Strengthening the climatic resilience of the drinking water sector in the South of Haiti

Part I: Project Information

GEF ID
10320

Project Type
FSP

Type of Trust Fund
LDCF

CBIT/NGI
CBIT **No**
NGI **No**

Project Title
Strengthening the climatic resilience of the drinking water sector in the South of Haiti

Countries
Haiti

Agency(ies)
UNDP

Other Executing Partner(s)
Ministry of Environment (MoE)

Executing Partner Type
Government

GEF Focal Area
Climate Change

Taxonomy
Focal Areas, Climate Change, Climate Change Adaptation, Least Developed Countries, Climate resilience, Influencing models, Transform policy and regulatory environments, Strengthen institutional capacity and

decision-making, Stakeholders, Civil Society, Community Based Organization, Type of Engagement, Participation, Information Dissemination, Consultation, Beneficiaries, Communications, Awareness Raising, Behavior change, Local Communities, Gender Equality, Gender results areas, Participation and leadership, Access to benefits and services, Access and control over natural resources, Capacity, Knowledge and Research, Learning, Adaptive management, Knowledge Exchange, Capacity Development

Sector
AFOLU

Rio Markers
Climate Change Mitigation
Climate Change Mitigation 0

Climate Change Adaptation
Climate Change Adaptation 2

Submission Date
12/1/2021

Expected Implementation Start
1/1/2023

Expected Completion Date
12/31/2027

Duration
60In Months

Agency Fee($)
427,933.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount($)	Co-Fin Amount($)
CCA-1	Outcome 1.1 Technologies and innovative solutions piloted or deployed to reduce climate-related risks and/or enhance resilience	LDCF	3,754,603.00	6,150,000.00
CCA-2	Outcome 2.1 Strengthened cross-sectoral mechanisms to mainstream climate change adaptation and resilience	LDCF	749,960.00	24,300,000.00
		Total Project Cost($)	**4,504,563.00**	**30,450,000.00**

B. Project description summary

Project Objective

To improve the resilience of drinking water access in Haiti to the effects of climate change

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 1. Improved understanding and awareness of the water sector vulnerability to climate change	Technical Assistance	Outcome 1.1: Improved awareness raising and knowledge and information management systems for the water sector to plan and respond to the impacts of climate change. Outcome 1.2: Target communities prepared to effectively plan responses to climate change impacts on their access to drinking water.	Output 1.1.1: Assessments, with gender-specific criteria, carried out at the national level to demonstrate the implications of different climate change scenarios on the availability of water. Output 1.1.2: A continuous information- and knowledge-generation system implemented to inform communities and the GoH on water management adaptation strategies and climate-resilient water supply. Output 1.1.3: Cost-benefit analyses of different adaptation strategies developed as per the predicted climate change scenarios identified under Output 1.1.1. Output 1.1.4: Training programmes	LDCF	400,000.00	5,000,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 2. Strengthening of the regulatory, policy and institutional capacity framework at national, regional, and local levels for the effective management of drinking water under climate change conditions	Technical Assistance	Outcome 2.1: Key regulatory and policy instruments adjusted to consider the implications of climate change for drinking water supply and promote adaptive community-based management. Outcome 2.2: Increased capacities in priority institutional stakeholders (DINEPA, OREPA Sud, CAEPAs and CTEs) with regards to the technical aspects of water resource management, territorial land-use planning, as well as management and application of information on water resources and climate change threats. Outcome 2.3: Target communities equipped with instruments and mechanisms that ensure the sustainable	Output 2.1.1: Two regulatory instruments adjusted to account for the evolving contextual needs and conditions resulting from climate change. Output 2.1.2: Strategic plans revised by sub-national regulatory institutions to prioritise adaptation interventions based on evaluations of climate change impacts on water supply vulnerability. Output 2.1.3: Frameworks and instruments developed and applied for planning and coordination between national, regional, private and community-based organisations. Output 2.2.1: Targeted programmes implemented to strengthen technical capacity of relevant institutions to	LDCF	515,000.00	20,801,030.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 3. Identification and promotion of practices for the conservation, management and supply of drinking water adapted to predicted climate change scenarios.	Investment	Outcome 3.1: Reliable access to drinking water ensured for target communities and households as a result of the implementation of climate change adaptation measures.	Output 3.1.1: 4,540 ha of aquifer recharge zones rehabilitated within the five target SAEPs ? of which 700 ha is restored through agroforestry. Output 3.1.2: Gabions, percolation tanks and contour bunds constructed to promote aquifer recharge and to reinforce the protection of the five target Drinking Water Supply Systems (SAEPs). Output 3.1.3: Rooftop water harvesting systems and household cisterns installed in 350 households in target communities. Output 3.1.4: Framework for financial plans for operations and maintenance (O&M) of the five target SAEPs to improve water-use efficiency and distribution, accompanied	LDCF	3,379,563.00	3,230,000.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
				Sub Total ($)	**4,294,563.00**	**29,031,030.00**
Project Management Cost (PMC)						
				LDCF	210,000.00	1,418,970.00
				Sub Total($)	**210,000.00**	**1,418,970.00**
				Total Project Cost($)	**4,504,563.00**	**30,450,000.00**

Please provide justification

C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Ministry of Environment	In-kind	Recurrent expenditures	350,000.00
Donor Agency	IDB	Grant	Investment mobilized	30,000,000.00
GEF Agency	UNDP	Grant	Investment mobilized	100,000.00
			Total Co-Financing($)	**30,450,000.00**

Describe how any "Investment Mobilized" was identified

Notes: Co-financing was identified through extensive discussions with key institutions, donor agencies and organizations in Haiti. These discussions helped identify synergies between the interventions, sites, and beneficiaries of the proposed project. *IDB finance stands for the investment programming to engage into synergies on institutional strengthening of DINEPA in its regulatory functions ** UNDP Core funds stand for capacity building on management policies and environmental regulatory measures

D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNDP	LDCF	Haiti	Climate Change	NA	4,504,563	427,933	4,932,496.00
			Total Grant Resources($)		**4,504,563.00**	**427,933.00**	**4,932,496.00**

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount ($)

150,000

PPG Agency Fee ($)

14,250

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
UNDP	LDCF	Haiti	Climate Change	NA	150,000	14,250	**164,250.00**
			Total Project Costs($)		**150,000.00**	**14,250.00**	**164,250.00**

Meta Information - LDCF

LDCF true
SCCF-B (Window B) on technology transfer false
SCCF-A (Window-A) on climate Change adaptation false

Is this project LDCF SCCF challenge program?
false

This Project involves at least one small island developing State(SIDS). true

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This Project involves at least one fragile and conflict affected state. true

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This Project will provide direct adaptation benefits to the private sector. true

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This Project is explicitly related to the formulation and/or implementation of national adaptation plans (NAPs). false

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This Project has an urban focus. false

This Project covers the following sector(s)[the total should be 100%]:*

Agriculture	**10.00%**
Natural resources management	**20.00%**
Climate information Services	**0.00%**
Costal zone management	**0.00%**
Water resources Management	**70.00%**
Disaster risk Management	**0.00%**
Other infrastructure	**0.00%**
Health	**0.00%**
Other (Please specify:)	**0.00%**
Total	**100%**

This Project targets the following Climate change Exacerbated/introduced challenges:*
Sea level rise false
Change in mean temperature true
Increased Climatic Variability false
Natural hazards true
Land degradation false
Costal and/or Coral reef degradation false
GroundWater quality/quantity false

To calculate the core indicators, please refer to Results Guidance

Core Indicators - LDCF

CORE INDICATOR 1	Total	Male	Female	% for Women
Total number of direct beneficiaries	130,000	65,000	65,000	50.00%

CORE INDICATOR 2	
Area of land managed for climate resilience (ha)	700.00

CORE INDICATOR 3	
Total no. of policies/plans that will mainstream climate resilience	2

CORE INDICATOR 4		Male	Female	% for Women
Total number of people trained	200	120	80	40.00%

OUTPUT 1.1.1

Physical and natural assets made more resilient to climate variability and change

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		Male	Female
Total number of direct beneficiaries from more resilient physical assets	**130,000**	**65,000**	**65,000**

Ha of agriculture land	Ha of urban landscape	Ha of rural landscape	No. of residential houses
700.00			**0**

No. of public buildings	No. of irrigation or water structures	No. of fishery or aquaculture ponds	No. of ports or landing sites
0	**350**	**0**	**0**

Km of road	Km of riverban	Km of coast	Km of storm water drainage

Other	Other(unit)	Comments
0		

OUTPUT 1.1.2

Livelihoods and sources of income of vulnerable populations diversified and strengthened

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		Male	Female
Total number of direct beneficiaries with diversified and strengthened livelihoods and sources of income	**0**	**0**	**0**

Livelihoods and sources of incomes strengthened / introduced			
Agriculture	Agro-Processing	Pastoralism/diary	Enhanced access to markets
true	**false**	**false**	**false**
Fisheries /aquaculture	Tourism /ecotourism	Cottage industry	Reduced supply chain
false	**false**	**false**	**false**
Beekeeping	Enhanced opportunity to employment	Other	Comments
false	**false**	**true**	**Please note that the direct beneficiaries (130,000 of which 65,000 is male and 65,000 is female) will also benefit from this output as well**

OUTPUT 1.1.3

New/improved climate information systems deployed to reduce vulnerability to climatic hazards/variability

		Male	Female
Total number of direct beneficiaries from the new/improved climatic information systems	**0**	**0**	**0**

Climate hazards addressed

Flood	Storm	Heatwave	Drought
false	**false**	**false**	**false**

Other	Comments
true	**Please note that the direct beneficiaries (130,000 of which 65,000 is male and 65,000 is female) will also benefit from this output as well**

Climate information system developed/strengthened

Downscaled Climate model	Weather/Hydromet station	Early warning system	Other
false	**false**	**false**	**false**

Comments

Climate related information collected

Temperature	Rainfall	Crop pest or disease	Human disease vectors
true	**true**	**false**	**false**

Other	Comments

true	**Drought Water resources**		

Mode of climate information disemination			
Mobile phone apps	Community radio	Extension services	Televisions
false	**false**	**false**	**false**

Leaflets	Other	Comments
false	**true**	**Workshops**

OUTPUT 1.1.4

Vulnerable natural ecosystems strengthened in response to climate change impacts

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Types of natural ecosystem

Desert	Coastal	Mountainous	Grassland
false	**false**	**false**	**false**

Forest	Inland water	Other	Comments
false	**false**	**true**	**Catchement areas - 4,540 hectare**

OUTPUT 1.2.1

Incubators and accelerators introduced

	Male	Female
Total no. of entrepreneurs supported	**0**	

	Comments
No. of incubators and accelerators supported	

	Comments
No. of adaptation technologies supported	

OUTPUT 1.2.2

Financial instruments or models to enhance climate resilienced developed

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Financial instruments or models			
PPP models **false**	Cooperatives **false**	Microfinance **false**	Risk insurance **false**
Equity **false**	Loan **false**	Other **false**	Comments

OUTPUT 2.1.1

Cross-sectoral policies and plans incorporate adaptation considerations

Will mainstream climate resilience	Of which no. of regional policies/plans	Of which no. of national policies/plan
0	**1**	**1**

Sectors

Agriculture	Fishery	Industry	Urban
false	**false**	**false**	**false**

Rural	Health	Water	Other
false	**false**	**true**	**false**

Comments

Despite the Haitian government's efforts to incorporate climate change into national planning processes, consideration in regulatory frameworks related to drinking water management in Haiti has been limited. Under this project, two regulatory instruments - DINEPA and OREPA Sud - related to the management of drinking water supply in Haiti will be revised to take into account the impacts of climate change on water resources.

OUTPUT 2.1.2

Cross sectoral institutional partnerships established or expanded

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No. of institutional partnerships established or strengthened **2**

Comments

OUTPUT 2.1.3

Systems and frameworks established for continuous monitoring, reporting and review of adaptation

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No. of systems and frameworks **2**

Comments
Integrated Water Resources Management, Ecosystem-based Adaptation

OUTPUT 2.1.4

Systems and frameworks established for continuous monitoring, reporting and review of adaptation

No. of systems and frameworks **2**

Comments
Integrated Water Resources Management, Ecosystem-based Adaptation

OUTPUT 2.2.1

No. of institutions with increased ability to access and/or manage climate finance

No. of institution(s)

Comments

OUTPUT 2.2.2

Institutional coordination mechanism created or strengthened to access and/or manage climate finance

No. of mechanism(s)

Comments

OUTPUT 2.2.3

Global/regional/national initiatives demonstrated and tested early concepts with high adaptation potential

No. of initiatives or technologies

Comments

OUTPUT 2.2.4

Public investment mobilized

Amount of investment
(US$)

Comments

OUTPUT 2.2.5

Private investment mobilized

Amount of investment
(US$)

Comments

OUTPUT 2.3.1

No. of people trained regarding climate change impacts and appropriate adaptation responses

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		Male	Female
Total no. of people trained	**100**	**60**	**40**
Of which total no. of people at line ministries	**60**	Male **36**	Female **24**
Of which total no. of community/association	**40**	Male **24**	Female **16**
Of which total no. of extension service officers	**0**	Male **0**	Female **0**
Of which total no. of hydromet and disaster risk management agency staff	**0**	Male **0**	Female **0**
Of which total no. of small private business owners	**0**	Male **0**	Female **0**
Of which total no. school children, university students or teachers	**0**	Male **0**	Female **0**

Other	Comments

OUTPUT 2.3.2

No. of people made aware of climate change impacts and appropriate adaptation responses

		Male	Female
No. of people with raised awareness	**100**	**60**	**40**

Please describe how their awareness was raised

OUTPUT 3.1.1

National climate policies and plans enabled including NAP processes by stronger climate information decision-support services

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No. of national climate policies and plans

Comments

OUTPUT 3.1.2

Systems and frameworks established for continuous monitoring, reporting and review of adaptation

---

No. of systems and frameworks

Comments

OUTPUT 3.1.3

Vulnerability assessments conducted

No. of assessments conducted

Comments

OUTPUT 3.2.1

No. of institutions with increased ability to access and/or manage climate finance

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No. of institution(s)

Comments

OUTPUT 3.2.2

Institutional coordination mechanism(s) created or strengthened to access and/or manage climate finance

---

No. of mechanism(s)

Comments

OUTPUT 3.2.3

Global/regional/national initiative(s) demonstrated and tested early concepts with high adaptation potential

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No. of initiative(s) or technology(ies)

Comments

OUTPUT 3.3.1

No. of people trained regarding climate change impacts and appropriate adaptation responses

		Male	Female
Total no. of people trained	**100**	**60**	**40**
		Male	Female
Of which total no. of people at line ministries	**0**	**0**	**0**
		Male	Female
Of which total no. of community/association	**100**	**60**	**40**
		Male	Female
Of which total no. of extension service officers	**0**	**0**	**0**
		Male	Female
Of which total no. of hydromet and disaster risk management agency staff	**0**	**0**	**0**
		Male	Female
Of which total no. of small private business owners	**0**	**0**	**0**
		Male	Female

Of which total no. school children, university students or teachers	**0**	**0**	**0**

Other	Comments

OUTPUT 3.3.2

No. of people made aware of climate change impacts and appropriate adaptation responses

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		Male	Female
No. of people with raised awareness	**150**	**75**	**75**

Please describe how their awareness was raised

Part II. Project Justification

1a. Project Description

Describe any changes in alignment with the project design with the original PIF

The *Project Description* section from the PIF has been restructured and considerably expanded into three new sections, namely: i) Development Challenges; ii) Strategy; and iii) Results and Partnerships. Brief summaries of these re-structured sections are as follows:

A. Development Challenges ? This section is divided into the following sub-sections: i) Background context; ii) Problem statement; iii) Root causes; iv) Underlying causes; v) Immediate causes; and vi) Alignment with national policies, strategies and plans. Further detail has been provided on the national climate and socioeconomic context, as well as for the country?s South-East Department. This context has also informed the expansion of the root causes, underlying causes and immediate causes, which provide added detail on the drivers of the problems the project will address.

B. Strategy ? This section is divided into the following sub-sections: i) Theory of Change; ii) Barriers to the preferred solution; iii) Assumptions underlying the identified solutions; and iv) Alignment with GEF focal areas. Further detail has been provided on the approach that the project will take to address the identified problem. This additional context informed the development of the theory of change, problem tree and solution tree diagrams, which visually represent how the implementation of the project approach will achieve the preferred solution and overcome the identified problem and barriers.

C. Results and Partnerships ? This section is divided into the following sub-sections: i) Expected results; ii) Partnerships; iii) Risks; iv) Stakeholder engagement and South-South cooperation; v) Gender equality and women?s empowerment; and vi) Innovativeness, sustainability and potential for scaling up. This section substantially expands on the *Proposed alternative scenario* from the PIF by restructuring the Outcomes and Outputs of Components 2 and 3 in the logframe. The section?s restructuring in the logframe is included under the *Expected Results* and will enable the project to better support GEF focal areas and national priorities, while also streamlining the project to ensure that implementation is as effective and efficient as possible.

Logframe restructuring:

The project Components have remained as detailed in the PIF, however the project Outcomes and Outputs have been restructured from 6 Outcomes and 21 Outputs to 6 Outcomes, 22 Outputs and 63 Activities. The intent of this restructuring is to streamline the project logframe and to improve the ease of implementation and reporting of the project, as well as to mitigate physical or economic displacement of stakeholders and mainstream gender and human rights considerations ? according to recommendations from the project ESS and Gender experts, respectively.

1a. Project Description

The global environmental and/or adaptation problems, root causes and barriers that need to be addressed

Haiti is situated in the Caribbean Archipelago and forms part of Hispaniola Island, together with the Dominican Republic. While the Dominican Republic occupies the east of Hispaniola, Haiti occupies the west, covering an area of 27,750 km2, with land covering 27,560 km2, and water 190 km2[1]. Haiti is located between the Atlantic Ocean and Caribbean Sea and includes five satellite islands, namely: i) La Gonave (670 km2); ii) La Tortue (180 km2); iii) Ile-?-Vache (52 km2); iv) Cay?mites (45 km2); and v) Navassa Island (7 km2)[2]. Approximately 80% of Haiti?s total land area is mountainous, coupled with river valleys and coastal flatlands. More than half of the landscape is steep at a minimum gradient of 40%, while ~21% of the landscape is at 10% or less. This steep topography makes most of the landscape prone to flooding and erosion under extreme rainfall events and concentrates much of the population into relatively small areas along the lowland plains. These plains, or flatlands, constitutes ~20% of the total land area (~5,500 km2)[3]. In addition to the challenges of a steep topography, Haiti is considerably impacted by the instability of its underlying geology. Specifically, the Hispaniola Island lies along the border of the North American and Caribbean tectonic plates with two major fault lines running through Haiti ? the Enriquillo-Plantain Garden and the Septentrional faults. Its geological location makes Haiti vulnerable to earthquakes and aftershocks, with the consequent adverse effects on its population further compounded by a limited capacity to respond and adapt to natural disasters[4].

Despite only ~20% of the country comprising plains and valleys, these landscapes contain ~85% of Haiti?s available groundwater within varied types of aquifers, including fractured limestones, sandstones, conglomerates, and schist aquifers[5]. The remaining 15% of groundwater is found in mountainous areas and is accessible from springs that originate from multiple aquifer types, including karstic, fractured, low permeability, and indigenous aquifers[6]. As a result of extensive deforestation in Haiti, the ability of aquifers to recharge has decreased to the extent that the water table now seasonally fluctuates by up to 15 m in many parts of the country. Despite abundant groundwater in the lowlands, access in rural areas is limited because of a lack of wells, causing much of the population in these areas to depend on surface water ? which is often contaminated[7].

Political, economic and social context

With a population of ~11 million, Haiti is the most populous country in the Caribbean. The country?s population is predominantly urbanised (~58%) and skewed to a younger composition, with only 9.6% of people aged over 55. It became the first country in the world to be led by former slaves after declaring its independence in 1804, but it was forced to pay an indemnity to France for more than a century. The U.S. then occupied the nation from 1915?1934, after which the country returned to independence. Against this background, the modern era of politics in Haiti has been turbulent, with the country experiencing 32 coups since independence[8]. A long history of oppression by dictators such as Fran?ois Duvalier (president from 1957?1971) and his son Jean-Claude Duvalier (president from 1971?1986) has markedly affected the nation, though since the end of the Duvalier era Haiti has been transitioning to a democratic system[9].

Haiti is the poorest country ? and the only LDC ? in the Western Hemisphere, with a Gross Domestic Product (GDP) per capita of US$1,272.49[10] and a Human Development Index (HDI) of 0.510 in 2019, which places the country in the low human development category, ranking 170th out of 189 countries and territories[11]. Accordingly, ~59%[12] of the country?s population lives below the poverty line[13], with ~25% of the total population earning less than US$1.90 per day. This has resulted in severe challenges for these individuals to finance their food expenses[14], with approximately one in three Haitians requiring food assistance[15].

The country?s economy is primarily based on agriculture, with 66% of the workforce employed in the agricultural sector which contributes 27% of the country?s GDP[16]. While the primary export crops produced are coffee, rope fibre (jute), sugar, and cocoa, much of Haiti?s agricultural workforce ? particularly women ? undertake small-scale subsistence farming[17]. Food security in Haiti relies

heavily on rainfed, subsistence farming, and the majority of the arable countryside has been degraded by unsustainable farming practices, leading to severe erosion[18].

Women in Haiti are not only subsistence farmers but also take care of the household according to traditional and cultural norms. While Haiti?s Constitution contains several protections for women (including from workplace discrimination and physical and sexual abuse, as well as guaranteeing the right to political participation), in practice, women routinely face exclusion, harassment and gender-based violence (GBV) in their public and private life[19]. The country has made progress regarding gender representation, with the 2012 Constitutional amendment instituting a 30% quota for women in all elected and appointed positions at the national level. Moreover, the 2015 Electoral Decree extended this quota to local councils and political candidates. However, the implementation of these amendments has not been effective, and women seeking political office continue to experience considerable obstacles, including patriarchal attitudes towards leadership, limited financial support, and threats of violence and intimidation. These barriers partially explain the low political representation of women in Haiti, with women holding just ~3% of seats in Parliament in 2018[20].

Climate change and hazards

Baseline climate conditions

Haiti is characterised by a year-round hot and humid tropical climate and is subject to variability driven by the El Ni?o Southern Oscillation (ENSO). It is divided into tropical rainforest and tropical monsoon climates with small areas of arid steppe and temperate climates (Figure 1). The rainy season is long, particularly in the northern and southern regions of the island, with two pronounced peaks in rainfall occurring between March and November. Haiti is situated in the middle of a hurricane belt, with the most severe storms routinely occurring from June to October and typically causing widespread flooding[21].

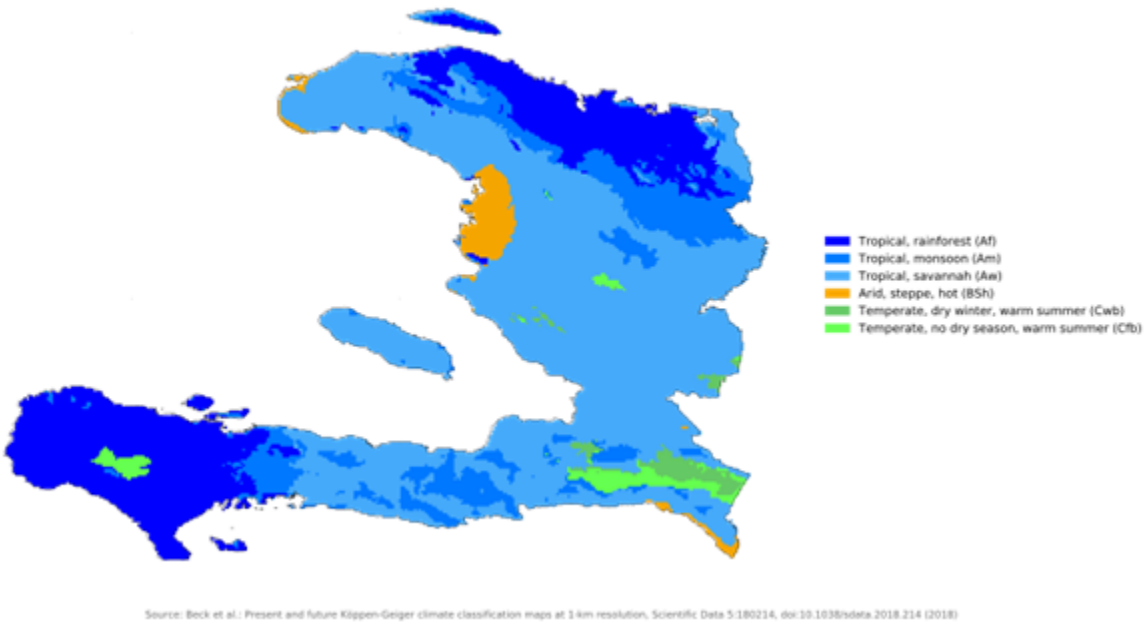

Figure 1. K?ppen-Geiger climate classification map for Haiti (1980?2016)[22].

Temperature

The average annual temperature in Haiti is 24.4?C (Figure 2), with monthly temperatures typically ranging between 19?28?C in winter and 23?33?C during summer (Figure 3). The size of the country allows for latitudinal variation in mean monthly temperatures. Still, temperatures are consistently high in the lowland areas, ranging between 15?25?C in winter and 25?35?C during the summer months. Across the island, cooler temperatures occur during the northern hemisphere winter (December to February), and warmer temperatures occur in summer (July to August). Temperatures peak from July to August and the mean annual range in temperatures between the coolest and warmest months of the year is between 3?C and 4?C. Occasional surges of cooler air from North America ? occurring from October through early April during the passage of cold fronts ? contribute to minimum temperatures that can fall below 20?C, particularly in the northern portions of the island[1].

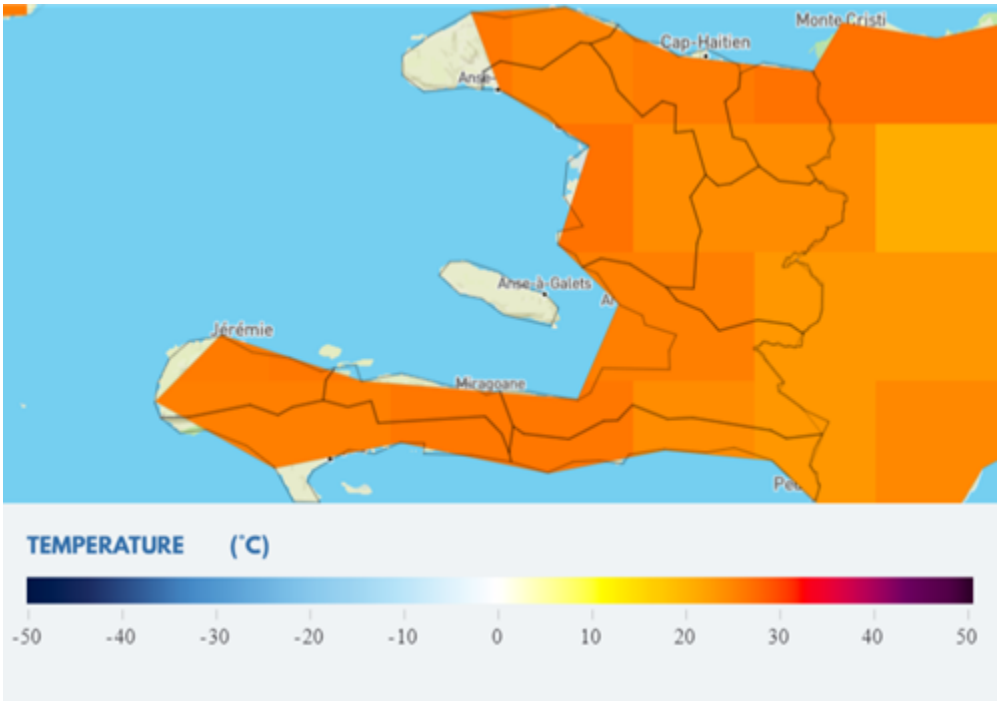

Figure 2. Average annual temperature of Haiti (1991?2020)[24].

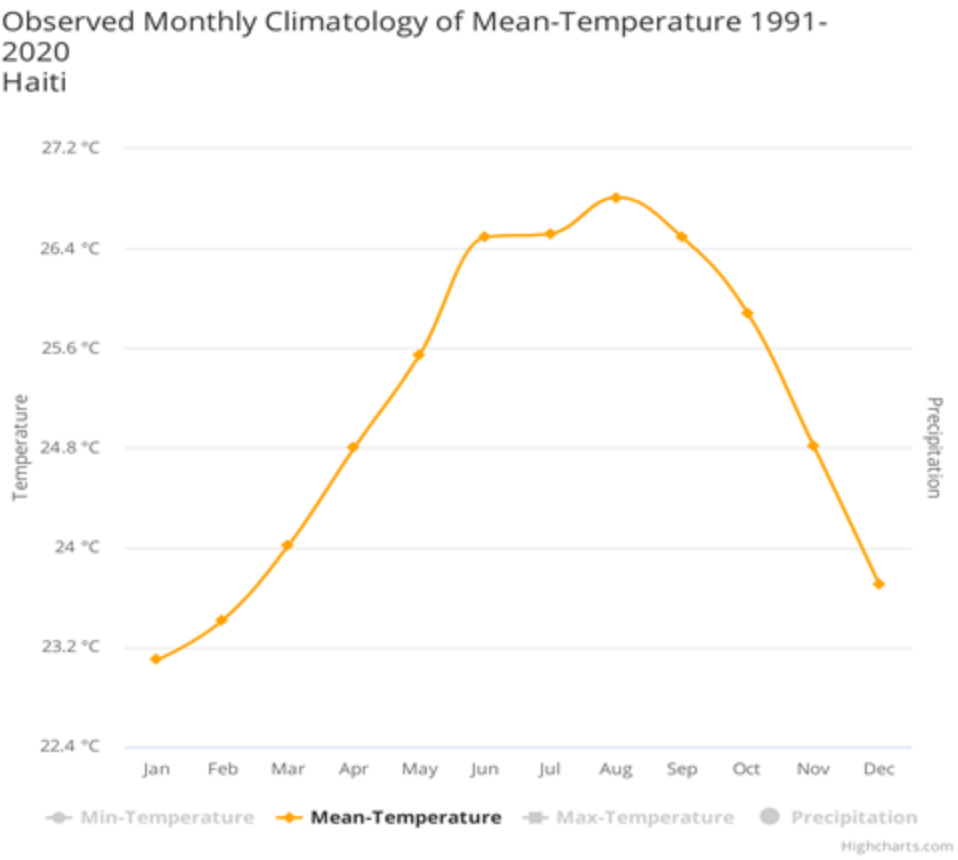

Figure 3. Average monthly temperature of Haiti (1901?2020)[26].

Rainfall

The average annual rainfall in Haiti ranges between 1,400 and 2,000 mm, with uneven distribution across the country (Figure 4), while the average monthly rainfall ranges between 40 and 210 mm (Figure 5). Heavier rainfall occurs in the southern peninsula and on the northern plains and mountains, whilst rainfall decreases from east to west across the northern peninsula. The eastern central region receives a moderate amount of precipitation, while the western coast from the northern peninsula to Port-au-Prince is dry[27].

Rainfall levels differ according to the island?s varied topography, with the central regions receiving more rainfall than the northern and western regions. Northern and windward slopes in the mountainous regions receive up to three times more precipitation than the leeward side. Annual precipitation in mountainous areas averages 1,200 mm, while the annual precipitation in the plains is as low as 550 mm. The Plaine du Gona?ves and the eastern part of the Plaine du Cul-de-Sac are the driest regions in the country, where combined with the effects of high temperatures, evaporation rates are high. The North-West, Artibonite, North-East, and Central Departments frequently experience repeated droughts caused by erratic rainfall patterns coupled with limited water management infrastructure[28].

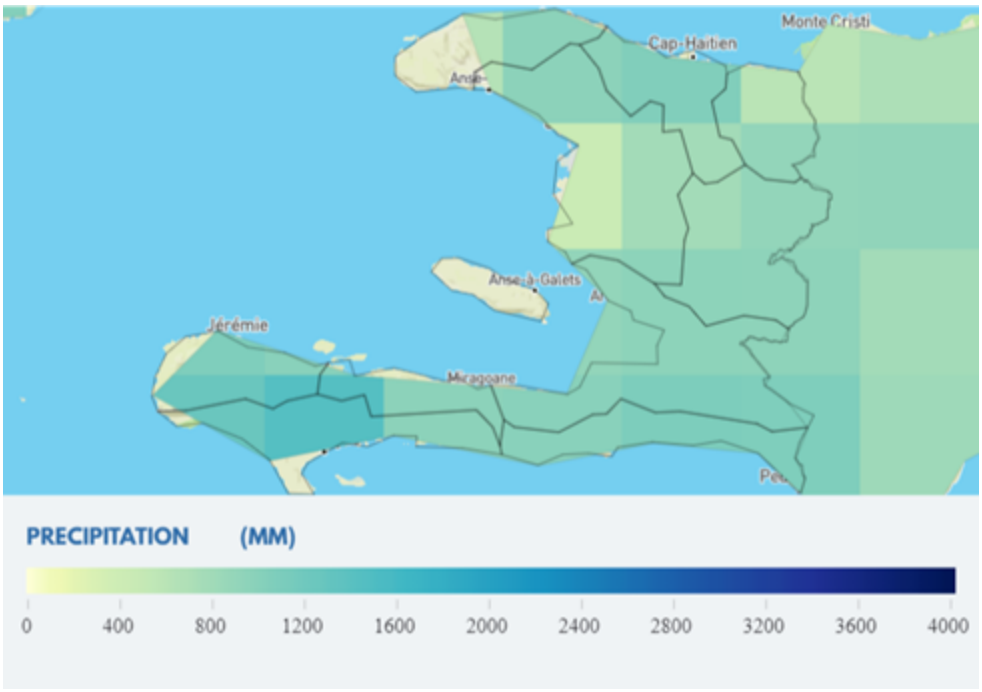

Figure 4. Average annual precipitation of Haiti (1901?2016)[29].

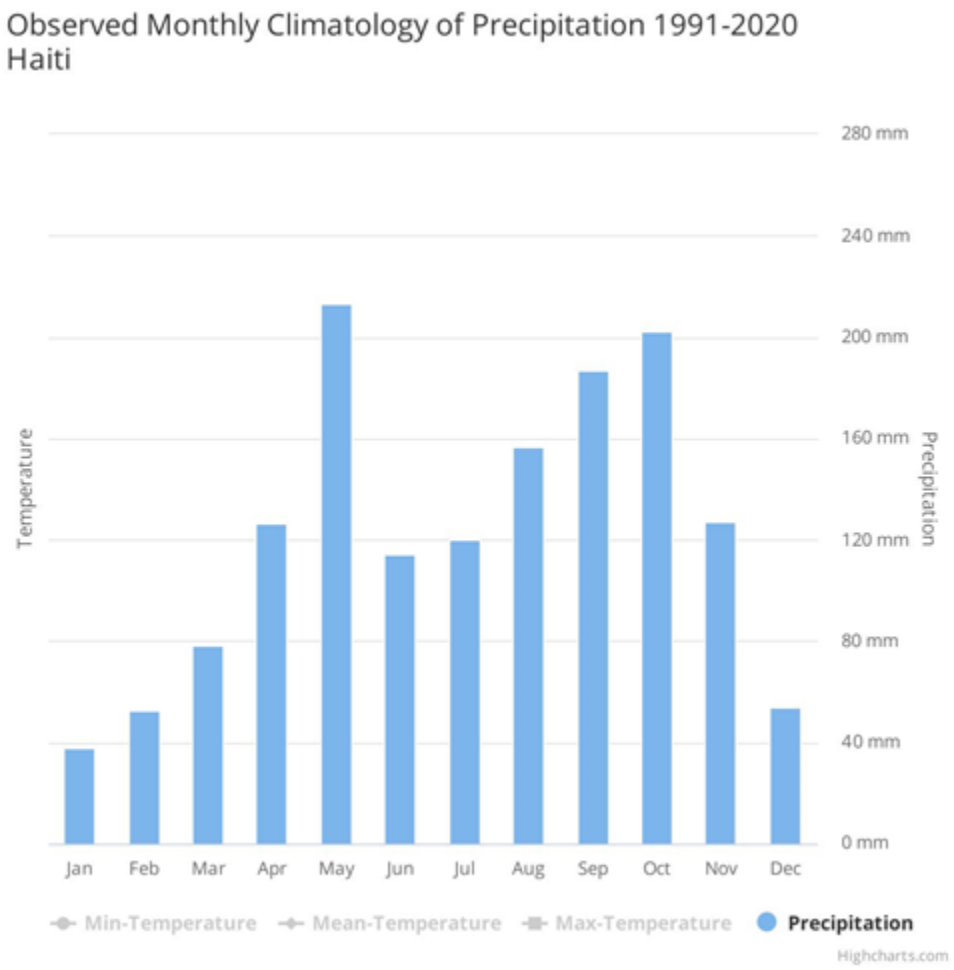

Figure 5. Average monthly rainfall of Haiti (1901?2016)**[30]**.

Extreme weather events

Haiti?s geographic location in the path of Atlantic hurricanes, combined with the steep topography of its western region from which all major river systems flow to the coast, makes the country particularly vulnerable to agricultural droughts and severe precipitation events, particularly during the main rain season between May and November. For example, between 1993 and 2012, the country experienced, two droughts, 26 hurricanes and 31 floods[30],[31] ? 10 of which were directly attributed to hurricanes. The higher frequency and intensity of extreme weather events, such as hurricanes, and the resulting flooding, are particularly concerning for Haiti as more than 93% of the country is exposed to these natural disasters (Figure 6 below). For example, since 2000, 16 non-cyclonic floods have occurred in Haiti, affecting 88,466[32] people and killing 2,725. Another example was Hurricane Matthew in 2016, which led to physical damages totalling US$1.9 billion (23% of GDP), in addition to a loss of over 500 lives[33].

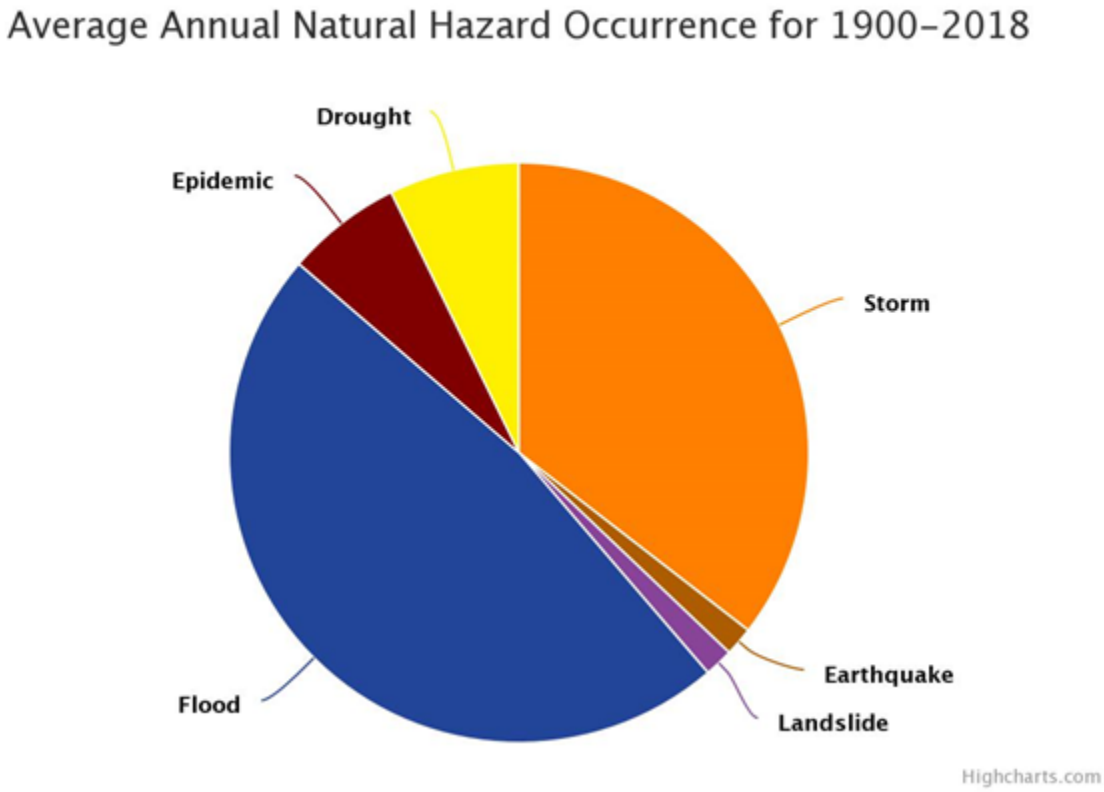

Figure 6. Natural hazard statistics for Haiti from 1900?2018[34].

Observed and projected climate change and associated hazards

General trends of projected temperature and precipitation changes for Haiti over the 21st century indicate a warmer and drier climate. While temperature projections are more certain, rainfall uncertainty will increase along with rainfall variability in terms of both rainfall seasonality and the intensity of rainfall events[35]. The main climate hazards resulting from these climate changes ? many of which are currently affecting communities and ecosystems in Haiti ? are: i) extreme temperatures, with potential increases in drought in the future; ii) flooding caused by heavy rainfall events; and iii)

extreme storms and hurricanes. These trends are projected to increase in intensity in the future (Figure 7).

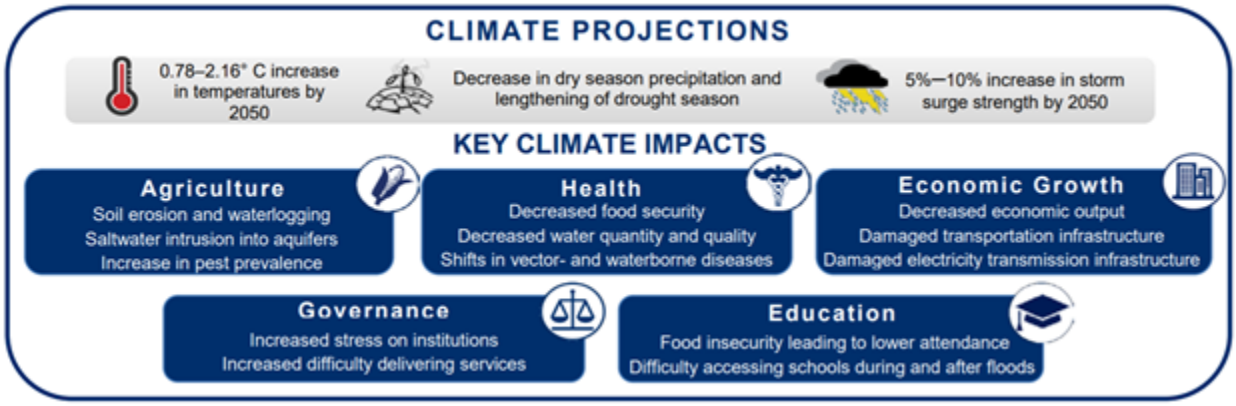

Figure 7. Main climate projections and their impacts for Haiti**[36]**.

Temperature

The annual mean daytime temperatures for the Caribbean region show an increase of 0.19?C per decade over the period 1961?2010[37]. This is less than the increase in mean night-time temperatures of 0.28?C per decade over the same period, with the resultant change being a decrease in the mean annual daily temperature range. When calculated for the period 1901?2013, minimum temperatures showed a slightly higher rate of increase (~0.12?C per decade) than maximum temperatures (~0.10?C per decade), which is consistent with the decrease in daily temperature range. Overall, mean temperatures increased at a rate of 0.09?C per decade in Haiti over the 112-year period[38]. Since 1960, a similar trend is observable in mean temperatures which have increased by 0.45?C, with warming occurring most rapidly in the warmest months (June to November). The frequency of hot days and nights increased by 63 and 48 days per year, respectively, between 1960?2003, while the frequency of cold days and nights has decreased steadily since 1960[39],[40]. Since 2014, Haiti has been affected by severe drought almost every year, destroying crops and livestock and threatening human livelihoods and health by increasing food insecurity. The country has one of the highest levels of food insecurity worldwide, with ~4.4 million Haitian (50% of the population) suffering from severe food insecurity[41].

These warming trends are projected to continue into the future. Across the country, using IPCC Representative Concentration Pathways (RCP) scenarios 4.5 and 8.5, mean annual temperatures are projected to increase. Under RCP4.5, the mean annual country temperature increase is expected to be 0.52?1.14?C for the 2030s and 0.78?1.71?C for the 2050s. Under RCP8.5, mean annual temperature increase in Haiti fells between 0.64?1.24?C for the 2030s and by 1.11?2.16?C for the 2050s[42]. Increases for maximum temperatures and minimum temperatures are projected to be approximately the same. The number of hot day days and nights will continue to increase, while the number of cold days and nights will be reduced[43].

Rainfall

Interannual (year to year) variability is a major feature of Haiti?s historical rainfall record. This record does not show a linear trend compared with the temperature time series, but instead shows considerable interannual and decadal variability. The prevalence of the interannual timescale in the rainfall time series is typical of Caribbean rainfall[44]. Accordingly, variations of annual rainfall in Haiti combine irregular, multi-decadal variability with insignificant variations, usually lasting for periods of approximately three or seven to nine years[45].

Projections suggest that from as early as the mid-2020s Haiti will experience a drying trend. From IPCC RCP4.5 and 8.5 ensemble median scenario[46], rainfall projections are expected to follow a downward trend in the future, with average annual rainfall change estimated to ~-0.1mm/day in the 2030s[47]. The 2050s will experience rainfall decrease during the driest months (July-August), while the projections for the remainder of the year are more uncertain. Under RCP8.5, the annual projected decrease in precipitation is ~45mm[48]. However, while decreases in precipitation coupled with increases in temperature are likely to intensify the frequency and intensity of drought events country-wide, rainfall is expected to be more intense during the wet season[49]. These climate change impacts are likely to severely impact Haitian livelihoods. With intensifying rainfall events, soil erosion and flooding will increase thereby reducing soil fertility and crop yields. As a large share of the population depend on subsistence agriculture for their livelihood, reduced yields are likely to adversely affect households? income, food security and human health[50].

Extreme weather events

While the historical record of Atlantic hurricanes dates to the mid-1800s, and indicates other decades of high activity, there is uncertainty regarding frequency and intensity in the record prior to the satellite era (early 1970s). Consequently, the ability to assess longer-term trends in hurricane activity is limited by the quality of pre-satellite data[51]. However, measures of intensity, frequency and duration as well as the number of Category 4 and 5 storms since the early 1980s indicate a considerable increase in Atlantic hurricane activity since high-quality satellite data became available[52],[53],[54],[55]. Hurricanes have considerable adverse consequences on human livelihoods, natural ecosystems, economic activities and infrastructure. Hurricane Matthew (category 4) that struck Haiti in 2016 resulted in ~550 casualties and left 175,500 displaced and 450,000 children out of school. Furthermore, major road and bridge infrastructure and up to 90% of the crops and livestock were destroyed in certain areas. Total damage and losses were estimated to amount to 22% of GDP[56].

The frequency and intensity of hurricanes and storms are projected to continue to shift under future climate change conditions. Specifically, estimates show that there will be: i) increased hurricane intensity of 5?10% and a related precipitation increase of 2% by 2050[57]; ii) similar tropical storm/hurricane genesis, frequency and tracks compared to the very recent past (last two decades) but increased intensities (rainfall rates and wind speeds)[58]; and iii) a relatively modest (~3%) but robust increase in the frequency of tropical storm tracks averaged over the 21st Century (2006?2100) compared with a baseline period of 1950?2005[59]. Although there is some uncertainty in the projections in trends for hurricane, there is widespread consensus within the available literature that rainfall variability is expected to increase, resulting in more intense rainfall in the wet season. In addition, sea level rise and an increased frequency of storm surges are expected, with coastal plains becoming increasingly prone to the influx of saltwater and soil salinisation, resulting in farmers becoming unable to cultivate them. These factors will exacerbate the current challenges of flooding and erosion in areas that lie in the direct path of tropical storms and hurricanes. In the absence of adaptation efforts, these dynamics will severely impact water resources, land, agriculture, and forest ecosystems. Moreover, the annual population growth of ~1% in Haiti will compound pressure on agricultural systems and natural resources[60].

Overview of climate impacts in the South-East Department of Haiti

The already-existing vulnerabilities of the South-East Department?s water sector (see ?Local context: South-East Department of Haiti? section above) are exacerbated by observed climate change impacts on water sources in Haiti. For example, the South-East Department has been severely affected by the 2013, 2015 and 2016 droughts in Haiti. During those events DINEPA observed that some sources had completely dried up while the flow rate had considerably reduced in general. According to DINEPA, Haiti?s water sources are not regularly monitored and measured, which is necessary for garnering the required knowledge on the seasonal and interannual variations in water flow in the department. An overview of the climate vulnerability of important water sources in the South-East Department is presented in Table 1 below.

Table 1. Climate vulnerability of most important water sources across the South-East Department

Source	Municipality	Watershed	Beneficiary population	Vulnerability to climate change
Cresson	Jacmel	Grande Rivi?re de Jacmel	60,000	The Cresson SAEP is of high priority for the project because of the extent of the population it reaches and its vulnerability to climate change. The upstream area of the source is not protected, increasing its exposure to degradation, contamination and dry spells. Observational data suggest that drought periods considerably affect flow rates during the different seasons of the year, making local populations particularly vulnerable to future increases in temperature and droughts.
Tuff Dur?	Vall?e de Jacmel	Grande Rivi?re de Jacmel	2,000	The communities of Tuff and Dur? are without reliable access to water during the year as result of problems with the distribution network?s infrastructure, which is compounded by seasonal variability in flow rate. While flow rate and seasonal variability readings are not documented for this site, testimonials obtained during the field mission conducted by the NC indicate that the flow rate of the water source differs considerably during Haiti?s dry season when compared to the rainy season.
Bourisquot Lavial	Vall?e de Jacmel	Bainet	n/a	The Vall?e de Jacmel city centre is not supplied by this water source or its network. Consequently, communities in the city centre of the Vall?e de Jacmel use alternative sources such as harvesting rainwater or purchasing water from water trucks. Given that there are no periodic flow readings documented, the variability of the flow rate of this SAEP during different seasons could not be assessed. However, observational data provided by communities during the field missions of the NC suggest that the Boursiquot Lavial SAEP is adversely affected during drought periods. This source is not a priority for the project as it is being targeted by REGLEAU Project.

Mirliton	Marigot	Marigot	21,000	According to testimonials from members of the abovementioned communities, the Mirliton SAEP has a highly varied water flow rate throughout the year and is considerably affected by droughts. However, no historical periodic flow records are available to adequately assess the SAEP?s seasonal variability. The land on the perimeter of the source is highly degraded, exacerbating its vulnerability to extreme climate conditions.
Prechet	Belle-Anse	Belle-Anse	15,000	While details of the flow rate of the Pr?chet SAEP ? as well as the seasonal variability of the flow rate ? are yet to be determined, observational data from community members indicate that waterflow is negatively impacted during dry seasons, with the Pr?chet water source often drying up completely during extended dry periods. In addition, degradation of the water catchment area and water distribution infrastructure further exacerbates the vulnerability of the source to droughts and pollution. Community members are forced to walk long distances with gallons and buckets to collect water.
Cascade Pichon	Belle-Anse	Belle-Anse	>30,000	Variability in the water flow is largely unnoticeable in the Cascade Pichon SAEP drinking water network throughout the different seasons of the year. Nonetheless, observational data provided by community members indicate that the flow rate has decreased considerably over the past 15 years. This has been further exacerbated by deforestation ? specifically for charcoal production and agricultural purposes ? in the recharge zone of this source.
K-Royer	Thiotte	Anse-?-Pitres	<10,000	According to data obtained during the site visit ? including observational data from community members and technical data ? the K-Royer water source is considerably vulnerable to droughts. In addition, agricultural activities and deforestation in the recharge zone have resulted in decreased water infiltration and an increase in the vulnerability of the water source during drought periods.

Tiban	Anse-?-Pitres	Anse-?-Pitres	6,000	During drought events, the water flow of the Tiban SAEP?s source is adversely impacted and at times it dries up completely. In 2015, a drought led to constrained water availability and access for communities relying on the Tiban SAEP distribution network. The catchment area is also severely degraded, exacerbating the source?s vulnerability to climate change. No quantitative water flow data is currently available for the Tiban SAEP.
Bodarie	Grand-Gosier	Belle-Anse	15,000	The Bodarie SAEP is used to supply the Grand-Gosier city centre, however the network has experienced gradual decreases in the water flow because of limited maintenance. While its exact flow rate is yet to be determined, based on observational data the Bodarie SAEP?s water source is considerably vulnerable to drought periods, with two recent drought events ? in 2010 and 2015 ? resulting in the source completely drying up. During these drought periods, household members ? especially the women ? travelled long distances to Thiotte (K-Royer SAEP) and to Pichon (Cascade Pichon SAEP) in search of water. The climate vulnerability of the Bodarie source is exacerbated by deforestation in the recharge zone, specifically for coal production and expansion of agricultural activities.
Cassedan	Marigot Belle-Anse	Marigot	>7,000	Agricultural activities upstream are fertiliser-heavy, leading to adverse impacts on the water quality in the Cassedan SAEP. Little variability in the flow rate of this SAEP has been observed across the different seasons of the year. However, deforestation as a result of agricultural activities ? which increases surface water runoff and reduces infiltration during rainfall events ? has resulted in increasingly lower volumes of water arising from the source over the past 20 years. This observation has been made by older members of the surrounding communities and was relayed to the NC during the field missions.

Local context: South-East Department of Haiti

The South-East (*Sud-Est*) Department is one of the 10 departments[61] of Haiti, with an area of ~2,000 km2 and a population of ~633,000 ? of which ~85% is rural[62]. The capital of the department is the commune Jacmel, which is bounded to the south by the Caribbean coast and to the north by the Massif de la Selle mountain range, which includes the country?s highest peak, 'Pic de la Selle' (2684 m). The South-East Department is divided into eight river basins of differing sizes, draining into the Caribbean, with mostly steep topography and only a narrow littoral strip. There is a steep rainfall gradient between mountainous and more western areas of the department. In mountainous areas, annual precipitation varies between 1,250 and 2,500 mm, and in the coastal strip, particularly the southeastern extreme of the area, annual precipitation ranges between 500 and 750 mm with strongly pronounced seasonal variations.

On the ridge top of Massif de la Selle there are two important forest remnants, Macaya and La Visite National Parks. Besides these two forest areas, higher parts of the Massif are characterised by a largely treeless altiplano used for vegetable production. Some areas have considerable tree cover at lower and middle altitudes, associated in some cases with coffee plantations, while the drier southeastern part of the department is largely dominated by *Prosopis* scrub, which is mainly used for the cyclical extraction of wood for charcoal production. The department's middle and lower altitude areas are heavily impacted by smallholder food production and extensive livestock raising, , most of which operates at subsistence level[63].

The South-East Department received a Subnational Human Development Index[64] (SHDI) rating of 0.481[65], which is below the national HDI. Approximately 56% of the department?s population obtain their drinking water from springs, 20% from communal water fountains, 12% from household water tanks ? connected to piped water systems ? and 6% from rivers. While water is generally free, high levels of dependence on springs and rivers result in water supply that is typically of poor quality and unreliable because of seasonal variations in runoff and the groundwater table level. The inadequate availability and poor quality of water expose the department?s communities to numerous health risks, particularly the risk of disease outbreaks resulting from poor sanitation, with only ~5% having access to a flushing toilet[66]. In rural areas, the water supply systems generally consist of water points equipped with handpumps, while small towns are served with gravity-fed piped systems supplied by spring catchments, from which water is delivered through standposts, kiosks and household connections. Many of these systems are not functional because of insufficient funds for operation and maintenance (O&M), and less than 10% are equipped with chlorination devices for water purification[67]. Both urban and rural populations mostly rely on individual on-site sanitation solutions, as sustainable collection and treatment of sewage are generally non-existent. DINEPA?s performance monitoring system, which monitors roughly half of the Department?s water supply systems, estimates that 41% of the standposts and 45% of the kiosks do not deliver water.

Root causes

Haiti is one of the most climate-vulnerable countries globally, ranked 173rd out of 181 surveyed countries for Climate Readiness under the ND-GAIN index[68]. Furthermore, this index lists Haiti as the 27th most vulnerable country to the impacts of climate change. According to the IPCC AR6 report[69], the frequency and intensity of heavy precipitation events have increased since the 1950s over most global land area for which observational data are sufficient for trend analysis, with human-induced climate change likely being the main driver. Therefore, human-induced climate change has contributed to increases in agricultural and ecological droughts in some regions due to increased land evapotranspiration. In addition to the abovementioned climate impacts, Haiti is vulnerable to earthquakes, which can constrain the resources available for recovery after extreme climate events. For example, a magnitude 7.0 earthquake struck the country in 2010 with an epicentre ~25 km west of the capital, Port-au-Prince, resulting in recovery costs nearing US$14 billion ? assessed as the worst in this

region over the last 200 years. The earthquake was also estimated to have killed over 300,000 people, while leaving ~1.5 million left homeless. These natural disasters and extreme climatic events have further hampered the already challenged socioeconomic development of the nation.

In addition to these natural hazards, the Haitian economy has been adversely affected by multiple shocks since mid-2018. Prior to the Covid-19 pandemic, the economy was already contracting and presented with considerable fiscal imbalances. Following a contraction of 1.7% in 2019 in the context of the political unrest and social discontent, GDP contracted by an estimated 3.8% in 2020, as the Covid-19 pandemic exacerbated the already weak economy and political instability[70].

Underlying causes

Poverty and basic resource insecurity

High poverty rates in Haiti increase the vulnerability of the country?s population to extreme climate events by constraining their adaptive capacity[71]. The country?s poverty rates are highest in isolated rural areas, where 52% of the population and 63% of extremely poor households reside[72]. The South-East department is one of the most vulnerable areas in the country to poverty, with a poverty rate of 39.6%[73]. Additionally ? as result of limited financial capital for development ? only 25% of Haiti?s population has access to basic water services, with 53% having limited access and 22% having no access, respectively[74]. There are disparities regarding access between urban and rural areas in Haiti, particularly for access to improved water sources, where 62% of urban and 34% of rural residents have access to distributed water[75], respectively. Accordingly, water supply in secondary villages in the South-East department serves only ~35.5% of the population[76].

The vulnerability of Haiti?s population to climate change impacts in the context of high poverty rates and low access to improved water resources is compounded by the associated limited access to sanitation facilities. Water requirements in rural areas are met through protected and unprotected springs and rivers, rainwater, wells, public fountains and the purchase of water buckets. Rural communities therefore depend heavily on unsafe water sources such as irrigation water, water run-off and river water, contributing to the spread of water-borne illnesses like cholera and typhoid[77]. Haiti?s South-East department is particularly vulnerable to these sanitation-related health risks as its population is predominately rural, with only ~19% of rural households having access to improved sanitation nationally[78],[79]. These vulnerabilities will be exacerbated by the impacts of climate change such as flooding through: i) the contamination of existing water supplies[80]; and/or ii) the destruction of water supply and sanitation facilities, which reduces water security and results in the increased use of contaminated water for household use[81]. The effect of such disasters was demonstrated during the 2010 post-earthquake recovery in Haiti, when limited access to sanitation and safe drinking water contributed to the 2010 cholera outbreak[82]. Additionally, women and children are disproportionately at risk of negative health-related impacts when compared with men[83], as the former have a higher level of exposure to contaminated water because of gender roles in the home (including women?s expected cooking and cleaning duties). Moreover, when displacement and relocation occur after a flooding event, women and girls are also exposed to a greater risk of gender-based violence (GBV) ? including sexual violence. This outcome may be partially attributed to the breakdown of traditional societal protections in the aftermath of a natural disaster[84].

Food insecurity is also a national concern, with Integrated Food Security Phase Classification (IPC) projections for March to June 2020 estimating that ongoing socioeconomic difficulties will push 4.1 million people, or 40% of Haiti?s population, into severe food insecurity (Phase 3 and above), including 1.2 million at emergency level (Phase 4)[85]. As of 2020, the South-East Department has been classified as Phase 3 ? indicating a state of crisis, with 50% of the population in need of immediate assistance[86]. Households in the Department currently living in food insecure conditions have been pushed to adopt negative coping strategies such as consuming low-quality food, selling goods, or reducing their number of daily meals[87]. The threat of greater food insecurity, coupled with inadequate access to water resources, is expected to present a health crisis if these needs are not addressed under worsening climate conditions that will exacerbate the impacts of these baseline challenges.

Deforestation and soil erosion

Haiti?s landscape has been subject to widespread deforestation given that subsistence farmers often resort to charcoal production to supplement their income as a response to low yields, crop failure or unexpected expenses ? particularly in extremely wet or dry years. As a result, most of the country?s native forests have been harvested over time with minimal efforts of reforestation[88]. These practices have radically changed the country's natural landscape, as the large-scale removal of tree cover has decreased the soil's infiltration capacity and contributed to increased surface runoff during heavy rainfall events. This, in turn, has considerably increased flood frequency and intensity, with floods washing away fertile soils and causing sedimentation of riverbeds and blocking drainage infrastructure. Given a near-complete absence of embankments and levees, this cycle then intensifies the next round of flooding, leading to the destruction of crops, farmland and agricultural infrastructure, as well as the loss of livestock and human lives[89]. For example, the Lamontagne de Jacmel section in the South-East Department is facing considerable erosion and soil degradation because of deforestation by local populations for fuel, income and land clearing needs[90]. Accordingly, vulnerable communities in the South-East Department that depend on agriculture for their livelihoods will be particularly affected by the increased flooding ? exacerbating the adverse economic, environmental and social conditions already being experienced in the area.

Social conflict over natural resources

Climate change undermines human security through reducing communities? access to natural resources ? as well as by undermining the capacity of states to provide opportunities and services ? that are required for sustaining their livelihoods, increasing the risk of violent conflict[91]. Accordingly, the impacts of climate change in Haiti?s the South-East Department have resulted in increased water and food insecurity, poverty and income insecurity, as well as increased social conflicts over the use of natural resources, ultimately resulting in a feedback loop of increasing human pressure on already degraded natural resources[92]. These trends have also resulted in negative impacts on gender equality, as women tend to focus on agriculture and water collection. Therefore, the rehabilitation of watersheds, strengthening of water availability and participatory management of natural resources will help reduce conflicts and maintain social cohesion among the local populations of Haiti?s South-East Department.

Immediate causes

Local water supply in the South-East Department is strongly dependent on springs and rivers, often resulting in inadequate quality or availability because of its susceptibility to seasonal variations in runoff and the water table level. In the region?s rural areas, water supply systems generally consist of water points equipped with handpumps, while spring catchments feed the piped systems of small towns, where water is delivered through fountains, kiosks and household connections. At present, several water distribution systems are not functional as a result of insufficient funds for operation and maintenance (O&M), while less than 10% are equipped with the necessary water cleaning technology,

such as chlorination devices. In addition, some communities have no access to drinking water at all as a result of minimal network maintenance and drought-related decreases in the water flow ? as in the cases of the K-Royer water supply system in the South-East Department[93]. These already-existing vulnerabilities are exacerbated by observed climate change impacts on water sources in Haiti, as unavailable or inadequate management of water infrastructure makes the agricultural regions ? and the livelihoods that depend on them ? particularly vulnerable to a changing climate[94]. For example, the South-East Department has been severely affected by the 2013, 2015 and 2016 droughts in Haiti. During those events, Haiti?s National Directorate for Drinking Water and Sanitation (DINEPA), observed that some sources had completely dried up while the flow rate had considerably reduced in general. Additionally, according to DINEPA, Haiti?s water sources are not regularly monitored and measured, which is necessary for garnering the required knowledge on the seasonal and interannual variations in water flow in the department.

Barriers

There are several barriers for addressing the challenges to drinking water availability in the target areas in Haiti. These barriers are elaborated on below.

Barrier 1: Effectiveness and sustainability of investments in the water sector is limited by inadequate knowledge at national and local levels with regards to the impacts of climate change.

Currently, there is limited knowledge and understanding of how projected changes in climatic conditions will affect the availability of drinking water in Haiti. This remains a challenge despite the efforts of Haiti?s national institutions ? such as the National Observatory on Quality of Environment and Vulnerability (ONQEV) and the National Service for Water Resources (SNRE) ? that are dedicated to the generation and management of information on water and other natural resources as well as the ongoing donor support to their necessary capacity development. At present, limited information includes the quantity, quality and spatial extent of water availability in the country, in addition to the relative cost-benefits of different adaptation options. While the abovementioned baseline initiatives will largely address the generation and management of information, the capacity for analysing, interpreting and applying the climate risk information as a support to effective evidence-based decision-making remains limited. Without this understanding, it is difficult to generate and replicate best practices for addressing the impacts of climate change on the drinking water sub-sector in Haiti, limiting the scope of additional investments.

Barrier 2: Limited consideration of climate change impacts and gender-related concerns within regulations and policies relevant to the water sector.

Despite the emergence of favourable regulations and policies in the environmental sector, these will not specifically address the challenge of water supply because it falls outside the Haitian Ministry of Environment?s mandate. In addition, existing policies are unable to ensure that climate change impacts are taken into consideration in their formulation, planning and execution. This results in the risk that these instruments will progressively lose their relevance and context by not accounting for the threats, appropriate strategies, and technical solutions required to remain adequately responsive to changing climatic conditions.

In addition to the abovementioned environmental policy limitations, Haiti?s current legislative frameworks also do not account for the interconnectedness of the impacts of climate change and gender dynamics in the water sector. Specifically, women are disproportionally affected by the impacts of climate change on the water sector because of the core role of collecting freshwater for household cooking and cleaning. For example, women that are forced to travel longer distances to collect freshwater as a result of drying resources are exposed to increased vulnerability to associated risks such as gender-based violence (GBV) and community conflict during water-scarce periods. In addition, there is minimal participation of women in decision-making positions in national and sub-national government. As detailed in Section II, ongoing national and international support is required to address

the persistent gender inequity in Haiti, because the empowerment and protection of women is important to the country?s economic and democratic development.

Barrier 3: Limited effective collaboration across national, regional and community levels in the planning and management of water supply

As mentioned under Barrier 1, the responsibilities for the generation and management of information are divided among several entities, including ONQEV (located in MoE), SNRE (located in MARNDR) and also DINEPA. These entities are additionally responsible for the planning, management and use of water and other natural resources in Haiti. However, these entities operate within a constrained policy and governance framework ? as discussed in Barriers 1 and 2 ? which has limited opportunities and incentives to coordinate efforts to address water resource-related climate risks. This has resulted in a lack of defined roles and responsibilities of institutions dealing with water management, which has led to uncoordinated efforts by donors and stakeholders and subsequent problems in planning, implementation and accountability. Local authorities and stakeholders at the forefront of managing climate change impacts are also not equipped and trained to incorporate climate change considerations into decision-making or to design and implement climate-resilient water resource management. This is evident in the lack of catchment and sub-catchment administration structures and capacity to oversee participatory, equitable and adaptation-focused decision-making on water and land use, which amplifies the trend of individual households prioritising private needs over sustainable community- or catchment-level management. This lack of vertical coordination and oversight is evident in line ministries providing minimal support to local communities. Although some ministries are present in rural communities, they are not very active, which leads to water user or farmer associations not having the resources and capacity to implement changes in conservation or productive practices for better managing water resources. While support has been provided by the World Bank Pilot Program for Climate Resilience (PPCR) in the form of lessons learned, the necessary inter-institutional collaboration to enable this knowledge to inform the planning and implementation of adaptation strategies currently remains inadequate in practice. The key lessons learned from the PPCR relevant to improving the planning and management of climate resilient water supplies in Haiti are as follows:

? Coordination across multiple sectors supported with leadership from the highest levels of government has been shown to be the most effective approach for shaping a program of resilient investments and facilitating scalability.
? An evidence base of knowledge for future impacts is a critical factor for accelerating resilient development.
? Funds leveraged at scale through formal MDB collaboration and Phase 2 grants and concessional loans is pivotal for country buy-in, with planning grants alone being insufficient.
? Investments and policy reforms that goes beyond Phase 2 investment funds has been shown to advance partnering with bilateral and country-based funding sources, spur policy reforms, and further the incorporation of resilience at the national, regional and local levels.
? Mandatory and documented stakeholder engagement builds ownership and support for the planning and investment selection process.
? Periodic dedicated learning and exchange fora among PPCR pilot countries help build credibility and professionalism of participants while sharing practical experiences.
? Upfront technical assistance and targeted advisory services has been critical for overcoming barriers to engaging the private sector on climate resilience.
? Tracking overall national progress towards resilience through the 5 PPCR core monitoring and reporting resilience indicators is necessary for maximining benefits.
? National-level strategies linked with concrete investments ensures sustained engagement with countries.

Barrier 4: Limited conditions and capacities at local level to ensure climate risk-informed water governance, planning and management.

Although water committees ? alongside several other community-based organisations ? exist in many communities in Haiti, the impact of these organisations is limited with regards to ensuring the

application of effective water or natural resource management practices to sustainably maintain the resilience of local water supplies. This is caused by a combination of conditions, including the absence of participatory and inclusive planning which is a fundamental principle of integrated water resource management approaches for climate resilience. Underlying factors for this include technical and financial capacity constraints at the municipal level, which have historically limited the ability of public officials to effectively engage with appropriate communities and stakeholders during decision-making on land and water resource management. Moreover, there is limited technical knowledge amongst communities on how to adapt to climate change and increase resilience, particularly using nature-based solutions. For example, although communities are aware of a relationship between droughts and deforestation, there is limited awareness of the need for collective action on catchment-wide rehabilitation and shared water resource management. There is also no experience or incentive among water users to consider sub-catchment scale water management in their household decision-making. This is because ? within the context of poverty that is prevalent in rural Haiti ? households make decisions in the interest of their own immediate survival first without necessarily considering the impact of those decisions on the sub-catchment and the long-term impacts on their own wellbeing. Owing to the above conditions, communities have limited capacity to resolve conflicts over local water resource use ? and while these conflicts are a recognised problem at the policy level, there has been minimal on-the-ground actions to address the conditions that cause them to arise .

Barrier 5: Inadequate practices and infrastructure to ensure water supply under the conditions of climate change.

Given the projected impacts of climate change on the runoff rates, spring yields and aquifer levels of water sources in Haiti, existing and proposed water supply systems will be unable to meet local water needs. In particular, communal water fountains may become unusable as they depend on springs that may dry up under the expected drought conditions. In addition, the capacities of reservoirs and tanks designed based on the current dry season durations are likely to be inadequate during the prolonged dry seasons ? as discussed in Section II ? that result from climate change. Similarly, wells may also dry up where the projected water table level reductions resulting from climate change were not considered in measuring their depth during initial construction. Moreover, current levels of household water consumption and agricultural water use may become more unsustainable as water yield decreases because of ineffective organisation among water users for planning and implementing adaptive water management options that would be necessary under the projected scarcity scenario without project interventions. These challenges are exacerbated inadequate operation and maintenance (O&M) of water distribution infrastructure, which contributes to the unavailability of drinking water.

The baseline scenario and any associated baseline projects

The impacts of climate change are resulting in a considerable reduction in the availability of fresh water for rural communities and small urban centres in Haiti?s South-East Department. These reductions are primarily driven by an increase in the duration and intensity of drought periods in combination with deforestation[95],[96], resulting in reduced water yields in springs, wells, and rivers. Shortfalls in groundwater resources are further compounded by an increase in the intensity of rainfall events, which, when coupled with extensive ecosystem degradation in critical recharge zones, reduce rainwater infiltration and subsequent aquifer recharge. The increased frequencies of drought-related wildfires also accelerate the rate of ecosystem degradation and the consequential impacts on aquifer recharge. In addition to the impacts on aquifer recharge, changes in rainfall patterns are increasing the frequency of floods and landslides, which threaten critical water distribution infrastructure and increase the risk of water-borne diseases. These climate change-induced reductions in water availability will exacerbate baseline water deficits driven by increasing demand from a growing population. The impact pathways underlying the core climate change problem, compounded by non-climate drivers, are presented in the problem tree in Figure 8 below, followed by a description of the baseline situation as it relates to each component of the LDCF project and the associated baseline projects.

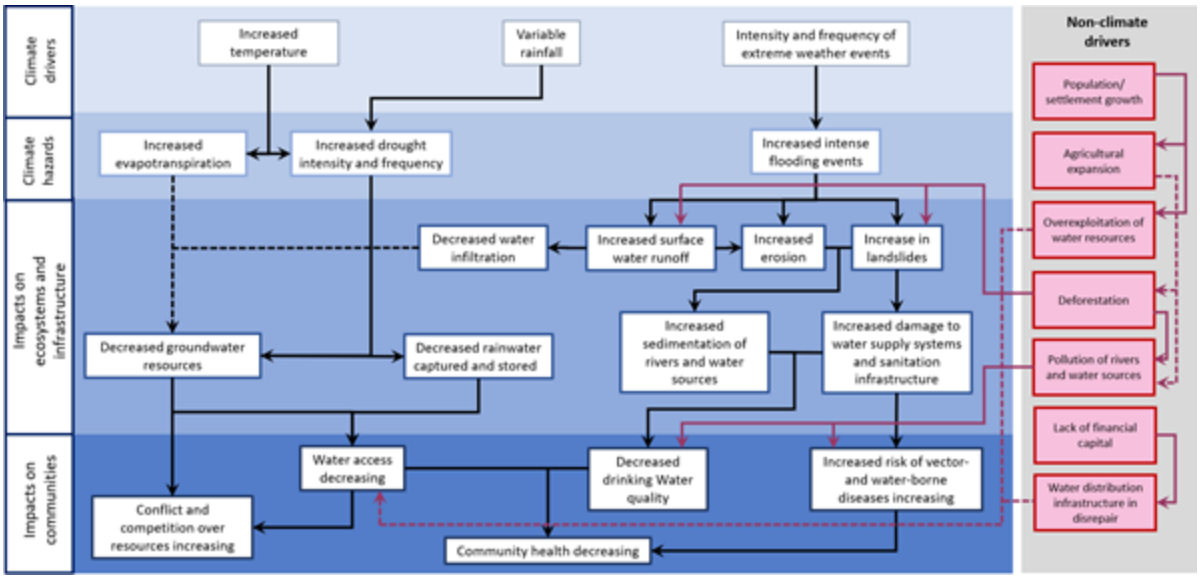

Figure 8. Problem tree detailing Haiti?s current and future climate variables, associated hazards and the subsequent impacts on communities? drinking water supply, including non-climatic drivers which exacerbate these impacts.

Component 1: Improved understanding and awareness of the vulnerability of the water sector to climate change

At present, the knowledge and understanding at both national and local levels of the impact of future extreme climate events on the availability of drinking water in Haiti is limited ? particularly with regards to the quantity, quality, and distribution of available water sources. This has resulted in limited awareness of and knowledge on effective water management adaptation strategies, which increases the vulnerability of water supply to climate change impacts. As a result of this constrained knowledge ? combined with limited technical and financial capacities among relevant government institutions to collect data on, monitor and manage natural resources in the South-East Department ? assessments have not been conducted to adequately identify, quantify and prioritise the vulnerabilities of local drinking water supply.

Component 2: Strengthening of the regulatory and policy frameworks, as well as institutional and technical capacities, at national, regional and local levels for the improved management of drinking water under climate change

There is currently limited consideration of climate change within regulatory frameworks related to Haiti's management of drinking water. Consequently, climate change impacts are inadequately accounted for in the provisions made for the management of watersheds and water supply systems and in identifying priority actions for natural resource-dependent sectors. The complex institutional frameworks for water resource management ? currently divided among several institutions, including the Ministry of Environment (MoE), National Directorate for Drinking Water and Sanitation (DINEPA) and the Ministry of Natural Resources and Rural Development (MARNDR) ? exacerbate these challenges, with constrained collaboration on the planning and management of water resources and related information systems. Combined with limited technical and financial capacities available within government institutions, these factors inhibit effective analysis, interpretation, and evidence-based decision-making regarding Haiti?s natural resources.

At the local level, the absence of community-level participatory planning approaches regarding water resource management and CCA interventions limits the effectiveness of strategies for the sustainable management of water resources and associated infrastructure.

Component 3: Promotion of practices for the conservation, management and supply of drinking water adapted to projected climate change scenarios

In 2010, ~25 of Haiti?s watersheds were degraded by deforestation, largely driven by increasing population growth, agricultural expansion and fuelwood harvesting. This degradation has resulted in increased surface water runoff and reduced water infiltration into soils, particularly during extreme rainfall events. Consequently, the rate at which aquifers are recharged has been adversely impacted, compromising freshwater sources. These conditions have been exacerbated under climate change through an increase in the intensity of rainfall events, as well as increased rainfall variability and drought frequency. Resultantly, current and projected climate change impacts on Haiti?s natural resources exacerbates communities? vulnerability to the disruption of freshwater resources because of their direct dependence on these sources for their household water supply. These communities are restricted from sufficiently adapting their livelihoods to the changing climatic conditions, as a result of not being adequately informed of the climate change impacts on their livelihoods.

As a result of nominal enforceable regulations for the monitoring and management of land use within the drainage and recharge zones in Haiti?s South-East Department, the land surrounding water sources is often degraded, which compromises aquifer recharge and subsequent water supply ? particularly during drought periods. This is exacerbated by the impacts of more intense and frequent extreme rainfall events that are projected to occur under future climate change. These extreme rainfall events result in severe flooding, damaging water supply systems and sanitation infrastructure, which ultimately compromises communities' water quality and health. In addition, water sources are often polluted by fertilisers and pesticides ? as a result of agriculture-related activities occurring along watersheds ? which further compromises water quality. Local water distribution networks are also poorly maintained because of limited financial resources, resulting in additional disruption to water supply to the relevant communities. Water supply is further impacted by overuse, because consumption is not tracked or regulated and there is a limited willingness to pay for water under existing tariff systems in some communities because of conflict around the exact ownership of local resources. In addition, no water pricing systems have been established yet in other water distribution networks in the South-East Department.

Table 2. Details of recent and ongoing projects that address the same development challenge as the proposed LDCF project.

Project title	**Implementation period**	**Funding (US$)**	**Implementing Agency/ Executing Entity**	**Description**	**Alignment with the proposed LDCF project**

Project title	Implementation period	Funding (US$)	Implementing Agency/ Executing Entity	Description	Alignment with the proposed LDCF project
*Water supply, sanitation and hygiene project in urban, peri-urban and rural areas in Haiti?s Greater Northern Region[97], Inter-American Development Bank (IDB)	2019?2025	125 million		The objective of this project is to improve the living conditions of households in Haiti?s Greater Northern Region by: i) strengthening water supply, sanitation and hygiene (WASH) sector regulation as well as technical and commercial management of the technical operation centres (CTE); and ii) increasing access to water and sanitation services for urban and rural residents as well as improving their hygiene practices. Target location: Northern region (numerous locations) Actors: IDB, AECID, DINEPA, OREPA Nord (North)	Through Outcomes 2.2 and 2.3, the proposed project will build on the best practices and replicate the technical and institutional capacity ? as well as the associated infrastructure ? strengthening local-level water resource management structures such as the CTE, to support and implement sustainable use and management of water and other natural resources.

Project title	Implementation period	Funding (US$)	Implementing Agency/ Executing Entity	Description	Alignment with the proposed LDCF project
*Port-au-Prince water and sanitation project III[98], Inter-American Development Bank (IDB)	2018?2022	30 million	DINEPA	This project forms part of a series of projects funded by the IDB promoting water and sanitation investments in the Metropolitan Region of Port-au-Prince (MRPP) and is based on the knowledge that additional investments are required to improve water service provision in the capital city. The objectives of this project are to: i) continue improving the financial situation of the CTE of Port-au-Prince to ensure that it does not operate at a loss; and (ii) reduce the number of households in the MRPP without access to potable water services. Target location: MRPP Actors: IDB, DINEPA, OREPA West (Ouest)	The proposed LDCF project will build on lessons learned on water and sanitation investments (Outcome 3.1), particularly best practices on appropriate mechanisms and instruments which support implementation of improved water sanitation mechanisms the context of the South-East Department of Haiti.

Project title	Implementation period	Funding (US$)	Implementing Agency/ Executing Entity	Description	Alignment with the proposed LDCF project
*Strengthening local governance of water and sanitation in Haiti (REGLEAU)[99],[100], Swiss Government	2016?2022	12.3 million[101]	HELVETAS Swiss Intercooperation/Ministry of Environment (MoE)	The objective of REGLEAU is to improve the living conditions of local populations in Haiti by increasing the availability and improving the quality of drinking water and sanitation services. The project aims to achieve this by, *inter alia*: i) strengthening institutional and technical capacities of sub-national governance in the Haitian communities of Bainet, La Vall?e de Jacmel, Jacmel and Marigot, located in the South-East Department; ii) strengthening existing coordination mechanisms to facilitate improved communication and accountability among actors involved in drinking water and sanitation; and iii) disseminating information and raising awareness on strategies and approaches aimed at improving drinking water and sanitation. The project	The efforts of REGLEAU strongly aligns with the proposed outcomes of the LDCF project. By addressing the additionality related to climate change impacts on natural resources, particularly drinking water availability, the proposed project will build on the institutional and technical efforts of REGLEAU to strengthen IWRM and coordination among relevant stakeholders. The proposed project will also build on best practices identified for improving drinking water and sanitation to facilitate enhanced awareness and knowledge on the impacts of climate change on water resources (Outcome 1.1) and drinking water and sanitation.

Project title	Implementation period	Funding (US$)	Implementing Agency/ Executing Entity	Description	Alignment with the proposed LDCF project
Sustainable rural and small towns water and sanitation project (EPARD)[102], World Bank	2015?2021	50 million	GoH	Implemented by DINEPA, the Ministry of Economy and Finance (MEF) and Laroche Essentielle Outsourcing Services (LEOS), this project?s objectives are to: i) increase access to improved water supply and sanitation in targeted rural areas and small towns in zones affected by cholera; ii) strengthen water and sanitation service delivery mechanisms at the local level; and iii) improve capacity to respond rapidly and effectively to emergencies, such as extreme weather events and disease outbreaks. The project will promote a shift from a project to a programmatic approach and contribute to the delivery of more sustainable water supply and sanitation services to rural and small-town communities. An estimated 300,000 direct	By promoting aquifer recharge and reinforcing the protection of water distribution infrastructure in Outcome 3.1, the proposed LDCF project will support the interventions of EPARD by enabling improved and resilient water supply to communities in the South-East Department.

Project title	Implementation period	Funding (US$)	Implementing Agency/ Executing Entity	Description	Alignment with the proposed LDCF project
Bilateral Programme[103], Spanish Agency for International Cooperation for Development (AECID)	2009?2021	100 million	AECID/ National Directorate for Drinking Water and Sanitation (DINEPA)	The Bilateral Programme fulfils part of AECID?s overarching objective in the WASH sector to promote access to water as a human right by improving and expanding water coverage as well as access to drinking water and sanitation, ensuring their sustainability through the integrated management of the hydrological cycle. This programme is structured into two main components: i) promoting access to drinking water and sanitation; and ii) strengthening the institutional capacity of national institutions responsible for drinking water and sanitation sector reforms. Target location: Nationwide (all 10 departments), including the Metropolitan Region of Port-au-Prince (MRPP) and 10 prioritised cities. Implementing	The proposed project will build on lessons learned on sustainable and IWRM (Outcome 2.3), particularly best practices on appropriate mechanisms and instruments which support improved water resource management in the Haitian context.

The proposed alternative scenario with a brief description of expected outcomes and components of the project:

The overall objective of the proposed project is to strengthen the resilience of vulnerable rural and peri-urban communities in the South-East (Sud-Est) Department of Haiti against projected impacts of climate change on drinking water availability and access. This will be achieved through three interrelated project components that will be implemented at the national, regional and local scales in Haiti, including: i) improving understanding and awareness of the water sector vulnerability to climate change; ii) strengthening of the regulatory, policy and institutional capacity framework at national, regional, and local levels for the effective management of drinking water under climate change conditions; and iii) identifying and promoting practices for the conservation, management and supply of drinking water adapted to predicted climate change scenarios. Additionally, Ecosystem-based Adaptations (EbA) interventions will be implemented in the South-East Department of Haiti, which will be used as a pilot to collect best practices for dissemination to other departments in the country. Further details on these project components are provided below.

Component 1. Improved understanding and awareness of the water sector vulnerability to climate change

Outcome 1.1: Improved awareness raising and knowledge and information management systems for the water sector to plan and respond to the impacts of climate change.

This Outcome will focus on addressing ?*Barrier 1: Effectiveness and sustainability of investments in the water sector is limited by inadequate knowledge at national and local levels with regards to the impacts of climate change?*. Currently, there is limited knowledge and understanding of how projected changes in climatic conditions will affect the availability of drinking water in Haiti. This remains a challenge despite the efforts of Haiti?s national institutions, such as the National Observatory on Environment and Vulnerability (ONEV) and the National Service for Water Resources (SNRE) to generate knowledge and information. In order to overcome this challenge, interventions under this Outcome will include *inter alia* i) determining the implications of different climate change scenarios on the availability of water at a national level; ii) informing communities and the GoH on water management adaptation strategies and climate-resilient water supply by means of a continuous information- and knowledge-generation system; and iii) performing cost-benefit analyses of different adaptation strategies developed as per the different predicted climate change scenarios identified. The abovementioned interventions will lead to the enhancement of Haiti?s government institutions? understanding of the impacts of climate change and the subsequent vulnerability of Haiti?s water sector to these impacts.

Further, there is currently limited information on the quantity, quality and spatial extent of water availability in the country. While the abovementioned initiatives will largely address the generation and management of information, the capacity for analysing, interpreting and applying the climate risk information as a support to effective evidence-based decision-making remains limited. In response, interventions under this Outcome also include i) training programmes for regional and national institutions on the extent of climate change impacts on freshwater availability; ii) an inventory and quality characterisation of groundwater aquifers in the target area carried out by OREPA Sud; as well as iii) scientific and technical studies on the impacts of climate change and options for adaptation management in the target area conducted. The latter interventions will facilitate an improved understanding of climate change which in turn will promote science- and evidence-based decision-making and governance of the water sector ? specifically among institutions involved in the management of water and other natural resources such as DINEPA and OREPA Sud ? to increase the resilience of both Haiti?s vulnerable population and its water resources to the current and projected impacts of climate change. Implementation of the interventions under Outcome 1.1 will be underpinned by capacity building to improve these institutions? technical capacity to analyse, interpret and apply climate risk information, thereby enhancing the sustainable and adaptive management of Haiti?s natural resources. Each output and related activities under Outcome 1.1 is detailed below and will be implemented at the national, regional and local scales.

*Outcome 1.2: Target communities**[104]** prepared to effectively plan responses to climate change impacts on their access to drinking water.*

Similar to Outcome 1.1, Outcome 1.2 will focus on addressing challenges listed under Barriers 1 and 4, but on a local scale. While community-based organisations currently operate across Haiti, these institutions often have limited technical and organisational capacity, as well as constrained social and institutional sustainability. These capacity constraints limit these organisations? ability to resolve water-related conflicts or ensure that existing or proposed norms of water or natural resource management are applied to ensure the sustainability and resilience of water supply. To overcome these barriers, Outcome 1.2 will develop methodologies and instruments for community-level vulnerability assessments (VAs) of drinking water supply, followed by conducting climate change VAs in the project?s target communities. Results from the VAs will be compiled and analysed to increase the awareness of local communities of climate change, providing them with the foundational tools to improve their understanding of their climate vulnerability while assisting them to effectively enhance their climate resilience. 150 people will benefit from awareness session on climate change impacts and appropriate adaptation responses (50% female). Further, under this outcome, integrated water resource modelling studies will be conducted at a national scale to demonstrate the projected long-term impacts of climate change on biodiversity, ecosystems and urban systems, as well as the relationships between these aspects and drinking water availability at the local landscape level. The information obtained from these modelling studies will thereby contribute to decrease the paucity of knowledge and limited understanding of the effects of projected climatic changes on the availability of drinking water in Haiti. Moreover, both the information obtained from the VAs and the modelling exercises will be used for

adequately implementing interventions under Components 2 and 3, such as agroforestry interventions and the installation of rooftop water-harvesting systems. Each output and related activities under Outcome 1.2 is detailed below.

Component 2. Strengthening of the regulatory, policy and institutional capacity framework at national, regional, and local levels for the effective management of drinking water under climate change conditions

Outcome 2.1: Key regulatory and policy instruments adjusted to consider the implications of climate change for drinking water supply and promote adaptive community-based management.

Project Outcome 2.1 aims to address Barriers 1?4, to enable effective and sustainable management of drinking water supply at Haiti?s national, regional and local levels under current and projected climate conditions. This will primarily be achieved by promoting an adaptive management approach ? based on scientific evidence garnered under Outcomes 1.1 and 1.2. Currently, the sustained relevance of existing GoH policies are threatened because they are unable to ensure the consideration of climate change impacts in their formulation, planning and execution. In response, the interventions under Outcome 2.1 will: i) establish an enabling environment to mainstream climate change and gender considerations into relevant national and local policy instruments and management plans (specifically DINEPA and OREPA Sud); ii) strengthen technical capacities of relevant government institutions for sustainable and integrated water resources management (IWRM); and iii) establish appropriate mechanisms to enable community-based adaptation planning and sustainable management of water resources. These interventions will ensure national policies and plans account for the evolving local contextual needs and conditions resulting from climate change, particularly affecting water supply ? by enabling standardised provisions and approval criteria for establishing and managing water distribution networks ? resulting in the sustainability, effectiveness and locally appropriateness of GoH plans and policies.

The sustainability of project interventions will further be secured by their adaptive management resulting from implementing the project?s monitoring and evaluation (M&E) system, to capture and disseminate lessons learned during project implementation for use in upscaling of interventions. Finally, Outcome 2.1 will facilitate improved coordination among institutions involved in the management of drinking water supply, to effectively and efficiently address climate change impacts in Haiti. The specific outcomes and associated outputs designed to ensure the achievement of Component 2?s objectives are detailed below.

Outcome 2.2: Increased capacities in priority institutional stakeholders (DINEPA, OREPA Sud, CAEPAs and CTEs) with regards to the technical aspects of water resource management, territorial

land-use planning, as well as management and application of information on water resources and climate change threats.

Outcome 2.2 of the proposed project aims to improve effective and sustainable planning and management for water supply in Haiti?s South-East Department, particularly under current and future climate change. This will be achieved by developing technical capacities ? following Capacity Needs Assessments (CNAs) ? of relevant government institutions on IWRM under Output 2.2.1 to ensure climate-resilient water resource management and sustainable land-use planning by improving data access and management within these institutions. Similar to Output 1.1.4, a Training of Trainers (ToT) approach will be used to provide target communities with continued support to ensure the institutional sustainability of capacity-building initiatives and facilitate the empowerment of local institutions. The ToT programme will also include elements to facilitate the operationalisation of the regulatory body of the water sector of Haiti, the National Institute of Water Resources (INARHY)[105]. This institute?s main objective will be to implement the GoH's water management and distribution policies and ensure their effective application to ensure sustainable water supply for Haiti?s vulnerable communities.

The abovementioned training programmes will be supported by providing the necessary equipment ? such as groundwater metering devices, rainfall gauges and discharge measurement devices ? to the relevant government institutions under Output 2.2.2, followed by training on operating this newly acquired equipment to ensure climate data is effectively managed and applied. The specific outcomes and associated outputs designed to ensure the achievement of Outcome 2.2?s objectives are detailed below.

Outcome 2.3: Target communities equipped with instruments and mechanisms that ensure the sustainable management of water resources and associated infrastructure, as well as specific strategies to target female-headed households.

To address Barriers 1?4, project Outcome 2.3 promotes an adaptive management approach to enable effective and sustainable management of drinking water supply at national, regional and local levels under current and projected climate conditions. This management will primarily be achieved by strengthening technical capacities of relevant government institutions for sustainable and integrated water resources management (IWRM) and establishing appropriate mechanisms to enable community-based adaptation planning and sustainable management of water resources.

In line with the adaptation interventions identified and appraised in Outcome 1.1, Output 2.3.1 will support community-based water resource management in target communities to enhance the climate resilience of both the communities and the availability of their water resources. To achieve this, community-level decision-making groups will be established to align community expectations and interests and facilitate continued engagement and participation of community members, ensuring the sustainability and effectiveness of project interventions. Complementary gender-responsive strategic and operational plans aimed at identifying priority adaptation actions and investment needs will be

developed to enable community-based water resource management for building climate resilience. The establishment of these groups and plans will facilitate community buy-in, securing the social sustainability of the plans and their impact beyond the lifespan of the project.

To further ensure long-term and sustainable development in Haiti?s South-East Department, the watershed programme under the PSDH (Output 2.1.1) prioritises reforestation activities to protect watersheds. Reforestation, combined with agroforestry activities, will reduce extreme degradation of important drainage basins and recharge zones and reduce surface water runoff and improve infiltration of rainwater in the SAEPs? catchments, thereby increasing groundwater resources and sustaining the livelihoods of the target communities. Through a Training of Trainers (ToT) programme under Output 2.3.2, technical capacity and skills pertaining to EbA and agroforestry initiatives will be developed where necessary to improve communities? climate resilience. These ToT programmes will be implemented in a consultative and participatory manner to facilitate the target communities? input of their traditional knowledge of agroforestry for land management, strengthening the appropriateness of interventions.

Output 2.3.3 will strengthen the organisational capacities of community-level water governance structures ? such as CAEPAs and CTEs ? to support the adoption of an integrated water resources management (IWRM) approach to facilitate sustainable and equitable management of water resources in the target SAEPs. By contributing to the monitoring and management of land-use practices, the community-driven IWRM approach within the SAEPs? catchment areas and recharge zones will manage non-climatic impacts on the ecosystems surrounding these areas. The specific outcomes and associated outputs designed to ensure the achievement of Outcome 2.3?s objectives are detailed below.

Component 3. Identification and promotion of practices for the conservation, management and supply of drinking water adapted to predicted climate change scenarios

Outcome 3.1: Reliable access to drinking water ensured for target communities and households as a result of the implementation of climate change adaptation measures.

To address the inadequate practices and infrastructure to ensure water supply under the conditions of climate change (Barrier 5), on-the-ground interventions will be implemented under Outcome 3.1 to improve drinking water availability in the South-East Department of Haiti, enhancing the climate resilience of the project?s target communities. These interventions will build on the previous investments and lessons learned in Haiti and specifically in the South-East Department, such as the DINEPA-implemented AECID programme (2009?2021) and the DINEPA-implemented REGLEAU project (2018?2030), as well as on international best practices in adaptive water management options and conservation.

Among the abovementioned on-the-ground interventions, the EbA approaches ? primarily reforestation ? under Output 3.1.1 will result in increased water infiltration on slopes[106] as well as improved soil conservation and land management in these areas[107]. Complementary agroforestry interventions,

using high-value tree species, will ensure direct benefits for upstream communities in the recharge zones ? that rely on agriculture for their livelihoods ? combined with the ecosystem services provided to downstream communities, thereby achieving community buy-in of interventions, promoting their sustainability. Interventions under Output 3.1.2, such as constructing gabions, percolation tanks, contour bunds and septic tanks, will improve aquifer recharge and protect important water distribution infrastructure from climate change impacts, such as flooding and erosion, improving their resilience to these changes. Similarly, the stored rainwater resulting from climate-resilient rainwater harvesting systems installed under Output 3.1.3, will reduce community members? reliance on seasonal rainfall and groundwater resources ? particularly during extended drought periods ? while also providing local access to water in communities where water distribution networks are not fully operational[108].

Ultimately, these outputs will lead to more sustainable water supply for household and agricultural use under future climate change conditions, as a result of improved planning and the implementation of adaptive water management options by water users. For the above interventions to be effective, the target SAEPs will require sustainable operations and management (O&M) of water distribution infrastructure, to contribute to the availability of drinking water. This will be achieved by establishing a financial plan that will include a monitoring and tariff system under Output 3.1.4. The financial plan will fund O&M plans that will also be developed under this output, to ensure adequate reinvestment of the tariffs. To improve their effectiveness, these monitoring and tariff systems will be accompanied by water consumption metering systems as well as tailored awareness-raising campaigns on water supply and the need for tariff systems, to promote the uptake of these systems. Finally, following water quality assessments, water treatment programmes using hypochlorite will be established under Output 3.1.5. Given the vulnerability of Haiti?s water distribution networks to climate change impacts, these programmes will assist with addressing the prevalence of cholera outbreaks following extreme weather events.

Alignment with GEF focal area and/or Impact Program strategies

The abovementioned interventions to be developed under the proposed project will contribute to three GEF-7 climate change adaptation focal area objectives, specifically: i) CCA-1 ? reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation; ii) CCA-2 ? mainstream climate change adaptation and resilience for systemic impact; and ii) CCA-3 ? foster enabling conditions for effective and integrated climate change adaptation. Specific project contributions to these focal area elements are described below.

CCA-1: Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation

By equipping communities with technologies such as water consumption monitoring systems (Output 3.1.4), Outcome 3.1 will increase the resilience of community water resources and infrastructure to climate change by tracking and managing demand under future scarcity scenarios. In addition, Outcome 3.1 supports this focal area objective by using physical structures and agroforestry to protect and rehabilitate water sources and recharge zones (Output 3.1.1 and Output 3.1.2) as well as by installing household rooftop water harvesting systems (Output 3.1.3). These locally innovative and appropriate technologies for CCA will ultimately enhance community access to drinking water.

CCA-2: Mainstream climate change adaptation and resilience for systemic impact

The proposed project will contribute to mainstreaming CCA and resilience by and developing new water sector-related knowledge and information management systems (Output 1.1.2), as well as using

existing environmental information managed by the National Observatory for Environment Quality and Vulnerability (ONQEV) and the National Service for Water Resource (SNRE) to strengthen regulatory and policy mechanisms focussing on climate change impacts on drinking water supply. For Outcome 1.1, this will involve adequate assessments to inform communities and the Government of Haiti (GoH) on water management adaptation strategies (Output 1.1.1 and Output 1.1.3), institutional training programmes (Output 1.1.4) and technical studies regarding adaptation management options as well as groundwater resource inventories (Output 1.1.5 and Output 1.1.6). Additionally, participatory vulnerability assessments will be developed and carried out in the target communities (Outputs 1.2.1 and 1.2.2) ? informing water resource modelling that will ultimately allow communities to better plan and respond to the impacts of climate change on their drinking water supply.

Moreover, CCA and resilience will be mainstreamed under Outcome 2.1 through the adjustment of regulatory instruments (Output 2.1.1), the development of plans through Water Supply and Sanitation Committees (Output 2.1.2), and the development of frameworks for improved intra-organisational coordination. In addition, under Outcome 2.2 the technical capacities of priority institutional stakeholders regarding water resource management will be strengthened through targeted training programmes and provision of necessary equipment (Output 2.2.1 and Output 2.2.2). This will strengthen the enabling environment at institutional and technical levels necessary for achieving climate resilience in the water sector.

Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing

Project Outcome	**Project Output**	**Business-as-usual (Without LDCF resources)**	**Incremental value (With LDCF resources)**
Outcome 1.1: Improved awareness raising and knowledge and information management systems for the water sector to plan and respond to the impacts of climate change. **US$400,000) (LDCF financing)**	Output 1.1.1: Assessments, with gender-specific criteria, carried out at the national level to demonstrate the implications of different climate change scenarios on the availability of water. Output 1.1.2: A continuous information- and knowledge-generation system implemented to inform communities and the GoH on water management adaptation strategies and climate-resilient water supply.	Haiti has two national departments which are responsible for the management of natural resource data in Haiti, namely the National Observatory on Environment Quality and Vulnerability (ONQEV). ONQEV?s responsibilities ensuring periodic monitoring on issues relating to rising water levels, the dynamics of aquifers and protected areas and areas at risk. The National Service for Water Resources (SNRE) is responsible for, *inter alia*, water resources data management. However, at present, knowledge and understanding at both national and local levels of how future climate changes will affect the availability of drinking water in Haiti is limited ? particularly with regards to quantity, quality, and distribution of available water sources. This has resulted in minimal awareness of and knowledge on effective water management adaptation strategies to ensure resilient water supplies. Further to this, Haiti?s Nationally Determined Contribution prioritises information dissemination and awareness raising to educate its population on climate change impacts.	Under this output, LDCF resources will utilise natural resource data generated and managed by ONQEV and SNRE to develop analyses of climate change impacts on Haiti?s drinking water supplies under different future climate change scenarios at the national level. These analyses will calibrate climate change projections using local hydrogeological and hydrometeorological data, and with the list of water sources in the South-East Department ? assisting in, *inter alia*, identifying potential water management adaptation strategies to improve resilient water supplies. The analyses will include gender-specific criteria to ensure that the differentiated impacts of limited drinking water availability on men and women are considered.

	Output 1.1.3: Cost-benefit analyses of different adaptation strategies developed as per the predicted climate change scenarios identified under Output 1.1.1.	Considering the limited climate change-related technical capacities, as well as the compounded impact of limited financial resources in the GoH, the country is not adequately capacitated to conduct analyses on the most appropriate adaptation strategies to be implemented to build communities? resilience.	Based on the findings of the climate change scenario analyses conducted under Output 1.1.1, LDCF resources will be used to conduct cost-benefit analyses to determine the most effective adaptation strategies for implementation in Haiti?s context.
	Output 1.1.4: Training programmes implemented for regional and national institutions on the extent of climate change impacts on freshwater availability ? including methodologies and application of vulnerability assessments (as developed under Output 1.2.1 below) and adaptation solutions.	The Government of Haiti (GoH) has enacted policies ? such as the National Policy to Combat Climate Change (PNCC, 2019) ? and committed to addressing the impacts of climate change on Haiti ? through, *inter alia*, the National Adaptation Plan of Action (NAPA, 2006; 2017), Nationally Determined Contribution (NDC, 2015) and First and Second National Communications (INC and SNC, 2001; 2013) ? however, there is still limited knowledge and understanding within national and regional government institutions of climate change impacts on Haiti?s freshwater resources. Resultantly, there are minimal considerations of climate change in the mandates of these institutions.	LDCF resources will be used to strengthen the technical capacity of government institutions at national and local levels through training programmes to enable improved governance and decision making related to water resource, taking into consideration the additional impacts of climate change on freshwater availability.

	Output 1.1.5: Inventory and quality characterisation of groundwater aquifers in the target area carried out by OREPA Sud.	The Regional Offices for Drinking Water and Sanitation (OREPA) are decentralised entities of the National Directorate of Water Supply and Sanitation (DINEPA) and are responsible for the provision of water and sanitation services in urban areas, as well as the administration of systems in rural areas. However, limited human, operational and financial capacity have compromised certain functions of the OREPAs ? including OREPA Sud ? such as conducting regular and extensive assessments of available groundwater resources in Haiti. Consequently, there is limited knowledge on the availability and characteristics of groundwater resources in the South-East Department, as well as on the impacts of climate change on these resources.	Based on analyses conducted under Outputs 1.1.1 and 1.1.3 as well as the knowledge-sharing mechanisms developed under Output 1.1.2, LDCF resources under this output will be used to develop an inventory of available water sources ? including an identification of the least and most climate-vulnerable water resources in the South-East Department ? and assess the quality of these water sources. The inventory will guide sustainable water-use planning under protected water stressed scenarios.
	Output 1.1.6: Scientific and technical studies on the impacts of climate change and options for adaptation management in the target area conducted, informing local decision-making on climate-resilient water supply.	Limited knowledge ? exacerbated by limited technical and financial capacities ? on the impacts of climate change on water resources in the South-East Department has inhibited the identification of appropriate climate change adaptation (CCA) interventions to reduce the vulnerability of water supply and distribution to climate hazards, as well as to facilitate improved adaptative management of water sources.	Based on the findings on appropriate CCA strategies identified under Outputs 1.1.1 and 1.1.3, LDCF resources will be used to conduct technical studies to identify appropriate CCA interventions for improved water resources management in target watersheds, resultantly informing effective, climate-sensitive decision-making related to drinking water supply.

Outcome 1.2: Target communities prepared to effectively plan responses to climate change impacts on their access to drinking water.	Output 1.2.1: Methodologies and instruments developed for community-level vulnerability assessments (VAs) of drinking water supply.	Vulnerability assessments have not been conducted in the South-East Department, which means no methodologies and instruments have been developed to inform the accurate identification, quantification and prioritisation of vulnerabilities of the local drinking water supply.	Under this output, LDCF resources will be used to develop appropriate methodologies and instruments for the community-level vulnerability assessments to be conducted in Output 1.2.2. The methodologies and instruments developed will aid accurate assessments of the vulnerability of drinking water supply in target communities.

	Output 1.2.2: Participatory climate change vulnerability assessments (VAs) carried out in the project?s target communities.	Communities in Haiti do not have adequate access to information on current and projected climate change impacts on the natural resources that their livelihoods depend on ? such as the availability of drinking water. As a result, they are inadequately informed of their vulnerability to climate change impacts, including associated gender-related vulnerabilities.	LDCF resources under this output will support the undertaking of participatory, community-level vulnerability assessments of drinking water supplies in target communities, which will include the assessment of gender-related vulnerabilities. This will improve community understanding of the negative effects of climate change on the availability of drinking water and the related impacts on their livelihoods, as well provide a platform for informed decision-making for future adaptation. 150 people will benefit from awareness session on climate change impacts and appropriate adaptation responses (50% female)

	Output 1.2.3: Integrated water resource modelling conducted to demonstrate the projected long-term impacts of climate change on biodiversity, ecosystems, and urban systems, as well as the relationships between these aspects and drinking water availability at the landscape level.	Given limited technical and financial capacities among relevant government institutions ? including minimal data collection as well as monitoring and management of natural resources ? a strong understanding of current and projected climate change impacts in Haiti is limited.	LDCF resources will be used to conduct integrated water resource modelling to demonstrate the projected impacts of climate change on biodiversity, ecosystems, urban development, as well as the linkages between these elements and the impacts on water availability.
Outcome 2.1: Key regulatory and policy instruments adjusted to consider the implications of climate change for drinking water supply and promote adaptive community-based management. **US$515,000 (LDCF financing)**	Output 2.1.1: Two regulatory instruments adjusted to account for the evolving contextual needs and conditions resulting from climate change.	The environmental programme under the Strategic Development Plan of Haiti (PSDH, 2012) prioritises mainstreaming climate change considerations into planning and long-term development. This is further supported by the National Policy to Combat Climate Change (PNCC, 2019) which aims to, *inter alia*, promote improved governance with respect to integrating climate change in planning processes at different administrative scales and in the national budget. However, despite these national instruments, consideration of climate change within regulatory frameworks related to the management of drinking water in Haiti has been limited. Resultantly, the impacts of climate change have minimal influence on the provisions made for the establishment and management of watersheds and water supply systems, as well as on identifying priority actions for natural resource-dependent sectors.	Under this output, LDCF resources will be used to develop technical recommendations for integrating climate change adaptation into two existing regulatory instruments. Resources will also be used to provide facilitation and draft support in mainstreaming climate change considerations into these two instruments.

	Output 2.1.2: Strategic plans revised by sub-national regulatory institutions to prioritise adaptation interventions based on evaluations of climate change impacts on water supply vulnerability.	There is limited consideration of the impacts of climate change on Haiti ? specifically on the availability of freshwater supplies ? within the development, planning and implementation of regulations and policies for sectors related to natural resources management.	LDCF resources will be used to support the development of strategic plans to improve the incorporation of adaptation strategies into water management at the community level and appropriately respond to climate change. These plans and their implementation are intended to enable improved climate resilience, cost-effectiveness and sustainability of water distribution networks.

	Output 2.1.3: Frameworks and instruments developed and applied for planning and coordination between national, regional, private and community-based organisations.	Responsibilities related to the management of water and other natural resources ? as well as the associated generation and use of information ? are divided among several institutions, including the Ministry of Environment (MoE), National Directorate for Drinking Water and Sanitation (DINEPA) and the Ministry of Natural Resources and Rural Development (MARNDR). Consequently, there is limited collaboration on the planning and management of water resources and related information systems. However, the Swiss government is currently implementing a project entitled ?Strengthening of local water and sanitation governance (REGLEAU) which aims to improve the living conditions of the populations by, *inter alia*, strengthening existing coordination mechanisms to facilitate improved communication and accountability among actors involved in drinking water and sanitation.	LDCF resources will be used to minimise the risk of conflicts and duplication of efforts between national, regional, local and community organisations ? including the private sector ? involved in natural resource management by developing and applying frameworks and instruments for improved planning and coordination. Resources will also be used to build on the efforts of the World Bank-funded ?Water and Sanitation Program?, which is currently contributing to strengthening the institutional capacity of Technical Operation Centres (CTEs) by facilitating the establishment of public-private partnerships to improve the management of water and sanitation service provision.

Outcome 2.2: Increased capacities in priority institutional stakeholders (DINEPA, OREPA Sud, CAEPAs and CTEs) with regards to the technical aspects of water resource management, territorial land-use planning, as well as management and application of information on water resources and climate change threats.	Output 2.2.1: Targeted programmes implemented to strengthen technical capacity of relevant institutions to incorporate climate change data into planning and management.	At present, limited technical capacities are available within government institutions involved in water resources management and conservation, as well as in land-use planning and management. Technical capacity strengthening efforts are currently being provided under the REGLEAU project, particularly relating to the governance and provision of water and sanitation services.	LDCF resources allocated to this output will be used to strengthen the technical capacity of relevant stakeholders on CCA in the drinking water sector through the development of context-specific training programmes. These programmes will include, *inter alia*, aquifer and land management, land-use planning and water conservation. Additionally, resources will be used to facilitate the operationalisation of the regulatory body of the water sector of Haiti, thr National Institute of Water Resources (INARHY).

	Output 2.2.2: Equipment provided to support the efficient application of technical capacity developed by training workshops.	Another limitation to the sustainable and climate-resilient management of water resources is the limited availability of appropriate equipment to enable this. This as a result of the country?s minimal financial resources available to invest in the improvement of natural resources monitoring, planning and management.	LDCF resources allocated under Output 2.2.2 will be used for the procurement of equipment required to effectively support CCA practices in Haiti?s water sector. This equipment will include groundwater-level meters, rainfall gauges, discharge measurement tools and other instruments identified as necessary for the effective implementation of adaptation measures for enhancing freshwater availability.

Outcome 2.3: Target communities equipped with instruments and mechanisms that ensure the sustainable management of water resources and associated infrastructure, as well as specific strategies to target female-headed households.	Output 2.3.1: Community-based strategic and operational plans, with gender-specific criteria, developed to ensure the climate resilience of drinking water access.	The National Watershed Policy (2000) policy focuses on building resilience through participatory planning by establishing a bottom-up approach towards developing watershed management plans. However, there have been minimal community-level participatory planning approaches implemented with regards to water resources management and CCA interventions. This has resulted in limited effectiveness of community-level approaches for the sustainable management of water resources and associated infrastructure, as well as limited community buy-in into climate-resilience natural resource management.	Using LDCF resources, community-based strategic and operational plans will be developed through a participatory approach ? to identify actions for promoting the conservation and sustainable management of water and target sub-catchment areas. This will improve the resilience of local communities to the impacts of climate change on drinking water availability. These plans will also define the priorities for the development of actions and investments regarding adaptive water management options ? which will be based on best practices and align with national and community-level priorities.

	Output 2.3.2: Consultative and consensus-based community-level engagement on land-use planning conducted, and training programmes developed, for sustainable land uses in drainage and recharge zones to ensure the climate resilience of drinking water recharge.	The watershed programme under the PSDH and the National Adaptation Plans of Action (NAPA, 2006; 2017) both prioritise protecting watersheds using reforestation plans based on agro-ecological zoning, however there are currently minimal enforceable regulations for the monitoring and management of land use within drainage and recharge zones in Haiti. This has resulted in the land surrounding water sources often being degraded which ultimately compromises aquifer recharge and subsequent water supply ? particularly during drought periods.	LDCF resources under this output will be used to support community-level territorial planning which will include the identification of aquifer recharge zones, water sources and associated buffer zones, as well as sustainable and equitable uses and supply of drinking water under climate change conditions.

	Output 2.3.3: Programmes implemented to strengthen organisational capacities and awareness of community-level stakeholders and organisations ? reflecting gender-specific differences and promoting the equitable management of water resources and supply infrastructure under climate change conditions.	Sustainable and equitable management of water resources and water supply infrastructure ? including monitoring the condition of water resources ? is currently inadequate because of limited technical and organisational capacities among community-level stakeholders and organisations. This is further exacerbated by the minimal consideration of issues related to gender and social inclusion in the sanitation sub-sector. DINEPA is currently implementing projects targeted towards improving water and sanitation service provision by: i) establishing a strengthened human resources system through the creation of professional and technical training programmes in Haiti to enable the establishment of a sustainable sanitation system; and ii) creating and maintaining an environment conducive to the mainstreaming of gender and social aspects in the sanitation sub-sector, in particular by taking into account the specific needs of women, in accordance with the general gender policy of the GoH.	To complement the implementation of community-level plans developed under Output 2.3.1, LDCF resources under this output will be used to strengthen the organisational capacity of local governance structures as well as to ensure improved management and monitoring of activities around water resources ? particularly aquifer recharge zones, water sources and buffer zones ? that could negatively affect the conditions of these water resources. These programmes will focus on improving mechanisms for gender-responsive and consensus-based community-level decision making, notably by distributing responsibilities and benefits associated with climate-proofing drinking water supply.

Outcome 3.1: Reliable access to drinking water ensured for target communities and households as a result of the implementation of climate change adaptation measures. **US$3,379,563 (LDCF financing)**	Output 3.1.1: 4,540 ha of aquifer recharge zones rehabilitated within the five target SAEPs ? of which 700 ha is restored through agroforestry.	The environmental and watershed programmes under Haiti?s PSDH upholds the need to: i) establish a network of protected areas; ii) restore degraded ecosystems; iii) ensure sustainable management and use of forests; and iv) protect watersheds by using reforestation plans based on agro-ecological zoning. Despite this, by 2010, ~25 of Haiti?s watersheds were degraded by deforestation[109] ? attributed to, *inter alia*, fuelwood harvesting, increasing population growth, and agricultural expansion. This degradation has resulted in increased surface water runoff and reduced water infiltration into soils during rainfall events. Consequently, the rate at which aquifers are recharged has been adversely impacted and freshwater supply has been compromised. A GEF-funded project entitled ?Increasing resilience of ecosystems and vulnerable communities to climate change and anthropogenic threats through a ridge-to-reef approach to biodiversity conservation and watershed management? (2016?2021) has been contributing to enhancing the resilience of vulnerable communities and ecosystems to the impacts of climate change by, *inter* alia, enabling improved watershed management through the promotion of ecosystem-based adaptation.	LDCF resources allocated to this output will be used to rehabilitate water sources and aquifer recharge zones by using reforestation and agroforestry, which will increase water infiltration into soils as well as support local communities whose livelihoods depend on agricultural production. Establishing agroforestry along watersheds will, *inter* alia: i) increase availability of water for communities by improving water infiltration; and ii) promote improved soil conservation and land management surrounding these watersheds.
	Output 3.1.2: Gabions, percolation tanks and contour bunds constructed to promote aquifer recharge and to reinforce the protection of the five target Drinking Water Supply Systems (SAEPs).	The degradation of several of Haiti?s watersheds because of deforestation[110] has resulted in higher overland flow speed and decreased water infiltration into soils, consequently increasing surface water run-off during extreme rainfall events. As a result, the rate at which aquifers recharge is also reduced, further compromising the freshwater production of the aquifer-fed water sources.	LDCF resources in this output will be used to construct physical measures ? such as gabions and percolation tanks ? to reduce surface water runoff and increase water infiltration into soils, consequently improving aquifer recharge and reducing erosion. These measures will be locally appropriate as guided by surveys carried out at vulnerable sites.

	Output 3.1.3: Rooftop water harvesting systems and household cisterns installed in 350 households in target communities.	Current and projected climate change impacts on Haiti?s natural resources exacerbates communities? vulnerability to the disruption of freshwater resources because of their direct dependence on these sources for their household water supply. Moreover, as several communities are not adequately informed on climate change impacts on their livelihoods (detailed under Output 1.2.2), they are unable to improve their resilience to these impacts.	Under this output, LDCF resources will be used to install rainwater harvesting systems, such as rooftop water capture structures and cisterns in 350 households, to capture and store water. This will subsequently reduce community members? reliance on surface- and groundwater resources, particularly during extended drought periods. These rainwater harvesting methods will be climate-proofed to increase their resilience to extreme weather events.

	Output 3.1.4: Framework for financial plans for O&M of the five target SAEPs to improve water-use efficiency and distribution, accompanied by awareness-raising and advocacy programmes.	Several water distribution networks in the South-East Department do not have established water pricing systems. For other distribution networks, communities refuse to pay for water as a result of conflict around the exact ownership of water resources. In addition, because of the limited financial resources ? as discussed under Output 2.2.2 ? to support the operations, the water distribution networks are not well maintained which often results in the disruption of supply to the relevant communities. The Framework Law on Water Supply assigned DINEPA with the authority to, *inter alia*, establish pricing schemes to support the provision of water and sanitation services, however limited institutional capacity building, as well as human and financial resources compromised the effective implementation of the framework.	LDCF resources under this output will be used to develop frameworks for financial plans for O&M within targeted water distribution networks to improve water use efficiency and distribution. This will be accompanied by awareness-raising campaigns for community members on the need for financial sustainability of water supply, particularly under climate change conditions, and comparing these costs with those of the alternative circumstances ? such as continual decreases in water supply ? which may involve the purchase of water from tanker trucks (an option on which many urban areas already depend).

	Output 3.1.5: Programmes for treating water supplies with sodium hypochlorite implemented to reduce water pollution-related health risks.	Severe flooding as a result of extreme rainfall events ? which are projected to increase in frequency and intensity ? causes extensive damages to water supply systems and sanitation infrastructure, compromising water provision and quality, as well as the health of communities. The projected increase in extreme rainfall events will result in severe flooding events. Moreover, as a result of agriculture-related activities occurring along watersheds, water sources are often polluted by fertilisers and pesticides, further compromising the quality of water. DINEPA is currently implementing a series of initiatives to improve water service provision, including one which aims to create an enabling environment for the implementation of drinking water and sanitation services regulation in the context of environmental health.	LDCF resources under this output will be used to develop and implement a programme for the treatment of water supplies to improve the quality of drinking water and reduce health risks in relevant communities. Drinking water will be treated using sodium hypochlorite ?an effective compound for large-scale purification of water ? to ensure appropriate water quality standards as provided by DINEPA and by the upcoming Environmental Health and Sanitation Regulatory Framework (EHSRF).

Indicative sources of co-financing for the project by name and by type are provided below.

Table 3. Project co-financing.

Source	Name	Type	Investment mobilized	Amount ($)
Recipient Country Government	Ministry of Environment	In-kind	Recurrent expenditure	350,000
Donor Agency	IDB	Grant*	Investment Mobilized	30,000,000
GEF Agency	UNDP TRAC Resources	Grant	Investment Mobilized	100,000
Total Co-financing				30,450,000

*IDB finance stands for the investment programming to engage into synergies on institutional strengthening of DINEPA in its regulatory functions

Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

Climate change is exacerbating existing pressures on drinking water resources in Haiti, adversely affecting the lives and wellbeing of vulnerable communities. The preferred solution to this problem is to increase water availability in target watersheds in the country?s South East-Department by conserving critical water recharge zones and aquifers, while enhancing the climate resilience of water distribution and storage infrastructure to ensure reliable access to water resources for target communities. These interventions will be supported by strengthened institutional and regulatory systems to promote the sustainable management of water resources and infrastructure.

The proposed project will target vulnerable areas of the country?s South-East department, specifically the catchment areas, recharge zones and springs of the Cresson, Bodarie, Pr?chet, Cascade Pichon and K-Royer[111] Drinking Water Supply Systems (SAEPs). These five target SAEPs were selected according to a methodology[112] that was defined and developed collaboratively between the Government of Haiti (GoH), UNDP Haiti and consultants on the PPG Team. In summary, this methodology involved identifying strategic SAEPs within the department according to their regional socioeconomic and environmental relevance, gathering related data on these SAEPs, and then prioritising the SAEPs according to a multi-criteria analysis (MCA). Prioritisation was carried out according to five weighted (%) criteria, namely: i) community vulnerability to climate change (40%); ii) ecosystem vulnerability to climate change (20%); iii) number of potential beneficiaries (15%); iv) potential to build on past or ongoing projects (15%); and v) potential for support and buy-in (10%). Adaptation interventions to be implemented under the above project components will positively impact local communities in these areas by reducing their vulnerability and increasing their resilience to droughts and floods. By providing tools and developing capacities for the improved management of drinking water resources, project interventions will enable ~ 130,000 direct beneficiaries ? reliant on the abovementioned drinking water sources ? to benefit from more reliably available drinking water throughout the year under the context of increasingly long and intense drought periods that are expected to result from climate change. This will be achieved through: i) strengthening the institutions and polices in the sector for adaptive water management; ii) establishing decentralized management systems around water resources; and iii) improving and diversifying water harvesting, storage and distribution technologies, ultimately enabling the regeneration and protection of critical aquifer recharge areas.

Under the project?s three components, the proposed climate change adaptation strategy will include: i) implementing on-the-ground interventions to improve aquifer recharge and climate-proof drinking water supply (such as agroforestry, the protection of water sources and aquifer recharge areas, percolation tanks and rainwater harvesting systems); ii) strengthening local capacities for climate-resilient water resource management through awareness raising and knowledge generation; and iii) developing support tools and strengthening technical/institutional capacities of decision-makers at the national and regional level to promote the mainstreaming of climate change into the planning and

management of drinking water and associated natural resources in Haiti. These interventions will contribute to the disruption of several climate change Impact Pathways (IPs), as discussed in greater detail below.

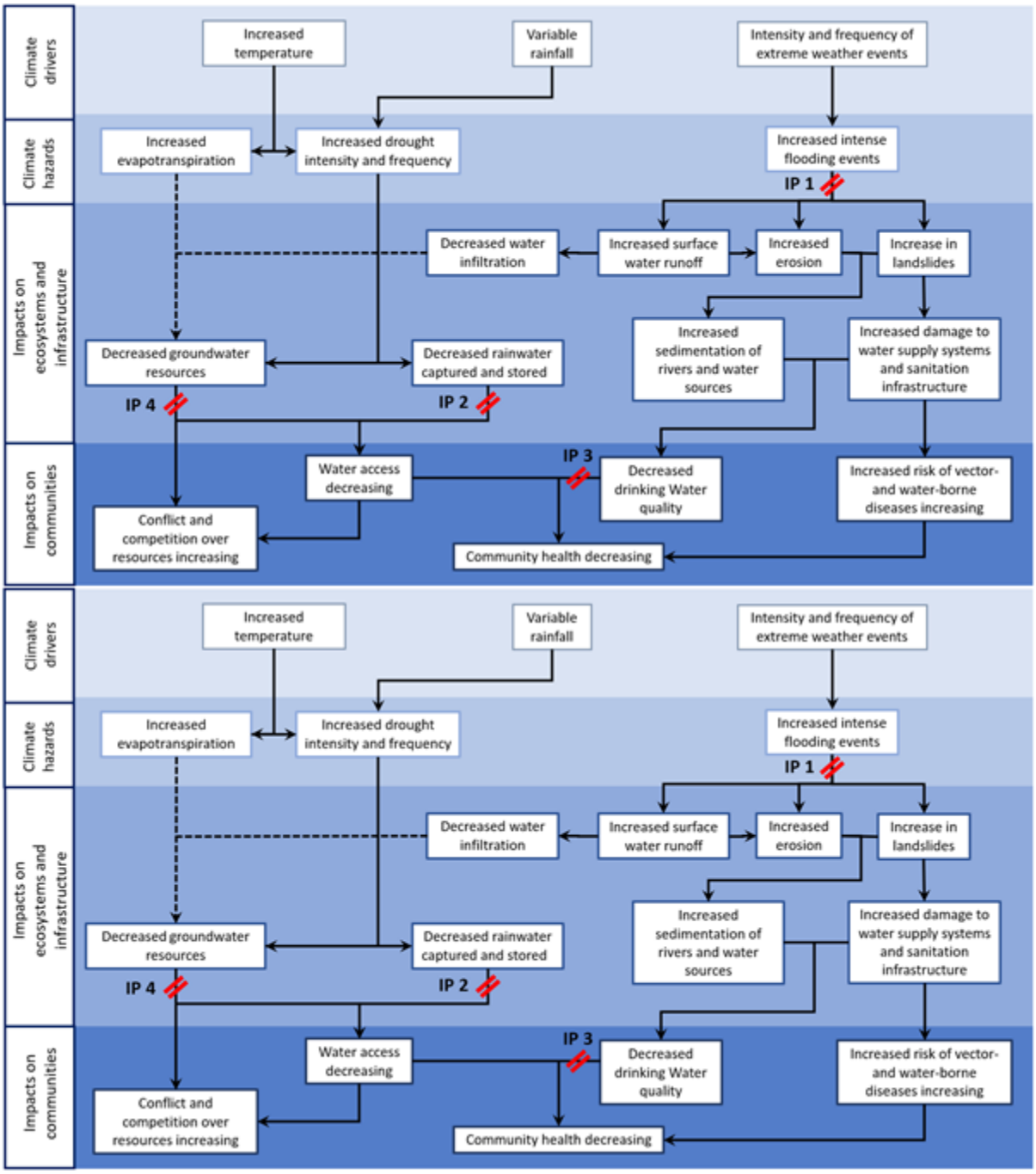

Figure 9. Impact pathway (IP) diagram demonstrating the pathways of drivers and hazards ? as well as disruptions to these pathways as a result of project interventions (labelled IP 1?IP 4).

Component 1: Improved understanding and awareness of the vulnerability of the water sector to climate change

Under Component 1 of this project, LDCF resources will be employed to utilise natural resource data generated and managed by the National Observatory on Environment Quality and Vulnerability (ONQEV) and National Service for Water Resources (SNRE) to analyse climate change impacts on Haiti?s national drinking water supply under different future climate scenarios. These analyses will calibrate climate change projections using local hydrogeological and hydrometeorological data ? assisting in identifying potential water management adaptation strategies to improve climate-resilient water supply in Haiti?s South-East Department (disrupting **IP 4**). The analyses will also include gender-specific criteria to ensure the consideration of differentiated impacts of limited drinking water availability on men and women in the country.

The abovementioned analyses will furthermore be used to conduct technical studies ? including integrated water resource modelling ? which will produce technical recommendations on how to maximise the suitability of adaptation strategies for local ecological and social contexts in the South-East Department (ultimately disrupting **IP 4**). This knowledge will inform training programmes to strengthen the technical capacity of government institutions at national and local levels, ultimately resulting in effective, climate-sensitive decision-making related to drinking water supply. Moreover, this component will include the development and implementation of appropriate methodologies and instruments for community-level vulnerability assessments, which will support such assessments of drinking water supply in target areas in a participatory manner ? including the assessment of gender-related vulnerabilities. These assessments will provide an inventory of available water sources in the South-East Department alongside an evaluation of the quality of these water sources. This assessment will comprise the eight river basins of South-East Department of Haiti, with the aim of covering all rural communities in the department while also including an identification of the least and most climate-vulnerable water resources in the area. Ultimately, this will improve community understanding of the adverse effects of climate change on the availability of drinking water and the related impacts on their livelihoods, in addition to providing a platform for informed decision-making for future adaptation.

The activities under Component 1 will address two of the barriers presented above, specifically:

? Barrier 1 ? by developing analyses of the effects of climate change on drinking water supply under different scenarios, informing technical studies that will ultimately form the basis for training programmes that will raise the awareness and technical capacity of government institutions at a national level.

? Barrier 4 ? by strengthening the technical capacities of government institutions at local levels through training programmes informed by technical studies on improved water resources management in the target watersheds.

Component 2: Strengthening of the regulatory and policy frameworks, as well as institutional and technical capacities, at national, regional and local levels for the improved management of drinking water under climate change

Under Component 2, LDCF resources will be used to develop technical reviews and recommendations for integrating climate change adaptation into two existing regulatory instruments, namely DINEPA and OREPA Sud, relating to the management of drinking water supply in Haiti. In addition, project resources will be used to minimise the risk of conflicting or duplicated efforts between national, regional, local and community organisations ? including the private sector ? engaged in natural resource management by developing and applying frameworks and instruments for improved planning and coordination. These instruments will be supported by context-specific training programmes on aquifer and land management, land-use planning as well as water conservation to strengthen the technical capacity of relevant stakeholders on CCA in the drinking water sector in the South-East

Department (disrupting **IP 4**). To support the application of skills acquired through these training programmes, stakeholders will receive the necessary equipment for the effective implementation of adaptation measures to enhance freshwater availability, including groundwater-level meters, rainfall gauges, discharge measurement tools and other equipment as required for each target site**.**

Second, LDCF resources will be used to consultatively aid communities to carry out land-use planning with supplemental training programmes implemented to strengthen community capacities and awareness ? with specific strategies to target female-headed households. This will result in improved climate resilience, cost-effectiveness and sustainability of water distribution networks and target sub-catchment areas through helping communities to sustainably and equitably monitor and use drinking water (disrupting **IP 4**).

Several barriers will be addressed by Component 2, specifically:

? Barrier 1 ? by mainstreaming climate change impacts into national regulatory mechanisms through integration into two existing regulatory instruments (DINEPA and OREPA Sud). Training programmes accompanying these mechanisms will strengthen the technical capacities of relevant stakeholders to analyse, interpret and apply climate risk information in support of effective evidence-based decision-making.

? Barrier 2 ? through the integration of climate change into regulations and policies related to the water sector.

? Barrier 3 ? by implementing frameworks and instruments for improved planning and coordination between national, regional, local and community organisations.

? Barrier 4 ? by increasing communities? capacity for water resource management through training on land and aquifer conservation, as well as on land-use planning approaches based on the theory and practice of agro-ecological zoning, agroforestry and integrated water resources management. These interventions will be with enhanced by strategic and operational planning structures developed collaboratively between community representatives, DINEPA and relevant ministries.

Component 3: Promotion of practices for the conservation, management and supply of drinking water adapted to projected climate change scenarios

Component 3 will facilitate the use of LDCF resources to protect water sources and aquifer recharge zones through the conservation of these zones and the implementation of reforestation and agroforestry within the South-East Department?s watersheds and eight river basins, resulting in: i) increased water availability for communities by improving water infiltration into soils; and ii) improved soil conservation and land management surrounding these watersheds (disrupting **IP 1**). This will support local communities whose livelihoods depend primarily on agricultural production. In addition, under Component 3 physical measures such as gabions and percolation tanks will be constructed to reduce surface water runoff and increase water infiltration into soils (disrupting **IP 1**), thereby improving aquifer recharge. Additionally, rainwater harvesting systems ? such as rooftop water capture structures and cisterns ? will be installed to capture and store water (disrupting **IP 2**), thereby reducing

community members? reliance on groundwater resources and rivers, particularly during extended drought periods.

Moreover, frameworks for financial plans for O&M within will be developed for targeted water distribution networks ? accompanied by awareness-raising and advocacy programmes ? to improve water efficiency and distribution. Finally, LDCF resources under this component will be used to develop and implement a programme for the treatment of water supply to improve the quality of drinking water and reduce health risks in the target communities (disrupting IP 3).

Component 3 will directly address:

? Barrier 5 ? by increasing groundwater levels through implementing on-the-ground (agroforestry) and engineered (gabions, contour bunds etc) water-saving measures, ensuring more resilient water supply under future climate change conditions. The potential for unsustainable consumption levels under future scarcity scenarios will be reduced through metering systems, while availability of higher quality drinking water will be ensured through treatment programmes. Additionally, unsustainable land management practices (such as deforestation for charcoal production) will be reduced through EbA approaches that will promote more sustainable livelihoods for communities who depend on agricultural production.

Innovativeness, sustainability and potential for scaling up

Innovativeness

Although there are several previous and on-going projects relating to the provision of water and sanitation services in Haiti, the scope of the projects do not incorporate the country?s vulnerability to climate change and the subsequent impacts on the provision of water services. The proposed project will bridge this gap by implementing climate-resilient interventions to rehabilitate degraded watersheds and recharge zones, and enable the sustainability of water provision in targeted communities in the South-East Department. The proposed project will establish 700 ha of agroforests ? for the restoration of watersheds and aquifer recharge zones ? using high-value plant species (Output 3.1.1). The use of these specific species will enable more resilient livelihood development through the establishment of small-scale agroforestry value chains, resultantly providing the target communities with alternative and/or additional income-generating activities. This intervention ? together with the proposed hard interventions under Output 3.1.2 ? will be complemented by the diversification of potential water sources to maximise local water availability and reduce the competition of water needs ? specifically by supporting conventional water supply methods with alternative methods such as household rainwater harvesting (Output 3.1.3).

The abovementioned interventions will be further complemented by strengthened technical capacity building initiatives and programmes across several governmental institutions. This will contribute to more innovative and appropriate climate risk assessments and modelling of Haiti?s vulnerability to climate change. Additionally, strengthened knowledge of climate risks and improved awareness will enable climate-resilient and adaptive management of Haiti?s water resources and other natural resources among key governmental institutions.

Moreover, this project is innovative in its commitment to the ecological transition, adaptation to climate change, preservation of water resources and at the same time protection of biodiversity. It

proposes an adequate level of response to the environmental challenges of the territory and allows to initiate territorial prospective approaches on the uses of water and the conditions of its sustainable management, and to implement adequate adaptation measures.

Sustainability

The project design will contribute to ensuring institutional, economic and social sustainability of interventions beyond the project lifespan ? in addition to maintaining and improving the environmental sustainability of the target watersheds in the context of climate change in the South-East Department. The sustainability of the project?s interventions is an important element that will be supported by community ownership as promoted by the stakeholder engagement process during the project design. The sub-sections below provide detail on how the project will contribute to the sustainability of its interventions.

Institutional sustainability
Limited technical and organisational capacities within Haiti?s governmental institutions present considerable barriers to improved climate resilience in Haiti. The proposed project comprises several interconnected outputs to ensure the institutional sustainability of its interventions. Firstly, climate change risks and appropriate adaptation interventions for Haiti will be mainstreamed into two existing regulatory frameworks to ensure the consideration of Haiti?s vulnerability to climate change? as provided by Output 2.1.1. This will support the incorporation of climate change adaptation (CCA) interventions and their prioritisation into strategic action plans developed by sub-national regulatory institutions under Output 2.1.3. Secondly, considering the limited operational and human resource capacity in Haiti?s government institutions, the project will prioritise developing and implementing frameworks and instruments which will enable the coordination between the public and private sectors ? including national, regional, private and community-based organisation (under Output 2.1.3). With these stakeholders being integral to water resources management and supply, improved coordination and planning among them will allow for more sustainable and climate-resilient water resources management and supply. Thirdly, organisational capacities of community-level water governance structures ? such as CAEPAs and CTEs ? will be strengthened under Output 2.3.3 to support the implementation of the community-level land-use plans developed under Output 2.3.2. However, this will be supported by the establishment and implementation of biannual multi-stakeholder forums (MSFs) comprising DINEPA, OREPA Sud, target CAEPAs, CTEs, CBOs, NGOs, as well as community representatives ? including farmers ? as a platform for effective dialogue between these stakeholders. Lastly, the proposed project focuses on facilitating country ownership of the project by housing several initiatives under existing government institutions. This will be supported by extensive capacity building efforts to ensure that while institutions are responsible for the execution of activities, they are adequately capacitated to carry out their functions.

The abovementioned institutional capacity building will facilitate improved climate-resilient governance and adaptive management of water and other natural resources. This will be supported by an institutional-level information and knowledge-management system (Output 1.1.3) which will serve as a climate change data repository and provide science-based information to inform national and regional level decision-making and governance.

Economic sustainability
A ?willingness-to-pay?[113] assessment will be conducted during project implementation. Following this assessment, the project will develop and implement appropriate water consumption monitoring and tariffication systems in the target water distribution networks (SAEPs) to improve the efficiency of water use and distribution. The revenue from the tariffication system will be collected into a centralised fund and distributed between the relevant sub-national institutions managing the SAEPs to support the operations and maintenance (O&M) costs required for these SAEPs, ensuring efficient water supply across the networks. In addition, the project will facilitate and promote engagements between government institutions, civil society organisations, private sector and other project partners to promote IWRM, improved operational performance in the water sector and implementation of climate change-responsive, safe and affordable water services for communities in Haiti.

An Approach of Payment for environmental services was considered at the PIF stage and is still being considered. A small fee will be set according to the decision among the local members of the SAEP. It is therefore necessary to ensure that the financial contribution for the proposed service can be borne by the subscribers according to their level of vulnerability and in compliance with the regulations (ethical sustainability). The community members contributions will be used to maintain the technical assets in good condition after the life of the project. It also allows for the maintenance and renewal of the assets in order to guarantee the operation of the service for present and future users.

Social sustainability

The social sustainability of project interventions will be ensured through an emphasis on stakeholder participation in the project design, as well as during project implementation. The vulnerability assessments (VAs) to be conducted under Output 1.2.2 will involve extensive participation of target community members to enable improved understanding among vulnerable communities of the impacts of climate change on water availability and the consequent impacts on their households and livelihoods. Through this intervention, communities are better equipped to develop the strategic and operational plans under Output 2.3.1, which will promote the conservation and sustainable management of water and target sub-catchment areas. The territorial planning conducted in Output 2.3.2 will also involve a community-level participatory approach to ensure consensus-based identification and permission of appropriate land uses in target SAEPs. Moreover, given that ~66% of Haiti?s population is dependent on agriculture for subsistence, as well as their livelihoods, establishing agroforests under Output 3.1.1 will embrace the livelihoods of communities while enabling them to rehabilitate 5,000 ha of degraded catchment areas, resultantly increasing their resilience to the impacts of climate change. The project will implement gender-responsive measures across community-level stakeholder participation to ensure that the gender-specific vulnerabilities of men, women and the youth are taken into consideration, as well as their differentiated needs. In addition, by emphasising stakeholder participation, the project will ensure adequate community buy-in and ownership of interventions, further ensuring the social sustainability of these interventions and their impact on the communities.

Scalability

Considering the vulnerability of Haiti?s water supply systems ? both in terms of the decreasing functionality of water distribution infrastructure, as well as reduced water availability ? the interventions of the proposed project have considerable potential to be scaled up at municipal, regional and national levels. The relatively small scale at which the interventions will be implemented ? particularly the ?hard? interventions (Outcome 3.1) ? will serve as a pilot for potential upscaling and replication across Haiti, and in more vulnerable communities. The national-level climate change scenario analyses conducted (Output 1.1.1) will enable an improved understanding of Haiti?s vulnerability to climate change and consequently, continued development of appropriate climate change adaptation options which can be adopted and tailored accordingly across Haiti. This project will provide substantial foundational tools to support the upscaling of climate resilience across Haiti beyond the lifespan of this project, particularly through strengthened institutional capacity and the mainstreaming of climate change and gender considerations in natural resources management.

This project is intended to be a pilot project and very innovative in the field. It will facilitate the application of the technique across other regions of the country in order to not only improve access to drinking water, but also to strengthen institutional capacity and the integration of climate change into our public policy programs.

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[106] See ?SWAT Assessment? (Annex 12c).

[107] Ibid.

[108] See Site Selection Annex (12a).

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[110] UNEP in Haiti. 2010 Year in Review.

[111] More information on the geographical locations of these sources as well as the relevant affected communities is available in the Site Selection Annex (12a)

[112] More information on the site selection methodology is available in the Site Selection Annex (12a).

[113] This refers to the maximum price at or below which a consumer will buy one unit of a product. This assessment will inform the model of the water consumption monitoring system.

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

The project?s selection methodology was defined and developed collaboratively between the GoH[1], UNDP Haiti and consultants on the PPG Team. The target water sources and supply systems for project interventions stretches across the following six watersheds in the South-East Department of Haiti: i) Anse-?-Pitre; ii) Bainet; iii) Belle-Anse; iv) C?tes de Fer; v) Grande Rivi?re de Jacmel; and vi) Marigot. These watersheds are outlined in green in Figure 10. A pre-assessment of the six watersheds, including geographic information system (GIS) mapping, was undertaken to provide a contextual overview of technical information for each watershed[2].

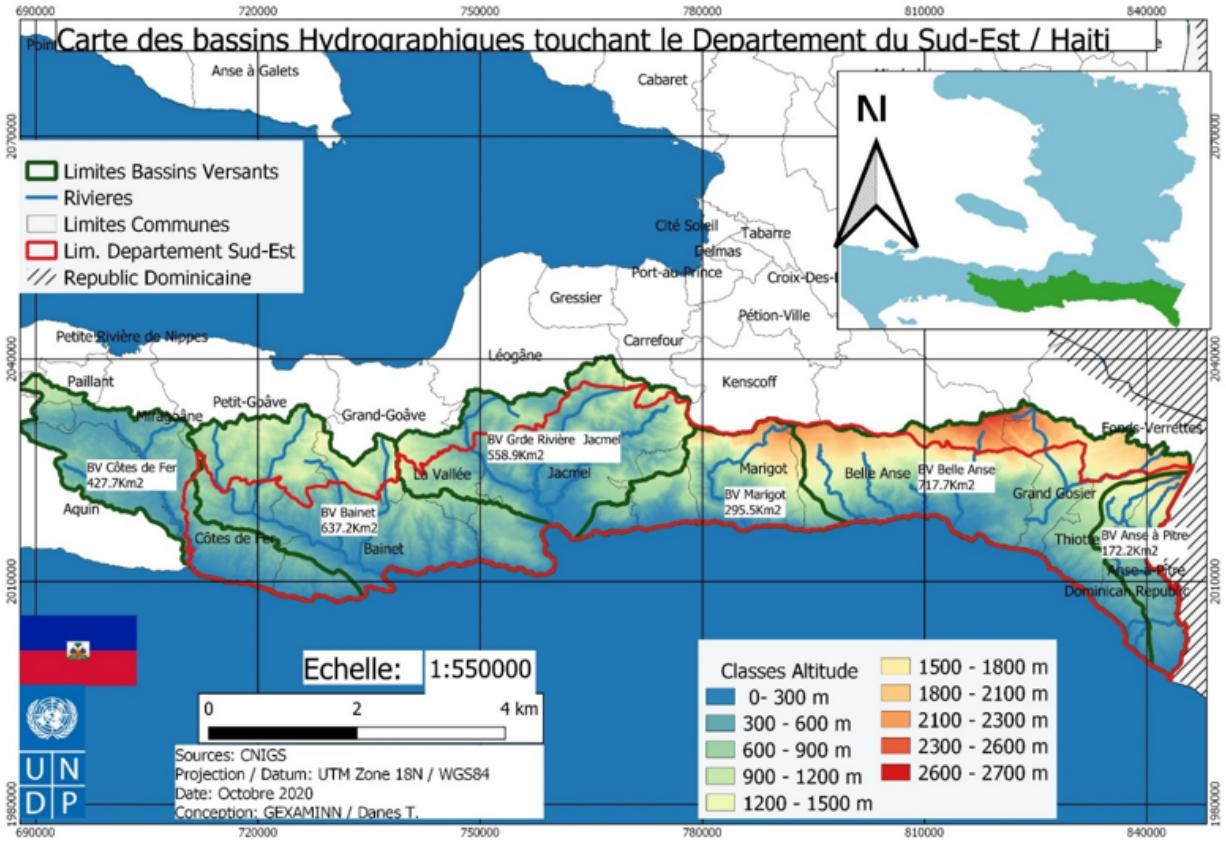

Figure 10. Map of the watersheds in the South-East Department of Haiti.

In December 2020, a series of meetings were convened between the National Consultant (NC) and the relevant stakeholders from the GoH. The objectives of these meetings were to have a shared understanding of the project intervention logic and find consensus among stakeholders on the sites to be selected. In particular, the meetings focussed on Component 3 of the project Logframe as site selection will be critical for the adequate implementation of the interventions listed under this component. During these meetings, it was decided that individual water sources (including their respective recharge zones) and drinking water supply systems (SAEP) should be regarded as the strategic targets for selecting project intervention sites, rather than a single watershed.

The following methodology was accordingly adopted for the preselection of intervention sites.

1. Identify strategic SAEPs and sources within the department, according to their regional socioeconomic and environmental importance, in collaboration with the Regional Office for Drinking Water and Sanitation (OREPA-Sud), the National Directorate for Drinking Water and Sanitation (DINEPA), the Ministry of Environment (MoE), the Departmental Directorate of Environment for the South-East (DDE-SE) and the Departmental Directorate of Agriculture for the South-East (DDA-SE).

2. Gather data on each identified water source and SAEP, including: i) mapping the hydrographic territory of each source; ii) collecting socioeconomic information ? such as local water management practices ? through consultations with local communities, civil society and non-governmental organisations operating in the area, as well as local and district-level government representatives; and iii) recording data and observations on the physical baseline of each site, including on existing water distribution infrastructure, hydrological data and levels of degradation and deforestation.

3. Prioritise the identified water sources and SAEPs based on the data collected in the field, according to a multi-criteria analysis (MCA) developed by the PPG Team, to rank the potential intervention sites within the South-East Department.

The final site selection for project interventions was made during roundtable discussions involving DINEPA, UNDP and the PPG Team. The following criteria were discussed to make the final selection:

? the number of beneficiaries within each pre-selected SAEP;

? the multi-criteria analysis (MCA) developed by the PPG team;

? the existence of similar initiatives in the pre-selected SAEPs;

? the presence of functional Drinking Water Supply and Sanitation Committees (CAEPAs) or Technical Operations Centres (CTEs) within the pre-selected SAEPs; and

? the respective projected effects of the agroforestry and reforestation interventions obtained in the SWAT modelling exercise.

Given high dependency on stakeholder engagement processes needed for the appropriate implementation of the interventions under Components 1 and 2 of the proposed project, as well as the need to maximise community buy-in for the implementation of the interventions under Component 3, it was decided that only SAEPs with functional local water governance bodies (such as CAEPAs or CTEs) would be retained from the 10 pre-selected SAEPs for project intervention. The presence of a CAEPA or CTE in a SAEPs will also partially mitigate the risk of the interventions increasing water availability, but not accessibility to the targeted beneficiaries. As a result, the following SAEPs were retained for project interventions: **Cresson, Bodarie, Pr?chet, Cascade Pichon and K-Royer.** The geographical location of the sources of the five target SAEPs, as well as their catchment areas are shown in Figure 11.

Descriptions of each of the target water SAEPs as well as their geographic location and GPS coordinates, are presented below.

Figure 11. Geographical location of respective sources and catchment areas of the five selected target Drinking Water Supply Systems (SAEPs) for project intervention

Table 4. Targeted drinking water sources? GPS coordinates.https://gefportal.worldbank.org/api/spapi/LoadDocument/?filename=/GEFHTMLEditorImage/d70f7ede-b6ae-e911-a840-000d3a375888/%D0%91%D0%B5%D0%B7%20%D0%B7%D0%B0%D0%B3%D0%BE%D0%BB%D0%BE%D0%B2%D0%BA%D0%B0.jpg-2022-2-2-18-41-7

Source	Latitude	Longitude
Cresson	18.2624400	-72.4890600
Bodarie	18.2921931	-72.3044819
Pr?chet	18.2442294	-72.0242353
Cascade Pichon	18.2985606	-72.0139117
K-Royer	18.2483167	-71.8333639

Cresson SAEP

The Cresson SAEP is located within the Grand Rivi?re de Jacmel watershed and supplies ~60,000 people. It is the main water source for the city of Jacmel, as well as for the neighbouring villages. Observational data suggest that drought periods considerably affect the Cresson SAEP?s flow rate during the different seasons of the year.

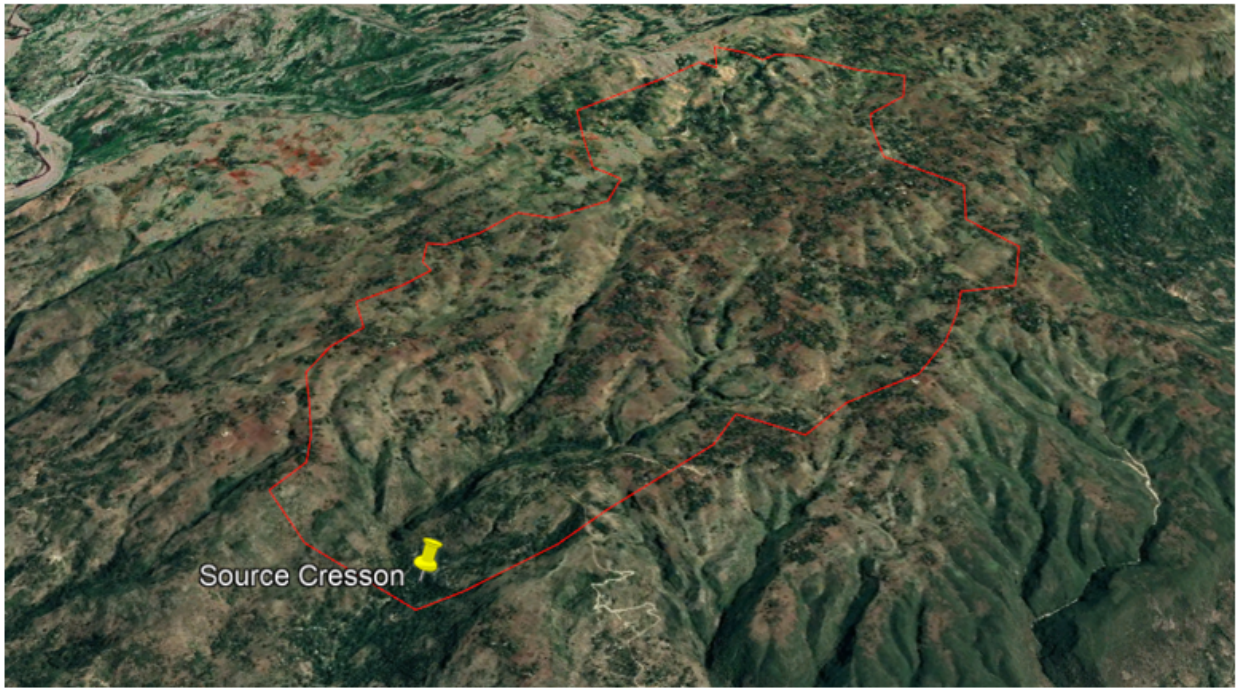

Figure 12. Recharge zone (delimited in red) of the Cresson SAEP source.

With a flow rate of 50?60 l/s, the Cresson SAEP gravity-fed water distribution network comprises i) four storage tanks ? with capacities of 1,100 m^3, 700 m^3, 600 m^3 and 200 m^3 respectively; ii) water collection points at 14 kiosks; and iii) 6,000 individual connections. The Cresson water network?s pipeline is made from high-density polyethylene (HDPE) and polyvinyl chloride (PVC) and is ~114,500 m long. The source has an upstream water treatment system that allows for multiple treatment processes to provide clean water, including i) flocculation; ii) settling; iii) pre-chlorination; and iv) post-chlorination.

The Cresson SAEP is managed by the city of Jacmel?s technical operating centre (Centre Technique d?Exploitation, CTE). Water prices for the private individual connections ? which are all equipped with meters ? are based on monthly consumption volume, with four tariff bands: i) US$0.47/$m^3$; ii) US$0.57/m^3; iii) US$0.69/$m^3$; and iv) US$1.26/m^3.

Pr?chet SAEP

The Pr?chet SAEP?s source is located in Passe Lafleur 6th Pichon, within the Belle-Anse watershed. This SAEP was originally established to supply water to ~4,000 people in the city of Belle-Anse and neighbouring communities, but is currently not operational. While details of the flow rate of the Pr?chet SAEP ? as well as the seasonal variability of the flow rate ? are yet to be determined, observational data from community members indicate that waterflow is negatively impacted during dry seasons, with the Pr?chet water source often drying up completely during extended dry periods. In

addition, the degradation of the water catchment area further exacerbates the vulnerability of the source to droughts and pollution.

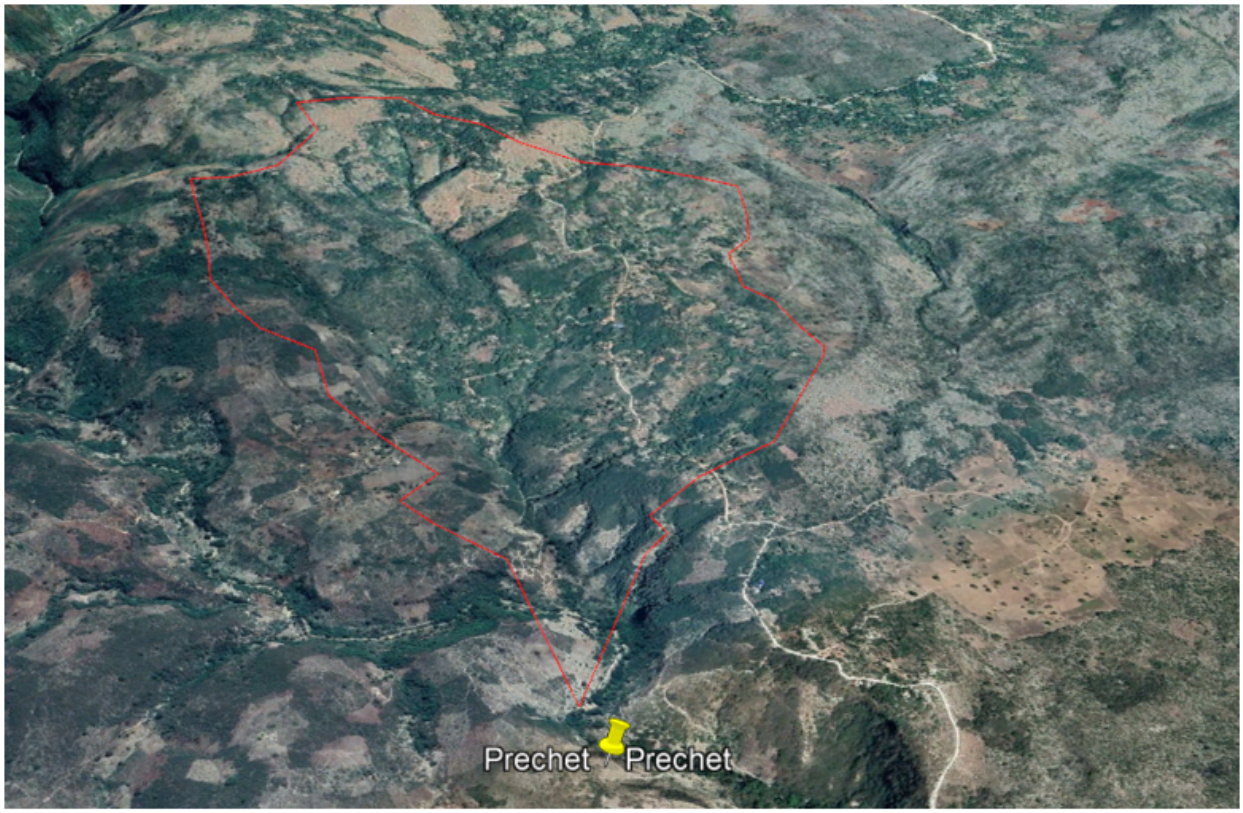

Figure 13. Recharge zone (delimited in red) of the Pr?chet SAEP source.

The Pr?chet SAEP is a gravity-fed water distribution network established in 1986, which consists of one dam with a capacity of 147 m3, and 17 water fountains ? connected through a PVC and steel pipeline of an undetermined length. A HK24 water treatment system has been installed on this distribution network but is also currently non-functional. In addition, a water distribution schedule has been established for the SAEP and is priced at a fixed rate of US$1.24 per month. This SAEP is managed by a CAEPA but its effectiveness is constrained by limited financial resources and as a result of the subsequent inadequate maintenance, several taps having been oxidised and become non-functional. Consequently, the communities dependent on the Pr?chet SAEP for water supply have been connected to the ?Cascade Pichon/Bel Air? network.

The K-Royer SAEP

Located within the Anse-?-Pitre watershed, the K-Royer SAEP?s source lies in the commune of Thiotte, in the 1st section of Colombier. The K-Royer SAEP supplies water to ~10,000 people and is the main water source for the city centre of Thiotte. It also supplies water to the neighbouring

communes of Anse-?-Pitre, Grand-Gosier and Fond-Verrettes (West), Marie Madeleine, Ka Royer, Ka Lendi, Haut et Bas Dupuy, Bleck, Guimb and Roma.

According to data obtained during the site visit ? including observational data from community members and technical data ? the K-Royer water source is vulnerable to droughts. In addition, agricultural activities in the recharge zone lead to decreased water infiltration and increase the vulnerability of the water source during drought periods. The local authorities managing this SAEP have relayed to the NC that they are determined to restrict any activities that can lead to negative impacts on its water flow.

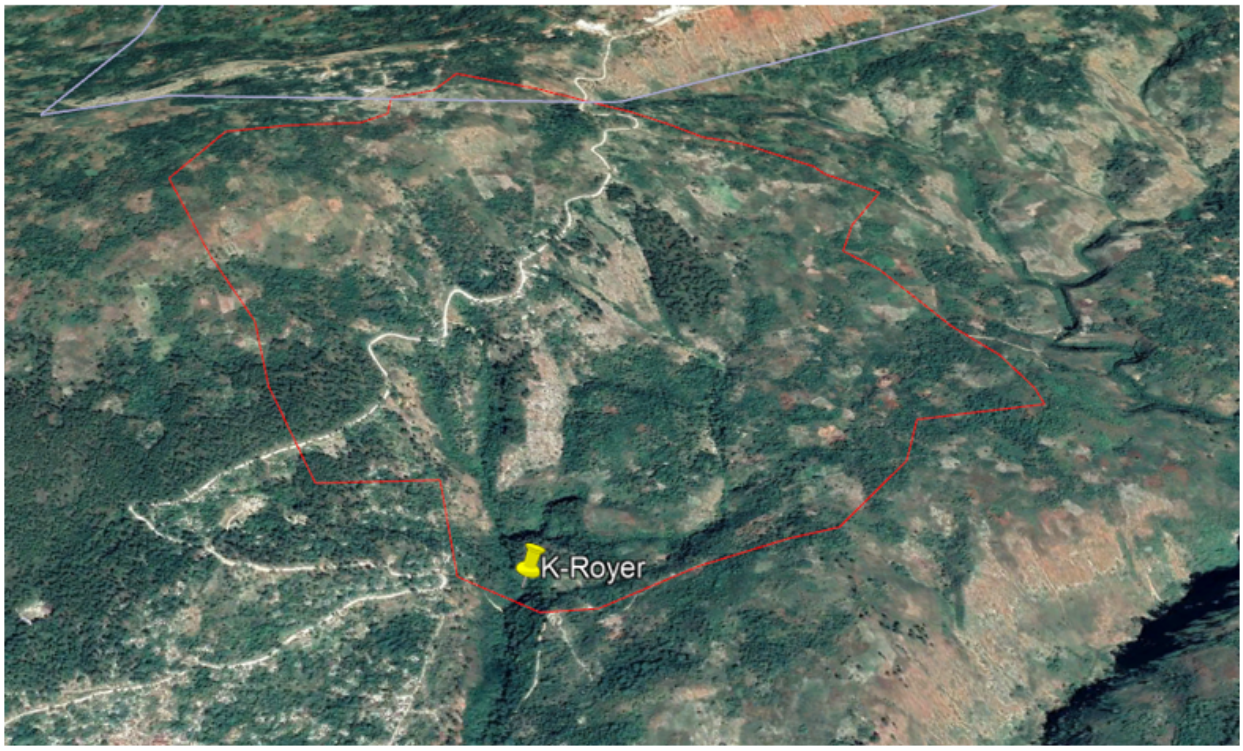

Figure 14. Recharge zone (delimited in red) of the K-Royer SAEP source .

The K-Royer water distribution network is both a pumped- and gravity-fed system ? water from the K-Royer source is first pumped into a storage tank then distributed along the network by gravity. The water flow rate of the K-Royer SAEP is estimated at 10 l/s during the dry season and ~20 l/s during the rainy season. The network consists of seven tanks with a total volume of 510 m3. Of these seven, two tanks supply the town of Thiotte ? one with a capacity of 120 m3 and a second, which is currently under construction, with a capacity of 70 m3. The other communities are supplied by the remaining five tanks, with capacities of 100 m3, 80 m3, 60 m3, 40 m3, and 40 m3, respectively. The network also consists of 11 kiosks, four water fountains, 72 individual connections with a 12,000 m distribution

pipeline, and a HK24 water treatment system. The K-Royer SAEP is managed and operated by a CAEPA, and a water pricing system has been established at a fixed monthly fee of US$3,08 for the individual connections, and US$0,07 per 19 litres for water from the kiosks.

A 24-month (2019?2021) project implemented by ACTED[3] aims to reinforce water management and drinking water access in Thiotte by rehabilitating the city?s drinking water supply system ? specifically by targeting the K-Royer SAEP ? and raising public awareness about water management. The interventions include the construction of a new storage tank with a capacity of 120 m3. According to the engineer leading the project, the water flow within the distribution network after the rehabilitation interventions have been completed will be sufficient to supply the local communities? water demand for the next 20 years, at an estimated 921 m3 per day.

Bodarie SAEP

The Bodarie SAEP was established in 1986 and is located in the commune of Grand-Gosier, which also lies in the Belle-Anse watershed. This source supplies ~15,000 people from several communities, including Bodarie, Oranger, Mare-Joffrey and Bois Chad?que. The SAEP also used to supply the Grand-Gosier city centre, however given minimal maintenance of the network[4] and gradual decreases in the water flow, water from the network no longer reaches the city centre. While its exact flow rate is yet to be determined, based on observational data, the Bodarie SAEP?s water source is considerably vulnerable to drought periods, with two recent drought events ? in 2010 and 2015 ? resulting in the source completely drying up. During these drought periods, household members ? especially the women ? travelled long distances to Thiotte (K-Royer SAEP) and to Pichon (Cascade Pichon SAEP) in search of water. The vulnerability of the Bodarie source is exacerbated by deforestation in the recharge zone, specifically for coal production and expansion of agricultural activities.

Figure 15. Recharge zone (delimited in red) of the Bodarie SAEP source .

The Bodarie water distribution network is fed using a solar-powered pump and consists of six storage tanks with a total capacity of 260 m3. The respective capacities of the tanks are 110 m3, 50 m3, 40 m3, 30 m3, 15 m3, and 7 m3. The network also consists of 13 kiosks, 46 individual connections, and PVC piping of a total length of 10,335 m. The Bodarie SAEP is managed by a CAEPA and a water pricing system has been established at a fixed monthly fee of US$1,23. Given to the considerable levels of pollution resulting from the use of fertilisers and pesticides in farming activities along the water catchment area, a HK24 water treatment level has been installed but only water from the 110 m3storage tank is currently being treated.

Restoration of the area in which the Bodarie SAEP is located is currently being facilitated by two projects financed by the World Bank. The first project involves the environmental restoration and protection of 28 ha of the Bodarie SAEP source?s recharge zone. The second project involves the rehabilitation of the Bodarie network by Soci?t? Carib?enne de Production (SOCAP). During the NC?s field missions, members of the Bodarie community relayed to the NC that an area of 28 ha was not substantial enough for the adequate restoration and protection of the recharge zone. The community also remarked on SOCAP?s inadequate repair interventions in the Bodarie network. For example, it was reported that solving the problem of broken pipes required replacing them, instead of gluing them together.

[1] Including representatives from the Ministry of Environment (MoE), Ministry of Agriculture, Natural Resources and Rural Development (MARNDR), National Directorate for Drinking Water and Sanitation (DINEPA) and Regional Office for Drinking Water and Sanitation (OREPA-Sud).

[2] Including population, land area, number of households, water resources (including distribution infrastructure), vulnerability to climate change and risk of erosion.

[3] ACTED. Reinforcing Water Management and Access to Drinking Water in Thiotte South East Departement. Available at: https://www.acted.org/en/projects/reinforcing-water-management-and-access-to-drinking-water-in-thiotte-south-east-department/

[4] SAEP Bodarie was established in 1986, which highlights the need for regular maintenance of the network.

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

N/A

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Civil Society Organizations Yes

Indigenous Peoples and Local Communities Yes

Private Sector Entities Yes

If none of the above, please explain why:

Please provide the Stakeholder Engagement Plan or equivalent assessment.

Please see the full Stakeholder Engagement Plan uploaded to GEF Portal (annex 8 to the Project Document). This can also be accessed directly via this link: https://gefportal.worldbank.org/api/spapi/LoadDocument?fileName=https%3A%2F%2Fworldbankgroup.sharepoint.com%2Fsites%2Fgefportal%2FGEFDocuments%2Fd70f7ede-b6ae-e911-a840-000d3a375888%2Fceoendorsement%2FOthers_Annex%208Haiti%20PPG%20GEFUNDPStakeholder%20Engagement%20Plan2%20Sep%202021.docx

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated,

and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

Stakeholder engagement undertaken during project development

Stakeholder engagement during the project preparation phase was facilitated by a series of meetings and field visits which occurred between December 2020 and February 2021. These meetings were convened with the relevant technical stakeholders from the Government of Haiti (GoH) ? specifically from the Ministry of Environment (MoE) ? from 7?12 December 2020 to pre-select potential target sites for the proposed project. Based on the extent of land degradation around watersheds observed during preliminary field visits, it was decided during these meetings that individual water sources (including their respective recharge zones) and drinking water supply systems (SAEPs) should be regarded as the strategic targets for selecting project intervention sites, rather than a single watershed. The objective of the fields visits ? which were later conducted between January and February 2021 ? was to assess and collect data on the 10 pre-selected water sources. Specifically, the data collected comprised, inter alia: i) socioeconomic contexts of the communes and communal sections served by the proposed SAEPs, as well as the gender dynamics of the communities; ii) vulnerability to climate change impacts; iii) exposure to pollution; iv) distribution network infrastructure and treatment systems; v) importance of water sources with regards to the ecosystems in which they are situated as well as socioeconomic productivity; and vi) governance structures of water distribution networks. To ensure that appropriate and required data was collected, the field visits were underpinned by extensive bilateral meetings and focus group discussions with several stakeholders. These stakeholders included: i) local communities and community-based organisations (CBOs); ii) non-governmental and civil society organisations (NGOs and CSOs); iii) gender-based organisations; iv) municipal officials; and v) regional government officials.

Stakeholder engagement during project implementation

Continuous engagement with stakeholders ? particularly community beneficiaries and the public sector ? will be maintained during the project implementation phase, primarily in the form of capacity building, awareness raising and information sharing, as well as institutional strengthening. This SEP will ensure consistent and ongoing engagement with key stakeholders to: i) facilitate information sharing and awareness raising regarding climate change adaptation (CCA) interventions; ii) establish community ownership of project interventions; iii) promote gender equality and the empowerment of marginalised groups including the youth and people with disabilities; and iv) enhance complementarity with other ongoing initiatives.

Extensive engagement with local communities ? the primary beneficiaries of the proposed project ? will be conducted to ensure all relevant outputs are informed by their needs and to their benefit. First, vulnerability assessments will be conducted using a community-level participatory approach (Output 1.2.2) to facilitate the inclusion of the communities? understanding and awareness of their vulnerability to climate change impacts. This will be enabled by convening and conducting gender-responsive consultative workshops and surveys, respectively, to document the communities? observed environmental, economic and social changes over time. Second, community-level decision-making groups ? comprising beneficiary communities of each targeted SAEP ? will be developed and serve to align the project with community expectations and interests, as well as facilitate continued engagement and participation of community members in project activities as necessary. These groups will uphold the role of community representatives, including by participating in the multi-stakeholder forums (MSFs, Output 2.3.3) to ensure that targeted beneficiaries are adequately represented on discourses which would affect them. They will also support the development of strategic and operations plans (Output 2.3.1) to enable community-based water resource management for enhancing community climate resilience. In addition, communities will be involved in developing community-level land-use plans of their targeted landscapes to enable effective management of important drainage basins and

recharge zones, as well as reduce extreme degradation of these landscapes (Output 2.3.2). Third, extensive community consultation will be conducted to establish an appropriate community-based ?Cash4Work? mechanism for the reforestation of degraded areas, as well as to identify ?agroforestry farmer champions? within these local communities to establish and adopt agroforestry systems ? which will be underpinned by continuous engagement and support from the MoE and MARNDR extension officers (Output 3.1.1). A ?willingness-to-pay? assessment will also be conducted with community members to develop a suitable and sustainable framework for financial plans for the operations and management (O&M) of SAEPs to improve the efficiency of water use, as well as distribution for the beneficiary communities ? and will be accompanied by awareness-raising campaigns and advocacy programmes (Output 3.1.4). Finally, community members will be engaged in training programmes and awareness-raising campaigns on ecosystem-based adaptation (EbA, Output 2.3.2) and efficient water-use practices (Output 3.1.4), respectively, to build their resilience to climate change and the associated impacts on water resources. In turn, this will be supported by the information and knowledge-generation system implemented under Output 1.1.2.

To complement the extensive engagement with local communities, the implementation of the project will also be undertaken through direct and ongoing engagement with CSOs and NGOs. These stakeholders provide implementation support of activities in several local communities and are involved in varying areas of intervention, inter alia : i) water and sanitation services, including water resources management ; ii) reforestation; iii) water governance ; iv) conservation of natural resources ; and v) disaster risk reduction and management. During project implementation, CSOs and NGOs will be directly involved through inter alia promoting community participation in project activities, research assistance, coordination and representation of local communities, and networking and coordination with other CSOs and NGOs to best achieve the desired outcomes of the project[1], [2]. CSOs and NGOs will also contribute to advocating principles of social justice and equity within the project implementation, and will be encouraged to engage with other similar organisations contributing to the project. Moreover, CSOs and NGOs will be active participants in project implementation by taking part, where necessary, in the provision of trainings and capacity building, through the provision of technical knowledge to beneficiaries, advising beneficiaries on how to take advantage of goods and services catalysed by the project, as well as planning, organisation and implementation of project activities. The participation of CSOs and NGOs during project implementation may also be extended to monitoring and evaluation of project activities.

Public sector stakeholders at the national, regional and municipal levels will also be engaged throughout several project outputs. Specifically, technical and human capacity building will be provided to officials, planners, decision-makers and climate information system units at all levels of government to, inter alia: i) adequately assess climate change risks and the impacts on water availability (Outputs 1.1.1 and 1.1.4); ii) interpret results from cost-benefit analyses as a decision-making tool (Output 1.1.3) ; iii) conduct climate change vulnerability assessments (Output 1.2.1); and iv) effectively integrate climate data into development planning and management related to water resources (Output 2.2.1). These capacity-building initiatives will support the mainstreaming of CCA into Haiti?s regulatory and institutional frameworks, while also improving technical and organisational capacities for climate-resilient water resource management.

The project will develop, implement and maintain a communications strategy ? particularly through the Project Steering Committee (PSC) and MSFs ? to ensure that all stakeholders are regularly informed on: i) the project?s objectives; ii) the project?s activities; ii) overall project progress; and iv) opportunities for involvement in different aspects of the project?s implementation. This strategy will ensure the use of communication techniques and approaches that are appropriate to the local contexts such as using appropriate languages and other skills that enhance communication effectiveness. In addition to the measures that will be implemented under each project output (Gender Action Plan Annex) to support women?s empowerment and promote gender equality, the SEP will be implemented in a gender-responsive manner to ensure equitable representation and participation of women and men

in stakeholder engagement. This will be ensured through the procurement of a Gender and Safeguards Specialist to support the Project Management Unit (PMU) and implementation of the SEP.

Select what role civil society will play in the project:

Consulted only; Yes

Member of Advisory Body; Contractor;

Co-financier;

Member of project steering committee or equivalent decision-making body;

Executor or co-executor;

Other (Please explain)

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

Please also refer to the full Gender Assessment and Action Plan uploaded to the GEF Portal (Annex 10 of Project Document) or it can also be accessed directly via this link:https://gefportal.worldbankgroup.sharepoint.com%2Fsites%2Fgefportal%2FGEFDocuments%2Fd70f7ede-b6ae-e911-a840-000d3a375888%2Fceoendorsement%2FOthers_Annex%2010Haiti%20PPG%20GEFUNDPGender%20Analysis%20%20Action%20Plan2%20Sep%202021.docx

Roles and responsibilities of women in households

In Haiti, the collection of water for household needs is predominantly the responsibility of women and girls, while men provide food. As a result, limited availability of freshwater resources affects women disproportionately, particularly because considerable time is spent travelling long distances to water sources and collecting water, which adversely affects women and girls? personal safety and health. In addition, the time available to dedicate to education, productive economic opportunities, and being in decision-making positions is reduced. Women are also the primary caregivers in their households and are responsible for cooking and caring for both children and elders, responsibilities that are dependent on water availability.

Women's access to resources

Men and women?s access to resources differs across several communities in Haiti?s South-East Department. For example, in the commune of Vall?e de Jacmel, access to resources such as land and water are the same for women as for men, but in the communes of Grand Gosier, Belle-Anse, Marigot and Anse-?-P?tres, water is more accessible to women while land is more accessible to men. Women's access to water is mostly influenced by the availability of freshwater sources and the distance required to travel to collect water. However, this often increases their vulnerability to risks associated with travelling extensive distances to reach water sources, including conflict among communities during

water-scarce periods. Regarding access to land, men often have easier access to land resources than women, as a result of cultural norms and beliefs upheld in most of the target communities. Women have more access to financing and credit resources than men, particularly because women engage in more local market trade activities, such as charcoal production, livestock and crop farming.

Women's participation and responsibilities in decision-making and management of water resources
There is minimal participation of women in decision-making positions in national and sub-national government agencies in the South-East Department. However, while women's overall participation in decision-making roles is less than men, it has been observed that this is also relatively dependent on whether there are women who uphold authoritative roles within communities. For example, there is considerable community-level participation of women in the commune of Jacmel Valley, where the mayor is a woman, whereas communes where women are not in high-ranking positions ? such as Grand Gosier and Thiotte ? women participate far less. The amendment of the Constitution of Haiti in 2012 instituted a 30% quota for women in public services, which means the appointment of at least one woman to local and municipal boards. While this obligation is often met, women are mostly appointed to low-ranking roles within these boards. This is also evident in the Water Supply and Sanitation Committees (CAEPAs), which are responsible for the management of drinking water supply in rural areas and settlements.

Potential impact of the project on women and other vulnerable groups
Considering the central role and involvement of women in drinking water supply in Haiti ? and particularly the South-East Department ? the interventions of the proposed project will positively impact women, the youth and other vulnerable groups. Increased availability of safe drinking water through improved aquifer recharge and diversified water sources (Outcome 3.1), will reduce the amount of time women and girls spend collecting water in other communities and enable more time for productive activities. The proposed project will also facilitate improved participation of women and strengthen gender-responsive climate change adaptation measures within several communities in the South-East Department ? ensuring that women and the youth?s differential vulnerability to climate change and the associated impacts on drinking water availability are considered.

Project Outcome	**Project Output**	**Gender Action**	**Indicators and Targets**	**Responsible Stakeholder**	**Timeline**
Outcome 1.1: Improved awareness raising and knowledge and information management systems for the water sector to plan and respond to the impacts of climate change.	Output 1.1.1: Assessments, with gender-specific criteria, carried out at the national level to demonstrate the implications of different climate change scenarios on the availability of water.	Conduct research analysis on gender and climate change adaptation and management in the water sector	Indicators: ? Number of relevant studies and strategies conducted with clear gender considerations Target: Gender considerations are assessed and integrated in scenarios as specific chapters / paragraphs in all relevant national policy documents and regulatory framework, studies	DINEPA, UNDP	Year 1 and Year 2

	Output 1.1.2: A continuous information- and knowledge-generation system implemented to inform communities and the GoH on water management adaptation strategies and climate-resilient water supply.	Include gender dimension in all strategies and scenarios procurement announcements and terms of references with implementing partners Mainstream gender in all subsequent energy projects	Indicator: Percentage of scenarios and strategies with gender dimension. Target: At least 80% of all scenarios and strategies.		
	Output 1.1.3: Cost-benefit analyses of different adaptation strategies developed as per the predicted climate change scenarios identified under Output 1.1.1.	Provide training and sensitization for relevant regional and national institutions targeted at addressing the gendered impacts of climate change within the water sector.	Indicators: Percentage of women and youth taking part in training programmes Number of women becoming a trainer. Target: At least 30% of people trained are women and youth At least 2 women are trainers of the different training to be provided.	Project Coordinatio n Unit	Year 1 to Year 5

	Output 1.1.4: Training programmes implemented for regional and national institutions on the extent of climate change impacts on freshwater availability ? including methodologies and application of vulnerability assessments (as developed under Output 1.2.1 below) and adaptation solutions.	Support scientific research on gender and climate change resistant water supply.	Indicators: Number of studies with clear gender considerations conducted Target: Gender aspects are assessed and integrated in all reports and documents.	DINEPA, UNDP	Year 1 and Year 2
	Output 1.1.5: Inventory and quality characterisation of groundwater aquifers in the target area carried out by OREPA Sud.	Create an inventory of all water resources within target area.	Indicator: Number of women involved in the activity. Target: At least 2 women.	DINEPA, UNDP	Year 1 and Year

	Output 1.1.6: Scientific and technical studies on the impacts of climate change and options for adaptation management in the target area conducted, informing local decision-making on climate-resilient water supply.	Science-based technical studies will be conducted to assess the suitability of the adaptation strategies identified under Output 1.1.1 to effectively build the climate resilience of the South-East Department in terms of water availability, as well as evaluate their appropriateness to the context of this department	Indicator: Number of concrete methodologies/recommendations with clear gender considerations Target: At least 2 methodologies and/or recommendations with gender considerations	DINEPA, UNDP	
Outcome 1.2: Target communities prepared to effectively plan responses to the impacts of climate change on their access to drinking water.	Output 1.2.1: Methodologies and instruments developed for community-level vulnerability assessments of drinking water supply.	Develop gender assessment methodology and tools for vulnerability assessment for water supply	Indicator: Developed gender assessment instrument and methodology Target: 100% complete by Year 1.	DINEPA, UNDP	Year 1

	Output 1.2.2: Participatory vulnerability assessments, carried out in xx target communities.	Support participatory vulnerability assessment in targeted communities.	Indicators: Percentage of women and youth consulted in the vulnerability assessment. Number of households headed by women consulted in the assessment Number of beneficiary of awerness session on climate change impacts Target: At least 20% of the community members consulted are women. At least 40% of households headed by women, are included in vulnerability assessment 150 people benefit from awareness session on climate change impacts and appropriate adaptation responses (50% female)	DINEPA, UNDP	Year 1 to year 3
	Output 1.2.3: Integrated water resource modelling conducted to demonstrate the projected long-term impacts of climate change on biodiversity, ecosystems and urban systems, as well as the relationships between these aspects and drinking water availability at the landscape level.	Conduct a comprehensive impact assessment study and modelling of climate change of climate change on biodiversity, ecosystems and urban systems, as well as the relationships between these aspects and drinking water availability at the landscape level with gender dimension.	Indicator Complete Modelling and Assessment Report. Target: 100% complete by Year 1.	DINEPA, UNDP	Year 1 and Year 2

Outcome 2.1: Key regulatory and policy instruments take into account the implications of climate change for drinking water supply and promote adaptive community-based management.	Output 2.1.1: Two regulatory instruments adjusted to account for the evolving needs and conditions resulting from climate change.	Update relevant national regulations on climate change to ensure they are gender sensitive	Indicators: ? Number of relevant regulations with clear climate change and gender considerations Target: Climate change and Gender aspects integrated into at least 2 regulatory instruments as specific paragraphs, /chapter.	DINEPA, UNDP	Year 1 to Year 4
	Output 2.1.2: Strategic plans revised by sub-national regulatory institutions to prioritise adaptation interventions based on evaluations of climate change impacts on water supply vulnerability.	Ensure adequate representation of women and young people in the committee and the development of the plans is done in an inclusive manner. The prioritisation of adaptation intervention should take into account the needs of women and young people.	Indicators: Number of women and youth aged 36 or lower Target: At least 40% of committee members are women and/or youth.	DINEPA, UNDP	Year 1 to Year 3
	Output 2.1.3: Frameworks and instruments developed and applied for planning and coordinating between national, regional, private and community organisations.	Mainstream gender in all subsequent water policies, plans and projects	Indicators: Percentage of water policies, plans and projects with gender dimensions. Target: At least 40% of all relevant water sector policies, plans and projects.	DINEPA, UNDP	Year 1 an Year 3

Outcome 2.2: Increased capacities in priority institutional stakeholders (DINEPA, OREPA, and 60 CAEPAs) with regards to the technical aspects of water resource management, territorial land-use planning, as well as management and application of information on water resources and climate change threats.	Output 2.2.1: Targeted programmes implemented to strengthen technical capacity of relevant institutions to incorporate climate change data into planning and management	Build the technical, managerial and regulatory capacity of key institutional stakeholders particularly women.	Indicators: Number of people trained. Percentage of women taking part in capacity building programmes. Number of capacity building programmes. Target: 80% of staff of key institutions. At least 30% of people trained are women. At least 2 per year.	DINEPA, UNDP	Year 1 and Year 5
	Output 2.2.2: Equipment provided to support the efficient application of technical capacity developed by training workshops	Provide relevant tools and resources for key institutions	Indicators: Percentage of tools and resources provided. Target: At least 80% of resources and equipment?s provided	DINEPA, UNDP	Year 1 to Year 5
Outcome 2.3: Target communities equipped with instruments and mechanisms that ensure the sustainable management of water resources and associated infrastructure, and specific strategies to target female-headed households.	Output 2.3.1: Community-based strategic and operational plans, with gender-specific criteria, developed to ensure the climate resilience of drinking water access	Develop a gender-sensitive strategic and operational plan for drinking water access	Indicators: Percentage of community involved in the consultation and exposed to announcement. Percentage of women consulted in the strategic and operational plan development. Percentage of female headed households consulted in the strategic and operational plan development Target: At least 80% of community members involved and exposed to strategic plan development 40% of households headed by women are consulted. At least 40% of community members consulted are women.	DINEPA, UNDP	Year 1 and Year 2

	Output 2.3.2: Consultative and consensus-based community-level engagement on land-use planning conducted, and training programmes developed, for sustainable land uses in drainage and recharge zones to ensure the climate resilience of drinking water recharge.	Conduct a participatory community water access territorial planning	Indicators: Percentage of community involved in territorial planning. Percentage of women involved in territorial planning or consulted during the process Target: At least 80% of community members involved in planning. At least 40% of the community members consulted and involved in planning are women.	DINEPA, UNDP	Year 1 to Year 3
	Output 2.3.3: Programmes applied to strengthen organisational capacities, and awareness of community-level stakeholders and organisations ? reflecting gender-specific differences and promoting the equitable management of water resources and supply infrastructure under climate change conditions.	Design and roll out capacity building programmes and awareness initiatives targeted at addressing cultural beliefs and practices associated with water access	Indicators: Number of people trained and exposed to awareness initiatives. Percentage of women involved in capacity building programmes or exposed to awareness raising initiatives. Number of capacity building programmes conducted. Target: At least 80% of staff of key stakeholders and institutions. At least 30% of women trained and exposed to initiatives. At least 2 per year.	DINEPA, UNDP	Year 1 to Year 5

Outcome 3.1 Reliable access to drinking water ensured for local communities and households as a result of the implementation of climate change adaptation measures. **US$3,379,563 (LDCF financing)**	Output 3.1.1: 4,450 ha of aquifer recharge zones rehabilitated within the five target SAEPs[1] ? of which 700 ha is restored through agroforestry	Facilitate the protection and rehabilitation of water sources and aquifer recharge zones using a gender dimension	Indicator: Percentage of water resources protected and rehabilitated with gender dimension. Number of land hectares protected. Target: At least 70% of water resources projected and rehabilitated using a gender dimension (ensuring women, young people are involved and their livelihoods are not negatively impacted . 60% of land protected.	DINEPA, UNDP	Year 2 to Year 5
	Output 3.1.2: Gabions[2], percolation tanks[3] and contour bunds[4] constructed to promote aquifer recharge and to reinforce the protection of the five target Drinking Water Supply Systems (SAEPs)	The construction of infrastructure should not negatively impact the livelihoods of women and young people.	Indicators: Number of young people and women involved in the decision-making and construction of infrastructure Target: 40% of team is composed of young people below 36 of people and / or women	DINEPA, UNDP	Year 2 to Year 5
	Output 3.1.3: Rooftop water harvesting systems and household cisterns installed in 350 households in target communities	Implement gender-sensitive water capture systems for communities	Indicator Number of systems implemented. Percentage of female headed households who benefit from structures and cisterns. Target: At least 20% of female-headed households benefit from installations.	DINEPA, UNDP	Year 2 to Year 5

	Output 3.1.4: Framework for financial plans for O&M of the five target SAEPs to improve water-use efficiency and distribution, accompanied by awareness-raising and advocacy programmes	Targeted gender specific considerations in the awareness-raising and advocacy programmes are implemented	Indicator: Number of women and young people reached Target: At least 50% of women and young people attend the awareness and advocacy activities	DINEPA, UNDP	

[1] More information on the geographical locations of these sources as well as the relevant affected communities is available in the Site Selection Annex.

[2] A gabion refers to a cage, cylinder or box filled with rocks, concrete, or sometimes sand and soil and is mostly used for temporary flood walls, silt filtration from runoff, and stabilising shorelines.

[3] A percolation tank is an artificial reservoir submerging a land area with adequate permeability, so that surface runoff is made to percolate and recharge the groundwater storage.

[4] Contour bunds involve the placement of lines of stones or soil along elevations in the landscape to capture and hold rainfall before it can become runoff.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

Yes
Closing gender gaps in access to and control over natural resources; Yes

Improving women's participation and decision making

Generating socio-economic benefits or services or women

Does the project?s results framework or logical framework include gender-sensitive indicators?

4. Private sector engagement

Elaborate on the private sector's engagement in the project, if any.

Private sector actors involved in drinking water in Haiti ? including local small and medium-sized private enterprises such as Culligan and Aquafin ? will be consulted during the development of the project as stakeholders for the project?s activities, such as water treatment. At the time of PPG, private

sector actors play no major role as financier in the project. During stakeholder engagements at the implementation phase, there will be scope for further interested actors from the private sector to join implementation and play a financial role.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

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Identified risk and consequence	**Risk Category**	**Risk rating (L/M/S/H), including impact and probability (I and P, rated 1?5)**[1]	**Proposed mitigation measures**
Civil unrest and general safety conditions could impede project implementation.	**Political**	I = 4 P= 3 High	The risk is not under the project control. One of the key measures to address the risk is postponing and stopping all project activities in the project area if the security situation deteriorates.

Insufficient institutional buy-in and coordination in relation to information management and the design and implementation of adaptation strategies	**Social**	I = 2 P = 3 Moderate	Local stakeholder engagement during the PPG phase includes the identification of project ?champions?, ideally within regional government(s) capable of lobbying for coordination and buy-in among entities of central government. The project will build up existing institutionalised environmental information databases managed by ONQEV and SNRE to implement a continuous information and knowledge-generation system (Output 1.1.3). This system will support coordinated water governance and related decision-making. The adaptation strategies identified under Output 1.1.1 will undergo a cost-benefit analysis (Output 1.1.2) and in addition to an appraisal by technical and scientific studies to ensure that the strategies are both locally appropriate and feasible within Haiti?s context. In addition to strengthening institutional capacities, the project will also facilitate improved planning and coordination between national, regional and local government institutions involved in the management of water and other natural resources to ensure adaptation interventions are optimised.

Financial unsustainability of water resilience measures as a result of inadequate buy-in of local community members to water charging systems	**Social**	I = 4 P = 4 High	The implementation of activities related to improving the sustainability of water supply will involve a participatory design of water tariff systems, including prior awareness raising of the costs of resilience measures, the implications of not implementing such systems, and the relative costs of the alternatives (such as the purchase of water from tanker trucks).
Low survival rates of trees established around water sources and recharge zones	**Social**	I = 3 P = 2 Low	The reforestation and agroforestry interventions to be established under the proposed project will involve the use of reforestation and agroforestry technical packages, which include detailed information on and climate-resilient plant and crop species. The proposed project will also utilise farmers? and communities? knowledge on appropriate plant species to use for these forests.

The potential outcomes of the project may be sensitive or vulnerable to potential impacts of climate change, especially those associated with increase in rainfall.	**Environmental**	I = 3 P = 2 Moderate	Activities during the PPG phase include a thorough inventory of potential site-specific hazards, including information provided by local communities and climate experts. Project implementation activities will be timed to not coincide with periods of the year when extreme weather events are more prevalent. Provision will be made in workplans and budgets to allow for weather-related interruptions to ensure that the project remains on schedule. Project interventions are designed to address the impacts of future climate change and to be resilient to climate change hazards themselves.

The proposed project could potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services.	**Environmental**	I = 3 P = 2 Low	Before the implementation of reforestation and agroforestry interventions, thorough inventories and scientific studies will be conducted in the project?s target sites. The results of these inventories, combined with the reforestation and agroforestry packages will limit the risk of environmental damage caused by this project. For instance, the reforestation technical packages will stipulate that these interventions can only be done with species indigenous to the region.
The proposed project could potentially limit women?s ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services.	**Social**	I = 3 P = 2 Moderate	The Project SES Officer (see Annex 8) will be responsible for the adequate implementation of the Gender Action Plan (GAP) during project activities.
Potential unlawful and unfair treatment of workers contracted under the Cash4Work programme for reforestation activities.	**Social**	I =4 P = 3 High	The Project SES Officer (see Annex 8) will be responsible for the adequate implementation of the SESP and the ESMF during the relevant project activities.
The resurgence of new variants of COVID-19, impacts the implementation of project activities	**Sanitary**	I = 2 P = 3 Moderate	Workshops, trainings and meetings will be held virtually or in a mixed format. For activities that require bringing people together, COVID-19 protective materials will be used and physical distance will be respected.

[1] The risk rating levels include Low, Moderate, Substantial or High (L/M/S/H) and are identified from a Risk Matrix that uses risk impact and probability, rated from 1 (Negligible) to 5 (Extreme).

[1] The risk rating levels include Low, Moderate, Substantial or High (L/M/S/H) and are identified from a Risk Matrix that uses risk impact and probability, rated from 1 (Negligible) to 5 (Extreme).

6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

Roles and responsibilities of the project?s governance mechanism

The project will be implemented following the **non-governmental organization Implementation** according to the Standard Basic Assistance Agreement (SBAA) signed between UNDP and the Government of Haiti on June 28, 1973.

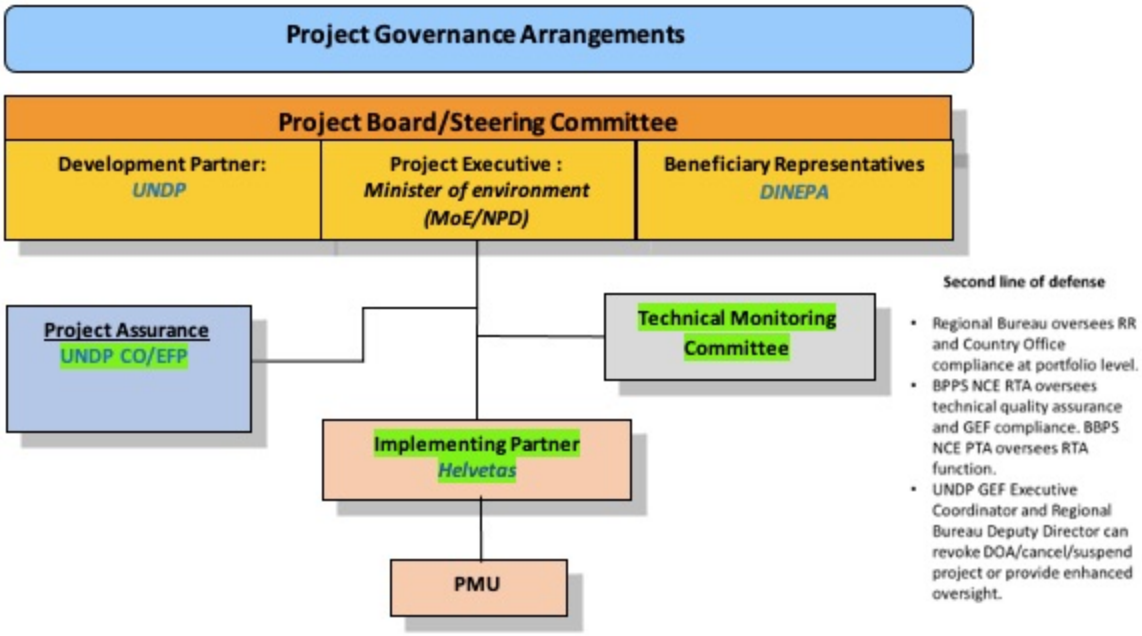
Implementing Partner: The Implementing Partner for this project is Helvetas by delegation of the Ministry of Environment in Haiti.

The Implementing Partner is the entity to which the UNDP Administrator has entrusted the implementation of UNDP assistance specified in this signed project document along with the assumption of full responsibility and accountability for the effective use of UNDP resources and the delivery of outputs, as set forth in this document.

The Implementing Partner is responsible for executing this project. Specific tasks include:

•Project planning, coordination, management, monitoring, evaluation and reporting. This includes providing all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes and is aligned with national systems, for the data used and generated by the project to support national systems.
•Risk management as outlined in this Project Document;
•Procurement of goods and services, including human resources;
•Financial management, including overseeing financial expenditures against project budgets;
•Approving and signing the multiyear workplan;
•Approving and signing the combined delivery report at the end of the year; and,
•Signing the financial report or the funding authorisation and certificate of expenditures.

Responsible Parties: *N/*



Project stakeholders and target groups

Table 5. Project stakeholders and target groups.

Stakeholder	Stakeholder interests	Engagement during project implementation
Government of Haiti (GoH) and parastatals		
Ministry of Environment (MoE)	? Sustainable development ? Environmental conservation	This stakeholder group will support project implementation and provide co-financing to the project. MoE and DINEPA have signed a cooperation protocol for the development of the project. They will mainstream climate change adaptation and sustainable water management principles into their policies and strategies and benefit from capacity development under the project.
National Directorate of Water Supply and Sanitation (DINEPA)	? Drinking water and sanitation	
Ministry of Agriculture, Natural Resources and Rural Development (MARNDR)	? Agriculture, renewable resources, livestock	These stakeholders will support the implementation of several outputs in the proposed project, as well as provide technical capacity on relevant outputs, based on the mandates and responsibilities of each stakeholder.

Ministry of Planning and External Cooperation (MPCE)	? Socioeconomic development at the national and local levels ? Decentralised, participatory and partnership mechanisms for local development and regional planning	
Inter-ministerial Committee for Regional Development (CIAT)	? Land-use planning ? Protection and management of watersheds ? Water management and sanitation	
Ministry of Women?s Conditions and Rights of Haiti	? Women?s rights and gender equality ? Improving women and children?s living conditions	
Ministry of Public Works, Transportation and Communication (MTPTC)	? Public physical infrastructure, including urban and rural amenities, as well as drinking water supply systems	
National Observatory for Environment Quality and Vulnerability (ONQEV)	? Environmental monitoring ? Aquifers ? Protected areas and areas at risk	

National Centre for Geospatial Information (CNIGS)	? Geographical information systems technology and services ? Repository for the geospatial data of the country ? Hydrological and meteorological data	
National Service for Water Resource (SNRE)	? Water resources data management	
Regional Office for Drinking Water and Sanitation (OREPA) Sud	? Decentralised entitiy of DINEPA ? Water supply services in urban areas and for the administration of systems in rural areas	
South-East Departmental Directorate of Agriculture (DDA-SE)	? Decentralised entity of MARNDR	
South-East Departmental Directorate of Environment (DDE-SE)	? Decentralised entity of MoE	
Drinking Water Supply and Sanitation Committees (CAEPAs)	? Drinking water supply systems in rural areas, as well as in some small towns and marginal urban neighbourhoods	This stakeholder group will support project implementation, including mainstreaming climate change adaptation and sustainable water management principles into their policies and strategies. These stakeholders will also benefit from capacity development under the project.
Technical Operating Centres (CTEs)		
Municipal agricultural office (BAC)		

Communal Section Administrative Council (CASEC)		
Communal Section Assembly (ASEC)		
Local communities		
Beneficiary communities of targeted SAEPs (including community-based organisations, CBOs)	? Principal water users ? Living and conducting livelihood practices within targeted watersheds and catchment areas	Local communities and local community-based water management organisations are the direct beneficiaries of the project. Buy-in from this stakeholder group into the project interventions is necessary, as without their support and participation, the interventions will not be successful. They will benefit from awareness-raising campaigns, capacity-building programmes and interventions for improved drinking water access, such as community plans for the sustainable management of drinking water, reforestation around aquifer recharge zones, the installation of rooftop rainwater capture systems and domestic cisterns.
Farmers and farmers? associations (both subsistence and commercial)		
Civil society and non-governmental organisations, including women?s rights and gender equality organisations		
Fanm Deside	? Improving living conditions of women and children ? Gender equality and women empowerment ? Environmental protection ? Agricultural development	These agencies are already supporting and implementing related activities at some project sites. They have the potential to provide general partnership support to project implementation, as well as sharing experiences, best practices and lessons learned for related interventions in the project area. The gender-based organisations will ensure the equitable participation and representation of women and the youth in activities implemented in the targeted communities, as well as equitable benefits from these activities. In addition, these stakeholders will ensure that gender dynamics are considered in activities that are implemented.
Asosyasyon Fanm Vanyan Pichon (AFVP)		
Tuff Women's Volunteer Association (AFVT)		
Movement of Women's Organizations for the Advancement of Belle-Anse (MOFAB)		
LEOS Foundation	? Ecosystem restoration ? Protection of water distribution networks	

CROSE	? Soil and water conservation ? Environmental awareness and education	
HELVETAS	? Drinking water ? Water governance ? Natural resource conservation	
Red Cross	? Drinking water and sanitation ? Environmental protection	
Multilateral and bilateral development organisations		
UN agencies	? Natural resource conservation ? Ecosystem restoration ? Agricultural production ? Community development ? Disaster and risk management	These stakeholders, specifically UNDP, will provide co-finance, guide the project and ensure it is implemented effectively. By collaborating with these stakeholders, both their initiatives and the project will benefit from best international knowledge and practices through knowledge sharing.
Interamerican Development Bank (IDB)		
Spanish Agency for International Development Cooperation (AECID)		
Deutsche Gesellschaft f?r Internationale Zusammenarbeit (GIZ)		
Food and Agriculture Organisation (FAO)		

UNDP is accountable to the GEF for the implementation of this project. This includes oversight of project execution to ensure that the project is being carried out in accordance with agreed standards and provisions. UNDP is responsible for delivering GEF project cycle management services comprising project approval and start-up, project supervision and oversight, and project completion and evaluation. UNDP is also responsible for the Project Assurance role of the Project Board/Steering Committee. The project organisation structure is indicated in Figure 16 below.

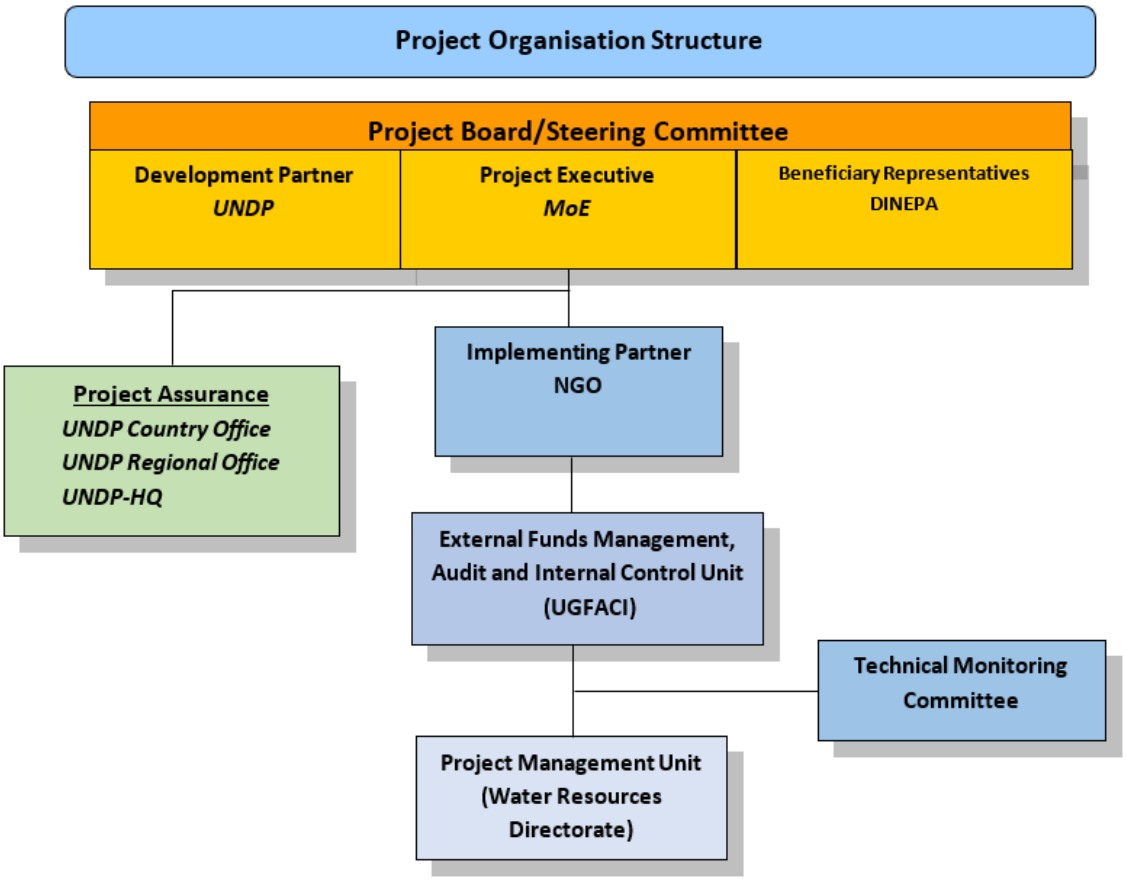


Figure 16. Project organisation structure.

The Project Board (also called Project Steering Committee) is responsible for taking corrective action as needed to ensure the project achieves the desired results. To secure UNDP?s ultimate accountability, Project Board decisions should be made in accordance with standards that ensure management for development results, best value money, fairness, integrity, transparency and effective international competition. In case consensus cannot be reached within the Board, the UNDP Resident Representative (or their designate) will mediate to find consensus and, if this cannot be found, will take the final decision to ensure project implementation is not unduly delayed.

Specific responsibilities of the Project Board include:

? Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
? Address project matters as raised by the project manager;
? Provide guidance on new project risks, and agree on possible mitigation and management actions to address specific risks;
? Agree on the project manager?s tolerances as required, within the parameters set by UNDP-GEF, and provide direction and advice for exceptional situations when the project manager?s tolerances are exceeded;

? Advise on major and minor amendments to the project within the parameters set by UNDP-GEF;
? Ensure coordination between several donor and government-funded projects and programmes;
? Ensure coordination with different government agencies and their participation in project activities;
? Track and monitor co-financing for this project;
? Review the project progress, assess performance, and appraise the Annual Work Plan for the following year;
? Appraise the annual project implementation report, including the quality assessment rating report;
? Ensure commitment of human resources to support project implementation, arbitrating any concerns within the project;
? Review combined delivery reports prior to certification by the implementing partner;
? Provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans;
? Address project-level grievances;
? Approve the project Inception Report, Mid-term Review and Terminal Evaluation reports and corresponding management responses;
? Review the final project report package during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.
? Ensure highest levels of transparency and take all measures to avoid any real or perceived conflicts of interest.

The composition of the Project Board must include the following roles:

i. *Project Executive*: An individual who represents ownership of the project and chairs the Project Board. The Executive is normally the national counterpart for nationally implemented projects. The Project Executive is: The Mininstry of Environment (MoE).

ii. *Beneficiary Representative(s):* Individuals or groups representing the interests of those who will ultimately benefit from the project. Their primary function within the board is to ensure the realisation of project results from the perspective of project beneficiaries. Often civil society representative(s) can fulfil this role. The Beneficiary representative (s) is/are: The Directorate for Drinking Water and Sanitation?s (DINEPA).

iii. *Development Partner(s):* Individuals or groups representing the interests of the parties concerned that provide funding and/or technical expertise to the project. The Development Partner(s) is UNDP represented by Fernando Hiraldo, UNDP-Haiti Resident Representative.

iv. *Project Assurance:* UNDP performs the quality assurance and supports the Project Board and Project Management Unit by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed, and conflict of interest issues are monitored and addressed. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. UNDP provides a three-tier oversight services involving the UNDP Country Offices and UNDP at regional and headquarters levels. Project assurance is entirely independent of project execution.

The Project Management Unit (PMU) is composed of a Project Manager, Project Assistants and Project Technical Consultants. The PMU will be recruited by MoE in coordination with UNDP. The PMU has the responsibility to run the project on a day-to-day basis on behalf of the MoE within the constraints laid

down by the Steering Committee. The PMU members will be selected through competitive selection procedure and will be different from the MoE?s representative in the Steering Committee.

The PMU will ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The PMU will inform the Steering Committee and in particular the UNDP in its Project Assurance role of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted. The Project Manager will remain on contract until the Terminal Evaluation report and the corresponding management response have been finalized and the required tasks for operational closure and transfer of assets are fully completed.

Specific responsibilities include[1]:

? Manage the overall conduct of the project.
? Plan the activities of the project and monitor progress against the approved workplan.
? Execute activities by managing personnel, goods and services, training and low-value grants, including drafting terms of reference and work specifications, and overseeing all contractors? work.
? Monitor events as determined in the project monitoring plan and update the plan as required.
? Provide support for completion of assessments required by UNDP, spot checks and audits.
? Manage requests for the provision of UNDP financial resources through funding advances, direct payments or reimbursement using the FACE form.
? Monitor financial resources and accounting to ensure the accuracy and reliability of financial reports.
? Monitor progress watch for plan deviations and make course corrections when needed within Project Steering Committee/Project Board-agreed tolerances to achieve results.
? Ensure that changes are controlled, and problems addressed.
? Perform regular progress reporting to the Steering Committee as agreed with it, including measures to address challenges and opportunities.
? Prepare and submit financial reports to UNDP on a quarterly basis.
? Manage and monitor the project risks ? including social and environmental risks ? initially identified and submit new risks to the Steering Committee for consideration and decision on possible actions if required; update the status of these risks by maintaining the project risks log;
? Capture lessons learned during project implementation.
? Prepare revisions to the multi-year workplan, as needed, as well as annual and quarterly plans if required.
? Prepare the inception report no later than one month after the inception workshop.
? Ensure that the indicators included in the project results framework are monitored annually in advance of the GEF PIR submission deadline so that progress can be reported in the GEF PIR.
? Prepare the GEF PIR;
? Assess major and minor amendments to the project within the parameters set by UNDP-NCE;
? Monitor implementation plans including the gender action plan, stakeholder engagement plan, and any environmental and social management plans;
? Monitor and track progress against the GEF Core indicators.
? Support the Mid-Term and Terminal Evaluation processes.

Project extensions: The UNDP Resident Representative and the UNDP-GEF Executive Coordinator must approve all project extension requests. Note that all extensions incur costs and the GEF project budget cannot be increased. A single extension may be granted on an exceptional basis and only if the following conditions are met: one extension only for a project for a maximum of six months; the project management costs during the extension period must remain within the originally approved amount, and any increase in PMC costs will be covered by non-GEF resources; the UNDP Country Office oversight costs in excess of the CO?s Agency fee specified in the DoA during the extension period must be covered by non-GEF resources.

[1] More detail on the respective responsibilities of each of the members of the PMU is presented in Annex 8 (Overview of Project Staff and Technical Consultancies)

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assesments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

Instrument	Summary
National Policy to Combat Climate Change (PNCC) **(2019)**	The main objective of Haiti?s PNCC is to contribute to the wellbeing of the population through an economic development process that is: i) inclusive; ii) climate resilient; and iii) focussed on using renewable energy sources available in the country. Specific objectives of this policy are to: ? considerably reduce climate change-related damages to the country?s strategic sectors; ? reduce or avoid at least 5% of GHG emissions in the energy and AFOLU (Agriculture, Forestry and other land use) sectors; ? build the capacity of public and private sector stakeholders for climate change mitigation; ? integrate climate change considerations into national, regional and local development planning and budgeting; ? create an enabling environment for wealth creation and economic activities? diversification to increase Haiti?s GDP compared to a business-as-usual scenario; ? enable financial mobilisation to adapt to climate change; and ? promote more coordination between institutions.
National Adaptation Plan of Action (NAPA)[1],[2] **(2006; 2017)**	Haiti?s NAPA was developed in 2006 ? and revised in 2017 ? to determine the country?s most climate-vulnerable sectors and inform the prioritisation of adaptation solutions in the country. Based on the 2006 NAPA, a number of adaptation priorities were identified, including: i) watershed management and soil; ii) coastal zones management; iii) promotion and preservation of natural resources; iv) improvement of food security; v) protection and conservation of water resources; vi) construction and rehabilitation of infrastructure; vii) improvement of waste management; and viii) increasing awareness of climate change through education. The revised NAPA identified four priority sectors for addressing the impacts of climate change ? namely soils, agriculture, coastal zones and water resources. These sectors were focussed on because they were identified as the most vulnerable to the impacts of climate change such as flooding, hurricanes and tropical storms. Addressing these adverse impacts will contribute considerably to climate-resilient sustainable development in Haiti.

Nationally Determined Contribution (NDC)[3] **(2015)**	Despite being one of the lowest emitters of greenhouse gases (GHGs) globally, Haiti has committed to reducing their GHG emissions by 31% by 2030, compared to a business-as-usual scenario. To complement the mitigation activities in Haiti, four key adaptation priorities were identified in the country?s NDC, namely: i) promoting integrated water resource and watershed management; ii) integrated coastal zone management and infrastructure rehabilitation; iii) preserving and strengthening food security; and iv) information dissemination, education and awareness raising. The NDC focusses on enhancing the resilience and management of 15 watersheds that are most vulnerable to extreme climate events, in alignment with regional plans, as well as afforestation and/or reforestation of 130,000 ha.
First and Second National Communications on Climate Change[4],[5] **(2001; 2013)**	Haiti?s Initial and Second National Communications (INC and SNC) to the UNFCCC highlights priority areas to address the impacts of climate change in Haiti. These priority areas include: i) implementing climate-resilient solutions to reduce the vulnerability of communities, as well as major economic sectors ? such as agriculture ? to climate change-induced flooding; ii) promoting the adoption of integrated land and water resources management; and iii) strengthening cohesion between existing and planned integrated resource management initiatives to ensure best practices are applied to the development of climate change projects and programmes.
Strategic Development Plan of Haiti (PSDH)[6],[7] **(2012)**	The PSDH provides a long-term development and economic reconstruction plan for the country after the 2010 destructive earthquake. The PSDH is based on four main pillars, namely: i) territorial (relating to land-use); ii) economic; iii) social; and iv) institutional refoundation. The proposed project aligns specifically to the territorial refoundation project pillar. The relevant programmes under territorial refoundation include the following: ? The environmental programme. This programme prioritises: i) mainstreaming climate change considerations into planning and awareness-raising initiatives at the national and local level; ii) establishing a network of protected areas; iii) restoring degraded ecosystems; and iv) ensuring sustainable management and use of forests. ? The watershed programme. This programme prioritises: i) protecting watersheds by using reforestation plans based on agro-ecological zoning; ii) constructing flood regulation structures; and iii) reducing the vulnerability of both the environment and Haitian communities to storms.
Framework Law on Water Supply **(2009)**	The Framework Law on Water Supply was enacted to address limited accessibility to improved water sources and sanitation experienced by the Haitian population. It assigns the authority of water and sanitation services in Haiti to DINEPA, with specific responsibilities, inter alia: i) developing policies; ii) design pricing schemes; and iii) establishing water quality standards. While the framework intends to address Haiti?s developmental challenges related to the improved provision of water and sanitation services, it does not commit adequate funding sources to achieve this objective. In addition, it does not commit to building institutional capacity for the effective implementation of the framework.

Presidential Decree on Environmental Management[8] **(2006)**	Haiti?s Presidential Decree on Environmental Management was established in 2006 to outline the roles and responsibilities of numerous stakeholders in Haiti?s environmental management. Through this decree, authority over forest management and water resources was transferred from the MARNDR to the MoE, further outlining MoE?s environmental management responsibility. However, the decree does not provide a commitment for building the financial and human capacity of MoE to fulfil its mandate.
Decentralisation Decree **(2006)**	Part of the Presidential Decree on Environmental Management, the Decentralisation Decree aims to empower local governments, delegating them with the authority to address specific environmental matters. The decree specifies that it is the duty of sections, communes, and departments to enforce logging prohibitions, protect watercourses, control pollution, and regulate livestock farming. Communes are responsible for elaborating resource management plans and building dams and reservoirs, while departments are responsible for monitoring facilities, verifying impact studies and establishing protected areas. Despite the decree?s focuss on empowering local government structures, it does not provide commitments for human and financial resources to facilitate this. Moreover, it does not include plans to build the capacities of local government structures to effectively fulfil their responsibilities.
National Action Plan for Integrated Management of Watersheds and Coastal Areas[9] **(2001)**	The Action Plan was established in 2001 to develop and implement initiatives to restore degraded watersheds and coastal areas. Representatives from MoE and MARNDR were engaged as stakeholders to develop the following four strategic focus areas of this plan: ? the restoration of coastal ecosystems and associated watersheds; ? the creation of a new institutional and legal framework to address the integrated management of watersheds and coastal areas; ? a reduction of communities? vulnerability to natural disasters; and ? the establishment of transboundary cooperation on the integrated management of watersheds and coastal areas with the Dominican Republic.
National Watershed Policy **(2000)**	This policy focusses on building resilience through participatory planning. However, many of the planned actions have not yet been implemented, resulting in the plan being outdated. MARNDR acknowledges that over the past 20 years the watershed approach in Haiti has evolved towards a participatory and integrated planning in local development framework. In addition, MARNDR recognises that Haiti?s ongoing decentralisation process resulted in the transfer of responsibilities to local governments, which has increased the importance of local governance to watershed management. This requires collectives to develop micro-watershed plans that are integrated into higher-level plans, creating a bottom-up governance structure ? however the human and financial resources committed in the policy were not made available to all collectives as anticipated. The policy also extended the authority of water resource management to MARNDR, despite the cross-sectoral nature of watershed management.

National Environmental Action Plan (PNAE) [10] **(1999)**	Haiti?s PNAE was established to guide the country?s environmental management for the period 2000?2015, addressing environmental concerns related to development. It continues to be the main government document specifying programmes and guidelines for the management of the environment, with no updates since its release. The PNAE calls for several implementing strategies, including land-use plans, watershed management plans, and the promotion of conservation agriculture to address poverty, unmanaged exploitation of natural resources and desertification, ultimately contributing to sustainable economic development. The management of strategic watersheds is a Priority Program of the PNAE. The plan included the restoration of the ecological equilibrium of watersheds by establishing norms for exploitation and management of strategic watersheds. The objectives of the PNAE are to: strengthen and rationalise the management of the environment; restore the ecological equilibrium of watersheds through the implementation of norms for exploitation and best practice; improve quality of life through improved management of urban and rural zones, as well as the valuation of the conservation of natural and cultural heritage; and provide a framework for improving coherence between plans and programmes in the environmental sector. While the action plan provides for ambitious goals, these are not accompanied with incremental steps on how they will be achieved, and subsequently does not adequately demonstrate how the overarching vision of the plan will be realised.
Action Plan for Water Resources Management in Haiti (1999)	This plan highlights the need for: i) reforms and legal frameworks in Haiti?s water sector; ii) capacity building among policymakers and water users; and iii) recognition of the economic importance of water resources as well as the need for integrated management of these resources. A 2018 review of the 1999 Action Plan noted gaps in the country?s capacity for implementing IWRM because of: i) limited knowledge on IWRM; ii) the unavailability of management instruments for IWRM; and iii) limited finance for the efficient implementation of IWRM interventions.
Constitution of the Republic of Haiti[11] **(1987)**	The Constitution of Haiti addresses Haiti?s roles and responsibilities towards the country?s natural resources through its Articles 253?258. Article 253 addresses conservation, stating that ?since the environment is the natural framework of the life of the people, any practices that disturb the ecological balances are strictly forbidden?. Regarding agricultural policy, Articles 245?252 address its economic importance, while Article 257 recognises agriculture as integral to the wellbeing of Haiti?s population, as well as its socioeconomic progress. Environmental protection on private properties is specified in Article 36, which recognises and guarantees private property and specifies the manner of acquiring, enjoying and using land. Article 36-4 addresses land use and erosion, specifying that landowners must cultivate, work and protect their land against degradation. The law prescribes a penalty for failure to fulfil this obligation. Article 36-5 distinguishes between an individual?s right to property and state-owned property along coasts, springs, rivers and watercourses.

Decree of 7 July 1987 (1987)	The use of fuelwood in Haiti is regulated by this decree, which defines procedures for applying for authorisation to cut trees, in addition to imposing the requirement to create wooded perimeters in populated rural areas. The decree also specifies control measures for the transport of firewood and charcoal ? made from firewood ? and establishes penalties and fines to prevent possible violations.
Rural Code **(1963; 1984)**	The Dr Fran?ois Duvalier Rural Code is still the main legal instrument in Haiti with regards to environmental protection and natural resource management, regulating several sectors, including water, soils/farming and forests. The rural code also specifies laws regarding access, creation and division of land, as well as the rules for the transfer of property through inheritance.

[1] GEF. 2013. Project Identification Form: Ecosystem Approach to Haiti?s C?te Sud.

[2] UNDP. 2015. Project Document: Increasing resilience of ecosystems and vulnerable communities to climate change and anthropic threats through a ridge-to-reef approach to biodiversity conservation and watershed management.

[3] Ministry of Environment. 2015. *Contribution Pr?vue D?termin?e au Niveau National*. Available at: http://www.un-gsp.org/sites/default/files/documents/cpdn_republique_dhaiti.pdf

[4] Ministry of Environment. 2001. Initial (First) National Communications. Available at: http://www.un-gsp.org/sites/default/files/documents/haiti_inc_french.pdf

[5] UNEP. 2005. Enabling Activities for the Preparation of the Second National Communication under the UNFCCC. Available at: http://www.un-gsp.org/sites/ddocefault/files/uments/haiti_prodoc_29.09.2005.pdf

[6] UNDP. 2015. Project Document: Increasing resilience of ecosystems and vulnerable communities to climate change and anthropic threats through a ridge-to-reef approach to biodiversity conservation and watershed management.

[7] The Ministry of Planning and External Cooperation. Government Priorities: Strategic Development Plan for Haiti. Available at: http://www.mpce.gouv.ht/index.php/planification/grands-chantiers

[8] The Monitor. 2006. Presidential Decree on Environmental Management.

[9] GEF. 2013. Project Identification Form: Ecosystem Approach to Haiti?s Cote Sud.

[10] *Ibid.*

[11] Constitution of Haiti. 1987. Available at: https://wipolex.wipo.int/en/text/217597

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

Knowledge management will be a key aspect of the project, which will strengthen capacities for evidence-based decision-making based on the management, interpretation and application of data on hydrometeorological conditions and climate change scenarios. This will be complemented by specific, and highly applied, technical and scientific studies, as necessary, to ensure the appropriateness and effectiveness of the proposed adaptation studies. Given the high potential of the project to generate lessons and models for future, wider application throughout Haiti, strong emphasis will be placed on knowledge systematisation and the generation of corresponding dissemination instruments. This will be carried out both in-house, by the project team, and in collaboration with national universities and NGOs specialised in hydrological issues.

The project supports the participatory process of adaptation of the existing framework of regulatory and policy instruments that considers climate change for the water sector management and planning. A targeted programme of capacity development will be formulated and applied, aimed at strengthening key institutional actors and communities in technical aspects of climate change adaptation in the water sector and strategic plans of DINEPA, of regional and local governments and communities in the target area will be developed.

Continuous monitoring and evaluation (M&E) of the project?s activities will also support the systematisation of best practices and lessons learned. The M&E process includes the production of knowledge and communication products that will provide inputs for the project?s management but that is also expected to be used as an information instrument for sharing the knowledge generated through the project?s activities in the target area and across the country.

Table 6. A breakdown of knowledge management products, the communication plan, and budget as pertaining to the proposed project?s Components.

Project Components	**Knowledge management and products**	**Timeline, communication channels and budget**

Project Components	Knowledge management and products	Timeline, communication channels and budget
Component 1. Improved understanding and awareness of the water sector vulnerability to climate change (CC).	Knowledge and information products on i) global climate change and the associated hazards and impacts; ii) climate change impacts on Haiti, particularly on water availability; iii) available freshwater resources in Haiti; iv) non-climatic drivers of reduced water availability; v) integrated water resources management (IWRM); and iv) appropriate climate change adaptation strategies. These products will be designed during the project implementation stage by an International Water Resources Advisor and an International Data Scientist and will be managed the National Observatory of Environment Quality and Vulnerability (ONQEV).	The knowledge and information products to be designed will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform (Y1?Y5). A three-day training workshop will be dispensed for ONQEV technical officers on managing information- and knowledge-generation systems (Y1; US$3,000; see Budget Note #14 in Annex 1).
	Report of cost-benefit analysis (CBA) of identified climate-resilient water management adaptation strategies Five-day training workshops hosted by the MPCE in each of Haiti?s 10 departments, coordinated by the Project Community Liaison Officer, for decision-makers in each department to equip representatives from relevant government institutions with the necessary skills and knowledge to interpret the CBA results.	The report of the CBA will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform (Y1?Y5). Five-day training workshops hosted by the MPCE in each of Haiti?s 10 departments, coordinated by the Project Community Liaison Officer, for decision-makers in each department to equip representatives from relevant government institutions with the necessary skills and knowledge to interpret the CBA results (Y2; US$30,000; see Budget Note #16 in Annex).

Project Components	Knowledge management and products	Timeline, communication channels and budget
	Training of Trainers (ToT) programme for (i) improved understanding of climate change impacts on Haiti?s freshwater availability; (ii) developing methodologies to design contextually appropriate vulnerability assessments; and (iii) identifying locally-relevant adaptation solutions.	Three five-day local-level workshops led by representatives from MoE, DINEPA and MARNDR trained via the ToT programme to disseminate the content of the ToT programme to CAEPAs and CTEs throughout the South-East Department of Haiti (Y2; US$15,000; see Budget Note #22 in Annex 1).
	Inventories of the groundwater resources and of the plant and forest cover of the catchment areas in the South-East Department, as well as reports of groundwater assessments to determine water quality and to evaluate the extent of degradation of the catchment zones in the South-East Department.	The inventories and reports will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform (Y1?Y5).
	Methodologies for conducting scientific and technical studies to determine fine-scale climate change impacts on water availability in the South-East Department of Haiti, as well as studies to determine the local suitability of the adaptation strategies, results of scientific and technical recommendations on appropriate and feasible adaptation solutions within the context of Haiti?s South-East Department.	The methodologies, results of scientific and technical studies, as well as the technical recommendations will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform (Y1?Y5).
	Methodologies for conducting appropriate gender-responsive climate change vulnerability assessments (VAs) in the project?s target communities, as well as reports of the VAs.	The methodologies will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform (Y2?Y5), while the VA reports will be freely and publicly available from the relevant CAEPAs, CTEs or CBOs of the communities in which the VAs were conducted (Y2-Y5).

Project Components	Knowledge management and products	Timeline, communication channels and budget
	Results of integrated climate change water resource modelling on long-term water availability and demand, as well as technical recommendations on integrated water resource management (IWRM) approaches for the South-East Department of Haiti.	The results of the modelling exercise and the technical IWRM recommendations will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform (Y2?Y5).

Project Components	Knowledge management and products	Timeline, communication channels and budget
Component 2. Strengthening of the regulatory, policy and institutional capacity framework at national, regional and local levels for the effective management of drinking water under climate change conditions.	The following reports will be generated as part of the gap and capacity needs assessments activities implemented under Component 2: ? Report of coordination and planning gaps among national, regional, and local government institutions involved in water resource management; ? Report of gap assessments of selected regulatory and policy frameworks to identify entry points for climate change and gender mainstreaming and technical recommendations for integrating climate change and gender considerations into abovementioned regulatory and policy frameworks; ? Report of technical capacity needs assessments (CNAs) for DINEPA, OREPA Sud, CAEPAs and CTEs on climate-resilient water resource management, sustainable territorial land-use planning, management and application of information on water resources and climate change threats; and ? Report of the gap analysis on the organisational capacity of community-level institutions involved in water resource management in the target communities.	The reports of the gap and capacity assessments will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform (Y3?Y5).

Project Components	Knowledge management and products	Timeline, communication channels and budget
	Framework, based on the gap and capacity needs assessments activities, to guide the development of institutionalised coordination mechanisms and mechanisms for national-regional and regional-local coordination and planning.	The framework will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform (Y3?Y5).
	Training of Trainers programme on climate-resilient water resource management, sustainable territorial land-use planning, management, and application of information on water resources and climate change threats.	Three five-day workshops to dispense ToT programme on climate-resilient water resource management, sustainable territorial land-use planning, management, and application of information on water resources and climate change threats (Y3; US$9,000, see Budget Note #56 in Annex 1).
	Training workshops on contextually relevant and gender-responsive IWRM for community-level water governance structures.	Five five-day training workshops on contextually relevant and gender-responsive IWRM for community-level water governance structures (Y3?Y4; US$15,000; see Budget Note #73 in Annex 1).
	Lessons on best practices ? captured as part of the proposed project?s monitoring and evaluation (M&E) plan.	The lessons learnt will feed into the continuous information- and knowledge-generation system to be developed during project implementation under Component 1 and will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform (Y1?Y5).

Project Components	Knowledge management and products	Timeline, communication channels and budget
	Agroforestry technical packages for communities reliant on agriculture for their livelihood in the target catchment areas and a ToT programme on the usage of agroforestry technical packages for MARNDR extension office workers stationed within the communities reliant on the five target SAEPs for water.	Summarised information on the agroforestry technical packages will be shared via the different platforms available on the UNDP website ? social media, newsletters and publications, as well as photo and video materials (Y3-Y5). The full agroforestry technical packages will be freely and publicly available on the Haitian Environmental Information System (SIEHa?ti) platform. It will also be possible to obtain the full packages from the extension offices of the Ministry of Agriculture, Natural Resources and Rural Development (MARNDR) of Haiti. The ToT programme for MARNDR extension office workers, on the appropriate usage of the technical packages, will be dispensed in three five-day sessions (Y3?Y4; US$9,000; see Budget Note #69 in Annex 1).
Component 3. Identification and promotion of practices for the conservation, management and supply of drinking water adapted to predicted climate change scenarios.	Awareness-raising campaigns and advocacy programmes for water consumption monitoring systems and efficient water uses.	Awareness-raising campaigns and advocacy programmes will be dispensed via the different platforms available on the UNDP website ? social media, newsletters and publications, as well as photo and video materials ? in addition to the Haitian Environmental Information System (SIEHa?ti) platform (Y1?Y5). (Y3-Y5).

9. Monitoring and Evaluation

Describe the budgeted M and E plan

Table 7. GEF M&E requirements and M&E budget.

Supervision missions	*UNDP Country Office*	*10,000*	Annually

Independent Mid-term Review (MTR)	*UNDP Country Office, PMU and International Monitoring and Evaluation Expert*	*40,250[1]*	*January, 2025*
Independent Terminal Evaluation (TE)	*UNDP Country Office, PMU and International Monitoring and Evaluation Expert*	*40,250[2]*	*September, 2027*
Project M&E Officer and Local expert for exit strategy	*UNDP Country Office*	*82,000*	*Year 1 to year 5*
TOTAL indicative COST		***172,500***	

[1] *Cost is contractual value for hire of an International Monitoring and Evaluation Expert to conduct MTR at US$700/day, including travel arrangements (US$8500/week).*

[2] *Cost is contractual value for hire of an International Monitoring and Evaluation Expert to conduct TE at US$700/day, including travel arrangements (US$8500/week).*

[1] *Cost is contractual value for hire of an International Monitoring and Evaluation Expert to conduct MTR at US$700/day, including travel arrangements (US$8500/week).*

[2] *Cost is contractual value for hire of an International Monitoring and Evaluation Expert to conduct TE at US$700/day, including travel arrangements (US$8500/week).*

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

Globally, there is an urgent need to implement sustainable and cost-effective measures for reducing the vulnerability of local communities to current and future impacts of climate change. Integrated Water

Resources Management (IWRM) has proven to be a successful approach to achieve this. The implementation of measures aimed at protecting, maintaining and enhancing critical watershed resources fosters the capacity of local communities to adapt to climate change, in both rural and urban communities. IWRM measures serve to improve water resources which act as buffers against climate-induced hazards ? such as floods and droughts. As part of an integrated adaptation approach, IWRM provides long-term socioeconomic and environmental returns and aligns with the GEF?s focal area objectives for climate change adaptation, specifically: i) CCA-1 ? reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation; and ii) CCA-2 ? mainstream climate change adaptation and resilience for systemic impact.

In accordance with the abovementioned objectives, the LDCF project will provide benefits to ~ 130,000 people living in Haiti?s South-East Department. These beneficiaries have been aggregated into ~65,000 men and ~65,000 women, or ~52,000 people under and ~78,000 people of or above the age of 18[1]. These individuals will benefit from: i) increased freshwater availability through rainwater harvesting and storage; ii) localised improvement of drinking water quality; and iii) increased groundwater resource bases through better management of shared resources in Haiti?s South-East Department. Female beneficiaries (65,000 people) will benefit in particular from structures enhancing the distribution and collection of water as women are generally tasked with water collection by foot. In addition, there will be benefits to agricultural livelihoods through the implementation of 700 ha of agroforestry, as well as a direct increase in the availability of irrigation water in the context of more severe water scarcity in the future. Because of the rural population of the South-East Department?s strong reliance on local freshwater sources for drinking and household use, as well as on agriculture for their livelioods and food security, these benefits (generated through activities under Output 3.1) will directly translate to increases in the income, health and food security of the project?s target beneficiaries. Lastly, local, sub-national and national stakeholders (130,000 people) will have improved knowledge and capacity for managing water resources under climate change.

Most of the project benefits will be in the form of public goods, delivered by implementing IWRM interventions in public open spaces. Some benefits will accrue directly to ~350 households that will benefit from household-level interventions such as rooftop rainwater harvesting systems and water storage tanks. Indirect benefits is expected to accrue to all of the communities surrounding the 10 target project water sources in Haiti?s South-East Department through the future upscaling of sustainable IWRM.

Outputs under Component 3 include promoting EbA initiatives through proven, sustainable farming technologies and systems ? such as agroforestry and reforestation ? that build resilience to the effects of adverse climatic conditions and foster high productivity. These initiatives will help the Haitian people decrease their reliance on imported food[2] for the local consumption. Further, the agroforestry and reforestation interventions will allow for green job creation for the youth in Haiti, as the unemployment rate in this age category is currently estimated to be at ~30%[3].

The EbA interventions under Component 3 are supported by interventions under Component 2 ? for instance the agroforestry and reforestation interventions will be implemented as per the guidelines listed in the agroforestry technical packages developed under the second Component of the proposed project. These technical packages will include information that will improve small-scale producers' access to both markets and financial services. Consequently, this will allow new and existing businesses to build and expand their business in a sustainable manner going forward. Moreover, it has been has demonstrated that reforestation

in tropical regions has the potential to serve as a carbon offset mechanism both above- and belowground for at least 40 to 80 years[4],[5] ? the EbA interventions to be implemented under the proposed project thereby present the opportunity for mitigation co-benefits in terms of carbon sequestration.

All three Components of the project have the combined objective of improving the resilience of the water sector in Haiti against the current and future threats of climate change. It has been demonstrated that polluted water sources can increase the risk of contracting life-threatening diseases such as dysentery, E-Coli as well as Covid-19[6]. Interventions under Components 1, 2 and 3 include *inter alia*:

? assessments of groundwater reserves;
? water quality tests;
? improvement of water management schemes,
? improved protection of the water distribution system;
? installation of rooftop water collection systems; and
? programmes for treating water supplies with sodium hypochlorite implemented to reduce water pollution-related health risks.

Together, these interventions will help reduce health risks (including Covid-19) related to poor water access and quality.

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE
	High or Substantial		

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

Please see the full Social and Environmental Screening Report (SESP) and Environmental and Social Management Framework (ESMF) uploaded to the GEF Portal.

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
Haiti ESMF 2021-10-19 v4 Annex 9 yap for submission	**CEO Endorsement ESS**	
Haiti, SESP, 2021-10-29 for submission	**CEO Endorsement ESS**	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

This project will contribute to the following Sustainable Development Goal (s): SDG 3: Good Health and Well-being; SDG 5: Gender Equality; SDG 6: Clean Water and Sanitation; SDG 11: Sustainable Cities and Communities; SDG 13 Climate Action; SDG 15 Life on Land				
This project will contribute to the following country outcome (UNDAF/CPD, RPD, GPD): Outcome: 3: Strengthened institutions to gradually ensure universal access to basic services; Outcome: 5: Reducing the risks of conflict and natural disasters, notably those linked to climate change.				
	Objective and Outcome Indicators **(no more than a total of 20 indicators)**	**Baseline**	**Mid-term Target**	**End of Project Target**
Project Objective: Increase water availability in target watersheds in Haiti?s South-East Department by conserving critical water recharge zones and aquifers, strengthening water resource management capacity, and enhancing the climate resilience of water distribution and storage infrastructure to ensure reliable access to water resources for target communities.	**Mandatory GEF Core Indicator 1:** 130,000 direct project beneficiaries disaggregated by gender (individual people)	0	30,000	130,000 people (men and women living in communities surrounding five water sources in Haiti?s South-East Department) with enhanced climate resilient water availability
	Mandatory GEF Core Indicator 2: Area of landscapes under climate-resilient management (ha)	0 ha of land rehabilitated or protected	100	700 ha land rehabilitated through agroforestry and 3,840 ha land reforested

Project Component 1	**Improved understanding and awareness of the water sector vulnerability to climate change**			
Outcome 1.1 *Improved awareness raising and knowledge and information management systems for the water sector to plan and respond to the impacts of climate change.*	**Indicator 3:** Number of stakeholders trained or made aware of climate change impacts and appropriate adaptation responses	0 people trained in water governance bodies at the national, regional, and local levels. The water governance bodies include the MoE, DINEPA, OREPA Sud, CAEPAs, CTEs and CBOs.	40 people trained in water governance bodies at the national, regional, and local levels. The water governance bodies include the MoE, DINEPA, OREPA Sud, CAEPAs, CTEs and CBOs.	80 people trained in water governance bodies at the national, regional, and local levels. The water governance bodies include the MoE, DINEPA, OREPA Sud, CAEPAs, CTEs and CBOs.
Outputs to achieve Outcome 1.1	*Output 1.1.1: Assessments, with gender-specific criteria, carried out at the national level to demonstrate the implications of different climate change scenarios on the availability of water.* *Output 1.1.2: A continuous information- and knowledge-generation system implemented to inform communities and the GoH on water management adaptation strategies and climate-resilient water supply.* *Output 1.1.3: Cost-benefit analyses of different adaptation strategies developed as per the predicted climate change scenarios identified under Output 1.1.1.* *Output 1.1.4: Training programmes implemented for regional and national institutions on the extent of climate change impacts on freshwater availability ? including methodologies and application of vulnerability assessments (as developed under Output 1.2.1 below) and adaptation solutions.* *Output 1.1.5: Inventory and quality characterisation of groundwater aquifers in the target area carried out by OREPA Sud.* *Output 1.1.6: Scientific and technical studies on the impacts of climate change and options for adaptation management in the target area conducted, informing local decision-making on climate-resilient water supply.*			
Outcome 1.2 *Target communities prepared to effectively plan responses to climate change impacts on their access to drinking water.*	**Indicator 4:** Number of communities/towns informed to more effectively plan for climate change adaptation through technical studies	5 Communities with increased access to technical information for effective adaptation planning	10 Communities with increased access to technical information for effective adaptation planning (50 people with 40% of female)	20 Communities with increased access to technical information for effective adaptation planning (10 0 people with 40% of female)

Outputs to achieve Outcome 1.2	*Output 1.2.1: Methodologies and instruments developed for community-level vulnerability assessments (VAs) of drinking water supply.* *Output 1.2.2: Participatory climate change vulnerability assessments (VAs) carried out in the project?s target communities.* *Output 1.2.3: Integrated water resource modelling conducted to demonstrate the projected long-term impacts of climate change on biodiversity, ecosystems, and urban systems, as well as the relationships between these aspects and drinking water availability at the landscape level.*			
Project Component 2	*Strengthening of the regulatory, policy and institutional capacity framework at national, regional, and local levels for the effective management of drinking water under climate change conditions*			
Outcome 2.1 *Key regulatory and policy instruments adjusted to consider the implications of climate change for drinking water supply and promote adaptive community-based management.*	**Indicator 5**: Number of policies, plans or development frameworks that mainstream climate resilience	0 revisions of the regulatory frameworks, to mainstream climate resilience, of two water regulatory bodies ? DINEPA and OREPA Sud	2 revisions of the regulatory frameworks, to mainstream climate resilience, of two water regulatory bodies ? DINEPA and OREPA Sud	2 revisions of the regulatory frameworks, to mainstream climate resilience, of two water regulatory bodies ? DINEPA and OREPA Sud
	Indicator 6: Number of community-based strategic and operational plans, with gender-specific criteria, developed and implemented to ensure the climate resilience of drinking water access.	0 strategic and operational plans of local- and community-level water governance bodies, to ensure the climate resilience of drinking water access, developed and implemented	5 strategic and operational plans of local- and community-level water governance bodies, to ensure the climate resilience of drinking water access, developed and implemented	5 strategic and operational plans of local- and community-level water governance bodies, to ensure the climate resilience of drinking water access, developed and implemented
Outputs to achieve Outcome 2.1	*Output 2.1.1: Two regulatory instruments adjusted to account for the evolving contextual needs and conditions resulting from climate change.* *Output 2.1.2: Strategic plans revised by sub-national regulatory institutions to prioritise adaptation interventions based on evaluations of climate change impacts on water supply vulnerability.* *Output 2.1.3: Frameworks and instruments developed and applied for planning and coordination between national, regional, private and community-based organisations.*			

Outcome 2.2 *Increased capacities in priority institutional stakeholders (DINEPA, OREPA Sud, CAEPAs and CTEs) with regards to the technical aspects of water resource management, territorial land-use planning, as well as management and application of information on water resources and climate change threats.*	**Indicator 7:** Number of people in core institutions trained in implementing climate-resilient water resource management and sustainable land-use planning	0 institutional staff with increased capacity for climate resilient water resource management	40 institutional staff with increased capacity for climate resilient water resource management	100 institutional staff with increased capacity for climate resilient water resource management
Outputs to achieve Outcome 2.2	*Output 2.2.1: Targeted programmes implemented to strengthen technical capacity of relevant institutions to incorporate climate change data into planning and management.* *Output 2.2.2: Equipment provided to support the efficient application of technical capacity developed by training workshops.*			
Outcome 2.3 *Target communities equipped with instruments and mechanisms that ensure the sustainable management of water resources and associated infrastructure, as well as specific strategies to target female-headed households.*	**Indicator 8:** Number of community decision-making groups established to facilitate ongoing stakeholder participation in climate resilient water resource management	10 community groups for inclusive, ongoing sustainable water resource management established	20 community groups for inclusive, ongoing sustainable water resource management established	40 community groups for inclusive, ongoing sustainable water resource management established

Outputs to achieve Outcome 2.3	*Output 2.3.1: Community-based strategic and operational plans, with gender-specific criteria, developed to ensure the climate resilience of drinking water access.* *Output 2.3.2: Consultative and consensus-based community-level engagement on land-use planning conducted, and training programmes developed, for sustainable land uses in drainage and recharge zones to ensure the climate resilience of drinking water recharge.* *Output 2.3.3: Programmes implemented to strengthen organisational capacities and awareness of community-level stakeholders and organisations ? reflecting gender-specific differences and promoting the equitable management of water resources and supply infrastructure under climate change conditions.*			
Project Component 3	*Identification and promotion of practices for the conservation, management and supply of drinking water adapted to predicted climate change scenarios*			
Outcome 3.1 *Reliable access to drinking water ensured for target communities and households as a result of the implementation of climate change adaptation measures.*	**Indicator 9:** Number of water distribution systems (SAEPs) protected against climate change-induced flooding through physical reinforcement	0 SAEPs reinforced against climate change impacts	2 SAEPs reinforced against climate change impacts	5 SAEPs reinforced against climate change impacts
	Indicator 10: Number of beneficiaries with access reliable access to clean drinking water	0 people benefiting from the project?s water treatment programme	30 000 people benefiting from the project?s water treatment programme	130 000 people benefiting from the project?s water treatment programme
	Indicator 11: Number of households with increased access to freshwater resources during dry periods.	0 households with drought resilient freshwater supply	35 households with drought resilient freshwater supply	350 households with drought resilient freshwater supply
Outputs to achieve Outcome 3.1	*Output 3.1.1: 4,540 ha of aquifer recharge zones rehabilitated within the five target SAEPs[1] ? of which 700 ha is restored through agroforestry.* *Output 3.1.2: Gabions, percolation tanks, contour bunds and septic tanks constructed to promote aquifer recharge and to reinforce the protection of the five target Drinking Water Supply Systems (SAEPs).* *Output 3.1.3: Rooftop water harvesting systems and household cisterns installed in 350 households in target communities.* *Output 3.1.4: Framework for financial plans for O&M of the five target SAEPs to improve water-use efficiency and distribution, accompanied by awareness-raising and advocacy programmes.* *Output 3.1.5: Programmes for treating water supplies with sodium hypochlorite implemented to reduce water pollution-related health risks.*			

[1] More information on the geographical locations of these sources as well as the relevant affected communities is available in the Site Selection Annex.

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

Comment	Agency Response
STAP 12/21/21	
STAP Overall Assessment and Rating	Minor issues to be considered during project design. STAP welcomes UNDP?s project ?Strengthening the climatic resilience of the drinking water sector in the South of Haiti?. The project aims to strengthen capacities, tools, infrastructure, and systems to make water supplies resilient to climate change. The problem statement, with regard to access to adequate safe drinking water, is well-defined and supported with evidence. Furthermore, the climate change projections are clear and STAP appreciates that they represent a range of possible outcomes. The PIF is hampered by the lack of data on the connection between the climate, particularly precipitation, and water availability. While it is clear that precipitation impacts both, the extent to which it does, and therefore the likely extent to which future changes will create new stresses, is not quantifiable (aside from a single estimate). STAP suggests that at the PPG stage the project attempt to gather more data about this critical connection between climate and water supply to ensure project activities are targeted to the most effective points of intervention. In addition, STAP recommends developing a theory of change and identifying the assumptions that underlie the outputs and outcomes. Monitoring the process of change will help validate the assumptions that are embedded in the PIF. Below, STAP describes further its recommendations.
Part I: Project Information **B. Indicative Project Description Summary** **Project Objective** Is the objective clearly defined, and consistently related to the problem diagnosis?	Yes, it is.

Project components A brief description of the planned activities. Do these support the project?s objectives?	The project will conduct participatory community-level vulnerability analysis related to water access, while simultaneously building capacity in the government to take up, understand, and act on the results of this analysis. The vulnerability analysis will inform a participatory approach to the identification of local actions around water management, including changes to and strengthening of local governance structures and the introduction of mechanisms for water pricing to facilitate the maintenance of water facilities. Once this work has made the sustainable implementation of interventions viable, the project will put in place concrete actions and investments to address the identified vulnerabilities. Broadly speaking, these activities do support the project?s objectives.
Outcomes A description of the expected short-term and medium-term effects of an intervention. Do the planned outcomes encompass important adaptation benefits?	The expected effects are not distinguished between short- and medium-term, but focus on increased resilience to climate change impacts by addressing climate-related vulnerabilities to the drinking water supply. This is an adaptation benefit.
Are the global environmental benefits/adaptation benefits likely to be generated?	Adaptation benefits are likely to be generated.
Outputs **A description of the products and services which are expected to result from the project.** Is the sum of the outputs likely to contribute to the outcomes?	? A vulnerability assessment ? Capacity-building materials for government at scales from the community to the national ? Concrete interventions that address specific vulnerabilities for communities in southeast Haiti. The sum of the outputs will contribute to the outcomes.

Part II: Project justification **A simple narrative explaining the project?s logic, i.e. a theory of change.** According to the PIF, the project will build household resilience to climate change impacts by improving the drinking water supply in the South-East Department of the country. While the theory of change appears to be that the drinking water supply will be strengthened through both increased capacity and knowledge and through concrete resilience measures, it is less clear how the improved drinking water relates to increased resilience. STAP suggests the project specifically articulate how the project?s efforts to address vulnerabilities in the water supply will result in greater resilience ? what will these communities be more resilient to? How does the water supply contribute to that resilience? **Project description. Briefly describe:** 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description) Is the problem statement well-defined?	The problem statement, with regard to access to adequate safe drinking water, is well-defined and supported with evidence. Further, the climate change projections are clear and STAP appreciates that they represent a range of possible outcomes. The PIF is hampered by the lack of data on the connection between the climate, particularly precipitation, and water availability. While it is clear that precipitation impacts both, the extent to which it does, and therefore the likely extent to which future changes will create new stresses, is not quantifiable (aside from a single estimate from UNDP). STAP suggests that at the PPG stage the project attempt to gather more data about this critical connection between climate and water supply to ensure project activities are targeted to the most effective points of intervention
Are the barriers and threats well described, and substantiated by data and references?	Yes, they are, with the exception of the connection between precipitation and water availability mentioned above.
For multiple focal area projects: does the problem statement and analysis identify the drivers of environmental degradation which need to be addressed through multiple focal areas; and is the objective well- defined, and can it only be supported by integrating two, or more focal areas objectives or programs?	Does not apply

2) the baseline scenario or any associated baseline projects Is the baseline identified clearly?	The baseline is as well-defined as it can be, given the absence of data on the connection between climate conditions and water availability. The PIF is forced to assume that changing climate conditions will impact water availability, but cannot quantify these potential changes. Therefore, the description of existing work in the baseline is more detailed than the likely outcomes of this baseline for water availability. This is a challenge, as understanding this connection is central to addressing one of the key barriers targeted by this project ? for example, the PIF states that ?Existing and proposed water supply systems will fail to meet local water needs if the impacts of CC on runoff rates, spring yields and aquifer levels aren?t taken into consideration. Communal water fountains may become redundant if they depend on springs that dry up under the expected droughts conditions. Additionally, the capacities of reservoirs and tanks designed on the basis of the current dry season durations are likely to prove themselves inadequate when dry seasons become prolonged as a result of CC and wells may dry up if their depth was calculated without taking into account expected future falls in water table levels.? All of this is true, but currently none of these measures seem readily available. It is not clear that the project can remedy this problem at the PIF level, but STAP recommends an effort to better understand the connection between precipitation, temperature, and water availability in the project area at the PPG stage.
Does it provide a feasible basis for quantifying the project?s benefits?	The baseline does not provide a feasible basis for quantifying benefits, such as the change in the number of people with access to safe drinking water, or the amount of safe drinking water that is available. It is reasonable to assume that the project will improve both of these measures against the baseline, but give the knowledge gap outlined above, quantifying those improvements will be difficult.
Is the baseline sufficiently robust to support the incremental (additional cost) reasoning for the project?	Given the knowledge gaps claimed in the PIF, the baseline is as robust as is reasonable to expect, and the assumption that the project would improve access to safe drinking water against the baseline seems reasonable.
For multiple focal area projects: are the multiple baseline analyses presented (supported by data and references), and the multiple benefits specified, including the proposed indicators;	Does not apply
are the lessons learned from similar or related past GEF and non-GEF interventions described; and	Does not apply
how did these lessons inform the design of this project?	Does not apply

3) the proposed alternative scenario with a brief description of expected outcomes and components of the project What is the theory of change?	There is no succinct theory of change in the PIF. The assumption appears to be that with appropriate data and governmental capacity, it will be possible to conduct a participatory vulnerability assessment that can be taken up by the government and addressed through investments in infrastructure and other interventions, which will result in increased resilience of the quality water supply in the project area relative to the baseline. STAP recommends the project develop a clear theory of change to make its assumptions transparent, and the relationship of its proposed activities and goals clear. The project team can rely on STAP?s primer for developing the theory of change: https://www.stapgef.org/theory-change-primer.
What is the sequence of events (required or expected) that will lead to the desired outcomes?	The project will draw upon existing data to inform the design of participatory community-level vulnerability analysis related to water access. At the same time, the project will build capacity in the government to take up, understand, and act on the results of this analysis. These actors will then use the vulnerability analysis to inform a participatory approach to the identification of local actions around water management. These actions will include substantial changes to and strengthening of local governance structures, as well as the introduction of mechanisms for water pricing to facilitate the maintenance of water facilities. Finally, the project will implement concrete actions and investments, such as reforestation of water sources and deepening of wells, to address the identified vulnerabilities.
What is the set of linked activities, outputs, and outcomes to address the project?s objectives?	See above
Are the mechanisms of change plausible, and is there a well-informed identification of the underlying assumptions?	Some mechanisms of change seem plausible, but others seem to require substantial assumptions. For example 1) why would the government respond to concrete data regarding climate stress on water, if there is already stress and it is not being addressed? 2) If there is no data on how changes in precipitation and temperature will impact water sources, how will it be possible to conduct a valid vulnerability analysis? 3) The project seems to assume that communities will willingly shift governance practices, and willingly accept pricing on water, but does not point to any possible issues with either.
Is there a recognition of what adaptations may be required during project implementation to respond to changing conditions in pursuit of the targeted outcomes?	While the problem description presents a range of possible climate futures for the project, the alternative scenario does not take these up and therefore does not address the changes that might have to be made to the project during implementation. Further, the assumptions about the feasibility of the social and governance changes expected suggest the need to assess the ways in which the project may have to adapt its activities to achieve its goals if these changes prove difficult or incomplete. STAP suggests the project would benefit from the consideration of a range of climate scenarios, and outcomes of social change/ governance change programming, to identify potential adaptations that might be needed to ensure the project achieves its goals.

4) incremental/additional cost reasoning and expected contributions from the baseline, the GEF trust fund, LDCF, SCCF, and co-financing GEF trust fund: will the proposed incremental activities lead to the delivery of global environmental benefits?	Does not apply
LDCF/SCCF: will the proposed incremental activities lead to adaptation which reduces vulnerability, builds adaptive capacity, and increases resilience to climate change?	The proposed activities, if executed as planned, will reduce the vulnerability of the water supply and people?s access to quality water, build adaptive capacity in the water system, and increase the resilience of that system to climate change.
5) global environmental benefits (GEF trust fund) and/or adaptation benefits (LDCF/SCCF) Are the benefits truly global environmental benefits/adaptation benefits, and are they measurable?	Yes, these are adaptation benefits, but as noted above, measuring these benefits will be challenging because of key knowledge gaps around water supply recharge and precipitation.
Is the scale of projected benefits both plausible and compelling in relation to the proposed investment?	The scale of projected benefits is reasonable.
Are the global environmental benefits/adaptation benefits explicitly defined?	The adaptation benefits are explicitly defined.
Are indicators, or methodologies, provided to demonstrate how the global environmental benefits/adaptation benefits will be measured and monitored during project implementation?	The measurement is focused on number of beneficiaries, but as noted above it will be challenging to develop measurements of impact on water availability and quality relative to the baseline without more knowledge of water supply recharge.
What activities will be implemented to increase the project?s resilience to climate change?	See discussion of adaptation required during project implementation above.
6) innovative, sustainability and potential for scaling-up Is the project innovative, for example, in its design, method of financing, technology, business model, policy, monitoring and evaluation, or learning?	The project?s claims to innovation lie in several areas: 1) Its multi-sector approach, including working with actors beyond the water sector. This is not that innovative an approach, but it is appropriate to the project. 2) Its use of low-cost, locally appropriate technologies. The technologies employed might be innovative in this specific context, but this is approach is not particularly innovative (but again, is appropriate). Therefore the project is not particularly innovative in a global sense, but does appear to have the potential to introduce innovations in approach to the Haitian context.

Is there a clearly-articulated vision of how the innovation will be scaled-up, for example, over time, across geographies, among institutional actors?	The project suggests that its measures will be replicable in Haiti because the issue of water access and climate change is pervasive. The project activities aimed at capacity-building for climate-change related planning and management suggest that such scale-up would be an inherent part of the project.
Will incremental adaptation be required, or more fundamental transformational change to achieve long term sustainability?	Most of the project focuses on incremental adaptations to water management practices, but the activities around shifts in local governance and water pricing may introduce transformational changes to the lives of those in the project communities.
1b. Project Map and Coordinates. Please provide geo-referenced information and map where the project interventions will take place.	The PIF provides a map of Haiti, and a map of the Sud-Est where the project will take place, but states that geo-referenced information for specific project sites will be provided at the PPG stage. STAP?s earth observation guidance is a resource the project team can use to specify the geo-referenced information (see page 64): https://stapgef.org/sites/default/files/publications/GEF%20EO%20Mainstreaming%20March2020%20Final%2020200331-v3.0.pdf
2. Stakeholders. Have all the key relevant stakeholders been identified to cover the complexity of the problem, and project implementation barriers?	The list of stakeholders to be engaged is extensive and, at least on the side of organizations, is likely comprehensive. The PIF also notes that youth and women will be key stakeholders requiring special engagement. However, there is little discussion of engagement with community members beyond water committees, which the PIF notes are of varying organization and effectiveness. Given a goal of the project is to improve the well-being of the people using the water resources to be protected, STAP suggests the project explicitly consider how it will engage with communities beyond water committees, and how it might identify other relevant marginal groups in these communities (beyond women and youth) whose viewpoints and experiences might provide important information for the project.
What are the stakeholders? roles, and how will their combined roles contribute to robust project design, to achieving global environmental outcomes, and to lessons learned and knowledge?	The roles of the stakeholders are not well-defined in the PIF. Many of the organizations seem to be included as recipients of training and capacity-building, but not as sources of information or direction for the project. STAP suggests the PIF more clearly articulate the roles of the different stakeholders mentioned in the alternative scenario, with particular attention to how their roles will contribute to project design and the achievement of project outcomes.
3. Gender Equality and Women?s Empowerment Have gender differentiated risks and opportunities been identified, and were preliminary response measures described that would address these differences?	The PIF identifies gender-differentiated risks and opportunities, as well as preliminary response measures. The focus on GBV, while important, is not well-connected to the project narrative. It is not clear if GBV might be an outcome of the project unless carefully implemented, or if the reduction of existing GBV is part of the project goals. STAP recommends this be clarified, and if GBV reduction is a project goal, it needs to be raised in the problem statement, the baseline, and the alternative scenario.
Do gender considerations hinder full participation of an important stakeholder group (or groups)? If so, how will these obstacles be addressed?	The PIF does not make this clear. It might be that the references to GBV are about the hindrances to participation that women face, but it is not clear in the PIF.

5. Risks. Are the identified risks valid and comprehensive? Are the risks specifically for things outside the project?s control? Are there social and environmental risks which could affect the project? For climate risk, and climate resilience measures: ? How will the project?s objectives or outputs be affected by climate risks over the period 2020 to 2050, and have the impact of these risks been addressed adequately? ? Has the sensitivity to climate change, and its impacts, been assessed? ? Have resilience practices and measures to address projected climate risks and impacts been considered? How will these be dealt with? ? What technical and institutional capacity, and information, will be needed to address climate risks and resilience enhancement measures?	The risks listed do not include any consideration of environmental events or trends. For example, there is no consideration of the impact of a hurricane on the project, despite Haiti?s exposure to this hazard. Further, there is no consideration of how climate extremes related to larger patterns of variability might impact the project. While the project is intended to address the risks climate change poses to quality water access, it does not address the risks of climate events or variability on the project itself. STAP recommends the project carefully consider such risks, assess the sensitivity of the project to them, and propose means of addressing them.
6. Coordination. Outline the coordination with other relevant GEF-financed and other related initiatives Are the project proponents tapping into relevant knowledge and learning generated by other projects, including GEF projects?	Yes
Is there adequate recognition of previous projects and the learning derived from them?	Yes
Have specific lessons learned from previous projects been cited?	Yes
How have these lessons informed the project?s formulation?	Lessons from baseline projects (DINEPA/AECID/UNDP and UNDP/LDCF project on adaptive capacities) will inform the development of component 3.
Is there an adequate mechanism to feed the lessons learned from earlier projects into this project, and to share lessons learned from it into future projects?	Yes

8. Knowledge management. What overall approach will be taken, and what knowledge management indicators and metrics will be used?	While highlighted as important to the project and its goals, the approach to knowledge management is unclear in the PIF. Generally, the PIF mentions emphasizing systemization (but it is not clear what would be systematized) and the generation of dissemination instruments (though none are named). The PIF mentions identifying lessons and creating dissemination instruments both within the project, and in partnership with national universities and NGOs. STAP suggests the PIF clarify what is to be systematized, and more clearly articulate some examples of the dissemination instruments envisioned.
What plans are proposed for sharing, disseminating and scaling-up results, lessons and experience?	See above
Notes **STAP advisory response** **1. Concur**	STAP acknowledges that on scientific or technical grounds the concept has merit. The proponent is invited to approach STAP for advice at any time during the development of the project brief prior to submission for CEO endorsement. * In cases where the STAP acknowledges the project has merit on scientific and technical grounds, the STAP will recognize this in the screen by stating that ?STAP is satisfied with the scientific and technical quality of the proposal and encourages the proponent to develop it with same rigor. At any time during the development of the project, the proponent is invited to approach STAP to consult on the design.?
2. Minor issues to be considered during project design	(i) Open a dialogue with STAP regarding the technical and/or scientific issues raised; (ii) Set a review point at an early stage during project development, and possibly agreeing to terms of reference for an independent expert to be appointed to conduct this review. The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.
3. Major issues to be considered during project design	STAP proposes significant improvements or has concerns on the grounds of specified major scientific/technical methodological issues, barriers, or omissions in the project concept. If STAP provides this advisory response, a full explanation would also be provided. The proponent is strongly encouraged to: (i) Open a dialogue with STAP regarding the technical and/or scientific issues raised; (ii) Set a review point at an early stage during project development including an independent expert as required. The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.
USA 12/21/21	

The United States appreciates the opportunity to review GEFID 9777 ? Sustainable Management of Wooded Production Landscapes for Biodiversity Conservation (Haiti). We are supportive of the project and have two comments addressing the longer term impact and sustainability of the project noted below. 1-Given the level of investment by this project and other projects in cacao production, there is a reasonable expectation that production will increase. However, it is unclear to what extent this project will work on the marketing side of cacao (and coffee) to increase the demand for these products. Historically, this region had a lot more coffee and cacao, and due to the fall in prices, disease, etc., these trees were cut down to produce charcoal or free up the land for other agricultural crops. How will this project address the longer term sustainability of this project?	To avoid loss of the value of the plantations as biodiversity habitat, as well as a reduction in their ability to generate food and other products alongside, the project will provide specific technical support to the development of branding based on a combination of factors including quality, environmental sustainability and cultural traditions. This will be done though market preference surveys in both local and export markets; advisory support for the definition of the precise product characteristics on which the brand would be based (quality standards, origins and growing/processing methods); and development of marketing materials. The current management system focus on productivity that results often in the simplification of the tree canopy to favor optimal shade species, and the elimination of plants and shrubs in the understory, which might hinder management efficiency, impede air circulation and/or compete with the cacao or coffee. The project will develop interest and capacities in local chambers of commerce through the provision of information materials and awareness-raising sessions regarding the commercial potential of environmentally sustainable production systems, and opportunities and potential benefits for developing commercial links with sustainable growers.
2-Given the heavy donor presence and investment already occurring in this region of Haiti, coordination is critical to ensure coordination and duplication of efforts. The proposal recognizes the other projects in the region, but we would recommend incorporating these efforts into the design of the activity.	There is indeed a heavy presence and investment in the region. However, any collective long-term undertaking such as environmental rehabilitation requires cooperation and coordination within the framework of joint leadership. The MdE launched the development of a new Environmental Action Plan (EAP) and have established an Environment Sector Table (EST) as mechanisms for cooperation, coordination and creation of synergies between actors and actions. This project will contribute to the EAP and will actively participate at the sectoral table to: - Develop synergies among environmental stakeholders through discussions on environmental policy issues; - Facilitate the integration of the Haitian private sector in environmental management, - Facilitate the integration of local authorities and grassroots community organizations (OCB) in biodiversity conservation and environmental management; - Promote partnerships with universities and research institutions in order to promote biodiversity conservation and environmental research.
Canada 12/21/21	

We are interested in learning more about the measures that will be taken to ensure that farmers do not carry out agroforestry activities in strict conservation areas.	In coordination and collaboration with the Biodiversity Directorate of the Ministry of Environment, the project team will work in close coordination with the National Agency for Protected Areas (ANAP) to ensure that the activities developed in the vicinity of protected areas (or in their buffer zones) follow the rules established by its management. The project will strengthen the monitoring capacities of the Biodiversity Directorate and of the ANAP and put in place a monitoring system to enable practitioners and institutional actors to obtain information on ecosystem health and the evolution of the effects of the interventions developed.
In the project management structure, we noted that the Ministry of Environment is designated as a leader. However, compared to other departments, this Ministry has seen the most changes in tenure in recent decades. Taking into account the impact that these chronic changes may have on the continuity of actions and reflections undertaken, we would suggest that the FAO and UNDP plan a formal agreement with the Ministry of Environment, to minimize the aforementioned risks during the project or after its immediate withdrawal.	A steering committee meeting will be held before starting the project to discuss and establish a formal agreement with the Ministry of Environment to evaluate and minimize the risk of discontinuity in project leadership. Also, there are discussions within the MoE on the creation of a Task Force to coordinate all project and programmes at national level and an ongoing discussion with Ministry of Environment to strengthen capacities in project management and M&E.
In accordance with UNDP and FAO procedures, and existing national environmental legislation, we would encourage for a comprehensive environmental strategy to be developed in a consolidated document with specificities relating to the potential negative and positive impacts of the various interventions planned under the project.	A comprehensive environmental strategy (ESMF) has been planned and budgeted to be completed at the beginning of the project.
GEFSec review 12/22/21	

2. Is the project structure/design appropriate to achieve the expected outcomes and outputs as in Table B and described in the project document? 12/21/21: a) We urge immense care/caution in using sodium hypochlorite to ensure that no harmful byproducts are ingested by communities; b) The ratio of PMC mapped to LDCF to the total LDCF grant is 4.6%. The ratio of PMC mapped to co-finance to the total co-finance is 0.4%. The two ratios need to be the same. Please adjust. c) The PIF stated that water use metering would be an implemented activity of this project. We are unable to see it at CER stage. Please re-include. d) Please provide greater specificity on the activities to be supported under Component 2, with an indication of scale. Approximately how many "groundwater-level meters, rainfall gauges, discharge measurement tools and other equipment" will be installed? We find that the PIF-stage GEF Sec comment (for CEO Endorsement stage) requesting greater clarity on " proposed investments and activities" has not yet been adequately addressed.	a) The water treatment systems will be managed by the regional office of DINEPA. Attention will be paid to the quality of the products and the dosage to be used. ProDoc, page 42. b) The PMC percentage of the co-financing has been adjusted to 4.6%. CEO ER, pages 3?7 c) This is well noted. The inclusion of water consumption metering systems under the project has been clarified in the description of Output 3.1.4 and its relevant sub-activities. ProDoc, page 41. CEO ER, page 46 d) This is well noted. Additional detail has been added throughout the ?Expected Results? section to provide greater specificity on the activities to be supported under Component 2. ProDoc, pages 22?43
4. Are the confirmed expected amounts, sources and types of co-financing adequately documented, with supporting evidence and a description on how the breakdown of co-financing was identified and meets the definition of investment mobilized, and a description of any major changes from PIF, consistent with the requirements of the Co-Financing Policy and Guidelines? 12/21/21: The last row of Table C needs to be adjusted, as recurrent expenditure cannot be categorized as grant co-finance. Please refer to the GEF's Cofinancing Policy.	Co-financing was identified through extensive discussions with key institutions, donor agencies and organizations in Haiti. These discussions helped identify synergies between the interventions, sites, and beneficiaries of the proposed project. The breakdown of co-financing has been done according to the importance of the activities and the identified synergies. There was no major change between the co-financing in the FIP and the co-financing in the project document. Table 3 gives details about the co-financing and the proposed project. The requirements of the co-financing Policy and Guidelines have been taken into account. ProDoc, pages 42?48 The necessary change has been made. CEO ER, page 7.

7. Are there changes/adjustments made in the core indicator targets indicated in Table E? Do they remain realistic? 12/21/21: Please select all appropriate sub-indicators in the results framework. It is unlikely that any adaptation project would have a zero value for Core Indicator 4. Also, despite inclusion of sub-components on awareness-raising, the relevant sub-indicator (3.3.2) has a zero value. Similarly, despite supporting vulnerability assessments for water,; building capacity to mainstream climate change into water resources; and trainings; the relevant sub-indicators currently have zero values	There seems to have been a mistake in filling out the project information in the GEF portal when submitting the project. This has now been corrected.
3. Is the proposed alternative scenario as described in PIF/PFD sound and adequate? Is there sufficient clarity on the expected outcomes and components of the project and a description on the project is aiming to achieve them? 12/21/21: See above comment (in review item on Table B) requesting greater clarity on proposed investments and activities.	Thank you, this is well noted. As mentioned above, additional detail has been added throughout the ?Expected Results? section to provide greater specificity on the activities to be supported under Component 2. ProDoc, pages 22?43
7. Is there further and better elaboration to show that the project is innovative and sustainable including the potential for scaling up? 12/21/21: The discussion on sustainability includes mention of exploring "willingness to pay". Please note this was not included/mentioned at PIF stage. We advise very strong caution where it comes to the criteria for making the vulnerable poor pay for access to water, especially through a project which should support easier water access for all, including the poorest. Please discuss how it will be ensured that such an approach will not impose greater pressure and vulnerability on communities.	This section has been reviewed. Additional information?s have been added ProDoc, page 57?60 CEO ER, page 59?62 An Approach of Payment for environmental services was considered at the PIF stage and is still being considered. A small fee will be set according to the decision among the local members of the SAEP. It is therefore necessary to ensure that the financial contribution for the proposed service can be borne by the subscribers according to their level of vulnerability and in compliance with the regulations (ethical sustainability). The community members contributions will be used to maintain the technical assets in good condition after the life of the project. It also allows for the maintenance and renewal of the assets to guarantee the operation of the service for present and future users. ProDoc, page 59 CEO ER, page 61

Is there an accurate and confirmed geo-referenced information where the project intervention will take place 12/21/21: A map has been provided and a table of lat/long coordinates. Is it possible to include a geo-referenced map?	The target water sources and supply systems for project interventions stretches across the following six watersheds in the South-East Department of Haiti: i) Anse-?-Pitre; ii) Bainet; iii) Belle-Anse; iv) C?tes de Fer; v) Grande Rivi?re de Jacmel; and vi) Marigot. The boundaries of the six watersheds are shown on the Figure 10 of the CEO ER (Page 62). CEO ER, page 62 A new georeferenced map with sources and watershed boundaries has been added to the Prodoc and CEO ER CEO ER, page 64 ProDoc, Annex 3, page 102
Does the project include detailed report on stakeholders engaged during the design phase? Is there an adequate stakeholder engagement plan or equivalent documentation for the implementation phase, with information on Stakeholders who will be engaged, the means of engagement, and dissemination of information? 12/21/21: Please also endeavor to engage communities and local NGOs/CSOs directly in project implementation, so they are more than passive beneficiaries. Please discuss how this will be done.	A detailed Stakeholder Engagement Plan (SEP) has been developed for this project and is presented as Annex 8. A list of stakeholders to be engaged during the implementation phase is presented in Table 1 on page 6 of the SEP. In addition, in Table 7 on page 50 of the ProDoc, details are presented on stakeholder engagement and South-South cooperation within the proposed project. Further, a Stakeholder Engagement Report has been added to the submission package (Annex 13i). SEP: Table 1 on page 6 ProDoc: Table 7 on page 50 CEO ER: page 70 Regarding engagement of communities and local NGOs/CSOs in project implementation, information is presented in the SEP on page 5, under Section 3: Stakeholder engagement during project implementation. This information has also been reflected on page 70 of the CEO EL and Table 7 on page 50 of the ProDoc.
Has the gender analysis been completed? Did the gender analysis identify any gender differences, gaps or opportunities linked to project/program objectives and activities? If so, does the project/program include gender-responsive activities, gender-sensitive indicators and expected results? 12/21/21: Is it possible to capture indicators for factors that will directly address women's vulnerability, e.g., reduction in distance traveled to collect water, increase in women's income, etc.?	Following the various field missions and virtual consultations, a gender analysis and a gender action plan (GAP) were developed as part of the project's development. Activities with gender-specific indicators were also developed. In addition, the gender dimension has been mainstreamed throughout the project document and during the project development process. Unfortunately, there is insufficient baseline data available to introduce more granular gender-responsive indicators than those listed in the GAP. ProDoc, pages 52?57, and Annex 10

If there is a private sector engagement, is there an elaboration of its role as a financier and/or as a stakeholder? 12/21/21: The section on Private Sector is blank in the CER. Please discuss if and how the project will engage the private sector in adaptation. We see mention throughout the document but the actual section on Private Sector is missing.	Thank you. Private sector involvement has been elaborated on in the CEO ER under Section 4. At present, the private sector plays no major financial role, however there is scope for private funding during implementation phase if parties are interested. CEO ER, page 79
Has the project elaborated on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved? Were there proposed measures that address these risks at the time of project implementation? 12/21/21: Please discuss potential risks from COVID-19 to project consultations and implementation.	COVID-19 could represent a risk for the implementation of some project activities. A paragraph related to the risk posed by COVID-19 has been included in the document. ProDoc, page 51
Is the institutional arrangement for project implementation fully described? Is there an elaboration on possible coordination with relevant GEF-financed projects and other bilateral/multilateral initiatives in the project area? 12/21/21: Please advise where we may find information on coordination with relevant GEF and non-GEF initiatives in the country. Please include, if relevant, discussion on coordination with planned or ongoing GCF-supported initiatives.	The institutional arrangement for the implementation of the project is clearly defined. The role and responsibilities of the various stakeholders are clarified. ProDoc, page 73?76 At the time of preparation of the project document, there were no GEF-funded projects or ongoing GCF initiatives in the proposed project area. However, the LDCF project will work on possible synergies with any GEF project that comes to the area during the implementation of this project. The project will also develop coordination/synergies with the projects listed in the table below that will still be running during project implementation. For those that will come to an end, this project will be able to capitalize on the actions implemented and the lessons learned. This will help avoid duplication of actions and better address future interventions. ProDoc, page 43

Are environmental and social risks, impacts and management measures adequately documented at this stage and consistent with requirements set out in SD/PL/03? 12/21/21: The ESMF presents information in a scattered manner. Please include a summary para in the ESS section of the Portal entry. Please also clarify how the climate change risks identified in the ESMF will be addressed. (The ESMF states: "Outputs and outcomes sensitive or vulnerable to potential impacts of climate change or disasters. Most particularly, climate change could compromise tree reforestation and agroforestry activities by increasing temperatures beyond vegetation tolerances.")	With regards to the climate change risks identified in the ESMF ? pertaining to the agroforestry and reforestation interventions ? suitable climate-resilient species will be identified and listed in the agroforestry technical packages to be developed at implementation stage under Output 2.3.2 ? this has been made clearer in the ProDoc. The project is part of the sustainable access to drinking water for the population of targeted localities in the South-East department of Haiti, by improving the resilience of the drinking water supply to the effects of climate change. This department is highly vulnerable to climate change, which, combined with massive and ongoing environmental degradation and systemic poverty, creates major challenges to human development. The project will raise awareness of the vulnerability of the water sector to climate change among the population and local authorities, develop regulatory tools, build the capacity of local authorities in water resources management, and promote conservation, management and drinking water supply practices. The beneficiaries will be national institutions (DINEPA, MDE, MARNDR, local authorities) and local communities (86 target communities, including 338,728 individual beneficiaries). The project will also provide environmental benefits through the reforestation of upstream watersheds that supply the populations of the targeted communes with drinking water. At the time of the development of this project, certain risks that could have negative environmental and social impacts were identified. These are related to the tree nurseries, reforestation and agroforestry activities, the protection of spring perimeters, the rooftop water collection system, the preparation of financial frameworks for operation and maintenance, and the engagement of contractors and stakeholders. The overall risks are moderate to substantial. Thus, an ESMF (Environmental and Social Management Framework) has been developed during this PPG phase and a Proportionate ESMPs (Environmental and Social Management Plan) for the activities will be developed during the implementation of the project The climate change risk will be addressed by proposing technical agroforestry packages that will anticipate potential increases in average temperature. The key is to include plant materials (trees and companion crops) that will be the least affected by potential temperature changes over their lifecycles (a few years for crops, longer for fruit trees, very long for pine). ProDoc, page 36

Are the socioeconomic benefits at the national and local levels sufficiently described resulting from the project? Is there an elaboration on how these benefits translate in supporting the achievement of GEBs or adaptation benefits? 12/21/21: a) The LDCF/SCCF Council has expressed interest in age-disaggregated direct-beneficiary information. Would it be possible to track this, at least for broad categories of the young and the aged? b) If there are expected benefits for income, health, sustenance, etc., as a result of this project, please discuss. c) Please discuss any opportunities this project offers in terms of green recovery and building back better in the COVID-19 context. d) The discussion on sustainability includes mention of exploring communities' "willingness to pay". Please note this was not included/mentioned at PIF stage. We advise very strong caution where it comes to the criteria for making the vulnerable poor pay for access to water, especially through a project which should support easier water access for all, including the poorest. Please discuss how it will be ensured that such an approach will not impose greater pressure and vulnerability on communities.	a) This is well noted. Age-disaggregated beneficiary information has been added under section 10 of the CEO ER, according to available statistics. CEO ER, page 97 b) Thank you. The health, income and food security benefits to the project?s target beneficiaries has been clarified accordingly in the CEO ER. CEO ER, page 97 c) This is well noted. Opportunities the proposed project offers in terms of green recovery and building back better in the COVID-19 context has been discussed under the ?Benefits? section in the CEO ER. CEO ER, pages 99?100 An Approach of Payment for environmental services was considered at the PIF stage and is still being considered. A small fee will be set according to the decision among the local members of the SAEP. It is therefore necessary to ensure that the financial contribution for the proposed service can be borne by the subscribers according to their level of vulnerability and in compliance with the regulations (ethical sustainability). The community members contributions will be used to maintain the technical assets in good condition after the life of the project. It also allows for the maintenance and renewal of the assets to guarantee the operation of the service for present and future users. ProDoc, page 59 CEO ER, page 61
GEFSec review 02/28/22	

7. Are there changes/adjustments made in the core indicator targets indicated in Table E? Do they remain realistic? 2/28/22: Further information is requested: a) For sub-indicators 2.1.1, 2.1.2 and 2.1.3, could you please select the sector (for 2.1.1) and include some information in the Comment section provided? It would be helpful to have qualitative, and not just quantitative, information. Thank you. b) Output 1.2.2 in Table B is for participatory climate change vulnerability assessments, yet no value has been provided against sub-indicator 2.1.4, which pertains to vulnerability assessments. Can you please include information? c) While values have been entered for number of people to be trained in the Core Indicators table, they dot appear under sub-indicator 2.3. Can you please correct this?	a) 2.1.1 Sector : Water Comment section: Despite the Haitian government's efforts to incorporate climate change into national planning processes, consideration in regulatory frameworks related to drinking water management in Haiti has been limited. Under this project, two regulatory instruments - DINEPA and OREPA Sud - related to the management of drinking water supply in Haiti will be revised to take into account the impacts of climate change on water resources. b) Output 2.1.4 Number of assessments conducted: 5 Comment : 5 vulnerability assessments will be conducted and will target the watersheds, recharge areas and springs of Cresson, Bodarie, Pr?chet, Cascade Pichon and K-Royer. c) Output 2.3.1 Total of people trained: 100 Women: 40 Men: 60 Of which total number of people at the line Ministries: 60 Women: 24 Men : 36 Of which total number of community / association : 40 Women : 16 Men : 24 Output 2.3.2 Number of people with raised awareness : 100 Women : 40 Men : 60 Comment: It was estimated that 5 people from each of the water governance structure (MoE, DINEPA, OREPA, CTE, CATEPA and selected community NGO) will be trained or sensitized on climate change impacts on water resources and appropriate adaptation measures.

7. Is there further and better elaboration to show that the project is innovative and sustainable including the potential for scaling up? 2/28/22: Cleared. Please ensure that the poorest and most vulnerable will not be deprived use of these important services on the basis of their inability to pay.	Reference:: ProDoc, pages 40-41 Well noted. It will be ensured that the poorest and most vulnerable will not be deprived use of these important services on the basis of their inability to pay. Pages 40 and 41 in the ProDoc: ?Currently, several of the target communities do not pay for water provision, predominantly because of the minimal financial capacity within the communities, as well as cultural and societal beliefs that water is a free commodity. As a result, water consumption volumes remain unmonitored, allowing for the unsustainable use of water resources and limited information for effective management. The effectiveness of SAEPs? water supply is also disrupted by the creation of illegal piping connections within the target communities, driven by communities? water supply needs. Under this output, LDCF funds will be used to develop an O&M framework based on lessons learned from existing efforts of HELVETAS as part of the REGLEAU project, specifically relating to rehabilitation of SAEPs. In addition, willingness-to-pay (WTP) assessments will be conducted among the target communities. Moreover, Project Social Impact Assessments (PSIAs) will be conducted determine the social impacts that the implementation of water tariffication systems may have on the target communities of the project. Based on the abovementioned lessons learned, PSIAs, as well as WTP assessments, equitable financial plans ? focussing specifically on the South-East Department ? for O&M of the five target SAEPs will be developed. This financial plan will include a monitoring and tariff system to promote the sustainability of the O&M of the SAEPs. Additionally, water consumption metering systems will be installed to ensure sustainable and equitable water use and distribution under future scarcity scenarios. The financial plan will fund O&M plans that will also be developed under this output, the ensure adequate reinvestment of the tariffs. However, seed funding ? by government institutions, donors, or loans ? will be required to operationalise the physical elements of the SAEPs before the tariff system can be implemented. Implementation of the ESMF and subsequent management actions will be fulfilled by the Project SES Specialist to ensure that financial plans developed as a result of interventions under this output do not result in unequal access to water during project implementation, as well as after project closure.

Risks to Achieving Project Objectives Has the project elaborated on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved? Were there proposed measures that address these risks at the time of project implementation? 2/28/22: We are still unable to see potential implementation risks from Covid entered in the Risks table. Please include.	3/23/22: Reference: Prodoc page 130, 49 CEO Endorsement Page 81 The various social and environmental risks, including climate risks, associated with project implementation have been identified and mitigation measures have been proposed through the environmental and social framework and in the project risk log. Risks related to COVID 19 have also been added to the table as follow : The resurgence of new variants of COVID-19, impacts the implementation of project activities. Workshops, trainings and meetings will be held virtually or in a mixed format. For activities that require bringing people together, COVID-19 protective materials will be used, and physical distance will be respected.
GEF Secretariat comments 2/28/22: Not yet cleared. Please paste the consolidated table of responses to PIF stage comments, including those provided by the GEF Sec, in the Annex B section of the online CER, as has been done for the other annexes. These should be available in the Portal entry and not just as an uploaded document.	This issue has been cleared with GEF IT support team
GEFSec review 03/28/22	
Annexes Are all the required annexes attached and adequately responded to? 3/28/22: Please remove the highlighting of any text in the Portal entry as well as the uploaded Project Document. Both items will be submitted for four-week Council review and the highlight can sometimes make it difficult to read the text.	04/21/22 Corrected in the documents and portal as well

GEF Secretariat comments 3/28/22: Not yet. What has been provided in the Annex is a repeat of the current (CEO endorsement stage) review sheet. This is not needed. What is needed is an explanation by the agency of how the comments provided at PIF stage, for consideration at CEO endorsement, were addressed. These are included at the bottom of the PIF-stage review, and for the agency's onvenience are pasted below: By CEO Endorsement, please ensure that detailed information has been provided on: 1) climate change rationale; 2) proposed investments and activities; 3) project locations/sites and community vulnerability; 4) stakeholder engagement (undertaken and proposed), including with civil society, women's groups and youth; 5) please discuss how women will be engaged in project design and implementation, and discuss in detail measures the project will proactively take to reduce women's vulnerability; 6) how the private sector has been and will continue to be engaged; and 7) Measures taken to ensure sustainability of project investments and durability of project outcomes." We understand that due to technical issues, the responses cannot be pasted into the Portal and have been included as an annex of the Project Document.	04/21/22 Reference: CEO End. Page 128- 135 ProDoc, pp. 7?9 Explanation of how the comments provided at PIF stage, for consideration at CEO Endorsement stage, were addressed, are presented below. 1) climate change rationale; During the PPG phase of the project, the contextually relevant climate change rationale was developed following extensive virtual consultations between the consulting team, the UNDP country office, and representatives of the Government of Haiti (GoH). The development of the climate change rationale was also strongly informed by the information obtained from field mission reports by the national consultant as well as from online resources. all latest climate risk information that was obtained and analysed, especially the trend analysis and historical evidence of losses and damages that climate variability induced in the target areas. This information was collated with a range of scenarios for probabilistic impact. Through a thorough baseline analysis critical adaptation deficiencies and gaps have been identified and the project solutions defined in broad consultation and engagement of stakeholders at all level. Barrier analysis finally informed the project TOC and framework as the proposed project hinges on a barrier removal strategy. Reference: ProDoc, pp. 21?42 The climate rationale is outlined under the ?Development Challenge? section of the ProDoc (Section II). First, the baseline climatic conditions of Haiti are described (ProDoc, p. 7), followed by a description of projected climate changes and associated hazards (ProDoc, pp. 7?8). These descriptions are then followed by the problem statement (ProDoc, pp. 8?9), whereby it is shown how observed and projected impacts of CC are currently, and will further impact the availability of freshwater in rural communities and small urban centres in the South-East Department of Haiti. Finally, the impact pathways underlying the core climate change problem, compounded by non-climate drivers, are presented in the problem tree in Figure 9 (ProDoc, p. 159). Reference: ProDoc, pp. 21?42 Site Selection Annex 13a (Filename: Annex 13a_Haiti PPG GEF_UNDP_Site Selection_6 Aug 2021). 2) proposed investments and activities; During the PPG phase, following virtual consultations between the consulting team, the UNDP country office, and representatives of the Government of Haiti (GoH), the project interventions were designed to improve the resilience of the drinking water supply. Component 1 focuses on capacity building (through the improvement of awareness, knowledge and information management systems) and the creation of an enabling environment (through preparation of communities to effectively plan responses to CC). Component 2 focuses on necessary strengthening of policies abs institutional capacities at national, regional and local levels (by mainstreaming CC into existing regulatory and policy instruments, capacity building of priority institutional stakeholders and equipping communities with instruments and mechanisms that ensure sustainable management of water resources). Finally, output 3 will identify and promote practices for the conservation, management and supply of drinking water by ensuring reliable access to drinking water by local communities and

Comment by Kordula Mehlhart, GEF Council Member, Head of Division on Climate Finance, BMZ, Council, Germany made on 6/18/2020 Comment: Germany welcomes the proposal, which aims to increase the resilience of communities to the effects of climate change in Haiti by improving access to drinking water in the South-Eastern part of the country. Furthermore, Germany appreciates that the proposed activities under the project are fully aligned with Haiti?s National Action Plan for Adaptation and have been framed to align with and support other ongoing development activities in the water sector. Given the universally poor coverage and vulnerability of water supply in the country, Germany also sees opportunities for scalability, as the measures to be implemented under the project can be replicated in other parts of the country. Suggestions for improvements to be made during the drafting of the final project proposal: ? Regulatory and policy instruments: Germany appreciates the approach to strengthening the institutional capacities. However, regarding component 2, Germany suggests incorporating an analysis of illegal and unregulated water extraction practices and unregulated spring water usage in the area of intervention and formulating a strategy to tackle this issue.	04/21/22 Reference: CEO EL, pp. 65?68 ProDoc, pp. 21?42 Information obtained from the national consultant?s field mission reports, relating to illegal and unregulated water extraction practices, as well as unregulated spring water usage in the areas targeted by the proposed project has been reported in the Site Selection Annex 13a (to the ProDoc) as well as in the CEO Endorsement Letter. It is important to note that there was insufficient baseline data available to introduce more granular detail regarding illegal and unregulated water usage in the targeted areas. Consequently, at implementation stage, more in-depth assessments will be carried out at to address the knowledge gaps.
? Role of the local level: Germany appreciates the central role of the Ministry of Environment?s (MdE) Direction for Climate Change. However, the MdE?s limited capacities regarding production and use of information as well as operationalization of policies supported by projects should be considered. Existing experiences regarding watershed management, to which UNDP projects have contributed, and experience in natural resource management in general show that regulatory and policy instruments should not depend on active application by central government stakeholders but be closely connected to the local level.	04/21/22 Reference: ProDoc, pp. 21?42 The fact that experiences in natural resource management in general show that regulatory and policy instruments should not depend on active application by central government stakeholders but be closely connected to the local level has been considered when designing the project interventions. The interventions were designed in such way that they include stakeholders ranging from the national level to the community level. Details of the project interventions can be found in the ProDoc under the ?Results and Partnerships? section.

Duplication of work: Germany appreciates the several types of plans that will be produced at local level. However, the ?community-based strategic and operational plans? should not lead to duplications and increased workload for the local participants. Germany suggests improving the quality of existing plans e.g. Plan de Development Communal (Municipal Development plans, required by law) wherever possible. Regarding the investments to be included in those plans, Germany further suggests considering the lack investment capacity of most local stakeholders or local governments ? especially small communities.	04/21/22 Reference: ProDoc, pp. 21?42 The project interventions were designed in such a way to improve the quality of existing plans ? whenever possible ? at a national, regional and local levels. For instance, an Outcome 2.1 of the proposed project is that key regulatory and policy instruments are adjusted ? rather than created or duplicated ? to consider the implications of climate change for drinking water supply and promote adaptive community-based management, knowledge generation and dissemination.
Synergies with existing projects and knowledge sharing: Germany appreciates the exploration of synergies with other projects and suggests to further include the experience of CIAT (Comit? interministerial d?Amenagement du Territoire), which has been working on pilot projects in spatial planning (plans d?amenagement du territoire) and improvement of hydro-meteorological data collection, as well as the experience of DINEPA, which worked with local committees in the Southern Department (financed by IDB and World Bank, 2007-2011).	04/21/22 Reference: CEO ER, p. 82 Stakeholder Engagement Plan Annex 8 (filename: Annex 8_Haiti PPG GEF_UNDP_Stakeholder Engagement Plan_17 Jan 2022) As recommended, CIAT and DINEPA have been included as key stakeholders during project implementation.
Financial sustainability of water supply systems: Germany appreciates that the financial sustainability of water supply systems is addressed in the proposal. However, Germany recommends considering the informality of the existing water supply especially in rural areas. Fees paid might not cover costs of meter systems and informality might limit the potential of policy and regulation efforts.	04/21/22 Reference: ProDoc, p. 41 As recommended, the informality of the existing water supply especially in rural areas was considered during project design. Specifically, the project proposes to allocate LDCF funds for the development of an O&M framework based on lessons learned from existing efforts of HELVETAS as part of the REGLEAU project, specifically relating to rehabilitation of water distribution. In addition, willingness-to-pay (WTP) assessments will be conducted among the target communities. Moreover, Project Social Impact Assessments (PSIAs) will be conducted determine the social impacts that the implementation of water tariffication systems may have on the target communities of the project. More information on the abovementioned intervention is shown in the ?Results and Partnerships? section of the ProDoc.

Gender: Germany welcomes that gender-sensitive approaches are explicitly considered and suggests including disaggregated numbers of direct beneficiaries by gender.	04/21/22 Reference: ProDoc, p. 60; 64; 137?140 CEO ER, p. 9; 97; 131; 133; 135 beneficiaries of the project have been presented in a gender-disaggregated manner, where required, throughout the CEO Endorsement Letter and the ProDoc.
Comment by Elizabeth Nichols, U.S. Department of State | Bureau of Oceans, International Environmental and Scientific Affairs (OES), Office of Environmental Equality and Transboundary Issues (EQT), Council, United States made on 7/2/2020 Comment: As UNDP prepares the draft final project document for CEO endorsement, we urge UNDP to: Clarify the geographic area the project is proposed to take place, understanding that different regions have different access to water. For example, most of the population in the South-East doesn?t have access to underground water. There also seems to be a mix-up between the South and Southeast. For example, Macaya National Park is not located on Massif de LaSelle.	04/21/22 Reference: CEO ER, pp. 22?26; pp. 62?63; pp. 65?68 Site Selection Annex 13a (Filename: Annex 13a_Haiti PPG GEF_UNDP_Site Selection_6 Aug 2021). The geographic area for the interventions of the proposed project has been clarified in the CEO Endorsement Letter in the ?1b. Project map and geo-coordinates? section (pp. 62?63), as well as in the ?Local context: South-East Department of Haiti? section (pp. 22?26). More comprehensive details on the geographic scope of the proposed project are given in the Site Selection Annex 13a to the ProDoc. Further, the differential access to water depending on the different communities being targeted by the project is also detailed in the Site Selection Annex 13a, as well as in the CEO Endorsement Letter (pp. 65?68). Finally, the mix-up regarding the location of the Macaya National Park has been cleared.
Consider the greater impact of watershed degradation on water supply. By focusing on the degradation at the aquifer recharge zones, it underestimates the overall impact of watershed degradation on water infiltration and yield.	04/21/22 Reference: CEO EL p. 33 Site Selection Annex 13a (Filename: Annex 13a_Haiti PPG GEF_UNDP_Site Selection_6 Aug 2021). The greater impact of watershed degradation on water supply is shown under the description of Component 3 ?Promotion of practices for the conservation, management and supply of drinking water adapted to projected climate change scenarios?, in the CEO Endorsement Letter (p. 33). However, in December 2020, during a series of meetings were convened between the National Consultant (NC) and the relevant stakeholders from the GoH, it was decided during those meetings that individual water sources (including their respective recharge zones) and drinking water supply systems (SAEP) should be regarded as the strategic targets for selecting project intervention sites, rather than a single watershed ? given the scope of the project. The objectives of these meetings were to have a shared understanding of the project intervention logic and find consensus among stakeholders on the sites to be selected. In particular, the meetings focused on Component 3 of the project Logframe as site selection will be critical for the adequate implementation of the interventions listed under this component. More details on the site selection methodology in shown in the Site Selection Annex 13a to the ProDoc.

Explain the path to sustainability for the different components of the project as well as the financial sustainability for the community-based strategic plans that would be developed under the proposed interventions.	04/21/22 Reference: CEO ER, p. 60?61 The path to sustainability for the different components of the project as well as the financial sustainability for the community-based strategic plans that would be developed under the proposed interventions is detailed under the ?Innovativeness, sustainability and potential for scaling up? section in the CEO Endorsement Letter.
Identify the location of the watershed protection component and explain in greater detail how the funding would adequately cover the costs of such a measure.	04/21/22 Reference: ProDoc, pp. 36?42; pp. 28?42 Greater detail as to how the funding would adequately cover the costs of such implementations is given in the ProDoc under the ?Results and Partnerships? section (pp. 36?42). It is important to note that there was insufficient baseline data available to introduce more granular detail regarding the location of the watershed protection component. Consequently, at implementation stage, assessments will be carried out at the national and local levels, under Components 2 and 3, to identify high-priority and strategic locations, prior to the physical implementation of watershed protection interventions (pp. 28?42).
Include a comprehensive view of different risks that may impact the region and water sector.	04/21/22 Reference: ProDoc, pp. 7?11; 12?20 A comprehensive view of different risks ? including current and future climate change impacts ? that may impact the region and water sector is outlined throughout the ?Development Challenge? and ?Strategy? sections of the ProDoc.
Consider the coordination potential of working in tandem with all water and sanitation stakeholders (such as IDB, Spanish AID, Swiss AID, USAID, World Bank) currently working in Haiti, either in partnership or in parallel toward the sustainable delivery of safe drinking water amid recurrent severe climate events in rural and/or high density population zones. The proposal mentions a few of these actors but does not elucidate on any of their accomplishments since their 2012 commencement (USAID since 2018) or how each may be better leveraged in a coordinated effort to improve the resilience of drinking water access in Haiti to the effects of climate change.	04/21/22 Reference: ProDoc, pp. 42?59 Stakeholder Engagement Plan Annex 8 (filename: Annex 8_Haiti PPG GEF_UNDP_Stakeholder Engagement Plan_17 Jan 2022) The potential for partnerships between the proposed project and other water and sanitation stakeholders, notably the IDB, AECID, World Bank and the Swiss Red Cross was considered during the project design. Details on how the above stakeholders may be better leveraged in a coordinated effort to improve the resilience of drinking water access in Haiti to the effects of climate change is outlined in the ?Results and Partnerships? section of the ProDoc, as well as in the Stakeholder Engagement Plan Annex 8 (to the ProDoc).

Utilize past drinking water/water supply programs, especially those in rural Haiti, to gain a comprehensive understanding of their success or failure.	04/21/22 Reference: ProDoc, pp. 21?59 Site Selection Annex 13a (Filename: Annex 13a_Haiti PPG GEF_UNDP_Site Selection_6 Aug 2021). During project development, lessons learnt and best practices from past drinking water/water supply in rural Haiti were used ? in tandem in field mission reports from the national consultant ? to design adequate interventions to improve the resilience of drinking water access in Haiti to the effects of climate change.
Consider a multi-sector and stakeholder commitment approach that not only includes high-level donors and government entities, but also local stakeholders (CBOs, FBOs, NGOs, municipalities, CASECs, ASECS, etc.).	04/21/22 Reference: ProDoc, pp. 21?42 The proposed project?s interventions were designed so as to have active and equal participation of the local stakeholders ? such as the CAEPAs, CBOs, FBOs, NGOs etc ? at implementation. This is outlined under Component 2 in the ?Results and Partnerships? section of the ProDoc.
Consider urbanization currently rampant in Haiti, including demand for livable land and subsequent unenforced activities in ad hoc informal settlements and how this impacts watershed efficiency and water quality in aquifers and other water sources.	04/21/22 Reference: ProDoc, pp. 21?42 Demand for livable land and subsequent unenforced activities in ad hoc informal settlements, particular around the aquifer recharge zones has duly been taken into consideration during the project design phase. During the implementation phase of the project, the Environmental and Social Management Framework (Annex 10 to the ProDoc) ? developed during the project design phased ? will be applied to ensure that no physical and economic displacement occurs in the target communities because of these interventions, even beyond project closure. Furthermore, the project was designed to benefit all the communities dependent on the aquifers and water sources being targeted by the project, whether they are in formal or informal settlements. More details on how the project interventions (for e.g. reforestation activities and agroforestry) will benefit the communities is given in the ?Results and Partnerships? section of the ProDoc.

Consider local ownership and responsibility for the sustainable management and actions (governance, finance, water resource management) that will be needed both during and beyond this project. Expand on how this project will address issues that arise related to the human resources needed to localize the proposed projects.	04/21/22 Reference: CEO ER, pp. 60?62 ProDoc, pp. 21?42 The project was designed to ensure institutional, economic, and social sustainability of interventions during and beyond the project lifespan ? in addition to maintaining and improving the environmental sustainability of the target watersheds in the context of climate change in the South-East Department. The sustainability of the project?s interventions is an important element that will be supported by community ownership as promoted by the stakeholder engagement process during the project design. Comprehensive details on the activities that will ensure the institutional, economic, and social sustainability attributes of the project is presented in detail under the Results and Partnerships of the ProDoc (Section IV, pp. 21?42).
Consider other sectors that are dependent on water access and availability such as agriculture, livestock, stream ecosystems, and local industries and how this project will benefit them.	04/21/22 Reference: ProDoc, pp. 21?42 Other sectors that are dependent of water and availability were considered during project intervention design. The project interventions are outlined in the ?Results and Partnerships? section of the ProDoc.
Focus on a more regional, zone-specific perspective that describes the water management and water needs/challenges in the target zone of South-East.	04/21/22 Reference: ProDoc, pp. 21?42 As mentioned above, during a series of meetings that were convened between the National Consultant (NC) and the relevant stakeholders from the GoH, it was decided during those meetings that individual water sources (including their respective recharge zones) and drinking water supply systems (SAEP) should be regarded as the strategic targets for selecting project intervention sites. The related interventions that consider the water management and water needs/challenges in the target areas of the South-East Department are outlined under Component 2 of the project.
Provide more information regarding what fora or communication media the implementing agency and its partners will use to communicate results.	04/21/22 Reference: Communications Plans Annex 13g (Filename: Annex 13g_Haiti PPG GEF_UNDP_Communications Plan_6 Aug 2021) A Communication and Knowledge Management Plan annex (Annex 13g) was developed for the ?Strengthening the climatic resilience of the drinking water sector in the South of Haiti? project, as required for the development of a comprehensive Project Document (ProDoc) for the Global Environmental Facility (GEF). This annex (to the ProDoc) provides comprehensive details on how this information sharing and communication to project stakeholders will be conducted under the proposed project.
GEFSec review 05/15/22	

	06/22/2022 Reference: Prodoc page 77-78, CEO ER page 9 The financing presented in Table D is adequate and the project demonstrates a cost-effective approach to meet the project objectives. The Project considered 2 alternative strategies to achieve the proposed outcomes: Scenario 1: Focus only on the supply side of water management and water access issues. In this scenario the Project would invest in i) deskreview and elaboration of plans for interventions on the water distribution networks, ii) Inventory and quality characterisation of groundwater aquifers in the target, iii) civil engineering works to procure and install physical structures of the water distribution network which would total about 800,000 USD Scenario 2: Implement a comprehensive approach by addressing watershed management upstream, water source protection as well as water supply and demand-side (management) for greater efficiencies. Investments include i) participative and inclusive consultation and awareness sessions informing communities and the GoH on water management adaptation strategies and climate-resilient water supply by means of a continuous information- and knowledge-generation system; and ii) performing cost-benefit analyses of different adaptation strategies developed as per the different predicted climate change scenarios identified, iii) training programmes implemented to strengthen community capacities and awareness ? with specific strategies to target female-headed households for sustainable and equitable monitoring and usage of drinking water. The costs add up to 3,000,000 USD These scenarios were considered from technical as well as cost-efficiency considerations. If evaluating short term minimum cost, scenario 1 is a clear winner. However, considering long term benefits and costs, scenario 2 is better as it promotes long term sustainability due to community-based and participatory climate-resilient water resource management and sustainable land-use planning. Therefore, choosing scenario 2 allows the implementation of a more comprehensive solution that will ensure the sustainability and the ownership by the population over the long term. Reference: CEO ER, pages 2-7 An M&E section has been added in Component 2 of Table B including associated co-financing

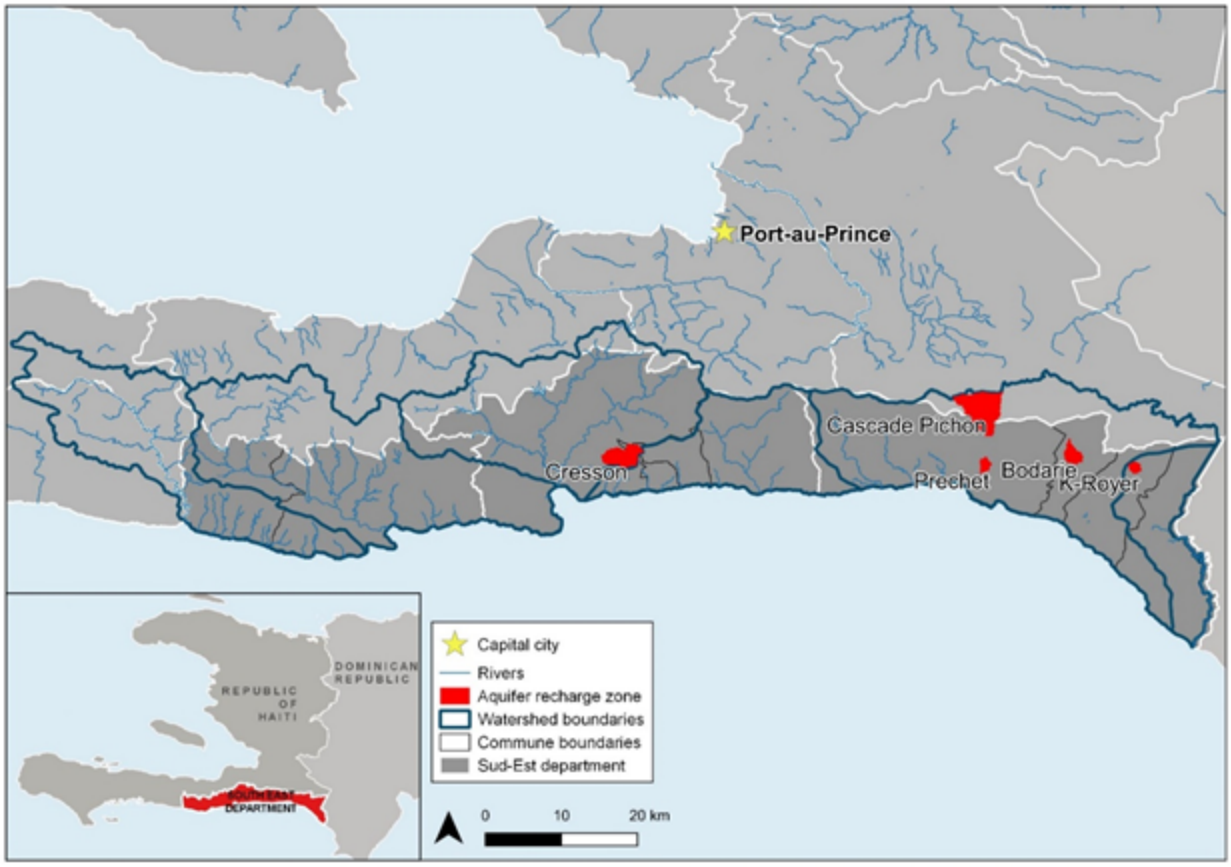
On Table B and the project budget table provided in Annex E : It looks like Component 2 ($515,000) includes not only the budget for Component 2 provided in the project budget table ($160,000 + $139,900 + $124,600 = $424,500) but also the M&E budget ($90,500). Therefore, please include in Table B, Component 2, the expected outcomes and outputs for M&E. In addition, if we look at the M&E budget table (in section 9: Monitoring & Evaluation), the total is $93,000 does not match the $90,500 stipulated in the project budget table. Please verify and make sure all the budget lines match across all budget tables	06/22/2022 Reference: ProDoc page 72, CEO ER pages 97, 98 The amounts in the M&E budget table have been corrected
On the budget: a. Unspecified miscellaneous costs cannot be funded by GEF resources. Please remove this item from the budget table and adjust accordingly. b. An international M&E Officer and a local M&E expert have been charged across the components. Please charge these activities to the M&E budget.	06/22/2022 A. Reference: ProDoc pages 80-91 The miscellaneous costs have been removed in the budget B. Reference: ProDoc pages 80-91 The Project M&E Officer and local M&E expert have been moved to the M&E in the budget.
Additional changes	06/22/2022 Reference: Prodoc Pages 1, 22-32, 34, 35, 38-41, 43, 44, 72, 73-74, 77-78, 80, 83, 92-94; CEO ER pages 1, 81, 82, 85 After analyzing the particularity and complexity of this project, which includes both the aspect of water resources protection and the aspect of use by the population, it was decided by mutual agreement that the UNDP and the MDE will explore the possibility of having a third-party organization to facilitate the implementation of this project. Following a mapping of potential actors and a HACT assessment with low-risk ranking level, HELVETAS has been selected to fulfill this role alongside MDE and DINEPA with oversight provided by UNDP as a GEF Agency. As a result, the project implementation modality has been changed to Non-Governmental Organization Implementation HELVETAS is the implementing partner (GEF Executing Entity)

ANNEX C: Status of Utilization of Project Preparation Grant (PPG). (Provide detailed funding amount of the PPG activities financing status in the table below:

PPG Grant Approved at PIF: **150,000**			
Project Preparation Activities Implemented	***GETF/LDCF/SCCF Amount ($)***		
	Budgeted Amount	***Amount Spent To date***	***Amount Committed***
UNDP *Activities implemented:* Drafting of Prodoc and CEO-Endorsement Stakeholder consultation (incl. field visits and workshops) Private sector engagement *Activities pending:* All comments received from GEFSEC and GEF council resolved, prior to CEO Endorsement Translation of Prodoc to French	150,000.00	120,557.64	29,442.36
Total	**150,000.00**	**120,557.64**	**29,442.36**

ANNEX D: Project Map(s) and Coordinates

Please attach the geographical location of the project area, if possible.


Port-au-Prince
Cascade Pichon
Cresson
Prechet
Bodarie
K-Royer
DOMINICAN REPUBLIC
REPUBLIC OF HAITI
SOUTHEAST DEPARTMENT
Capital city
Rivers
Aquifer recharge zone
Watershed boundaries
Commune boundaries
Sud-Est department
0
10
20 km

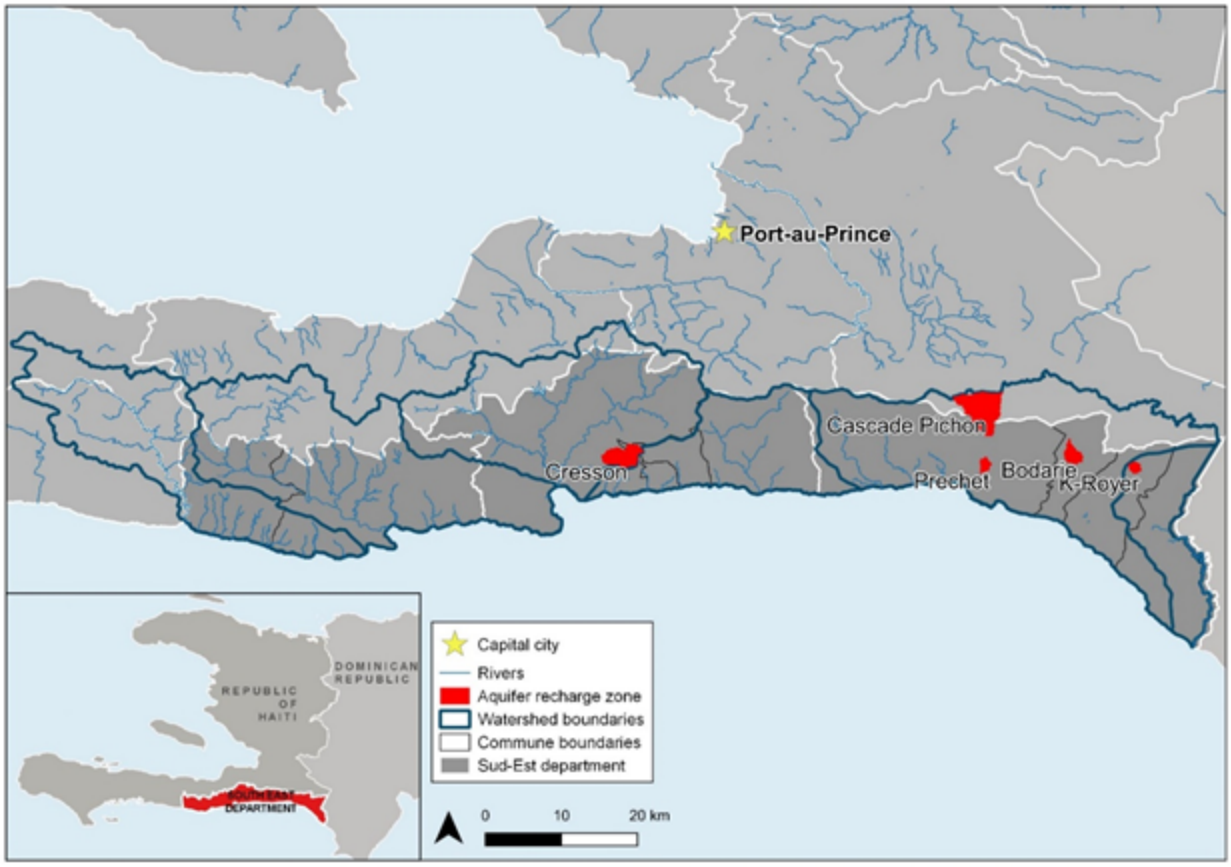


Figure 17. Geographical location of respective sources and catchment areas of the five selected target Drinking Water Supply Systems (SAEPs) for project interventions.

Table 8. Targeted drinking water sources? GPS coordinates.

Source	Latitude	Longitude
Cresson	18.2624400	-72.4890600
Bodarie	18.2921931	-72.3044819
Pr?chet	18.2442294	-72.0242353
Cascade Pichon	18.2985606	-72.0139117

ANNEX E: Project Budget Table

Please attach a project budget table.

Expenditure Category	Detailed Description	Component (USDeq.)						Total (US Deq.)	Responsible Entity
		Component 1	*Component 2*	*Component 3*	*Sub-Tot*	*M & E*	*PMC*		(Executing Entity receiving

		Sub-components 1.1	*Sub-components 1.2*	*Sub-component 2.1*	*Sub-component 2.2*	*Sub-component 2.3*	*Sub-component 3.1*	*al*				**funds from the GEF Agency)[1]**

Equipment	Costs for equipment to establish nursery in each target SAEP for tree seedlings to be dispensed for the reforestation and agroforestry interventions (USD35,000 per nursery, 1 per SAEP, total USD175,000). Cost for procurement of gabions, percolation tanks, contour bunds and septic tank, to be installed at sites identified under Activity 3.1.2.1 to increase resilience of aquifer recharge zones and water distribution infrastructure against climate change (USD100,000 per SAEP, total USD500,000). Costs for procurement of 350 rooftop water harvesting systems, including household cisterns (USD500/un						887 500	887 500			887 500	

Equipment	Costs over 5 years for project office materials (desk, chairs, printers, ink cartridges etc.) including a solar panel setup (total USD24,000).							-		24000	24000	
Equipment	DINEPA to procure groundwater metering devices, rainfall gauges, and discharge measurement devices (127 units, at USD750/unit, total USD95,250)				95250			95250			95250	
Equipment	Water quality test equipment (10 kits at USD350 per water testing kit, total USD3,500).	3 500						3500			3500	
Equipment	Costs over 5 years of communication and audiovisual equipment, including internet connection over 5 years, for project office (total USD33,600).							-		33600	33600	

Equipment	Costs for laptops, USB drive, Software, screen, and antivirus for the project team (PM and Administrative & Financial Officer) (total USD12,400)							-		12400	12400	
Equipment	Two laptops pre-loaded necessary software to connect to water quality test equipment, as well as to run water quality analyses (USD2,450 per laptop-software setup ? total USD4,900).	4 900						4900			4900	

Contractual services-Individual	Five Local Foresters from the DFER, with support from Local Agroforestry Expert, to establish a nursery for tree seedlings to be dispensed for the reforestation and agroforestry interventions; and to conduct quarterly site visits in the areas where trees have been planted to manage tree sapling mortality and replace with new saplings where necessary (5 Foresters, for 40 months at USD750/month, total USD150,000). Agroforestry ?farmer champions?, with support from MoE and Project Community Liaison Specialist, through extensive community consultation and awareness raising, to promote and establish of up to 700 ha of agroforests across the							1 467 250	1 467 250			1 467 250		

Contractual services-Individual	Project Administrator (60 months at USD1,000/ month, total USD60,000).							-		60000	60000	

Contractual services-Individual	Project Community Liaison Specialist to support DINEPA in establishing community-level decision-making groups in the target communities reliant on the five target SAEPs; and to develop community-based strategic and operational plans, with the support of regional and local government stakeholders (4 months at USD1,200/ month ? total USD4,800, 6.7% of total Project CLS salary over 60 months). Project SES Specialist to coordinate the identification of suitable zones for reforestation and agroforestry interventions (6 months at USD1,200/ month ? total USD7,200, 10% of total Project SES Specialist salary over 60 months). Project Community						21 600		21 600			21 600			

Contractual services-Individual	Project Driver to drive International Water Resources Advisor throughout areas served by DINEPA and OREPA Sud for data collection (9 months at USD650/month ? total USD5,850, 15% of total Project Driver salary over 60 months). Project Driver to drive International Water Resources Advisor throughout areas served by DINEPA and OREPA Sud for data collection (9 months at USD650/month ? total USD5,850, 15% of total Project Driver salary over 60 months). Project Community Liaison Specialist to provide support in the training workshops for CAEPAs and CTEs in the target communities on adequate use of equipment, as necessary (4 months at USD1,200/					10 650			10 650			10 650		

Contractual services-Individual	Project Monitoring and Evaluation Officer to ensure project?s M&E meets the requirements of the Government, the UNDP Country Office, and UNDP-GEF; develop project-specific M&E tools as necessary; oversee and ensure the implementation of the project?s M&E plan, including periodic appraisal of the Project?s Theory of Change and Results Framework with reference to actual and potential project progress and results; facilitate mid-term and terminal evaluations of the project as well as the project's exit strategy (60 months at USD1200/month, total USD72,000).							-	72000		72000	

Contractual services-Individual	Project SES Specialist to ensure training programme being developed by International Water Resources Advisor (see above) ? to enable relevant national government institutions on conducting situational analyses in the water sector ? is situationally appropriate and gender-responsive; to advise on the identification of appropriate gender-responsive and situationally appropriate climate-resilient adaptation strategies at a national scale (during workshop between relevant GoH institutions ? see below); and to assist international water resources advisor dispense training programme, in a gender-responsive manner, to enable	39 600	18 900					58 500			58 500		

Contractual services-Company	Local companies hired to establish Cash4Work programmes to facilitate the implementation of reforestation interventions in suitable degraded areas (identified under Output 2.3.2) to increase the tree cover in ~4,540 ha of degraded in the recharge zones of the five target SAEPs. Local companies will employ, organise, and oversee locally recruited workers to plant the trees (USD115,000 per CFW programme, 1 per SAEP, total USD575,000). Local companies contracted to procure and install rooftop water harvesting systems and household cisterns in priority households identified under Activity 3.1.3.1 (1 company per SAEP							825 000	825 000			825 000		

International Consultants	International Applied Anthropologist, supported by Project Community Liaison Specialist, CAEPAs and CTEs, to conduct a ?willingness-to-pay? assessment and PSIAs in target communities within the five target SAEPs (60 days at USD800/day, total USD48,000).						48 000	48 000			48 000	

International Consultants	International Environmental Law and Legislation Consultant to conduct gap and reviews assessments of selected regulatory and policy frameworks to identify entry points for climate change and gender mainstreaming, and to develop technical recommendations for integrating climate change and gender considerations into abovementioned regulatory and policy frameworks; to develop standardised matrices for DINEPA and its regional entities to guide the identification of appropriate adaptation solutions and prioritisation of investments; and to conduct two three-day workshops with representatives from DINEPA and its regional entities to			36 000	16 000			52 000			52 000		

International Consultants	International Monitoring and Evaluation Expert to conduct project mid-term and terminal evaluations (50 days at USD660/day, total USD33,000)							-	33000		33000	

International Consultants	International Water Resources Advisor to design a training programme to enable relevant national government institutions on conducting situationally appropriate and gender-responsive analyses in the water; to advise on the identification of situationally appropriate and gender-responsive climate-resilient adaptation strategies at a national scale (during workshop between relevant GoH institutions ? see below); and to conduct workshops to dispense training programme to enable relevant national government institutions on conducting situational analyses in the water sector (25 days at USD800/day ? total 20,000). International	72 000	20 000					92 000			92 000		

Local Consultants	Local Agroforestry Expert to identify the most suitable zones for the reforestation and agroforestry interventions to be implemented under Output 3.1.1, to develop the agroforestry technical packages and to conduct technical trainings under Component 2 (126 days at USD500/day, total USD63,000).					63 000		63 000			63 000	

Local Consultants	Local Agroforestry Expert to support the MoE and dispense two five-day workshops to train ?agroforestry farmer champions? on the usage of agroforestry technical packages (developed under Activity 2.3.2.3) on contextually appropriate agroforestry practices, and to support Local Foresters to establish a nursery for tree seedlings to be dispensed for the reforestation and agroforestry interventions (same as in Output 2.3.2, for 50 days at USD500/day, total USD25,000). Local Water Resources Advisor to increase the capacity of water governance institutions (MoE, DINEPA, MARNDNR) to procure and install physical structures (gabions						82 000	82000			82 000		

Local Consultants	Local Hydrologist to support DINEPA in procuring the equipment required for strengthening technical capacities of relevant government institutions, and to provide support in the training workshops for CAEPAs and CTEs in the target communities on adequate use of equipment, as necessary (same as in Output 1.1.5, for 30 days at USD500/day, total USD15,000).			15 000				15 000			15 000	

Local Consultants	Local Monitoring and Evaluation Expert to design the project's exit strategy (20 days at USD500/day, total USD10,000). Local Monitoring and Evaluation Expert to assist International Monitoring and Evaluation Expert in conducting project mid-term and terminal evaluations (60 days at USD500/day, total USD30,000).							-	40000		40000	

Local Consultants	Local Water Resources Advisor to assist relevant national government institutions in conducting situationally appropriate and gender-responsive analyses of Haiti?s water sector and to support the implementation of project activities Component 1 (64 days at USD500/day ? total USD32,000). Local Hydrogeologist (for 30 days at USD500/day) to assist relevant national government institutions in collecting and analysing hydrogeological and hydrometeorological data (using ONQEV and SNRE) and to conduct downscaled climate change scenario modelling which demonstrate the impacts of climate change on Haiti?s	97 000	15 000					112 000			112 000		

Local Consultants	Local Water Resources Advisor to develop and conduct five five-day training workshops on contextually relevant and gender-responsive IWRM for community-level water governance structures (same as in Output 1.1.1, for 50 days at USD500/day, total USD25,000).				25 000			25 000			25 000	
Training, Workshops, Meetings	Training worshops on development of Agroforestery packages by the national consultant (USD 3,000 per workshop - Total 45,000 USD).					45 000		45 000			45 000	

Training, Workshops, Meetings	Two five-day workshops to equip relevant national government institutions with the necessary skills and knowledge to conduct situational analyses to generate gender-disaggregated and contextually relevant data on Haiti?s the water sector (USD3,000 per workshop ? total USD6,000). Five-day meeting between relevant government institutions to identify appropriate gender-responsive and situational climate-resilient adaptation strategies at a national scale (USD3,000 per meeting ? total USD3,000). Three-day training workshop for ONQEV technical officers on managing information- and knowledge-generation systems	51 000	18 000					69000			69000		

Training, Workshops, Meetings	Two five-day workshops to train ?agroforestry farmer champions? on the usage of agroforestry technical packages (developed under Activity 2.3.2.3) on contextually appropriate agroforestry practices (USD3,000 per workshop, total USD6,000). Five one-day training workshop, hosted by CAEPAs and CTEs, conducted to equip recipient household members with the knowledge for appropriate use and maintenance of rainwater harvesting equipment and household cisterns (USD,3000 per workshop, total USD15,000).						21 000	21 000			21 000	

Travel	Travel costs and DSA for International Applied Anthropologist (total USD8,500). Travel costs for International Applied Anthropologist and Project CLS to travel throughout the South-East Department for data collection (USD200/day for 20 days ? total USD4,000).						12 500	12 500			12 500	
Travel	Travel costs and DSA for International Law and Legislation Consultant (total USD10,000).			10 000				10 000			10 000	

Travel	Travel costs and DSA for International Monitoring and Evaluation Expert when conducting mid-term evaluation and terminal evaluation (total USD17,500). Travel costs and DSA for MoE/DINEPA representatives and PM to visit project sites (total USD10,000).							-	27 500		27 500	

Travel	Travel costs and DSA for International Water Resources Advisor (total USD8,500). Travel costs and DSA for International Data Scientist (total USD8,500). Travel costs for PM and Project Community Liaison Specialist to conduct workshops throughout the 10 departments of Haiti (USD200/day for 30 days ? total USD6,000). Travel costs for Local Hydrologist and Local Biodiversity Expert for data collection throughout the South-East Department (USD200/day for 15 days ? total USD3,000). Travel costs for Project SES Specialist and Local Hydrologist throughout the South-East Department (USD200/day for 10 days ? total USD2,000). Travel costs for Project	28 000	15 100					43 100			43 100		

Travel	Travel costs and DSA for supervision of the project activities (total USD 23,400)							-		23 40 0	23 400	
Travel	Travel costs for International Water Resources Advisor to travel throughout areas served by DINEPA and OREPA Sud (USD200/day for 25 days ? total USD5,000). Travel costs for International Water Resources Advisor to travel throughout areas served by DINEPA and OREPA Sud (USD200/day for 25 days ? total USD5,000).				5 000			5 00 0			5 000	

Office Supplies	Cost for stationery and other supplies for use during surveys on water usage volumes in the South-East Department of Haiti (total USD1,000) - Outputs 1.2.1, 1.2.2, 1.2.3		3 500					3 500			3 500	
Office Supplies	Cost for stationery and other supplies for use during workshops (total USD500) - Output 3.1.1 Cost for stationery and other supplies for use during workshops (total USD500) Output 3.1.3						1 000	1 000			1 000	
Office Supplies	Cost for stationery and other supplies for use during workshops (total USD7,000) (Outputs 1.1.1, 1.2.2, 1.1.3, 1.1.4)	4 500						4 500			4 500	
Other Operating Costs	Costs of fuel for generator (USD25,000)							-		25 000	25 000	

Other Operating Costs	Cost of maintenance over 5 years for project office (total USD6,600).							-		6 600	6 600	
Other Operating Costs	Maintenance costs over three years for five nurseries in each target SAEP to ensure continuity in the distribution of tree seedlings for the reforestation and agroforestry interventions during project implementation (total USD35,313).						35 313	35 313			35 313	
Other Operating Costs	Audit (USD5,000/ year, total USD25,000).							-		25 000	25 000	

Other Operating Costs	Communication (printed reports) of appropriate gender-responsive and situational climate-resilient adaptation strategies at a national scale, identified by relevant government institutions during five-day meeting (total USD1,000). Communication (printed report) of contextually appropriate and gender-responsive methodologies for conducting climate change Vas in the project?s target communities developed during five-day workshop between MoE, DINEPA and MARNDR representatives (total USD1,000). Communication (printed reports) of vulnerability assessments done in the project?s target communities (USD1,000 per workshop 2	1 000	8 000					9 000			9 000			

		301 500	**98 500**	**61 000**	**151 900**	**129 600**	**3 379 563**	**4 122 063**	**172 500**	**210 000**	**4 504 563**	

ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

Table 9: Core indicators for the LDCF and the SCCF (2018-2022)

Climate Change Adaptation Strategy Objective		**Corresponding Core indicator**	**Sex-disaggregated?**
1	*Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation*	**Number of direct beneficiaries**[1] Total beneficiaries: 130,000 people (65 000 men and 65 000 women living in communities surrounding 5 water sources (SAEPs) in Haiti?s South East Department) with more climate resilient water availability. ? Cresson SAEP: 60,000 people (30,000 men, 30,000 women) ? Bodarie SAEP: 15,000 people (7,500 men, 7,500 women) ? Pr?chet SAEP: 15,000 people (7,500 men, 7,500 women) ? Cascade Pichon SAEP: 30,000 people (15,000 men, 15,000 women) ? K-Royer SAEP: 10,000 people (5,000 men, 5,000 women)	**Yes**
		Area of land under climate-resilient management (ha) 700 ha land rehabilitated through agroforestry and 3,840 ha land protected in Haiti?s South East Department	**n/a**
2	*Mainstream climate change adaptation and resilience for systemic impact*	**Number of policies, plans or development frameworks that mainstream climate resilience** 2 regulatory instruments adjusted	**Yes**

[1] This is a GCF Board-approved indicator.

ANNEX G: (For NGI only) Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agencys is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

N/A

ANNEX H: (For NGI only) Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies? capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).

N/A