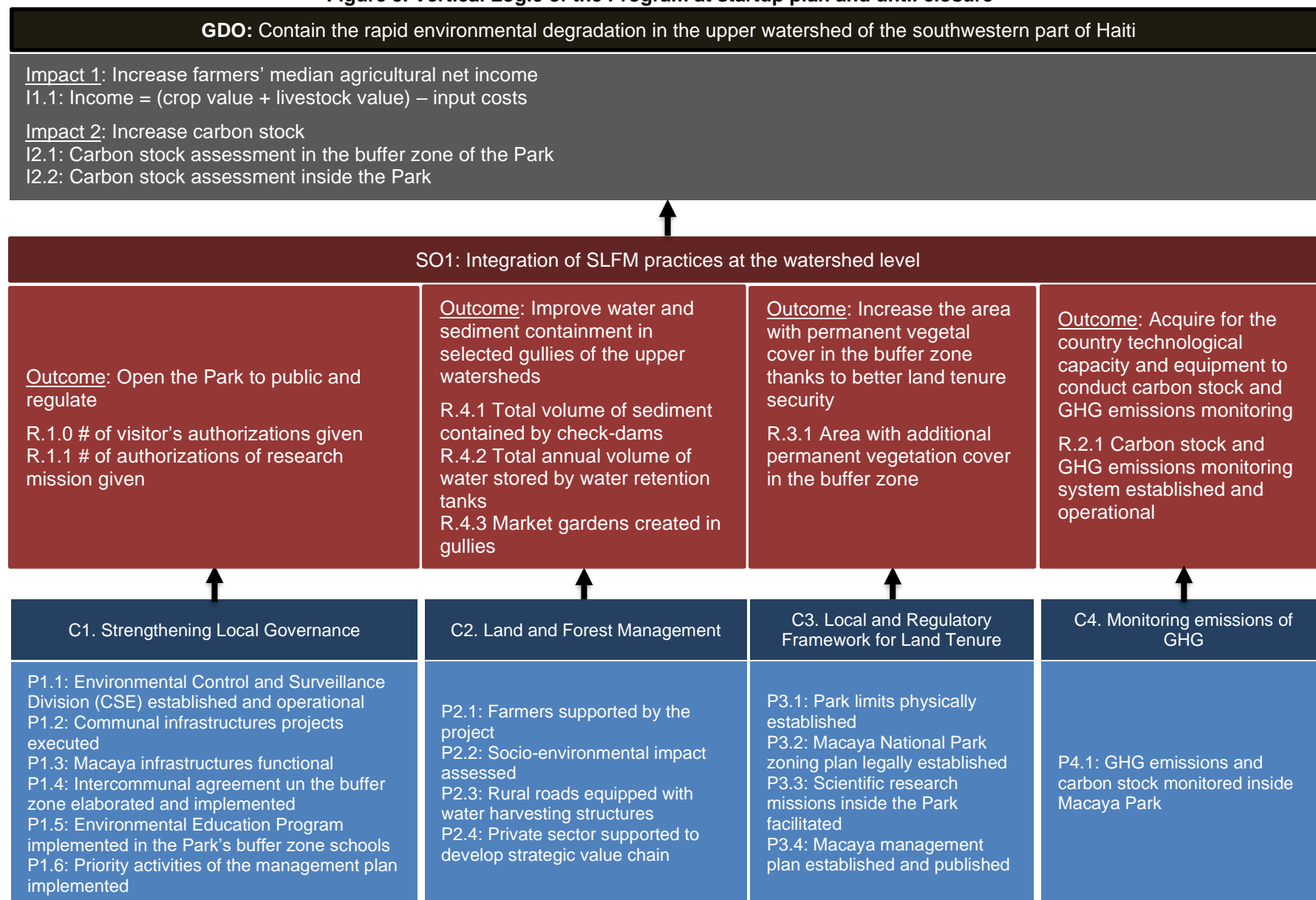
¹⁹ "P" value is not shown in Convergence. Value provided in the table corresponds to "P(a)".

²⁰ "P" value is not shown in Convergence. Value in the table corresponds to "P(a)".

²¹ "P" value is not shown in Convergence. Value in the table corresponds to "P(a)".

²² "P" value is not shown in Convergence. Value in the table corresponds to "P(a)".

Figure 3. Vertical Logic of the Program at startup plan and until closure



II.2 Effectiveness

a. Statement of project development objectives.

- 2.21 The general development objective (GDO) of the Macaya Program was to contain the rapid environmental degradation in the upper watershed of the southwestern part of Haiti, through the following specific objective (SO): to integrate sustainable land and forest management (SLFM) practices at the watershed level.

b. Results Achieved

- 2.22 **Table 2** presents the Results Matrix achieved at the time of completion. Achieved outputs are presented in **Annex 1**. Operations HA-X1002 and HA-G1023 were both expected to last for 48 months (four (4) years). In the end, operation HA-X1002 reached eligibility in October 2012 and closed in December 2017, after a 15-months extension. Operation HA-G1023, on the other hand, reached eligibility in June 2014 and closed in March 2020, after a 22-months extension. These extensions were granted because of a combination of external factors (the context of intervention was marked by the impact of hurricane Matthews in 2016, and by the socio-political and security crisis that began mid-2018) and internal ones (frequent changes in the PEU, lack of presence and communication on the field, procurement issues, financial management weaknesses, etc.), which slowed execution.²³

Specific Objective: Improve SLFM practices at the watershed level

- 2.23 By the end of the Program, 14 visitors' authorizations (**R.1.0**; 78% of the target achieved) and 10 research missions' authorizations had been granted (**R.1.1**; 100% of the target achieved). However, as described above, these two outcome indicators, by focusing only on the Park's visibility and attractiveness to outsiders, were too narrow in scope to be able to fully capture, at closure, whether the Program really did strengthen local governance, in a multidimensional way (as reflected in the diversity of outputs which constitute Component 1: surveillance, public and administrative infrastructures, co-management framework, environmental education and management of the Park and its resources), even though all the outputs associated with Component 1 either fully met or exceeded their targets (see **Annex 1**).
- 2.24 A carbon stock and GHG emissions monitoring system was established and helped, for the first time, to estimate the Park's carbon stock in 2016. But that same year, hurricane Matthews severely damaged the reference plots that were used to monitor carbon stocks and GHG emissions. Thus, at closure, while the monitoring system was still in place (methodology and processes defined, trained human resources in place, etc.), it was not fully operational due to issues of access to the reference plots (**R.2.1**; 0% of the target achieved). More generally, the hurricane significantly affected the park forest ecosystems' making them more vulnerable to anthropogenic activities (use as firewood, production of coal and boards, change of land use in favor of agriculture) and external shocks. It might have altered their capacity to stock carbon, and monitoring activities did not resume afterward. The natural disaster risk had been identified in the Program's risk matrix and classified as high. As described above, **R.2.1** was not an appropriate outcome indicator for the Program. It did reflect the local capacity to measure the impact of such an

²³ [*Évaluation finale du programme de protection durable des terres des hauts bassins versants du Sud-Ouest d'Haïti / PNN Macaya – Accord de Don GRT/HR-13930-Ha, Octobre 2012-Mars 2020. BRL. Mars 2020.*](#)

intervention on the Park's carbon storage capacity, one of the key ecosystem services rendered by the park and threatened by environmental degradation, but this was an output, instead of an outcome, and was already reflected as such in output **P4.1**. Conversely, **Impact 2 (I2.1 and I2.2)** measured the number of carbon stock assessments conducted (which should have been the outcome), instead of carbon stock levels (one of the Program's impacts).

- 2.25 In the buffer zone, an estimated 1,507 Ha was reforested with permanent vegetation (**R.3.1**; more than 100% of the target achieved) during the Program. However, the main driver of its change was not associated with Component 3 but with Component 2: reforestation and the promotion of agroforestry practices through trainings and input distribution (**P2.1**). In addition, outputs associated with Component 3 (**P3.1**, **P3.2** and **P3.4**, in particular) were expected, as described above in paragraph 2.19, to also improve the state of natural resources within the Park, and not just in the buffer zone (as suggested by **R.3.1**), by incentivizing the 10 communes where the Park is located to engage in land use planning and regulation, and its enforcement in the Park area.
- 2.26 In the upper watersheds, the Program did not build any of the 75 check-dams that were planned with the technical support from PMDN (which failed to materialize for this intervention due to conflicting execution schedules), and which were expected to help retain sediments (**R.4.1**), to store water (**R.4.2**) and to increase agricultural productivity via the creation of market gardens (**R.4.3**).²⁴ Instead, the Program financed the construction of 1,500 loose stone/rock dams, which contributed to reduce erosion (a [key SLFM practice](#)) by helping contain an estimated 6,600 m3 of sediments (**R.4.1**; more than 100% of the target achieved). The capacity of such dams to create market gardens is more limited than that of check-dams, but still helped create an estimated 46 Ha of market gardens in the targeted gullies (**R.4.3**; 61% of the target achieved). The Program also financed the construction of 19 rainwater catchment areas with a total capacity of 1,650 m3 (**R.4.2**; 37% of the target achieved), to provide for domestic water needs of an estimated 755 families and to reduce soil erosion around the road rehabilitated by the Program (**P2.3**). Overall, the outcome associated with Component 2, namely to "Improve water and sediment containment in selected gullies of the upper watersheds", and its three associated indicators described above were too narrow in scope, and only captured the results associated with one sub-activity of **P2.1**: the construction of loose stone/rock dams and rainwater catchment areas. These indicators did not capture the results associated with the Program's efforts to improve accessibility (**P2.3**, which represented over 15% of total Program costs and was expected to create opportunities for economic development via tourism and improved access to rural markets) and to incentivize the adoption of agroforestry practices through trainings and input distribution (**P2.1**, which represented one the Program's main income-generating activities, according to the Program's final evaluation) through Component 2.
- 2.27 In sum, the Macaya Program's SO was only partially achieved, with an average achievement ratio of outcomes of 68%. While most of these outcomes were appropriate and did provide evidence that the Program contributed to achieve its SO via the expansion of key SLFM practices such as soil erosion control (**R.4.1**), the provision of tools for carbon stocks monitoring (**R.2.1**) and the enhancement of soil fertility (**R.4.3**), the Program's Results Matrix failed to adequately capture all of the Program's expected outcomes. On the other hand, external factors, such as hurricane Matthew in 2016 and the socio-political and security crisis that began mid-2018, as well as internal ones, such as frequent

²⁴ A market garden refers to a flat and humid area, suitable for agriculture, created by the accumulation of sediments on the upstream side of watershed infrastructures such as check-dams.

changes in the PEU, also had negative consequences on the Program's effectiveness. With respect to the latter, limited implementation capacity (including financial management and procurement) by the MOE and its unstable political environment had both been identified in the Program's risk matrix, but the proposed mitigation measures proved insufficient.²⁵

²⁵ *Évaluation finale du programme de protection durable des terres des hauts bassins versants du Sud-Ouest d'Haïti / PNN Macaya – Accord de Don GRT/HR-13930-Ha, Octobre 2012-Mars 2020. BRL. Mars 2020.*

Table 2. Results Achieved Matrix

| Specific Objectives/Indicator | Unit of Measure | Baseline value ²⁶ | Baseline year | Targets and Actual achievement ²⁷ | | % Achieved ²⁸ | Means of verification |
|---|-------------------|------------------------------|---------------|--|-------|--------------------------|--|
| Impact 1: Increase farmers' median agricultural net income | | | | | | | |
| I1.1 Income = (crop value + livestock value)-input costs | % | 0 | 2013 | P | | N/A | N/A |
| | | | | P(a) | 20 | | |
| | | | | A | | | |
| Impact 2: Increase carbon stock | | | | | | | |
| I2.1 Carbon stock assessment in the buffer zone of the park | % | 0 | 2014 | P | 5 | 20% | PEU reports |
| | | | | P(a) | 5 | | |
| | | | | A | 1 | | |
| I2.2 Carbon stock assessment inside the park | % | 0 | 2014 | P | | 50% | Final evaluation (BRL, 2020) |
| | | | | P(a) | 2 | | |
| | | | | A | 1 | | |
| Specific Objective #1 | | | | | | | |
| R.1.0 Number of visitor's authorizations given | Authorization | 0 | 2014 | P | | 78% | Final evaluation (BRL, 2020) |
| | | | | P(a) | 18 | | |
| | | | | A | 14 | | |
| R.1.1 Number of authorizations of research missions given | Authorization | 0 | 2014 | P | | 100% | Final evaluation (BRL, 2020) |
| | | | | P(a) | 10 | | |
| | | | | A | 10 | | |
| R.2.1. Carbon stock and GHG emissions monitoring system established and operational | Monitoring system | 0 | 2013 | P | 1 | 0% | Final evaluation (BRL, 2020) |
| | | | | P(a) | 1 | | |
| | | | | A | 0 | | |
| R.3.1 Area with additional permanent vegetation cover in the buffer zone | Ha | 0 | 2012 | P | | +100% | Final evaluation (BRL, 2020) |
| | | | | P(a) | 1,500 | | |
| | | | | A | 1,507 | | |
| R.4.1 Total volume of sediment contained by check-dams | m3 | 0 | 2013 | P | | +100% | Final evaluation (BRL, 2020) ²⁹ |
| | | | | P(a) | 5,250 | | |
| | | | | A | 6,600 | | |

²⁶ Data source: Convergence.

²⁷ Where: P = Start-Up Plan (source: PMR "2nd period Jan-Dec 2014" in Convergence); P (a) = Revised Annual Target (source: last PMR in Convergence); A = Actual (source: last PMR in Convergence).

²⁸ Relative to P; when P is not provided, relative to P(a).

²⁹ The PEU visited a sample of dams to verify whether those were functional and to estimate an average sediment storage capacity. The Program's final evaluation multiplied this estimate with the total number of dams constructed.

| Specific Objectives/Indicator | Unit of Measure | Baseline value ³⁰ | Baseline year | Targets and Actual achievement ³¹ | | % Achieved ³² | Means of verification |
|--|-----------------|------------------------------|---------------|--|-------|--------------------------|--|
| R.4.2 Total annual volume of water stored by retention tanks | m3 | 0 | 2013 | P | | 37% | Final evaluation (BRL, 2020) ³³ |
| | | | | P(a) | 4,500 | | |
| | | | | A | 1,650 | | |
| R.4.3 Market gardens created in gullies | Ha | 0 | 2013 | P | | 61% | Final evaluation (BRL, 2020) |
| | | | | P(a) | 75 | | |
| | | | | A | 46 | | |

³⁰ Data source: Convergence.

³¹ Where: P = Start-Up Plan (source: PMR "2nd period Jan-Dec 2014" in Convergence); P (a) = Revised Annual Target (source: last PMR in Convergence); A = Actual (source: last PMR in Convergence).

³² Relative to P; when P is not provided, relative to P(a).

³³ The PEU visited a sample of retention tanks to verify whether those were functional and to estimate an average volume of water storage capacity. The Program's final evaluation multiplied this estimate with the total number of retention tanks constructed.

c. Counterfactual Analysis

Specific Objective: Improve SLFM practices at the watershed level

- 2.28 An impact evaluation was conducted using a synthetic control method to provide evidence supporting the attribution of the results captured by indicator **R.3.1**.³⁴ Using publicly available forest regrowth data within national parks in Haiti, a counterfactual was constructed, which replicated the forest regrowth trend observed within the Macaya National Park prior to the start of the Program. The effect of the Program's intervention was then estimated by comparing forest regrowth within the Macaya National Park with the counterfactual, for the years after the Program started. Compared to what would have happened in the absence of the Program, the impact evaluation found a statistically significant increase in forest regrowth of 565 Ha. This value is lower than what is reported in this PCR (1,507 Ha), but it is likely to be underestimated for at least three reasons: (i) satellite data used in the impact evaluation are a proxy, with often limited precision (especially in the Macaya area where clouds are almost continuously present), and cannot exhaustively capture all the elements of an agroforestry system; (ii) there's a 3-year lag in the satellite data, which means that forest vegetation regrowth that happened after 2018 is not included in the impact evaluation;³⁵ and (iii) satellite data only captures forest regrowth on previously deforested areas but not forest expansion to other land where there was previously no forest (which is likely to have been the case in the buffer zone). To conclude, the impact evaluation provides supporting evidence that the results captured by indicator **R.3.1** can be attributed to the Program. Since the estimate of 1,507 Ha for **R.3.1** has been measured directly on the ground, it is considered more accurate than the impact evaluation's estimate of 565 Ha and is thus preferred for this PCR.
- 2.29 Before-after comparisons were implemented to determine the share of the changes, observed in the Program's other outcome indicators, attributable to the Program itself. It is reasonable to assume that the changes observed were primarily attributable to the Program, considering:
- a. The Program's vertical logic: Despite the issues with the Program's vertical logic mentioned above (outcomes' narrow scope relative to that of outputs, in particular), all outcomes have a clear causal relationship with activities conducted by the Program. **R.1.0** and **R.1.1** are directly attributable to the establishment of a functional Park management unit by the Program. **R.2.1** is the direct consequence of **P4.1**. Similarly, **R.4.1**, **R.4.2** and **R.4.3** are directly attributable to the construction of loose stone/rock dams and rainwater catchment areas by the Program (**P2.1**).
 - b. The absence of any other similar and large-scale intervention in the area over the same period, which might have had any influence over these results.

General Development Objective (Impacts)

- 2.30 During the Program, farmers' median agricultural net income likely rose as a result of the intervention, in particular through the support provided to 3,000 people living in rural areas

³⁴ Impact Evaluation of the projet for the "Sustainable Management of Upper Watersheds of Southwestern Haiti – Macaya National Park" (HA-X1002 and HA-G1023).

³⁵ The impact evaluation uses a 3-year lag because the following conservative assumption is made: "a given pixel is only counted as having forest regrowth after 3 consecutive years since the reappearance of forest vegetation in that area and only if there is vegetation present for all the 3 years".

through agroforestry, community farming and cash for work activities (**P2.1**; this indicator, as it is phrased, only focuses on beneficiary farmers but an estimated 1,200 rural workers also benefited from community development activities, thus bringing the total number of beneficiaries to 3,000). While the Program measured some outcome indicators associated with **P2.1** (**R.3.1** and **R.4.3**, in particular), it failed to measure changes at the impact level (**Impact 1**).³⁶

- 2.31 On the other hand, indicators associated with **Impact 2** were not appropriately defined. They focused on the number of carbon stock assessments conducted (which is an outcome), instead of carbon stock levels. **I2.1** and **I2.2**, as reported in **Table 2**, were simply measured using a before-after comparison. Changes in **I2.1** and **I2.2** would have been higher, had hurricane Matthews (2016) not severely damaged the reference plots that were used to monitor carbon stock.

d. Unanticipated outcomes

- 2.32 The Program did not lead to unanticipated outcomes.

Overall, the Program's effectiveness can be considered partly unsatisfactory. Despite the extensions granted and a high ratio of output targets achieved (80%), the SO was only partially achieved for three main reasons: (i) the Program's inadequately structured Results Matrix failed to adequately capture all the of Program's expected outcomes associated with the SO; (ii) external factors: hurricane Matthew in 2016 caused "considerable damages" to natural resources within and around the Park as well as to its infrastructures in 2016, according to the Program's final evaluation, while the socio-political and security crisis that began mid-2018 slowed execution; and (iii) internal factors, such as frequent changes in the PEU, also slowed execution and had negative consequences on the Program's effectiveness.

II.3 Efficiency

- 2.33 According to the Program's ex-ante economic analysis (2013), its internal rate of return (IRR) would reach 24% over 20 years. Three economic benefits were expected to generate this IRR: (1) an increase in the value of agricultural production by switching from corn and peas crop systems to more sustainable timber and charcoal production practices based on several tree species; (2) another increase in the value of agricultural production resulting from watershed infrastructures (rainwater harvesting water-tanks and check-dams, in particular), which would facilitate the adoption of more profitable crops such as vegetables; and (3) a reduction of agricultural losses caused by floods and silting in irrigation districts located downstream of the areas of intervention.
- 2.34 At completion, the Program had spent US\$12,650,079 (**Table 3**). Two complementary ex-post efficiency analyses were conducted: (i) a cost-effectiveness analysis (CEA) focusing on two of the Program's main activities, and (ii) [a cost-benefit analysis](#) (CBA) using the results of the impact evaluation described above.
- 2.35 The CEA focused on two of the Program's main activities which had a clear relationship between their costs and results and for which other comparable interventions had already been implemented in Haiti: the distribution of incentives for the adoption of agroforestry

³⁶ *Évaluation finale du programme de protection durable des terres des hauts bassins versants du Sud-Ouest d'Haïti / PNN Macaya – Accord de Don GRT/HR-13930-Ha, Octobre 2012-Mars 2020. BRL. Mars 2020.*

practices (part of **P2.1**) and the rural road rehabilitation (part of **P2.3**). Together, these two activities represented approximately 20% of the Program's costs. For each of the two selected activities, their costs for the result achieved was compared to that of other projects in Haiti (for other projects, when actual costs were not available, budget estimates were used instead). As shown in **Table A**, the cost per Ha for the adoption of agroforestry practices was significantly lower for the Program (US\$459.82) than for three other operations financed by the Bank in Haiti around the same period.³⁷ In terms of price per kilometer of road rehabilitated, the Program ranked in the mid-range (US\$139,570.80). While its price per kilometer of road rehabilitated was slightly higher than that of another project financed by the European Union (EU; US\$109,433.73) and that which was budgeted for another Bank-financed operation (HA-J0002; US\$129,030.46), it is important to note that this could largely be explained by: (i) the very low accessibility of the road-to-rehabilitate selected by the Program, which worsened after Hurricane Matthew in 2016 and forced the Program to re-do its pre-rehabilitation basic accessibility and preparation work (river-crossing, in particular); and (ii) the insecurity associated with the socio-political crisis that began mid-2018.

- 2.36 While the adoption of agroforestry practices was achieved at a cost significantly lower than that of alternatives (20%), the rehabilitation of the rural road was achieved at approximately 117% of the cost of the alternatives. The weighted average of these two cost comparisons, using the total cost of the two activities considered, equals 96%, which indicates that, overall, these results were achieved at a cost below the cost of alternatives

Table A. CEA of the Project

| Activity: Adoption of agroforestry practices (P2.1) | | | | | | |
|--|-----------|------|----------------------|-----------------|-----------------|-----------------------------------|
| | Project | | The Program - Macaya | PMDN (HA-L1041) | PTTA (HA-L1059) | PITAG (<i>budget</i> ; HA-L1107) |
| | Indicator | Ha | 1,175.46 | 4,974.00 | 8,525.00 | 27,900.00 |
| | Costs | US\$ | \$ 540,501.87 | \$ 5,392,656.00 | \$33,698,513.00 | \$55,909,305.00 |
| | CE ratio | US\$ | \$ 459.82 | \$ 1,084.17 | \$ 3,952.90 | \$ 2,003.92 |

| Activity: Rural road rehabilitation (P2.3) | | | | | |
|---|-----------|------|-----------------|------------------------------------|----------------------|
| | Project | | EU (2015) | PAPAIR (<i>budget</i> ; HA-J0002) | The Program - Macaya |
| | Indicator | Km | 24.39 | 358.83 | 13.70 |
| | Costs | US\$ | \$ 2,669,088.76 | \$46,300,000.00 | \$ 1,912,120.00 |
| | CE ratio | US\$ | \$ 109,433.73 | \$ 129,030.46 | \$ 139,570.80 |

- 2.37 An ex-post cost-benefit analysis (CBA) was also conducted to measure the Program's economic viability at the end of its execution, based on estimates of incremental costs and benefits.
- 2.38 Incremental benefits are benefits which can be attributed directly to the Program and which would not have arisen in its absence. Estimates of incremental benefits came from

³⁷ While the outcomes of these interventions were similar, the exact contents varied to reflect the different objectives, contexts and scales of intervention. More specifically, while high expected transportation costs and the lack of existing local input suppliers led the Project to promote community-led seedling production, the other projects listed here relied on existing private suppliers. Facing less accessibility issues, these projects were also able to put more emphasis on the provision of technical assistance at the plot level, which tends to be costly.

the counterfactual analysis described above: 1,507 hectares reforested with permanent vegetation, which was measured on the field and whose attribution to the Program was supported by an impact evaluation. It was assumed here that this reforestation would generate two types of economic benefits: (i) an increase in the capture of carbon dioxide (CO₂), a green-house gas, and (ii) for the share of these 1,507 Ha composed of agroforestry systems (78%, or 1,175 Ha), an increase in agricultural profits, as evidenced by the recent impact evaluation of a similar intervention that supported agroforestry in Haiti (PTTA; HA-L1059). With respect to the former, the Program's baseline for carbon monitoring had estimated that a hectare of mixed forest (which includes agroforestry systems) in the Macaya area stored approximately 427 [tons of CO₂](#).³⁸ Using references from the literature, it was estimated that it would take approximately 20 years for these 1,507 Ha of regenerated forest cover to reach this CO₂ stock level and it was assumed, for the purpose of this analysis, that this would take place linearly, at a constant rate of 5% (of the total CO₂ stock level) every year from one year after plantation until year 20.^{39,40}

- 2.39 Regarding the impact of adopting agroforestry practices on agricultural profits, the impact evaluation of PTTA showed that it was positive: +63% per beneficiary farmer.⁴¹ In line with PTTA's ex-post CBA and PCR, the following assumptions were made. Considering that agroforestry profits include profits from crops such as banana and yam, which materialize less than 12 months after plantation, as well as from perennial crops such as coffee and cocoa, which start materializing 4 years after plantation and are fully materialized 5-to-6 years after plantation, it was assumed that agroforestry profits would materialize as follows: 50% in years 2 and 3 after plantation, 75% in year 4, and 100% starting from year 5 (cumulative). Moreover, while cocoa and coffee trees produce for an average of 15 years after plantation, banana trees and yams need to be replaced every 5 and 3 years, respectively. As a result, to maintain a constant flow of incremental benefits over the period of analysis (20 years in total, including the Program's duration), recurrent private costs (more details below) were incorporated to account for the replacement of banana trees and yams over that period.
- 2.40 Incremental costs, on the other hand, correspond to expenditures which would not have been incurred in the absence of the Program such as actual Program expenditures related to the incremental benefits described above as well as associated recurrent costs. The Program's CBA considered actual expenditures related to Component 1 as a whole, the share of **P2.1** invested in the promotion of agroforestry practices, Component 3 (except the conduct of scientific missions) and associated administrative costs: US\$4,770,883 (or approximately 39% of the Program's costs). Recurrent costs, on the other hand, represent all the additional costs that arise from the existence of the Program, and that must be covered by beneficiary farmers themselves (such as costs to replant banana trees and yam) or by the GoH (such as operation and maintenance costs associated with new infrastructures as well as salaries of newly hired Park surveillance guards).
- 2.41 Based on all the incremental benefits (CO₂ capture and agricultural profits) and costs associated with the Program's reforestation effort, the Net Present Value (NPV) was estimated at US\$2,723,097, with an Internal Rate of Return (IRR) of 30.84%. This indicates that these interventions were economically viable.

³⁸ [Methodology and Baseline for Monitoring Carbon Sequestration and Avoided GHG Emissions](#). Forest Resources Management. June 2009.

³⁹ [Verified Carbon Standard \(VSC\) Program](#). Verra.

⁴⁰ [Les forêts au secours de la planète: quel potentiel de stockage du carbone?](#) Boulier J. and Simon L. L'Espace Géographique. 2010.

⁴¹ [Technology Transfer to Small Farmers Program in Haiti \(PTTA\)](#). Macours K. et al. May 2018.

- 2.42 A sensitivity analysis was conducted to see how the economic viability of these interventions would be affected by changes in some of the main hypotheses. The breakeven point, where the NPV equals 0 and the IRR equals 12%, was estimated both for the number of reforested hectares and for the value of CO2 capture. For the former, keeping costs constant, a decrease in the number of reforested hectares of 51% would make the NPV equal to 0. In other words, we would need to reforest at least 745 Ha to make this intervention economically viable. For the latter, we would need the price per ton of CO2 to be at least US\$ 17.04 (57% less than the US\$40 assumed in the Program's CBA) to make this intervention economically viable.

A CEA was conducted with two of the Program's main activities that represented approximately 20% of the Program's costs. Overall, it showed that the results were achieved at a cost below the cost of alternatives. Similarly, the CBA conducted using approximately 39% of the Program's costs showed an IRR of 30.84%, which largely exceeds the discount rate used in this analysis (12%). Taken together, the overall rating of the Program's efficiency is excellent.

Table 3. Costs of the Project

| | | | | | | | | | | | Component Revised Cost |
|--|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|---------------------------|
| 1 Strengthening local governance | | | | | | | | | | | \$3,054,344.00 |
| Outputs | | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Cost |
| 1.1 Municipal land use plan established | P | \$460.00 | \$11,000.00 | \$145,000.00 | \$193,540.00 | | | | | | \$350,000.00 |
| | P(a) | \$66,645.00 | \$11,000.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | | | | \$460.00 |
| | A | \$460.00 | \$0.00 | \$0.00 | | | | | | | \$460.00 |
| 1.1 Macaya National Park management unit established | P | \$14,377.00 | \$220,000.00 | \$140,000.00 | \$171,473.00 | | | | | | \$545,850.00 |
| | P(a) | \$229,405.00 | \$220,000.00 | \$284,747.00 | \$0.00 | \$0.00 | \$0.00 | | | | \$281,899.00 |
| | A | \$14,377.00 | \$267,522.00 | \$0.00 | | | | | | | \$281,899.00 |
| 1.1 Environmental Control and Surveillance Division (CSE) established and operational | P | | | \$316,149.00 | \$205,687.00 | \$205,687.00 | \$190,677.00 | | | | \$918,200.00 |
| | P(a) | | | \$192,216.00 | \$183,664.00 | \$235,108.00 | \$245,068.00 | \$64,500.00 | \$304,820.00 | \$3,266.00 | \$994,965.00 |
| | A | | \$0.00 | \$81,322.00 | \$233,159.00 | \$100,392.00 | \$172,641.00 | \$119,649.00 | \$284,536.00 | \$3,266.00 | \$994,965.00 |
| 1.2 Communal infrastructure projects executed | P | | | \$32,533.00 | \$320,533.00 | \$344,533.00 | \$32,533.00 | | | | \$730,132.00 |
| | P(a) | | | \$32,533.00 | \$20,533.00 | \$7,561.00 | \$369,920.00 | \$450,000.00 | \$75,067.00 | \$6,903.00 | \$349,811.00 |
| | A | | | \$18,338.00 | \$171,905.00 | \$44,915.00 | \$38,659.00 | \$49,001.00 | \$20,090.00 | \$6,903.00 | \$349,811.00 |
| 1.3 Macaya infrastructures functional (Administrative Center, Hosting Center, Checkpoints) | P | | | \$480,608.00 | \$366,848.00 | \$319,328.00 | \$175,200.00 | | | | \$1,341,984.00 |
| | P(a) | | | \$256,328.00 | \$250,000.00 | \$392,886.00 | \$215,736.00 | \$202,000.00 | \$255,107.00 | \$30,242.00 | \$1,349,903.00 |
| | A | | | \$138,808.00 | \$519,920.00 | \$168,873.00 | \$117,609.00 | \$182,688.00 | \$191,763.00 | \$30,242.00 | \$1,349,903.00 |
| 1.4 Intercommunal agreement in the buffer zone elaborated and implemented | P | | | \$63,250.00 | \$63,250.00 | \$63,250.00 | \$63,250.00 | | | | \$253,000.00 |
| | P(a) | | | \$42,533.00 | \$45,000.00 | \$20,167.00 | \$73,306.00 | \$30,839.00 | \$5,000.00 | \$0.00 | \$135,741.00 |
| | A | | \$0.00 | \$40,627.00 | \$41,559.00 | \$38,555.00 | \$0.00 | \$15,000.00 | \$0.00 | \$0.00 | \$135,741.00 |
| 1.5 Environmental Education Program implemented in Parks's buffer zone schools | P | | | \$64,041.00 | \$14,041.00 | \$50,000.00 | \$0.00 | | | | \$128,082.00 |
| | P(a) | | | \$25,000.00 | \$25,000.00 | \$80,000.00 | \$66,510.00 | \$19,746.00 | \$32,206.00 | \$647.00 | \$202,453.00 |
| | A | | \$0.00 | \$0.00 | \$29,240.00 | \$23,539.00 | \$47,475.00 | \$89,937.00 | \$11,615.00 | \$647.00 | \$202,453.00 |
| 1.6 Priority activities of the management plan implemented | P | | | \$40,000.00 | \$141,667.00 | \$61,667.00 | \$11,667.00 | | | | \$255,001.00 |
| | P(a) | | | \$10,000.00 | \$15,022.00 | \$40,000.00 | \$56,000.00 | \$0.00 | \$0.00 | \$0.00 | \$21,471.00 |
| | A | | \$0.00 | \$16,170.00 | \$1,479.00 | \$3,195.00 | \$627.00 | \$0.00 | \$0.00 | \$0.00 | \$21,471.00 |

| | | | | | | | | | | | Component Revised Cost |
|---|------|------------|--------------|----------------|--------------|----------------|--------------|--------------|----------------|-------------|---------------------------|
| 2 Land and forest management | | | | | | | | | | | \$6,527,816.00 |
| Outputs | | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Cost |
| 2.1 Farmers supported by the project | P | \$0.00 | \$0.00 | \$260,000.00 | \$140,000.00 | | | | | | \$400,000.00 |
| | P(a) | \$2,110.00 | \$0.00 | \$961,144.00 | \$661,144.00 | \$691,010.00 | \$578,390.00 | \$454,500.00 | \$642,112.00 | \$72,415.00 | \$4,586,496.00 |
| | A | \$0.00 | \$0.00 | \$932,010.00 | \$922,372.00 | \$570,587.00 | \$262,713.00 | \$708,043.00 | \$1,118,356.00 | \$72,415.00 | \$4,586,496.00 |
| 2.1 Farmers supported by the project | P | | | \$1,679,988.00 | \$362,300.00 | \$62,644.00 | \$62,644.00 | | | | \$2,167,576.00 |
| | P(a) | | | \$961,144.00 | \$0.00 | \$0.00 | \$0.00 | | | | \$0.00 |
| | A | | | | | | | | | | \$0.00 |
| 2.2 Forest cover restored | P | \$4,312.00 | \$138,040.00 | \$180,000.00 | \$97,648.00 | | | | | | \$420,000.00 |
| | P(a) | \$8,789.00 | \$138,040.00 | \$1,225,010.00 | \$0.00 | \$0.00 | \$0.00 | | | | \$58,987.00 |
| | A | \$4,312.00 | \$54,675.00 | \$0.00 | | | | | | | \$58,987.00 |
| 2.2 Rain water harvesting structures built | P | \$0.00 | \$0.00 | \$50,000.00 | \$126,000.00 | | | | | | \$176,000.00 |
| | P(a) | \$3,373.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | | | | \$0.00 |
| | A | \$0.00 | \$0.00 | \$0.00 | \$0.00 | | | | | | \$0.00 |
| 2.2 Socio-Environmental impact assessed | P | | | \$36,500.00 | | | | | | | \$36,500.00 |
| | P(a) | | | \$36,500.00 | \$7,300.00 | \$7,300.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$29,200.00 |
| | A | | \$0.00 | \$29,200.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$29,200.00 |
| 2.3 Rural roads equipped with water harvesting structures | P | | | \$157,910.00 | \$870,410.00 | \$870,410.00 | \$32,910.00 | | | | \$1,931,640.00 |
| | P(a) | | | \$101,743.00 | \$300,000.00 | \$1,000,883.00 | \$718,480.00 | \$753,000.00 | \$786,895.00 | \$53,906.00 | \$1,912,120.00 |
| | A | | \$0.00 | \$126,053.00 | \$106,929.00 | \$293,572.00 | \$141,089.00 | \$653,731.00 | \$536,840.00 | \$53,906.00 | \$1,912,120.00 |
| 2.4 Private sector supported to develop strategic value chain | P | | | | \$100,000.00 | \$210,000.00 | | | | | \$310,000.00 |
| | P(a) | | | | \$31,000.00 | \$17,000.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| | A | | | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |

| | | | | | | | | | | | Component Revised Cost |
|--|------|--------------|-------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|------------------------|
| 3 Local regulatory framework for land tenure | | | | | | | | | | | \$972,465.00 |
| Outputs | | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Cost |
| 3.1 Park limits physically established | P | | | \$114,800.00 | \$49,200.00 | | | | | | \$164,000.00 |
| | P(a) | | | \$114,800.00 | \$110,000.00 | \$80,000.00 | \$68,069.00 | \$7,374.00 | \$0.00 | \$0.00 | \$323,800.00 |
| | A | | \$0.00 | \$163,800.00 | \$0.00 | \$91,931.00 | \$60,695.00 | \$7,374.00 | \$0.00 | \$0.00 | \$323,800.00 |
| 3.2 Land tenure plan inside the park developed and approved | P | | | \$153,297.00 | \$65,699.00 | | | | | | \$218,996.00 |
| | P(a) | | | \$0.00 | \$0.00 | \$0.00 | \$0.00 | | | | \$0.00 |
| | A | | \$0.00 | \$0.00 | \$0.00 | | | | | | \$0.00 |
| 3.2 Macaya National Park zoning plan legally established | P | | | | | | | | | | \$0.00 |
| | P(a) | | | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| | A | | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| 3.3 Macaya National Park limits established and accepted | P | \$5,904.00 | \$52,500.00 | \$273,000.00 | \$704,960.00 | | | | | | \$1,036,364.00 |
| | P(a) | \$172,574.00 | \$52,500.00 | \$121,224.00 | \$0.00 | \$0.00 | \$0.00 | | | | \$24,552.00 |
| | A | \$5,904.00 | \$18,648.00 | \$0.00 | | | | | | | \$24,552.00 |
| 3.3 Scientific research missions inside the park facilitated | P | | | \$112,492.00 | \$164,892.00 | \$164,892.00 | \$50,092.00 | | | | \$492,368.00 |
| | P(a) | | | \$40,074.00 | \$133,474.00 | \$109,542.00 | \$200,204.00 | \$67,564.00 | \$0.00 | \$0.00 | \$280,292.00 |
| | A | | \$0.00 | \$19,594.00 | \$90,866.00 | \$145,522.00 | \$21,687.00 | \$0.00 | \$2,623.00 | \$0.00 | \$280,292.00 |
| 3.4 Macaya management plan established and published | P | | | \$133,500.00 | \$20,500.00 | \$3,500.00 | \$3,500.00 | | | | \$161,000.00 |
| | P(a) | | | \$133,500.00 | \$13,000.00 | \$13,156.00 | \$14,467.00 | \$44,500.00 | \$75,000.00 | \$36,043.00 | \$368,373.00 |
| | A | | | \$114,313.00 | \$18,921.00 | \$14,690.00 | \$29,296.00 | \$68,944.00 | \$86,166.00 | \$0.00 | \$332,330.00 |

| | | | | | | | | | | | Component Revised Cost |
|---|------|--------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|---------------------------|
| 4 Monitoring emissions Green House Gases | | | | | | | | | | | \$173,132.00 |
| Outputs | | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Cost |
| 4.1 Green House Gases emissions and carbon stock monitored inside Macaya Park | P | \$0.00 | \$50,000.00 | \$90,000.00 | \$68,150.00 | | | | | | \$208,150.00 |
| | P(a) | \$52,038.00 | \$50,000.00 | \$0.00 | \$44,383.00 | \$128,150.00 | \$64,142.00 | \$128,284.00 | \$0.00 | \$0.00 | \$173,132.00 |
| | A | \$0.00 | \$14,738.00 | \$0.00 | \$31,555.00 | \$97,715.00 | \$0.00 | \$29,035.00 | \$89.00 | \$0.00 | \$173,132.00 |
| Other Cost | | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Cost |
| Evaluation | P | | | \$30,000.00 | \$95,000.00 | \$95,000.00 | \$30,000.00 | | | | \$250,000.00 |
| | P(a) | | | \$15,000.00 | \$45,000.00 | \$37,761.00 | \$19,712.00 | \$50,000.00 | \$30,000.00 | \$0.00 | \$169,259.00 |
| | A | | \$0.00 | \$0.00 | \$133,171.00 | \$0.00 | \$0.00 | \$36,088.00 | \$0.00 | \$0.00 | \$169,259.00 |
| Audit | P | | | \$31,381.00 | \$20,429.00 | \$15,000.00 | \$15,000.00 | | | | \$81,810.00 |
| | P(a) | | | \$16,381.00 | \$16,381.00 | \$30,429.00 | \$30,000.00 | \$46,801.00 | \$33,224.00 | \$0.00 | \$118,341.00 |
| | A | | \$10,000.00 | \$16,380.00 | \$21,948.00 | \$27,401.00 | \$12,041.00 | \$16,000.00 | \$14,571.00 | \$0.00 | \$118,341.00 |
| Project management | P | \$21,687.00 | \$136,000.00 | \$297,876.00 | \$267,876.00 | \$267,876.00 | \$267,876.00 | | | | \$1,259,191.00 |
| | P(a) | \$182,126.00 | \$136,000.00 | \$276,876.00 | \$250,000.00 | \$223,526.00 | \$159,070.00 | \$200,250.00 | \$207,982.00 | \$12,209.87 | \$1,262,280.87 |
| | A | \$21,687.00 | \$244,201.00 | \$152,611.00 | \$132,145.00 | \$212,842.00 | \$157,452.00 | \$156,829.00 | \$172,304.00 | \$54,796.00 | \$1,304,867.00 |
| Total Cost | | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total Cost |
| | P | \$46,740.00 | \$607,540.00 | \$4,882,325.00 | \$4,630,103.00 | \$2,733,787.00 | \$935,349.00 | | | | \$13,835,844.00 |
| | P(a) | \$717,060.00 | \$607,540.00 | \$4,846,753.00 | \$2,150,901.00 | \$3,114,479.00 | \$2,879,074.00 | \$2,519,358.00 | \$2,447,413.00 | \$215,631.87 | \$12,643,535.87 |
| | A | \$46,740.00 | \$609,784.00 | \$1,849,226.00 | \$2,455,169.00 | \$1,833,729.00 | \$1,061,984.00 | \$2,132,319.00 | \$2,438,953.00 | \$222,175.00 | \$12,650,079.00 |

II.4 Sustainability

a. General Sustainability Aspects

- 2.43 This sustainability assessment focuses primarily on results associated with (i) reforestation efforts within the Park and the adoption of sustainable agricultural practices in the buffer zone (**R.3.1**), and with (ii) the construction of watershed protection infrastructures (check-dams and rainwater catchment areas) (**R.4.1**, **R.4.2** and **R.4.3**). This assessment also focuses on the sustainability of the Park's operational structures. Finally, this assessment includes the risk-mitigating strategies that were implemented to mitigate the risks that threaten the sustainability of the achieved results.
- 2.44 The sustainability of changes induced by the Park's reforestation and the adoption of sustainable agricultural practices in the buffer zone (**R.3.1**), depends on different factors:
- a. Technical factors: The quality of agricultural inputs and seedlings distributed/used is crucial to ensure their appropriate implementation/use, and the materialization and durability of their associated benefits. The Program, however, failed to monitor the survival rate of these seedlings as well as the adoption rate of these new practices. Other sustainability threats include the continuation of the open grazing of cows in the Park and in its buffer zone. These technical factors represent low probability risks with high negative impacts.
 - b. Environmental factors: These new practices and newly reforested areas are vulnerable to extreme adverse climatic events such as droughts and hurricanes, especially the first few years after implementation/plantation. Such events represent a low/medium probability risk with a high negative impact.
 - c. Economic factors: The socio-politico-economic and security crisis that began mid-2018, combined with the Covid-19 pandemic, is likely to have a negative impact on farmers' income, which might, in turn, incentivize the use of inappropriate land use practices such as tree cutting both in the park and in its area of influence as a way to obtain complementary incomes.
- 2.45 The sustainability of expected changes induced by the construction of watershed protection infrastructures and the distribution of productive equipment (**R.4.1**, **R.4.2** and **R.4.3**), depends on different factors:
- a. Environmental factors: These infrastructures and equipment are vulnerable to extreme adverse climatic events such as hurricanes. Such events represent a low/medium probability risk with a high negative impact.
 - b. Financial factors: According to the Program's final evaluation, beneficiaries (individuals and groups) of these infrastructures and equipment would not possess the financial capacity to repair them in the aftermath of a significant adverse climatic event. This also represents a low/medium probability risk with a high negative impact. Regarding the maintenance of these infrastructures, financial factors are unlikely to represent a major constraint considering that (i) these are small-scale infrastructures, (ii) beneficiaries were involved in their construction through cash for work activities, and (iii) materials needed for this type of maintenance (stones and cement, in particular) is available in the areas of intervention.
- 2.46 The sustainability of the Park's operational structures (which is key to the sustainability of results **R.1.0**, **R.1.1** and **R.2.1**) depends, first, on financial factors. According to the Program's final evaluation, the MOE does not currently have enough-budgetary resources

to maintain the Park's public infrastructures (Park physical limits, in particular) and to continue implementing activities of the Park's management plan. The sustainability of the Park's operational structures also depends on the degree of support it gets from local communities and NGOs. However, according to the Program's final evaluation, repeated execution delays caused frustrations in the local population. In addition, communities living within the park have not shown extensive support for reforestation efforts that took place within the Park. Lastly, the sustainability of the Park's operational structures depends on institutional factors: (i) stability within the MOE, to ensure the continued appropriation and implementation of existing tools and strategies; and (ii) stability as well as wider institutional recognition of the Park's new governance system. With respect to the latter, with the support of the Program, a few key steps have been achieved such as the nomination of the Park's director and the conception and approbation of a governance charter (and its action, or programmatic, plan). In addition, steps have been taken so that members of the Control and Surveillance Division (CSE; Park surveillance guards, in particular) continue to receive their salary either from the MOE or from other existing projects/programs. The different stakeholders' roles are now better defined than before the Program, but there is still room for improvement. The same applies to the involvement of local authorities, which remains insufficient primarily because of the high turnover of mayors and municipality management teams. To conclude, these different factors are medium probability risks for the sustainability of the Park's operational structures with a high negative impact

- 2.47 Finally, the sustainability of the results achieved depends on the mitigation of the main risks that were identified and tackled during the project implementation: (i) Natural disaster risks (hurricanes, floods and landslides) that affects the activities implemented; (ii) Inadequate fiduciary and project management that limit the timely achievement of results and (iii) resistance of local stakeholders to modify unsustainable practices (such as timber exploitation). These three main risks materialized during project implementation: (i) Hurricane Matthew in 2016 strongly impacted ecosystems and access to the park; (ii) political and administrative instability within the MoE caused significant turmoil; and (iii) collaboration with some local communities was sometimes difficult, which delayed interventions. However, throughout the project, the project team was able to adapt, notably through adapted and prioritized planning. For example, regarding the first risk, after Hurricane Matthew, the project unit reviewed the planning to define a priority intervention plan that responded to the post-disaster needs but also ensured that the results matrix of the operation was respected. Priority was then given to communication, monitoring, and support to local communities so that they could recapitalize while using non-degrading practices on the ecosystems. Regarding the second risk, based on the mid-term evaluation of the program, a monitoring committee at the central level was set up to facilitate the ownership and monitoring of the activities. Finally, for the last point, the project relied on an implementation strategy with local actors (operators) who had activities before the project and who will remain after the project. This allows the activities to be included in a coherent territorial continuity. In addition, the signing of the park's governance charter at the end of the project is based on the project's achievements to ensure continuity of interventions beyond the project's funding.

b. Environmental and Social Safeguards

- 2.48 The Grant proposal of operation HA-G1023 states that the Program was classified as Category B.
- 2.49 An [Environmental and Social Management Report \(ESMR\)](#) was prepared in April 2013. It was initially prepared for the PMDN (HA-L1041). Considering that the Program and PMDN

had similar intervention areas and expected social and environmental impacts, it was decided to also apply this ESMR to HA-G1023, and thus to the Program as a whole. This ESMR, however, was of poor quality and, according to the Program's final evaluation, failed to properly identify social and environmental risks (such as: the higher risk of unregulated exploitation of the Park's natural resources resulting from the road rehabilitation; and the risk of conflicts/tensions between local communities and the Park's operational structures, and its potential implication on sustainability) and to propose adequate mitigation measures.

There are significant unmitigated risks to the sustainability of changes induced by the Program. These are primarily external factors such as extreme adverse climatic events and Haiti's ongoing socio-politico-economic and security crisis. The main environmental and social risks identified at the design stage (including extreme climatic events) did materialize during execution but, as described above and despite a very unfavorable context of intervention, safeguards measures implemented by the Program were adequate. The overall Program's sustainability is considered partly unsatisfactory.

III. NON-CORE CRITERIA

III.1 Bank Performance

- 2.50 Overall, the Bank's performance was partly unsatisfactory during the design and implementation of the Program. The design of the Program was weak (weak vertical logic; incomplete, often changing and sometimes incoherent Results Matrix; incomplete risk matrix; absence of ESMR; etc.), which hindered its comprehension by local and national stakeholders, and negatively affected its performance and the assessment of it.
- 2.51 During implementation, in addition to supervision by Bank's technical, fiduciary and procurement staff, the Bank hired a full-time international consultant to supervise the Program through regular meetings with the Program's PEU, and frequent field visits in the areas of intervention. The consultant also provided technical as well as administrative support to the PEU. Despite the Bank's efforts and frequent meetings with the PEU and the MOE to review and update the content of the intervention, the context (hurricane Matthew, in particular) and the MOE's weak execution capabilities made it difficult for the Program to maintain a clear and consistent implementation strategy. The Bank's support fell short, however, of improving the Program's M&E tools and processes. Overall, the relationship between the Bank (including Financial Management and Procurement Specialists) and the PEU was considered "good" by both parties. No-Objection requests were treated in a timely manner by the Bank. The Bank also showed flexibility to adjust the Program to evolving/changing local realities, in particular in the aftermath of hurricane Matthew in 2016
- 2.52 Financial management by the Bank was satisfactory. The Program's PEU indicates that the Bank responded quickly to disbursement requests and provided adequate support whenever requested.

III.2 Borrower Performance

- 2.53 Overall, the Borrower's performance was partly unsatisfactory during the Program's preparation and execution.
- 2.54 The MOE played its role in the design of the Program by providing guidance to align the Program's objectives with sectorial needs and national development objectives.
- 2.55 The Program was executed by a PEU at the MOE. Contracts and payment orders above US\$ 20,000 were signed directly by the Minister, while MOE's National Agency for Protected Areas (ANAP, for its French acronym) was responsible for the Program's technical supervision. Overall, the Borrower, including the PEU, carried out its responsibilities and tasks entitled, but several internal issues constrained its performance: (i) institutional instability led to a high PEU turnover (six different Ministers headed the MOE during execution, and each Minister change was followed by a change of the PEU), which caused significant execution delays and losses of information during transitions; (ii) Ministers' unavailability led to frequent delays for the signature of contracts and payments orders; and (iii) the PEU's lack of presence on the field slowed Program appropriation and made relationships and communication with local communities, stakeholders, and partners more difficult.

IV. FINDINGS AND RECOMMENDATIONS

IV.1 Dimensions 1 to 5

Table 4
Findings and Recommendations

| Findings | Recommendations |
|---|---|
| Dimension 1: Technical-sectorial | |
| <p>1.1 The design of the Program was weak (weak vertical logic; incomplete, often changing and sometimes incoherent Results Matrix; incomplete risk matrix; absence of ESMR; etc.), which hindered its comprehension by local and national stakeholders, and negatively affected its performance and the assessment of it. Moreover, outcomes and outputs indicators were included during the executing period, increasing the number of activities within the Program.</p> | <p>1.1.1 At the design stage, conduct a detailed analysis of the factors of degradation of the park's ecosystems and evaluate the population flows as well as economic flows for each geographical area to establish a clear strategy of interventions and realistic objectives. A documented knowledge of the geography of the park (community maps, paths with travel times, infrastructures and projects carried out, eroded areas, burnt areas, etc.) and of the main conservation objects (the nature, location and dynamics of the main forest ecosystems, in particular) is a prerequisite for the fine elaboration of a relevant and coherent action strategy. It should allow to check certain assumptions before including them in the vertical logic.</p> |
| | <p>1.1.2 Keep the program's vertical logic simple and clear, to facilitate its comprehension, execution, and evaluation. Improving the zoning of the park and reducing pressure on natural resources, was particularly ambitious. In such a fragile and unstable context, simplify the content and scope of activities by verifying that each activity addresses a specific problem and keeping this in mind when carrying out the activity. An activity should not simultaneously address issues of land management, reduction of human pressure in the park, improvement of producers' income and environmental restoration. The prioritization of activities considering the capacity of execution is a key factor of success.</p> |
| | <p>1.1.3 Avoid including additional activities that are not aligned with the project's main and specific objectives. While it is understandable that Haiti's needs are multiple, it is not a good practice to add activities not planned during the design of the project. Indeed, during the execution of the project, the team must promote an adaptive approach to meet the needs that may evolve (evolution of the socio-economic context, natural disasters, new project in the area). However, the initial activities should not be called into question, and, above all, the team should not try to respond to all the needs of the intervention area. In the framework of this project, although all the activities responded to the global and</p> |

| Findings | Recommendations |
|---|---|
| | <p>specific objective initially determined, too many different activities were planned. Their implementation was limited due to the lack of capacity of the execution unit, but also due to the oversizing of the interventions. During the mid-term evaluation of the program, it is essential to verify this alignment between the activities and the general / specific objectives of the project. If some activities do not fully fit into a specific objective, it is necessary to (i) reassess the relevance of that activity or (ii) add, in cooperation with SPD, an outcome indicator that will demonstrate the results of that activity. This assessment can also be done during the PMR review.</p> |
| <p>1.2 According to the ex-post CEA, the Program was able to achieve the adoption of agroforestry practices at a cost significantly lower than that of alternatives. It was made possible by adjusting the content of the support to reflect the specificities of the Program's objectives as well as scale and context of intervention (accessibility issues, absence of local input suppliers, etc.)</p> | <p>1.2.1 During the design of the Program, it is necessary to take into consideration the geography and the specificities of the areas of intervention, to be able to provide solutions that are adequate to the context (in terms of accessibility, availability of suppliers, etc.) and most effective.</p> |
| Dimension 2: Organizational and managerial | |
| <p>2.1 The Program had to deal with a fragile institutional framework that requires significant Bank efforts to support project implementation. These difficulties were exacerbated by external events such as Hurricane Matthew in 2016. Institutional instability led to a high PEU turnover (six different Ministers headed the MOE during execution, and each Minister change was followed by a change of the PEU), which caused significant execution delays and losses of information during transitions.</p> | <p>2.1.1 PEU must remain a technical entity and remain, as such, independent of political cycles. The human resources and means of the Ministry being limited, the latter has chosen to appoint the Project Coordinator as the Director of the Parc Macaya. This dual role has sometimes limited the proper execution of activities and brought confusion to local communities. Since the park management was not clearly established and functional as a local territorial entity, too often the park director was seen only as a project coordinator without territorial legitimacy. Therefore, the establishment of a directorate for the park, appointed by the Ministry, which would implement the Park's management plan and intervene on a long-term basis, independently of projects, would make it possible to limit the political impact on the PEU. This would also ensure better sustainability of interventions beyond the life of the project.</p> <p>2.1.2 Plan, evaluate and adjust institutional strengthening activities on a regular basis. The project design should evaluate existing counterpart capacities and coordination mechanisms while allocating enough resources to support regular institutional capacity assessments. The Bank should also carefully consider the timing, sequencing, and nature of proposed institutional strengthening mechanisms to ensure adequate execution and the delivery of expected results.</p> |

| Findings | Recommendations |
|--|--|
| | Where units have low capacity (PACI analysis), ongoing training sessions on technical aspects, procurement and financial management should be provided. A specific capacity building plan should be defined. Within the framework of this project, the bank has put in place a transversal technical assistance (technical and project management) through the recruitment of a consultant based in Haiti. This modality proved to be essential for the supervision of the project, as highlighted by the final evaluation. |
| 2.2 PEU's lack of presence on the field slowed Program appropriation and made relationships and communication with local communities, stakeholders, and partners more difficult. | <p>2.2.1 Members of PEU must be based on the field and acquire a good understanding of the environment through regular field visits/excursions (including inside the Park). Other projects (e.g., HA-L1096; HA-L1107) have shown that decentralization of supervision (via Departmental directorates of Ministries) allows for better implementation during crises, better response in case of emergency and, above all, greater proximity to the beneficiaries (needs analysis and management of complaints). It might also be appropriate, if possible, to hire a person from the local area in the PEU to facilitate the understanding of local needs and realities.</p> <p>2.2.2 Consider providing additional support to the PEU in the form of a full-time technical assistance based at the PEU.</p> |
| 2.3 A strong M&E system is crucial to monitor program implementation and help respond quickly to potential problems. | <p>2.3.1 As part of institutional strengthening activities, expect special monitoring and evaluation support for the executing agency to ensure a regular and appropriate follow-up of key indicators. The M&E plan should be implemented at the start of the project and not in the final year (which was the case for this project). For each activity, a clear link should be established with the outcome indicators. Although a person dedicated to this monitoring was recruited by the project, his focus was mainly on monitoring the implementation of the activities on daily basis rather than on monitoring the results indicators. External or Bank support is needed to ensure the proper implementation of the M&E plan.</p> <p>2.3.2 The work of the M&E Team should primarily take place on the field. M&E officers should report program indicators and play a key role in the identification of unanticipated problems. For this, the M&E specialist must be permanently in the field to follow the progress as it happens and not only during occasional supervision visits.</p> |
| Dimension 3: Public processes and stakeholders | |

| Findings | Recommendations |
|--|---|
| 3.1 Trust from local communities and stakeholders is crucial to secure their support for the Program. | <p>3.1 Ensure that the objectives of the project and scope of interventions are well communicated to beneficiaries to avoid confusion. During project implementation, and as highlighted by the final project evaluation, there was often a lack of understanding between the general management objectives of Macaya Park (as a public administrative entity with a management plan) and the specific project objectives. This confusion may have led to confusion and blockages, as some communities thought that the project was going to fund all of the activities in the park's management plan. Therefore, the articulation between the management objectives for the park and the activities implemented in the field and towards communities must be explicit and understandable. The project adopted a good practice in the last phase of its implementation (after Hurricane Matthew) by holding public consultations with beneficiary communities to (i) identify needs; (ii) clearly explain which activities will be funded and which will not; and (iii) report on activities done. In addition, to secure local support, it is necessary for such an intervention to include income-generating activities (such as payments for ecosystem services) that can quickly improve the livelihoods of local communities, while contributing to conservation efforts.</p> |
| 3.2 Proper communication and exchange of information between the different actors hired to work on the field is crucial to maximize potential synergies and facilitate problem-solving. | 3.2 The PEU must ensure that this communication takes place regularly. This would make it possible to avoid management "by contract" by favoring a global integrated approach of activities facilitating complementarity and synergies. |
| 3.3 The lack of clear governance for the Park has delayed and hampered the implementation of field activities. The failure to put in place co-management arrangements for the Park was a major factor in the failure to achieve several objectives essential to the success of the Program. The need for negotiation processes with local actors has been underestimated | 3.3 The implementation of the governance charter elaborated in the last year of the project in collaboration with the institutional partners and the civil society organizations appears as a precondition for future interventions in the Park. In addition, the Project Steering Committee must be able to play a decision-making role and not limit itself to the presentation of the annual balance sheet and action plan. |
| Dimension 4: Fiduciary | |
| 4.1 Ministers' unavailability led to frequent delays for the signature of contracts and payments orders. | <p>4.1.1 Administrative and financial management must be more decentralized. A technical director based in project implementation area should be granted sufficient decision-making powers, such as the ability to sign contracts and payment orders, to limit the administrative constraints that slowed down the implementation of the Program. In addition to this decentralization, it is imperative to promote ownership of the project by the</p> |

| Findings | Recommendations |
|--|---|
| | central Ministry (to avoid isolating the project) by designating a focal point at the central Ministry level who will be responsible for liaising between the project and the Ministry's management. |
| 4.2 Efficient procurement team and processes are crucial for Program execution. | <p>4.2.1 Before the start of the Program, an institutional and technical assessment of the procurement team should be conducted and updated to identify relevant reinforcement and capacity strengthening needs. More generally, procurement processes need to be mapped out to identify potential bottlenecks and anticipate mitigation measures.</p> <p>4.2.2 Contracts should include stricter clauses for breach of contracts in case of poor performance as well as conditions for mobilizing payments that depend on the quality of the outputs and the achievement of well-defined tangible results. Contracting a supervision firm is recommended, especially when the contract is executed by an NGO.</p> |
| Dimension 5: Risk management | |
| 5.1 Project developed in ongoing humanitarian, sociopolitical and environmental situations require better sector and comprehensive risk assessments to mitigate potential problems. The Program's ESMR failed to properly identify social and environmental risks and to propose adequate mitigation measures ((e.g., vulnerability of communities and degradation of living conditions, impacts of extreme events, low sustainability of infrastructure). | 5.1 Incorporate a robust risk analysis from the project's inception. It should be associated with the country's institutional, sectoral, socioeconomic, and environmental issues. Also, it should serve as strategic and operational guidance for defining appropriate mitigation measures and facilitate proper decision-making. Finally, a sound and continuous risk analysis will become a valuable input for future evaluations. |
| 5.2 The implementation of the Program took place in a political (Peyi Lock), security (increased insecurity and isolation of the southern peninsula from the capital due to the presence of gangs in the south of Port-au-Prince) and environmental (extreme climatic events, in particular hurricane Mathew in 2016) context that deteriorated over the years. This revealed the need to put in place adaptation measures to guarantee quality implementation in a fragile context. | 5.2.1 Readiness, programmatic approach, and agility: Since 2019, the implementation of projects in Haiti is done in a context of fragility. This context requires adaptive measures to ensure that project objectives are met and that targeted beneficiaries are reached. This context of fragility must be taken into account in the design of operations in order to propose appropriate and agile measures to ensure implementation. |

ANNEX 1 – Outputs Achieved

| Outputs | Unit of Measure | Baseline value ⁴² | Baseline year | Targets and Actual achievement ⁴³ | | % Achieved ⁴⁴ | Means of verification |
|---|-----------------|------------------------------|---------------|--|-------|--------------------------|-----------------------|
| Component #1 – Strengthening Local Governance | | | | | | | |
| P.1.1. Environmental Control and Surveillance Division (CSE) established and operational | CSE system | 0 | 2013 | P | 1 | 100% | PEU reports |
| | | | | P(a) | 1 | | |
| | | | | A | 1 | | |
| P.1.2. Communal infrastructure projects executed | Projects | 0 | 2013 | P | 12 | 100% | PEU reports |
| | | | | P(a) | 12 | | |
| | | | | A | 12 | | |
| P.1.3. Macaya infrastructures functional (administrative center, hosting center, checkpoints) | Infrastructures | 0 | 2013 | P | 4 | +100% | PEU reports |
| | | | | P(a) | 7 | | |
| | | | | A | 7 | | |
| P.1.4. Intercommunal agreement in the buffer zone elaborated and implemented | Agreement | 0 | 2013 | P | 1 | 100% | PEU reports |
| | | | | P(a) | 1 | | |
| | | | | A | 1 | | |
| P.1.5. Environmental Education Program implemented in the Park's buffer zone schools | Schools | 0 | 2013 | P | 23 | +100% | PEU reports |
| | | | | P(a) | 38 | | |
| | | | | A | 38 | | |
| P.1.6. Priority activities of the management plan implemented | Activities | 0 | 2013 | P | 3 | +100% | PEU reports |
| | | | | P(a) | 4 | | |
| | | | | A | 4 | | |
| Component #2 – Land and Forest Management | | | | | | | |
| P.2.1. Farmers supported by the project | Farmers | 0 | 2013 | P | 450 | +100% | PEU reports |
| | | | | P(a) | 1,805 | | |
| | | | | A | 1,805 | | |
| P.2.2. Socio-environmental impact assessment | Assessment | 0 | 2013 | P | 1 | 100% | PEU reports |
| | | | | P(a) | 1 | | |
| | | | | A | 1 | | |
| P.2.3. Rural roads equipped with water harvesting infrastructures | Km | 0 | 2013 | P | 20 | 65% | PEU reports |
| | | | | P(a) | 13 | | |
| | | | | A | 13 | | |
| P.2.4 Private sector supported to develop strategy value chain | Project | 0 | 2013 | P | 3 | 0% | PEU reports |
| | | | | P(a) | 0 | | |
| | | | | A | 0 | | |

⁴² Data source: Convergence.

⁴³ Where: P = Start-Up Plan (source: PMR "2nd period Jan-Dec 2014" in Convergence); P (a) = Revised Annual Target (source: last PMR in Convergence); A = Actual (source: last PMR in Convergence).

⁴⁴ Relative to P; when P is not provided, relative to P(a).

| Outputs | Unit of Measure | Baseline value ⁴⁵ | Baseline year | Targets and Actual achievement ⁴⁶ | | % Achieved ⁴⁷ | Means of verification |
|--|-----------------|------------------------------|---------------|--|-----|--------------------------|-----------------------|
| Component #3 – Local Regulatory Framework for Land Tenure | | | | | | | |
| P.3.1. Park limits physically established | Km | 0 | 2013 | P | | 100% | PEU reports |
| | | | | P(a) | 132 | | |
| | | | | A | 132 | | |
| P.3.2. Macaya National Park zoning plan legally established | Statement | 0 | 2013 | P | | 100% | Presidential decree |
| | | | | P(a) | 1 | | |
| | | | | A | 1 | | |
| P.3.3. Scientific research missions inside the Park facilitated | Mission | 0 | 2013 | P | | 100% | PEU reports |
| | | | | P(a) | 9 | | |
| | | | | A | 9 | | |
| P.3.4. Macaya management plan established and published | Plan | 0 | 2013 | P | | 100% | PEU reports |
| | | | | P(a) | 1 | | |
| | | | | A | 1 | | |
| Component #4 – Monitoring Emissions of GHG | | | | | | | |
| P.4.1. GHG emissions and carbon stock monitored inside Macaya Park | System | 0 | 2013 | P | 1 | 100% | PEU reports |
| | | | | P(a) | 1 | | |
| | | | | A | 1 | | |

⁴⁵ Data source: Convergence.

⁴⁶ Where: P = Start-Up Plan (source: PMR “2nd period Jan-Dec 2014” in Convergence); P (a) = Revised Annual Target (source: last PMR in Convergence); A = Actual (source: last PMR in Convergence).

⁴⁷ Relative to P; when P is not provided, relative to P(a).