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Report No: PAD3422

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT

IN THE AMOUNT OF SDR 61.2 MILLION
(US\$84 MILLION EQUIVALENT)

TO THE

REPUBLIC OF HAITI

FOR A

CARIBBEAN REGIONAL AIR TRANSPORT CONNECTIVITY PROJECT - HAITI

May 6, 2020

Transport Global Practice
Latin America and Caribbean Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective February 29, 2020)

Currency Unit = Haitian Gourdes (HTG)

HTG 88.35 = US\$1

US\$1 = SDR 0.72818362

FISCAL YEAR

October 1 - September 30

Regional Vice President: Humberto J. Lopez (Acting)

Country Director: Anabela Abreu

Regional Director: Franz R. Drees-Gross

Practice Manager: Bianca Bianchi Alves (Acting)

Task Team Leader(s): Malaika Becoulet, Vickram Cuttaree

ABBREVIATIONS AND ACRONYMS

AAN	National Airport Authority (<i>Autorité Aéroportuaire Nationale</i>)
ACC	Area Control Center
ACCPAC	A Complete and Comprehensive Program for Accounting Control
ADS-B	Automatic Dependent Surveillance-Broadcast
AGL	Airfield Ground Lighting
AIDC	Air Traffic Services Inter-Facility Data Communication
AIM	Aeronautical Information Management Transition
AIS	Aeronautical Information Services
ALoSP	Acceptable Level of Safety Performance
ANSP	Air Navigation Service Providers
APV	Approach Procedures with Vertical Guidance
ATCT	Air Traffic Control Tower
ATFM	Air Traffic Flow Management
Baro-VNAV	Barometric Vertical Navigation
BCA	Centre Artibonite Regional Development Project (P133352)
BRH	Central Bank (<i>Banque de la République d'Haïti</i>)
CAA	Civil Aviation Authority
CAP	IATA three-letter code for Cap-Haïtien Airport
CAR	Caribbean
CARICOM	Caribbean Community
CATCOP	Caribbean Regional Air Transport Connectivity Program
CATCOP-Haiti	Caribbean Regional Air Transport Connectivity Project in Haiti
CE	Citizen Engagement
CERC	Contingent Emergency Response Component
CFR	Crash Fire Rescue
CHUD	Cap-Haïtien Urban Development Project (P168951)
CNS	Communications, Navigation, and Surveillance
CO ₂	Carbon dioxide
CPF	Country Partnership Framework
DCF	IATA three-letter code for Canefield Airport (Dominica)
DOM	IATA three-letter code for Douglas-Charles Airport (Dominica)
ECCAA	Eastern Caribbean Civil Aviation Authority
EI	Effective implementation. A measure of the state's safety oversight capability, calculated for each critical element, each audit area, or as an overall measure. The EI is expressed as a percentage.
E&S	Environmental and Social
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework

ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FCV	Fragility, Conflict, and Violence
FIRs	Flight Information Regions
FM	Financial Management
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GND	Grenada
GoH	Government of Haiti
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
IATA	International Air Transport Association
IBRD	International Bank for Reconstruction and Development
ICAO	International Civil Aviation Organization
IDA	International Development Association
IDB	Inter-American Development Bank
IPF	Investment Project Financing
MASA	Multilateral Air Services Agreement
MDOD/AMO	Delegated Implementing Agencies Model (<i>Maîtrise d’Ouvrage Déléguée or Assistance à maîtrise d’ouvrage</i>)
MDUR	Municipal Development and Urban Resilience Project (P155201)
M&E	Monitoring and Evaluation
MTPTC	Ministry of Public Works, Transportation, and Communication (<i>Ministère de Travaux Publics, Transport et Communications</i>)
MTR	Mid-term Review
NGO	Nongovernmental Organization
NPV	Net Present Value
OECS	Organisation of Eastern Caribbean States
OFNAC	National Office of Civil Aviation (<i>Office National de l’Aviation Civile</i>)
OLDI	On-Line Data Interchange
O&M	Operations and Maintenance
PAIP	Pacific Aviation Investment Project
PAP	IATA 3-letter code for Port-au-Prince Toussaint Louverture Airport
PBN	Performance-Based Navigation
PDO	Project Development Objective
PIU	Project Implementation Unit
PLR	Performance and Learning Review
POM	Project Operations Manual
POS	Port of Spain
PPSD	Project Procurement Strategy for Development
PRGRD	Disaster Risk Management and Reconstruction Project (P126346)

PROReV	Emergency Bridge Reconstruction and Vulnerability Reduction Project (P114292)
PRUII	Institutions and Infrastructure Emergency Recovery Project (P120895)
RESA	Runway End Safety Area
RN3	National Road 3 (<i>Route Nationale 3</i>)
ROT	Runway Occupancy Time
SARP	Standards and Recommended Practices
SCD	Systematic Country Diagnostic
SEA	Sexual Exploitation and Abuse
SEO	SEO Amsterdam Economics
SEP	Stakeholder Engagement Plan
SGBV	Sexual and Gender-Based Violence
SH	Sexual Harassment
SMS	Safety Management System
SNGRD	National System for Disaster Risk Management (<i>Système National de Gestion des Risques et des Désastres</i>)
SOE	Statement of Expenditure
SOP	Series of Projects
SPN	Specific Procurement Notices
STEP	Systematic Tracking and Exchanges in Procurement
TOC	Terms of Reference
UCE	Central Execution Unit (<i>Unité Centrale d'Exécution</i>)
UNDB	United Nations Development Business
UNOPS	United Nations Office for Project Services
USOAP	Universal Safety Oversight Audit Programme
UVF	IATA 3-letter code for Hewanorra International Airport (St. Lucia)
VSAT	Very Small Aperture Terminal
WB	World Bank
WBG	World Bank Group
WDR	World Development Report



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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Haiti	Caribbean Regional Air Transport Connectivity Project - Haiti	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P170907	Investment Project Financing	Moderate

Financing & Implementation Modalities

☐ Multiphase Programmatic Approach (MPA)	☒ Contingent Emergency Response Component (CERC)
☒ Series of Projects (SOP)	☒ Fragile State(s)
☐ Disbursement-linked Indicators (DLIs)	☐ Small State(s)
☐ Financial Intermediaries (FI)	☐ Fragile within a non-fragile Country
☐ Project-Based Guarantee	☐ Conflict
☐ Deferred Drawdown	☐ Responding to Natural or Man-made Disaster
☐ Alternate Procurement Arrangements (APA)	

Expected Approval Date	Expected Closing Date
28-May-2020	30-Jun-2026

Bank/IFC Collaboration

No

Proposed Development Objective(s)

The objectives of the Project (PDO) are to: (i) improve operational safety and navigation efficiency of air transport in the Recipient's territory; and (ii) increase the climate and disaster resilience of associated infrastructure at the Recipient's international airports.

**Components**

Component Name	Cost (US\$, millions)
Component 1– PAP and CAP operational safety and navigation efficiency investments	58.00
Component 2–PAP and CAP airfield drainage system improvements	14.00
Component 3 – Institutional strengthening & Project Management	12.00
Component 4 – Contingent Emergency Response	0.00

Organizations

Borrower: Republic of Haiti

Implementing Agency: Central Execution Unit of the Ministry of Public Works (UCE)

PROJECT FINANCING DATA (US\$, Millions)**SUMMARY**

Total Project Cost	84.00
Total Financing	84.00
of which IBRD/IDA	84.00
Financing Gap	0.00

DETAILS**World Bank Group Financing**

International Development Association (IDA)	84.00
IDA Grant	84.00

IDA Resources (in US\$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Haiti	0.00	84.00	0.00	84.00
National PBA	0.00	44.00	0.00	44.00



Regional	0.00	40.00	0.00	40.00
Total	0.00	84.00	0.00	84.00

Expected Disbursements (in US\$, Millions)

WB Fiscal Year	2020	2021	2022	2023	2024	2025	2026	2027
Annual	0.00	6.50	9.50	17.00	17.50	15.50	12.50	5.50
Cumulative	0.00	6.50	16.00	33.00	50.50	66.00	78.50	84.00

INSTITUTIONAL DATA

Practice Area (Lead)

Transport

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● High
2. Macroeconomic	● Moderate
3. Sector Strategies and Policies	● Moderate
4. Technical Design of Project or Program	● Moderate
5. Institutional Capacity for Implementation and Sustainability	● Substantial
6. Fiduciary	● Substantial
7. Environment and Social	● Moderate
8. Stakeholders	● Moderate
9. Other	
10. Overall	● Substantial



COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

☐ Yes ☒ No

Does the project require any waivers of Bank policies?

☐ Yes ☒ No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Not Currently Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Not Currently Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description



Schedule 2 Section I A 1, 2, 3 and 4 (Institutional Arrangements)

1. The Recipient shall vest the overall responsibility for the implementation of the Project in MTPTC and ensure that: (a) MTPTC shall carry out Parts 1, 2 and 3 of the Project in collaboration with AAN and OFNAC; and (b) the Coordinating Authority shall carry out Part 4 of the Project; all in accordance with the Operational Manual, the ESCP and the CER Operations Manual, as applicable.
2. The Recipient shall operate and maintain, at all times during the implementation of the Project, the Project Implementing Unit under the administrative authority of MTPTC, with functions, staffing and resources satisfactory to the Association, as further detailed in the Operational Manual.
3. The Recipient shall operate and maintain, at all times during the implementation of the Project, AAN and OFNAC under the administrative authority of MTPTC, with functions, staffing and resources satisfactory to the Association, as further detailed in the Operational Manual.
4. The Recipient shall ensure that the Project Implementing Unit shall be responsible for the day-to-day administration, overall planning, coordination, fiduciary (procurement, disbursement, safeguards and financial management), monitoring, evaluation, reporting, and communication of Project activities; as further detailed in the Operational Manual.

Sections and Description

Schedule 2 Section I B 1 and 2 (Operational Manual)

1. The Recipient shall carry out the Project in accordance with a manual (the Operational Manual), satisfactory in form and substance to the Association, which consists of different schedules setting forth rules, methods, guidelines, specific development plans, standard documents and procedures for the carrying out of the Project, including the following:
 - (a) the detailed description of all Project activities, their sequencing and the prospective timetable and benchmarks in relation thereto;
 - (b) the Project administrative, financial, accounting, auditing, procurement and disbursement procedures, including all relevant standard documents;
 - (c) the monitoring indicators for the Project; and
 - (d) The grievance mechanisms and the code of ethics and conduct.
2. The Operational Manual shall only be amended from time to time in consultation with, and after approval of, the Association. In case of any conflict between the terms of the Operational Manual and those of this Agreement, the terms of this Agreement shall prevail.

Sections and Description

Schedule 2 Section I C 1, 2 and 3 (Implementation Arrangements for Part 4 of the Project (CERC))

1. In order to ensure the proper implementation of contingent emergency response activities under Part 4 of the Project ("CER Part"), the Recipient shall take the following measures:
 - (a) prepare and furnish to the Association for its review and approval, an operations manual ("CER Operations



Manual”) which shall set forth detailed implementation arrangements for the CER Part, including: (i) designation of terms of reference for, and resources to be allocated to, the entity to be responsible for coordinating and implementing the CER Part (“Coordinating Authority”); (ii) specific activities which may be included in the CER Part, Eligible Expenditures required therefore (“Emergency Expenditures”), and any procedures for such inclusion; (iii) financial management arrangements for the CER Part; (iv) procurement methods and procedures for the CER Part; (v) documentation required for withdrawals of Emergency Expenditures; (vi) environmental and social management arrangements and instruments applicable to the CER Part, consistent with the provisions of Section E below; and (vii) any other arrangements necessary to ensure proper coordination and implementation of the CER Part;

- (b) afford the Association a reasonable opportunity to review the proposed CER Operations Manual;
- (c) promptly adopt the CER Operations Manual for the CER Part as accepted by the Association and integrate it as an annex to the Operational Manual;
- (d) ensure that the CER Part is carried out in accordance with the CER Operations Manual; provided, however, that in the event of any inconsistency between the provisions of the CER Operations Manual and this Agreement, the provisions of this Agreement shall prevail; and
- (e) not amend, suspend, abrogate, repeal or waive any provision of the CER Operations Manual without prior approval by the Association.

2. The Recipient shall, throughout the implementation of the CER Part, maintain the Coordinating Authority, with adequate staff and resources satisfactory to the Association.

3. The Recipient shall undertake no activities under the CER Part (and no activities shall be included in the CER Part) unless and until the following conditions have been met in respect of said activities:

- (a) the Recipient has determined that an Eligible Crisis or Emergency has occurred, has furnished to the Association a request to include said activities in the CER Part in order to respond to said Eligible Crisis or Emergency, and the Association has agreed with such determination, accepted said request and notified the Recipient thereof; and
- (b) the Recipient has prepared and ensured the disclosure of all environmental and social instruments as may be required for said activities, in accordance with the CER Operations Manual and the ESCP, the Association has approved all said instruments, and the Recipient has ensured the implementation of any actions which are required to be taken under said instruments.

Sections and Description

Schedule 2 Section I E 1, 2 and 3 (Environmental and Social Standards)

1. The Recipient shall ensure that the Project is carried out in accordance with the Environmental and Social Standards, in a manner acceptable to the Association.

2. Without limitation upon paragraph 1 above, the Recipient shall ensure that the Project is implemented in accordance with the Environmental and Social Commitment Plan (“ESCP”), in a manner acceptable to the Association. To this end, the Recipient shall ensure that:

- (a) the measures and actions specified in the ESCP are implemented with due diligence and efficiency, and as further specified in the ESCP;
- (b) sufficient funds are available to cover the costs of implementing the ESCP;



(c) policies, procedures and qualified staff are maintained to enable it to implement the ESCP, as further specified in the ESCP; and

(d) the ESCP or any provision thereof, is not amended, revised or waived, except as the Association shall otherwise agree in writing and the Recipient has, thereafter, disclosed the revised ESCP.

In case of any inconsistencies between the ESCP and the provisions of this Agreement, the provisions of this Agreement shall prevail.

2. The Recipient shall:

(a) take all measures necessary on its part to collect, compile, and furnish to the Association through regular reports, with the frequency specified in the ESCP, and promptly in a separate report or reports, if so requested by the Association, information on the status of compliance with the ESCP and the management tools and instruments referred to therein, including resettlement action plans, all such reports in form and substance acceptable to the Association, setting out, inter alia: (i) the status of implementation of the ESCP; (ii) conditions, if any, which interfere or threaten to interfere with the implementation of the ESCP; and (iii) corrective and preventive measures taken or required to be taken to address such conditions; and

(b) promptly notify the Association of any incident or accident related to or having an impact on the Project which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers, including, gender-based violence and violence against minors, in accordance with the ESCP, the instruments referenced therein and the Environmental and Social Standards.

3. The Recipient shall maintain and publicize the availability of a grievance mechanism, in form and substance satisfactory to the Association, to hear and determine fairly and in good faith all complaints raised in relation to the Project, and take all measures necessary to implement the determinations made by such mechanism in a manner satisfactory to the Association.

Conditions

Type	Description
Disbursement	Conditions of disbursement: Schedule 2 Section III B.1 1. Notwithstanding the provisions of Section III A above, no withdrawal shall be made: (a) for payments made prior to the Signature Date; or (b) under Category (2), for Emergency Expenditures, unless and until the Association is satisfied, and notified the Recipient of its satisfaction, that all of the following conditions have been met in respect of said activities: (i) the Recipient has determined that an Eligible Emergency has occurred, has furnished to the Association a request to include said activities in the CER Part in order to respond to said Eligible Crisis or Emergency, and the Association has agreed with such determination, accepted said request and notified the Recipient thereof; (ii) the Recipient has ensured that all environmental and social instruments required for said activities have been prepared and disclosed, and the Recipient has ensured that any actions which are required to be taken under said instruments have been implemented, all in accordance with the provisions of Section I.E. of this Schedule 2;



- | | |
|--|--|
| | <p>(iii) the Recipient's Coordinating Authority has adequate staff and resources, in accordance with the provisions of Section I.C of this Schedule 2, for the purposes of said activities; and</p> <p>(iv) the Recipient has adopted the CER Operations Manual in form, substance and manner acceptable to the Association and the provisions of the CER Operations Manual remain – or have been updated in accordance with the provisions of Section I.C. of this Schedule 2 so as to be appropriate for the inclusion and implementation of said activities under the CER Part.</p> |
|--|--|



I. STRATEGIC CONTEXT

A. Regional and Country Context

- 1. The proposed operation is part of a Series of Projects (SOPs) for the Caribbean Regional Air Transportation Project.** The other countries in the SOPs are Grenada, Dominica and St. Lucia. Although preparation of the SOPs was initiated in 2019 prior to the COVID-19 pandemic, they will help support economic recovery by improving air transportation safety and resilience, which are critical to the economic growth of the islands. The project is set within a broader international response to the pandemic crisis in Haiti. In addition to this operation, the World Bank is providing COVID-19 Fast Track Facility financing of US\$20 million¹ and is reprogramming several projects using Contingency Emergency Response Components.
- 2. Haiti remains the poorest country in the Western hemisphere and suffers from recurrent episodes of institutional and political instability.** Haiti is the third-largest Caribbean nation by area and population (11.12 million in 2018) and shares the island of Hispaniola with the Dominican Republic. Haiti benefits from proximity and access to major markets with favorable trade agreements, a young labor force, a dynamic diaspora, and substantial geographic, historical, and cultural assets. The country also possesses untapped markets and a pent-up demand for the private sector to explore, including agribusiness, light manufacturing, and tourism.² Despite these opportunities, the country's GDP per capita was only US\$766 in 2017 and 57 percent of the population was considered poor in the same year.³ Historically, political violence and instability have been both a symptom and a driver of fragility in Haiti. Recurrent episodes of institutional instability and civil unrest have severely impaired its progress in poverty reduction. The social contract between the Government of Haiti and its citizens remains weak, as over the past decades there has been little improvement in living conditions, service provision and enforcement of the rule of law.
- 3. The lack of land connectivity among the Caribbean island nations and the emergence of the tourism sector as a key economic pillar means that improved air connectivity is critical for economic growth and shared prosperity in the region.** On average, tourism's contribution to GDP for the region rose from 12 percent in 2011 to 15.2 percent in 2017, by when it accounted for 4.3 percent of jobs.⁴ Almost half of these contributions can be traced to capital investments in the travel and tourism industry, while a third are linked to tourism-related service industries. Overall, Caribbean origin and destination air passenger traffic grew 50 percent between 2007 and 2017, from about 40 million to almost 60 million passengers annually.
- 4. Given the insularity and geographic location of the islands, air transport connectivity and resilience are undermined by high levels of exposure to natural hazards, which are exacerbated by climate change.** Past extreme weather events and other natural disasters in the Caribbean Sea region⁵ (for example, hurricanes, flooding, earthquakes, and landslides) have exposed the region's lack of resilient infrastructure that would be capable of continuing to deliver essential services even when affected by natural disasters. The climate events have further demonstrated the critical importance of climate/disaster resilient transportation systems—especially air transport—when called to provide

¹ The Haiti COVID-19 Response Project (P173811) was approved on April 2, 2020.

² World Bank's Country Partnership Framework (CPF) with Haiti for the FY16-21 period. Report No. 98132-HT

³ Haiti has not produced any official poverty data since 2012. Poverty data estimated through a Survey of Well-being via Instant and Frequent Tracking methodology show that changes in poverty between 2012 and 2017 were only marginal: the predicted poverty rate for 2017 is 57 percent against 58.5 percent in 2012.

⁴ The World Fact Book. <https://www.cia.gov/library/publications/the-world-factbook/>.

⁵ https://www.humanitarianresponse.info/files/documents/files/20191203-ocha-desastres_naturales.pdf.



immediate lifesaving response in post-disaster situations and to contribute to a speedy economic recovery.

5. **Haiti is also among the countries in the world with the highest exposure to multiple natural hazards, and climate change exacerbates these risks.** Over 93 percent of its surface and more than 96 percent of its population are exposed to two or more hazards.⁶ The human and economic impacts of disasters have been extremely severe, given Haiti's exposure to hazards, the high vulnerability of its infrastructure, and institutional fragility.⁷ Between 1961 and 2012, the damages and losses associated with hydro-meteorological events alone amounted, on average, to the equivalent of almost two percent of annual GDP.⁸ Climate change is expected to increase the frequency and severity of hydro-meteorological hazards.⁹

6. **Since February 2019, Haiti's fiscal, political, and security situation has deteriorated.** Weak revenue mobilization continues to pose severe constraints to public investment, undermining growth and exacerbating the economy's vulnerability to shocks. Unproductive expenditures and subsidies, including subsidized prices of fuel products, also contribute to the Government's fiscal constraints. Between May 2019 and March 2020, Haiti's Parliament was unable to ratify the nominated prime minister, leaving the country without a fully functioning government. Recurrent mass demonstrations, the uncertain political situation, and persistent security challenges have hampered the country's growth and development prospects.

7. **The shock of the coronavirus pandemic has further exacerbated the existing challenges in Haiti.** The threat of global recession, disruptions in international trade, supply chains and travel; as well as local containment and mitigation measures have paralyzed the economic activity including tourism, and adversely affected domestic production in other sectors. It is expected that COVID-19 will affect growth in several sectors, including tourism, as people refrain from flying, and remittances decline with the slow-down in global growth. The magnitude of the impact will depend on the length of the crisis and how quickly the global economy rebounds. As of April 20, 2020, there were 50 confirmed cases of COVID-19 in Haiti. The risk of local transmission and further imported cases, particularly from the Dominican Republic, is very high. The latter has reported 7 954 cases and 333 deaths as of May 4, 2020.

B. Sectoral and Institutional Context

8. **At the regional level, the airspace is fragmented with no fewer than 10 Air Navigation Service Providers (ANSPs) in the Eastern Caribbean alone.** Poor cohesion of the regional space with no overarching entity providing air traffic control across the entire airspace leads to increased operational complexity, indirect routings, longer travel times, and higher costs. Furthermore, the Caribbean is known as a particularly outward-looking region, with external flows greatly surpassing internal flows, attesting that cross-country benefits of regional connectivity are more likely to accrue with air transport infrastructure investments targeted at achieving uniform operational requirements across the region.

⁶ Primarily hurricanes, floods, earthquakes and landslides, but also tsunamis and drought. Haiti Country Risk Profile, World Bank 2018.

⁷ Between 1961 and 2012, the country experienced more than 180 disasters causing the death of more than 240,000 people. Source: "Diagnostic on the Economic and Fiscal Impact of Disasters in Haiti", World Bank 2014.

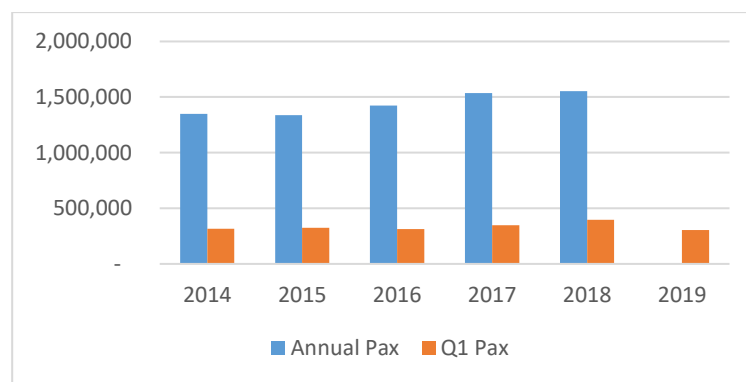
⁸ The 2010 earthquake destroyed the equivalent of 120 percent of GDP and Hurricane Matthew resulted in estimated damages and losses equivalent to around 32 percent of GDP.

⁹ Climate projections for the Caribbean estimate that temperatures could rise between 0.5 to 2.3 °C by 2060, possibly leading to cyclonic events of increased duration and intensity. According to the US Climate Change Science Program Climate Change simulations, for each 1°C increase in sea surface temperatures, rainfall caused by hurricanes may rise by 6 to 17 percent and surface wind speeds of the strongest hurricanes by 1 to 8 percent. In addition, the dry season will likely intensify further with an increase of between 8 percent to 19 percent of the present duration. Likewise, increases in maximum temperatures in recent years have led to greater propensity for extreme rainfall events and flash floods; this pattern is expected to worsen with the effects of climate change.



9. **Like most Caribbean countries, Haiti is highly dependent upon air transportation.** Connectivity by air transportation is critical to Haiti's economy given its insularity. In 2011, air transport accounted for 73 percent of Haiti's international arrivals and departures. While tourism is relatively small relative to other Caribbean countries, it is growing and already accounted for 4.2 percent of GDP in 2015.¹⁰ Passenger traffic levels at Port-au-Prince's Toussaint Louverture Airport (PAP)—Haiti's main international airport—have been steadily growing in recent years and are expected to continue growing as the political and social situation in the country stabilizes. From 2014 to 2018, passenger volumes at PAP have grown by 15 percent, from about 1.35 million to about 1.55 million passengers annually, a compound annual growth rate of 3.5 percent (Figure 1). Haiti's second largest airport, Cap-Haïtien International Airport (CAP), has had an annual average of 152,000 passengers and 92,000 lbs.¹¹ in freight volume in 2018 and 2019.

Figure 1. Port-au-Prince Toussaint Louverture—Passenger Traffic



Source: Data provided by *Autorité Aéroportuaire Nationale (AAN)*.

10. **However, the existing airport infrastructure and navigation systems at PAP and CAP do not comply with the international standards on safety oversight, operational, and logistical aspects.** Haiti scores 1.78 percent in effective implementation (EI) of International Civil Aviation Organization (ICAO)'s Standards and Recommended Practices (SARPs) regarding Air Navigation Services, compared to a global average of 67.42 percent (Figure 2). Haiti's airports are characterized by the absence of electronic navigation systems [no Very Small Aperture Terminal (VSAT) or Automatic Dependent Surveillance-Broadcast (ADS-B)]. The country has been red-flagged between 2012 and 2019 under the Universal Safety Oversight Audit Programme of ICAO,¹² raising significant concerns about Haiti's ability to properly oversee airports, aircraft, and air navigation services. Aircraft operational safety is also undermined by the deteriorating condition of the runway pavement at CAP. The lack of ICAO-required Runway End Safety Areas (RESAs) for both PAP runway ends and weak and cracked runway pavement at CAP pose a risk of damage to aircraft engines and undercarriage. The air navigation instrument for approaches at PAP and CAP are non-precision, which limit arrivals in poor meteorological conditions, resulting in aircraft arrival delays, periodic diversions to alternate airports, and even flight cancellations. Further, insufficient taxiway infrastructure at PAP results in significant operational challenges and inefficiencies, such as greater taxiing distances and increased runway occupancy times (ROT). The infrastructure deficiencies have been particularly apparent in the immediate aftermath of natural disasters (for example, the 2010 earthquake and Hurricane Matthew in 2016) when the airfield and aircraft parking apron infrastructure was insufficient to accommodate surges in air traffic associated with humanitarian aid flights and other disaster relief air traffic activity.

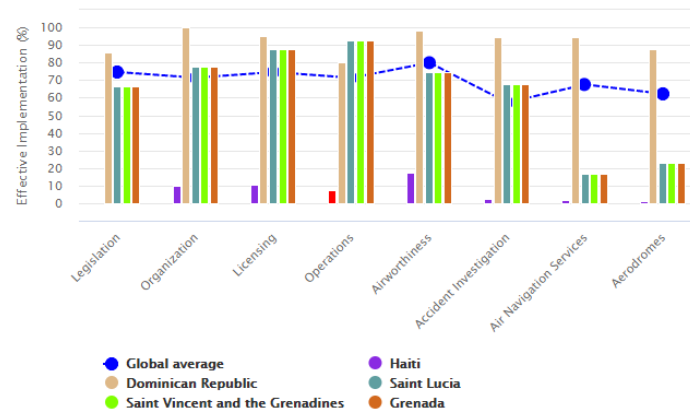
¹⁰ *Évaluation des Besoins Post-Cyclone Mathieu*, Secteur Tourisme, Ministère du Tourisme, Novembre 2016,

¹¹ Source: Data provided by *Autorité Aéroportuaire Nationale (AAN)*.

¹² ICAO, Safety Audit Results, <https://www.icao.int/safety/pages/usoap-results.aspx>.



Figure 2. Effective Implementation of ICAO SARPs for Selected Countries Versus Global Average



Source: ICAO

11. **Both international airports—PAP and CAP—are highly exposed to potential impacts from natural disasters and climate change.** These impacts include extreme temperatures that can increase the risk of buckling of airport runways and taxiways, and flooding, which can inundate and damage airfield pavements, parked aircrafts, and terminal buildings. While significant investments have been made over the past decade in these two international airports, infrastructure deficiencies continue to persist resulting in operational constraints and inefficiencies, safety concerns, and vulnerability to flooding associated with the annual rainy season, hurricanes, and climate change. CAP suffers from recurrent flooding due to a lack of appropriate drainage infrastructure to evacuate rainwater. While putting at risk the safety and continuity of airport operations,¹³ the improperly designed airport drainage is also thought to be at the core of the recurrent floods affecting the Balan neighborhood to the east of CAP.). At PAP, the absence of a culvert under the taxiway results in an increased flood risk to the taxiway, the aprons, and, eventually, the runway and the terminal.

12. **The oversight of both regulation and infrastructure and operations management of the Haitian air transport sector could be improved, particularly in the areas of Crash Fire Rescue, maintenance, climate resilience, wildlife management, and gender diversity.** The Ministry of Public Works, Transport, and Communications (*Ministère de Travaux Publics, Transport et Communications*, MTPTC) is the Government of Haiti (GoH)'s central body responsible for designing, defining, and implementing the air transport policy. It relies on two primary agencies: (i) the National Office of Civil Aviation (*Office National de l'Aviation Civile*, OFNAC) in charge of the organization and regulation of air transport, and (ii) the National Airport Authority (*Autorité Aéroportuaire Nationale*, AAN), which ensures the planning, construction, extension, management, and operation of the country's airport facilities. The state of deterioration of infrastructure, combined with ineffective management and a weak institutional capacity, threatens the short-term continuity of the logistics chain.

13. **In recognition of the strategic importance of both PAP and CAP airports, the MTPTC, OFNAC, and AAN have recently benefitted from several diagnostic, planning, and investment instruments,** including two investments by the Inter-American Development Bank (IDB) in the sector. These investments include: (i) the Support for Transport Sector in Haiti IV Project (US\$50 million), approved in 2012, which financed the rehabilitation of the PAP runway and airfield

¹³ Aircraft operations means the airborne movement of aircraft in controlled or uncontrolled airport terminal areas.



ground lighting, and (ii) the Transport and Departmental Connectivity Project (US\$225 million), approved in October 2018, which is financing equipment and the construction of a new Air Traffic Control Tower (ATCT) at PAP. By addressing safety concerns and navigation deficiencies at PAP and CAP the proposed project would complement the IDB's investments in Haiti.

14. Haiti lags behind in most areas of gender equality, including access to employment, professional opportunities, and equal wages, including in the transport sector. In 2018, the female unemployment rate in Haiti was 16.3 percent, which is above the average of other low-income countries with similar characteristics; however unemployment rates are also high, and the quality of jobs are low.¹⁴ According to the Haiti Systematic Country Diagnostic (SCD 2015),¹⁵ women are 20 percent more likely than men to be unemployed and 6 percent more likely to be employed in the informal sector. Women represent 7 percent of people employed in the transport and communications sector, and, in the construction sector, women are only 2 percent of the total workforce.¹⁶ Even if there is unavailable data on gender gaps in employment in the aviation sector in activity, gaps in transport and communications can be considered as a good proxy. Moreover, studies show that, besides lower participation rates than men, women commonly occupy lower-skilled, low-wage and less structurally relevant jobs than men, which will directly impact their inclusion in the aviation sector.¹⁷ Gender norms and beliefs define acceptable roles for women and men in the work force (eg. women should not work in construction) deepening employment segregation.¹⁸

15. Air transportation will be critical for Haiti's post COVID-19 economic recovery. Having safe and reliable air transportation will support the COVID-19 recovery efforts and a faster return to growth in Haiti's tourism industry as well as other sectors. Haiti's international airports, PAP and CAP, will play a critical role in receiving emergency equipment, screening passengers at arrival and departure, and dispatching equipment and medicine to hospitals and patients.

16. The proposed Caribbean Regional Air Transport Connectivity Project - Haiti (CATCOP-Haiti, the Project), to be financed by a SDR 61.2 million (US\$84 million equivalent) grant from the International Development Association (IDA), would contribute to enhance air transport connectivity in Haiti by increasing the level of operational safety and navigation efficiency at PAP and CAP to international standards and by improving resilience of their airfields to natural hazards/climate change.

C. Relevance to Higher-Level Objectives

17. The proposed Project is aligned with the Country Partnership Framework (CPF) of Haiti for the period FY16-21,¹⁹ as updated in the Performance and Learning Review (PLR) dated May 31, 2018.²⁰ It supports improvements in Area of Focus 1 (Inclusive Growth), Area of Focus 3 (Resilience) of the CPF and, more specifically, contributes to the achievement

¹⁴ International Labour Organization, ILOSTAT database. 2018.

¹⁵ Singh, Raju Jan and Mary A. Barton-Dock. 2015. Haiti - Toward a New Narrative: Systematic Country Diagnostic (English). Washington, DC: World Bank Group, p. 35, <http://documents.worldbank.org/curated/en/642131467992805241/Haiti-Toward-a-new-narrative-systematic-country-diagnostic>.

¹⁶ International Labour Office. 2016. Women at Work: Trends 2016 (English). Geneva.

¹⁷ USAID. (2016). *Haiti Gender Assessment*. Washington: USAID.

¹⁸ USAID. (2016). *Op. cit.* Washington: USAID

¹⁹ The Haiti Country Partnership Framework for the Period FY16-21 (Report No. 98132-HT, dated August 27, 2015) was discussed by the Board of Executive Directors on September 29, 2015.

²⁰ Performance and Learning Review of the aboved mentioned (Report No. 124812-HT, dated May 31, 2018) was discussed by the Board of Executive Directors on June 27, 2018.



of the following objectives: (i) Objective 1 (Enhance Income Opportunities) through improvements in air transport connectivity, resulting in competitiveness and economic growth, and (ii) Objective 9 (Improve Disaster Prevention and Strengthen Climate Resilience) by improving the resilience of key airport infrastructure and navigation systems to natural hazards and by strengthening institutions and the capacity of the GoH to manage the air transport sector.

18. **The Project is also aligned with the Port of Spain Declaration (POS) signed by 34 countries including Haiti to improve air transport connectivity and safety in the Caribbean.** The POS Declaration is an important element of air transport policy, which outlines the priority actions and measures agreed on operational safety, air navigation capability, and air service market liberalization (Annex 7). The Declaration was signed by 34 countries and territories in the Caribbean region, including Haiti, in 2014. Paragraph 10 of the POS Declaration illustrates the interlinkage and mutual dependency amongst Caribbean economies: “delays from one State can negatively affect surrounding States.” It is another indication that regional cooperation related to air transportation is increasingly recognized as vital to economic growth and shared prosperity in the region. While the proposed Project’s mission is more limited in scope and scale than the POS Declaration, it would prioritize investments consistent with its implementation plans. Haiti has its own unique challenges and priorities in the air transport sector but given the inherent regional nature of air transportation and the similar characteristics of Caribbean nations, the proposed Project would contribute to addressing common problems and goals by supporting greater regional cooperation and integration across countries (Annexes 7). The proposed Project would contribute to promoting harmonization of aviation policy and standards in the Caribbean region, as well as to advancing Haiti’s compliance with the existing regional agreement.

19. **The proposed Project would also assist Haiti in its post-COVID-19 response,**²¹ by providing additional means to generate short-term employment through infrastructure works as it emerges from the lockdown and the associated economic slow-down. It would also contribute to medium-to-long term recovery, growth, and resilience through better air transport connectivity to support resumption of economic activity.

D. Regional Approach

20. **Series of Projects (SOPs) Objective.** The proposed CATCOP-Haiti would be the first project in a SOPs with a regional approach (CATCOP). In addition to Haiti, three other countries—St. Lucia, Dominica, and Grenada—have agreed to participate in the CATCOP and all support the common goal of improving regional air transport connectivity and climate/disaster resilience of associated infrastructure. Emphasis on regional planning, harmonization, and coordination allows avoidance of “overinvestment” and encourages regional cooperation to achieve air traffic safety standards and promote an economically viable regional airline industry. The SOPs with multiple borrowers would allow effective preparation and implementation of each project in the SOPs under a common regional-level strategy.

21. **Criteria to participate in the SOPs.** The regional strategy under CATCOP SOPs would require basic criteria to participate, including: (i) an agreement and commitment to elevate compliance with international operational safety standards (for example, ICAO SARPs) and/or regional air transport agreements such as the POS Declaration; (ii) adequate leadership to advance the enhancements proposed under the program; (iii) satisfactory monitoring and evaluation (M&E) arrangements; (iv) commitment to support and participate in common regional training activities; and (v) commitment to support the common regional procurement activities.

22. **In view of the regional approach being deployed in CATCOP-Haiti and the potential cross-country spillover**

²¹ The Haiti COVID-19 Response Project (P173811) was approved on April 2, 2020.



benefits of project investments, Regional IDA funding resources are being mobilized to support the financing of the proposed Project. The utilization of Regional IDA funding can be justified based on the following reasons:

- a) At this stage, four countries (Dominica, St. Lucia, Grenada, and one fragile state, Haiti) have met the above criteria and would participate in the CATCOP (Annex 6);
- b) Three of the four countries are served by the same regional civil aviation authority—the Eastern Caribbean Civil Aviation Authority (ECCAA);
- c) To be financially viable, regional air service operators, which are critical to improving regional air transport connectivity, require a “critical mass” of airports in the region to: (i) achieve uniformly high levels of effective implementation of ICAO SARPs, and (ii) be sufficiently climate/disaster resilient;
- d) The proposed Project’s investments are expected to generate significant cross-boundary benefits through a uniform approach to improving air transport safety and climate/disaster resilience. Moreover, regional planning and coordination allow avoidance of “overinvestment” and encourage regional cooperation in achieving safety standards; and
- e) All participating countries have agreed on the regional agenda of enhancing regional air transport connectivity through targeted investments in improving operational safety and oversight of air transport and increasing climate/disaster resilience.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

23. The objectives of the Project (PDO) are to: (i) improve operational safety and navigation efficiency of air transport in the Recipient’s territory; and (ii) increase the climate and disaster resilience of associated infrastructure at the Recipient’s international airports.

PDO Level Indicators

24. The Project’s progress towards its PDO will be measured by the following PDO indicators:

25. **PDO 1: Improve operational safety and navigation efficiency of air transport.**

- (i) Targeted upgrade of air navigation systems achieved;
- (ii) PAP and CAP runways in compliance with ICAO standards/requirements; and
- (iii) Average Runway Occupancy Time (ROT) of airplanes at PAP.

26. **PDO 2: Increase the climate/disaster resilience of associated infrastructure at Haiti’s international airports.**

- (iv) Average number of days per year the discharge exceeds the capacity of the airport drainage system.

B. Project Components



27. The proposed Project would include four components. Total cost of the Project is US\$84 million.

28. **Component 1: PAP and CAP operational safety and navigation efficiency investments (Total Cost: US\$58 million).** This component would finance infrastructure and equipment at Haiti's two international airports—PAP and CAP—aimed at improving aircraft operating conditions in compliance with international safety standards as per the requirements of the ICAO SARPs and OFNAC (Annex 6) and improving navigation/taxiing efficiency to better accommodate existing air traffic volumes and air traffic surges associated with post-disaster relief flights. This component would finance inter alia:

- (i) **Civil works, including:** (i) PAP taxiway and apron expansion; (ii) CAP runway rehabilitation and airfield ground lighting installation; (iii) PAP RESAs construction; and (d) CAP ATCT replacement;
- (ii) **Purchase and installation of equipment** to upgrade and modernize air traffic monitoring and control capacity in compliance with international standards and requirements and with the regional air navigation plans: (i) Automatic Dependent Surveillance-Broadcast (ADS-B), and (ii) communication and surveillance technology for the new CAP ATCT; and
- (iii) **Consulting and non-consulting services** for corresponding supervision activities, associated technical studies as needed, including for relevant social and environmental safeguards instruments.

29. The civil works to be financed under Component 1 would integrate climate/disaster resilience measures through appropriate choice of materials and design of enhanced drainage features. Likewise, for all equipment purchases, the investments would incorporate resilient designs (for example, elevated power generator and storm-resistant tower cab for the new CAP ATCT). As such, Component 1 would contribute to the overall climate/disaster resilience and sustainability of Haiti's two primary airports.

30. The civil works will also be implemented according to best COVID-19-informed construction site practices and overall worksite safety management.

31. **Component 2: PAP and CAP airfield drainage system improvements (Total Cost: US\$14 million).** These investments seek to reduce the risk of airfield flooding associated with the annual rainy season, hurricanes, and climate change at PAP and CAP by increasing the drainage capacity at both airfields and thus improving their climate/disaster resilience. This component would finance inter alia:

- (i) **Civil works**, including PAP and CAP airfield drainage system and flood management improvements. Investments would be located within the perimeter of each airport. At PAP, culverts would be integrated in the design of the proposed taxiway; and
- (ii) **Consulting and non-consulting services** for corresponding supervision activities, associated technical studies as needed, including for relevant social and environmental safeguards instruments.

32. **Component 3: Institutional strengthening and project management (Total Cost: US\$12 million).** This component aims to: (i) strengthen the institutional capacity of the MTPTC, AAN, and OFNAC to manage, operate, and oversee airport operations and their development through a combination of TA activities and training; (ii) provide technical assistance (TA) to assess the capabilities, needs, and opportunities for the use of Unmanned Aircraft Systems (UAS) in Haiti to define the associated legal framework, as well as to support the GoH in the identification and development of potential logistic and supply chains; and (iii) finance project implementation support. With respect to institutional capacity, the focus would be on enhancing: (i) aircraft operational safety and associated air transport sector regulatory oversight; (ii) the quality of airport management, operations, and maintenance; (iii) capacity for improving climate/disaster resilience and gender diversity in the aviation sector by analyzing the recruitment, retention and promotion barriers that women



face and informing the development of a Gender Action Plan (GAP) to promote women's employment in medium level jobs in the sector ; and (iv) capacity for adapting to a COVID-19 environment, including trainings for best COVID-informed construction site practices and overall worksite safety management both at the ministerial level and for Haitian construction contractors. In support of this, the Project would finance consulting and non-consulting services plus the provision of goods.

33. **Component 4: Contingent Emergency Response (Total Cost: US\$0 million).** Due to the high risk of catastrophic events in Haiti, the proposed Project would include a contingent component for rapid response in the event of an eligible emergency, subject to the request of the GoH. This component would provide immediate response to an eligible emergency, as needed. Such components, which include triggers and conditions for the use of funds, are included in most investment projects in Haiti, in keeping with the recommendations of the *2011 World Development Report: Conflict, Security, and Development*,²² and with the World Bank's operational experience in Haiti when responding to catastrophic natural events.

C. Project Beneficiaries

34. **Primary Project beneficiaries include air travelers, airline companies, and air service providers.** The Project would benefit air travelers (around 1.5 million annually) to and from Haiti, which include, among others: (i) tourists; (ii) travelers visiting friends and relatives; (iii) public administration and business travelers; (iv) seasonal workers, recipients of education, training, and specialized health services; and (v) recipients of medical emergency services. They would benefit from safer aircraft operations, fewer flight disruptions due to inclement weather, and possibly increased air service. The following would also be direct beneficiaries of Project activities: (i) passenger and freight air service providers; (ii) perishable goods importers/exporters; (iii) spare part importers; and (iv) the tourism industry. Likewise, they would benefit from safer aircraft operations and fewer disruptions due to inclement weather.

35. **Another key Project beneficiary would be the GoH,** especially its ministries and agencies responsible for air transport infrastructure and services. The GoH would benefit from new and upgraded air traffic control equipment and targeted staff training. Further MTPTC, OFNAC, and AAN would benefit from investments in institutional strengthening. National and regional administrative bodies, as well as personnel involved in air transport management, would also benefit from the implementation of activities dedicated to strengthening regulatory and operational oversight in participating countries. The proposed Project has a strong focus on increasing women's participation in the aviation sector. The Project would benefit women through training for female professionals in the air transport sector and promote the recruitment of new female trainees.

36. **Indirect beneficiaries are the entire population of Haiti, as well as the neighboring Caribbean island nations that have substantial economic and cultural ties with Haiti.** Given the vital importance of air transport infrastructure to an island nation, the entire population of Haiti would benefit from: (i) safer air connectivity, and (ii) the economic development opportunities that would arise from more reliable international flights, particularly with regard to tourism. Further, given Haiti's vulnerability to climate change and natural disasters, and the unique importance of air transport infrastructure in recovery and relief efforts, the Project would provide broad societal benefits in this regard through enhancing the resilience and capacity of CAP and PAP.

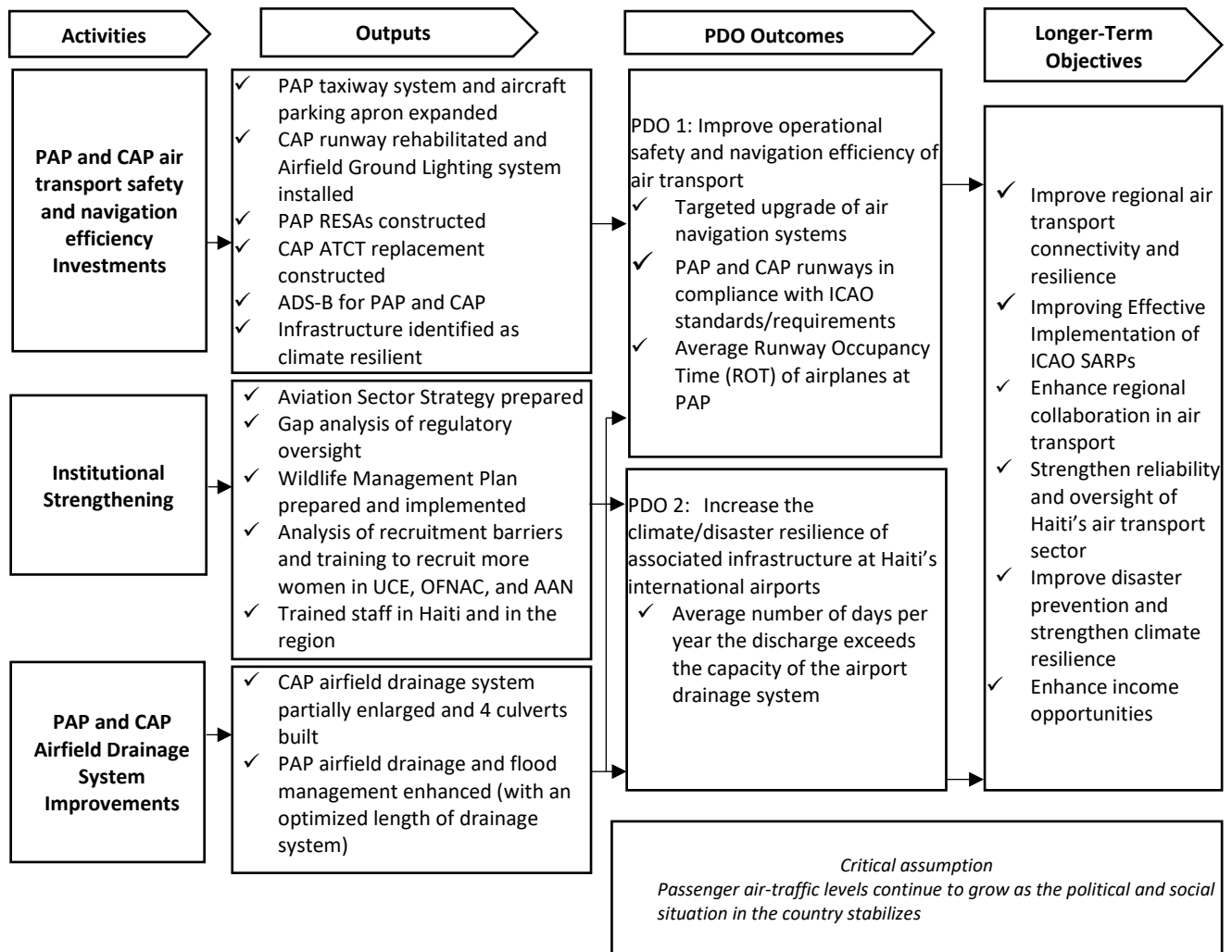
²² The World Bank, 2011, *2011 World Development Report: Conflict, Security, and Development*, https://siteresources.worldbank.org/INTWDRS/Resources/WDR2011_Full_Text.pdf.



D. Results Chain

37. **Addressing four key challenges in the air transport sector has been identified as crucial to improve operational safety and navigation efficiency of air transport in Haiti; and increase the climate and disaster resilience of associated infrastructure.** These are: (i) the inadequacy of the air navigation systems; (ii) the noncompliance of airfield infrastructure; (iii) the operational inefficiencies at PAP and (iv) the high vulnerability of airports infrastructure to flooding associated with the annual rainy season, hurricanes, and climate change. The Theory of Change below (Figure 3) illustrates the links between the proposed interventions and their expected contribution to specific outcomes and impacts.

Figure 3. Theory of Change Chain for CATCOP-Haiti





E. Rationale for World Bank Involvement and Role of Partners

38. **The World Bank is in a strong position to support the Caribbean region through the proposed CATCOP SOP based on its vast experience in supporting aviation worldwide, including in small and vulnerable economies.** World Bank-financed aviation projects include regulatory reforms and capacity building for sector oversight, investment financing in infrastructure at airports, air traffic control, and technical advice on a variety of topics (for example, safety and security, sector analysis, and reform). The World Bank's engagement in Haiti's airport sector adds value in several ways, including: (i) bringing worldwide expertise in air transport connectivity, safety, and resilience; (ii) promoting harmonization of practice and sector coordination across the region, leveraging existing capacity to deliver a regional project and capitalize on and maximize synergies; and (iii) sharing best practices in climate/disaster resilient solutions. The World Bank's expertise has played a key role in helping the GoH identify the optimal investments needed to support targeted development objectives and would contribute to supporting the GoH in preparing and implementing the Project efficiently and effectively.

39. **Maximizing Finance for Development approach.** The project is not envisaged to mobilize private financing directly as the project focuses on resilience and safety improvement as well as rehabilitation of the existing assets managed by the public entity. Therefore, public sector financing is the appropriate vehicle for this. However, these activities will support activities to create an enabling environment for attracting private financing on airport operation in the future.

40. **Role of partners.** In the specific context of Haiti, the proposed Project fits within a coordinated sectorial effort, complementing activities financed by the World Bank and the IDB by focusing on improving aircraft operational safety and climate/disaster resilience of air transport and associated infrastructure. It would be coordinated closely with Haiti's key partners in the aviation sector to ensure complementarity by considering previous, ongoing, and planned airport investments by the GoH, the IDB, and other partners. As referenced above, these include substantial recent investments financed by the IDB, which, in partnership with the GoH, developed a master plan for PAP in 2013 and recently completed a PAP runway rehabilitation and widening project (the US\$50 million Transport Sector in Haiti IV Project). In October 2018, the IDB approved the US\$225 million Transport and Departmental Connectivity Project, which is financing equipment and the construction of a new ATCT for PAP. The Project also fits within a coordinated territorial initiative in Cap-Haïtien, complementing existing operations, including the approved IDA-financed Cap-Haïtien Urban Development Project (CHUD, P168951). The works required to improve the drainage system at CAP directly benefit the airport but also indirectly benefit the SoS road, the urban areas Balan and La Petite Anse, and the surrounding area of Bassin Rhodo targeted under CHUD. The CHUD includes rehabilitation of the SoS road (south of the airport) and the construction of an outlet culvert from the airport under the Route National 3 (RN3) to the sea.

F. Lessons Learned and Reflected in the Project Design

41. The design of the proposed CATCOP SOP builds upon the lessons learned from previous regional programs such as the Pacific Aviation Investment Project (PAIP) in Kiribati (P128093), Timor-Leste (P128151), Tonga (P128094), and Tuvalu (P128095). The design of the CATCOP SOP is based on the idea of replicating common solutions and lessons learned across countries with a common objective and framework. The lessons learned from the PAIP demonstrated that the introduction of regional Communications, Navigation, and Surveillance (CNS) systems created regional spillover benefits. ADS-B is being deployed for all CATCOP airports and this would help upgrade air traffic safety across the region. Further, it would encourage other non-participating countries to do the same.



42. The proposed Project's institutional arrangements reflect best practice models from other small countries and lessons learned from other projects investing in large public infrastructure. Due to the acute lack of local specialized capacity in Haiti to operate international airports capable of meeting ICAO safety and security standards, *Unité Centrale d'Execution* of the Ministry of Public Works (UCE-MTPTC) would contract, by effectiveness, a Delegated Implementing Agency (MDOD/AMO) covering the implementation of Components 1, 2, and 3. The contracts would include local staff development. The contracts would also include TA to support AAN and OFNAC with the implementation of the transition plan at the end of the Project.

43. The proposed Project incorporates lessons learned from the ongoing and closed IDA-financed projects in Haiti (Haiti Infrastructure and Institutions Emergency Recovery Project, P120895; Disaster Risk Management and Reconstruction Project, P126346; and Center and Artibonite Regional Development Project, P133352) by considering the following in its design and preparation: (i) to identify a few technically simple investments with limited environmental and social impacts, which can be delivered in the short term and produce visible results for the population; (ii) to elaborate a contingency plan to ensure continued implementation support in periods of severe fragility and insecurity; and (iii) to incorporate resilience as a crosscutting theme. The Project's design also incorporates lessons identified in the Performance and Learning Review of the FY16-21 CPF (2018), such as the need to continue to include emergency components (CERCs) in investment projects, and the need to prioritize simple project design and streamlined implementation arrangements.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

44. The proposed Project would be implemented by, and under the fiduciary responsibility of the MTPTC through its Project implementation Unit (PIU), the Central Execution Unit (UCE-MTPTC), and its technical directorates (OFNAC and AAN). UCE is familiar with the World Bank's fiduciary and safeguards policies and procedures. It has implemented and is currently implementing a number of projects financed by the World Bank, and has the capacity to manage additional funds.²³ The UCE-MTPTC has a decentralized office in Cap-Haïtien which supports the implementation of both the Municipal Development and Urban Resilience Project (MDUR, P155201) and the Cap-Haïtien Urban Renewal Project (CHUD, P168951).

45. A Delegated Implementing Agencies model (*Maîtrise d'Ouvrage Déléguée* or Assistance à Maîtrise D'ouvrage, MDOD/AMO) would be used and contracted by grant effectiveness. The MDOD/AMO would complement the PIU's capacity with the specialized technical skills necessary to help procure and control the quality of the provision of works, goods, and studies to be financed under Components 1, 2, and 3. For those activities, the MDOD/AMO would be delegated the responsibility of preparation of procurement documentation and for monitoring the activities under the oversight of UCE-MTPTC.

46. AAN and OFNAC, as the main beneficiaries of the Project's TA activities under Component 3, have been closely involved in project preparation and would continue to play a key role during implementation. During preparation, AAN

²³ The closed Emergency Bridge Reconstruction and Vulnerability Reduction Project (PRORéV, P114292) and the Institutions and Infrastructure Emergency Recovery Project (PRUII, P120895), and the ongoing Disaster Risk Management and Reconstruction Project (PRGRD, P126346), the Centre Artibonite Regional Development Project (BCA, P133352), the Municipal Development and Urban Resilience Project (MDUR, P155201), and the Haiti Rural Accessibility & Resilience Project (RARP, P163490).



and OFNAC supported UCE-MTPTC and the World Bank's team in identifying key challenges and priority investments and in designing activities for project support. During implementation, they would continue to be consulted throughout the conceptualization and implementation of Project activities and would play a key overseeing role in the implementation of the activities as detailed in the Project Operations Manual (POM).

47. The proposed Project would be implemented using the institutional framework, procurement, financial management (FM), and disbursement arrangements in place under the previous IDA-financed projects, all of which have demonstrated substantial results.

48. The World Bank would provide implementation support on a regular basis, based on an implementation support plan detailed in Annex 1. This plan would be complemented by contingency measures that would ensure continuation of implementation support in situations with access restrictions and elevated security risks.

B. Results Monitoring and Evaluation (M&E) Arrangements

49. Joint supervision missions by the GoH and the World Bank would monitor the status of Project outcomes, safeguards, and compliance with legal covenants. A dedicated M&E staff member in the UCE-MTPTC would monitor all indicators through a dedicated M&E system, including project outputs and outcomes, communications and awareness-raising activities, environmental and social safeguards activities, and the activities of the Grievance Redress Mechanism (GRM). Detailed progress reports would be submitted to the World Bank on a semiannual basis. The reports would include information on disbursements, FM, procurement, social and environmental safeguards, overall implementation progress as well as an updated annual plan of works and activities. A Mid-Term Review (MTR) would be conducted no later than three years after the first disbursement. The Project may also leverage innovative technology to enhance monitoring and evaluation capacity.

C. Sustainability

50. **The GoH has demonstrated a strong commitment to and ownership of the Project.** As referenced above (paragraph 13), substantial recent investments and progress have been made over the past few years. The separation of the regulator (OFNAC) from the operator (AAN) has already put the country on the path towards sustainability and a preliminary Airport Master Plan for PAP has been developed in 2013. Although the GoH's commitment to the Project is not likely to waver, the Project's design specifically addresses the two key risk factors to sustainability: lack of technical and financial capacity of the GoH to operate and maintain airport infrastructure and equipment.

51. **The Project would contribute to reducing the risk of physical damage to the targeted airport infrastructure if an adverse natural event were to occur and, as a result, to lowering future operational costs.** ToRs for the design of infrastructure would require providers to actively incorporate operations and maintenance (O&M) constraints into infrastructure design, including climate resilience aspects. The use of locally sourced materials, low-maintenance materials, and low-maintenance construction practices would be encouraged whenever possible. A detailed maintenance strategy or plan would also be required as one of the deliverables for each investment and equipment financed by the Project.

52. **Institutional strengthening and training activities would improve efficiency of the airport management and maintenance and of the skilled local staff to manage aviation infrastructure, which would ensure sustainability of the Project's achievements.** The human capacity constraints would be alleviated through a matrix of activities tailored to



suit Haiti's specific needs, as follows: (i) purchase of equipment would include on-the-job training and end-of-contract transfer of TA; (ii) specialized TA (MDOD/AMO) for the entire duration of the Project; and (iii) extensive training programs, including staff secondment and other regional twinning initiatives.

IV. PROJECT APPRAISAL SUMMARY

A. Technical and Economic Appraisal

Technical Appraisal

53. The design of the works to be financed by the proposed Project would apply international engineering standards and build upon lessons learned under past and ongoing IDA-financed operations in Haiti supporting transport infrastructure construction and rehabilitation, including best practices on climate/disaster resilience measures and environmental sustainability.

54. While the works under Components 1 and 2 are relatively straightforward from a technical perspective, CAP runway rehabilitation would have to be implemented carefully and in close coordination with the airlines given that CAP has only one runway. To avoid the economic losses associated with closing the airport for an extended period of time, the runway rehabilitation works would likely need to be conducted only at night following a consistent schedule so that airlines can operate with minimal disruption to services. Strict protocols for clearing, cleaning, and inspecting the runway area each morning before opening would need to be followed to ensure operational safety. Further, rapid curing/drying pavement materials would need to be used given the need to keep the runway operational during the period of rehabilitation works with due consideration for using materials that are resistant to climate impacts such as extreme temperatures.

55. An upgrade of the drainage system at CAP would lead to increased discharge capacity, and consequently increased discharges. To protect the airport against flood hazard, the sequence of works is crucial. The discharge capacity downstream (outside) the airport would be improved first as part of the CHUD project (i.e., prior to increasing the discharge capacity inside the airport and upstream (outside) the airport).

56. The ADS-B equipment to be deployed is well understood and has been used successfully around the world. This very effective, low-cost technology solution would improve aircraft monitoring and surveillance capabilities and significantly improve situational awareness of both pilots and air traffic controllers. Its deployment in Haiti requires only that one (or more) simple ground station(s) is(are) installed to receive the signal and relay to monitors in each ATCT and that Haiti-based aircraft are equipped with an ADS-B transmitter. Since well over a decade, all jetliner aircraft have been equipped with ADS-B and it will become compulsory for all aircraft in the United States and Europe by 2020. Since many smaller aircraft still need to be equipped with ADS-B, budget has been included under the Project to equip the estimated 12 Haiti-based aircrafts.

57. **Project Implementation Readiness.** Several technical documents were prepared during project preparation to improve project implementation readiness. ToRs for the MDOD/AMO has been finalized and the tender would be launched in May 2020. The launch of the tender for the ADS-B is expected in July 2020 and the launch of the tenders for the construction of PAP taxiway and the rehabilitation of CAP runway are expected in February 2021. The POM manual has been finalized and approved. Aiming to strengthen UCE/MTPTC's capacity to absorb the CATCOP-Haiti project, TORs



are being developed for: (i) a Project team leader; (ii) an accountant (central office); (iii) a procurement assistant; (iv) an M&E and communication specialist; and (v) an additional environmental and social specialist at UCE.

58. **Climate Adaptation Co-Benefits.** Resilience is a central feature of design solutions identified for the investments and technical studies under Component 1 (use of climate-resilient and environmentally optimized designs and materials), and for the institutional strengthening activities designed under Component 3. The Project would also focus on integrating climate resilience and disaster risk mitigation specifically for the airfield at both airports under Component 2. The hydraulic sizing of the drainage system at the engineering design stage will use hydro-meteorological data based on climate change projections and most recent rainfall data collected under the Haiti Strengthening Hydro-Met Services Project (P148259) and the Municipal Development and Urban Resilience Project (P155201). Specific adaptation co-benefits per component include:

- a) Component 1: Civil works to be financed would be designed to incorporate climate/disaster resilient features to the extent it is economically and technically feasible. Climate adaptation investments would include enhancing the resilience of the new ATCT at CAP (for example, elevating the power generator and using storm resistant windows in the tower cab) and using airfield pavement materials suitable for high-temperature environments.
- b) Component 2: This component is designed for mainstreaming adaptation measures in infrastructure design and for improving resilience of the selected drainage system to climate change impacts. Component 2 would contribute to improving airfield drainage and flood management features to reduce the risk of flooding events on the airfield and in the terminal buildings. These could include, but are not limited to, expanded drainage canals, overflow retention ponds in areas distant from airfield pavements and terminal buildings, and sump pumps in critical locations. These investments aim to improve airport resilience by reducing the risk of airfield and terminal flooding associated with the annual rainy season, hurricanes, and climate change.
- c) Component 3: This component would include climate resilience building such as activities designed to: (i) develop training for maintenance/resilient infrastructure and climate change adaptation measures, and (ii) strengthen the capacity of the GoH for airport asset management and maintenance.

Economic Appraisal

59. **The proposed Project is economically viable and expected to improve operational safety and navigation efficiency of air transport, and to increase the climate/disaster resilience of associated infrastructure at Haiti's two main international airports.** It would deliver substantial economic benefits to Haiti's society as any material enhancement or degradation of air services for island nations like Haiti would have significant and rapid economic and social consequences given air transport is their primary means of economic and cultural connectivity to the rest of the world. Accordingly, failure to adequately address the operational safety deficiencies at Haiti's international airports would likely result in a steady withdrawal of both domestic and international air services. The economic costs that a loss of such connectivity would entail would impact the entire Haitian economy, not just the regions of Port-au-Prince and Cap-Haïtien. The loss of or curtailment of airline services would affect the entire society throughout the country, including the flows of tourism, remittances, labor, goods, services, knowledge, and investments. The major economic benefits of the Project's investments are summarized below:

- (i) **Capacity increase at PAP:** The Project would contribute to: (a) reduced airline operating costs through lower fuel burn and crew costs associated with reduced aircraft taxiing time and arrival/departure queuing (also reduced carbon emissions) on a daily basis; and (b) reduced risk of airline service reductions during apron rehabilitation by providing new remote apron area through: (i) increased runway throughput by constructing a



new taxiway system (i.e., a partial parallel taxiway and two additional perpendicular taxiways connecting the runway to the aircraft apron) that would reduce runway occupancy times; and (ii) increased capacity for a greater number of aircrafts to simultaneously load/unload passengers and cargo by constructing an additional aircraft parking apron. In the long run, these investments would significantly improve PAP's ability to fill its critical and unique role as the primary gateway for movement of people and goods in/out of the country in a post-disaster scenario and reduce the risk of loss of life and human suffering post disaster by accommodating surges in humanitarian and other relief flight activity.

(ii) **Runway rehabilitation at CAP:** This investment would reduce: (a) the risk of aircraft accidents/incidents due to deterioration of the runway and associated loss of life; and (b) risk of airport closure due to major pavement failure and associated economic loss to the region and country.

(iii) **Resilience improvement at PAP and CAP:** These activities would reduce the risk of airport closure for both PAP and CAP due to airfield flooding risk reduction. They would eventually contribute to enhanced national and regional resilience to natural disaster and an associated reduced risk of loss of life and human suffering after a disaster by ensuring the availability of functional airports during emergency operations.

(iv) **Air Traffic Safety-enhancement:** The benefits of the abovementioned investments (PAP taxiway improvements, PAP and CAP drainage improvements, CAP runway rehabilitation) are expected to be significantly complemented by safety improvements from the rest of investments planned under the Project, which are focused on enhancing operational safety at targeted airports. These include: (i) the construction of RESAs, (ii) the replacement of CAP ATCT; and (iii) the ADS-B installation. These improvements would further reduce the risk of aircraft accidents/incidents and associated loss of life.

60. **A cost-benefit analysis (CBA) shows that the Project is economically viable.** Considering the total project cost of US\$84 million and the quantified benefits of the PAP taxiway improvement and the CAP runway rehabilitation, the Project has a net present value (NPV) of US\$3 million and an internal rate of return (IRR) of 7 percent. These benefits are expected to be significantly complemented by other investments mentioned above, even though it is difficult to quantify these in monetary terms. Details of the economic evaluation can be found in Annex 4.

61. **In addition to climate change adaptation (i.e., reducing vulnerability to climate risks), the Project would contribute to climate change mitigation by reducing greenhouse gas emissions.** The Project would result in a reduction in GHG emissions at PAP due to the taxiway system enhancements, which provide an operational savings of about five minutes per aircraft turnaround. Specifically, the proposed taxiway improvements for PAP are anticipated to reduce aircraft-related GHG emissions by about 95 kilograms of CO₂ per aircraft turnaround. At current demand levels, this represents a reduction of about 1.25 million kilograms of CO₂ annually. These GHG emissions reductions are based on the jet fuel consumption savings associated with reduced aircraft arrival and departure delays (due to lower runway occupancy times) and reduced taxiing distances.

B. Fiduciary

Financial Management

62. The Project's financial management (FM) would be managed by the existing coordinating unit, UCE-MTPTC, which is currently responsible for this function for other IDA-financed projects (Annex 1). An institutional capacity diagnostic



of UCE-MTPTC has been carried out by the United Nations Office for Project Services (UNOPS) in order to identify current and future obstacles to the implementation of the World Bank portfolio and to set out relevant mitigation measures and recommended actions. In addition to these measures and actions, UCE-MTPTC will need to put in place adequate supervision and monitoring procedures for delegated activities in order to ensure that Project activities and investments are satisfactorily implemented and accounted for.

Procurement

63. Procurement would be carried out in accordance with the Procurement Regulations and the World Bank's Systematic Tracking and Exchanges in Procurement (STEP) system. The STEP system would be used to prepare, clear, and update the procurement plans and conduct procurement transactions for the Project.

64. The World Bank's standard procurement documents would be used for all contracts that are subject to international competitive procurement. When approaching the national market, GoH procurement procedures may be used in accordance with the National Procurement Arrangements (paragraph 5.3) of the Procurement Regulations. This would be specified in the Procurement Plan tables in STEP. When the GoH uses its own national open competitive procurement arrangements, as set forth in the 2009 law outlining general rules relating to public contracts and public service concession agreements, such arrangements would be subject to paragraph 5.4 of the Procurement Regulations and the conditions included in the Grant Agreement. When national procurement arrangements other than national open competitive procurement arrangements are applied by the GoH, such arrangements would be subject to paragraph 5.5 of the Procurement Regulations.

65. The Project Implementation Unit in the Ministry of Public Works, UCE-MTPTC, would have the overall responsibility to carry out procurement activities. A procurement capacity assessment of UCE-MTPTC has been conducted and it revealed that the unit has experience with GoH and World Bank procedures for implementing IDA-financed projects. The unit has a manual of procedures in place that has been revised and updated for use for the proposed Project. The main challenge identified during the assessment is the additional workload in UCE-MTPTC and the limited human resources available on the procurement and technical side. The assessment also noted the lack of delegation in the decision-making mechanism, the absence of an appropriate filing system, the non-publication of contracts awarded, and the lack of internal and external oversight on procurement activities. To mitigate the risk, the following measures are proposed: (i) review of workload distribution between the two procurement staff; (ii) appointment of a procurement assistant to help with administrative tasks and filing; (iii) strengthening of the technical team; (iv) preparation of an appropriate procurement plan with anticipation of some key contracts; (v) conduct of a procurement audit annually during the project life; and (vi) training of the procurement specialists and technical experts on World Bank Procurement Regulations and on contract management.

C. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

D. Environmental and Social



66. The proposed Project is one of the first in Haiti to apply the World Bank's Environmental and Social Framework (ESF). The ESF represents a shift in the approach, scope, and content of risk management throughout the project lifecycle. Based on an assessment of the proposed CATCOP-Haiti's activities and considering contextual factors such as project location and institutional capacity, the proposed Project presents a moderate environmental and social risk. The proposed activities are site-specific and geographically confined, no physical or economic resettlement is anticipated, and the works focus on medium-scale construction or rehabilitation works.

67. As of Project appraisal, six of the ESF's 10 Environmental and Social Standards (ESS) are relevant. They are: ESS1 (Assessment and Management of Environmental and Social Risks and Impacts), ESS2 (Labor and Working Conditions), ESS3 (Resource Efficiency and Pollution Prevention and Management), ESS4 (Community Health and Safety), ESS6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources), and ESS10 (Stakeholder Engagement and Information Disclosure).

68. An analysis of the Project's potential environmental and social risks and impacts is outlined in the Stakeholder Engagement Plan (SEP). Such analysis identified the following potential risks and impacts: (i) risks linked to waste management; (ii) possible impacts on the communities from the construction activities, including the increase of dust and noise, and the labor influx; (iii) community health and safety risks, particularly related to traffic management and road safety; and (iv) the risk linked to the capacity of the UCE-MTPTC to prepare and implement the Project according to the ESF, given the Project's tight deadline, the fragile status of the governance structures, and the security challenges, which may hinder timely implementation and supervision of environmental and social measures. Mitigation measures are mentioned in the SEP and ESCP.

69. A more detailed and site-specific analysis of the Project's potential risks and impacts and their respective mitigation measures will be outlined in two Environmental and Social Management Plans (ESMPs) for PAP and CAP once the Project's design documents and relevant technical feasibility studies are finalized. The ESCP and SEP have been finalized and disclosed: (i) on MTPTC's website on February 7, 2020²⁴, and (ii) on the World Bank's website on January 29, 2020. Consultations took place on February 10, 2020. The Labor Management Procedure (LMP) has been finalized and will be disclosed before approval of the Grant by the World Bank's Board of Directors. TA will address wildlife strikes and wildlife management, which were raised by the stakeholders as a critical operational safety concern. The relevant requirements of the ESF will apply, as appropriate to the nature of the risks and impacts arising from the TA. Terms of reference, work plans, or other documents that define the TA scope and outputs will be drafted to maintain consistency with the ESF.

70. **Citizen Engagement.** The proposed Project builds upon, and further deepens, earlier initiatives implemented in Haiti under previous IDA-financed projects for citizen engagement, project monitoring, and transparency. The SEP identifies the stakeholders, the means to ensure effective project communication with each stakeholder group, and indicators to monitor its implementation. During project preparation, consultations were held with direct stakeholders to gather feedback and inform the proposed design and the prioritization of investments. The proposed Project emphasizes open and recurring two-way consultations throughout implementation and relies on robust Grievance Redress Mechanisms (GRMs) for project workers and for all other stakeholders. The Project's GRMs will quarterly report and record all salient issues or grievances; and UCE will ensure timely follow-up and tracking of grievances to their resolution. The Project will track the percentage of grievances adequately responded to and/or resolved within the stipulated service standards as part of the SEP implementation.

²⁴ <https://www.mtptc.gouv.ht/accueil/publications/appels-d-offre.html>



71. **The Project would contribute to closing gender employment gaps in the aviation sector.** For all CATCOP airport operators and regulators, training will be provided on improving gender diversity in recruiting and staff development activities. The Project will support the increase of women's participation in the aviation sector through several activities related to: (i) carrying out an analysis of the recruitment, retention, and promotion barriers for women in the aviation sector in Haiti and development and implementation of a Gender Action Plan by UCE-MTPTC under Component 3 on Institutional Capacity; (ii) providing training for female professionals in the air transport sector and recruitment of new female trainees; and (iii) developing a nondiscrimination and equal opportunity policy under the Human Resources Department of UCE-MTPTC. To this end, the Project will support the full training requirements of new female recruits, including all costs associated with sending them to specialized, accredited international training programs (which for air traffic control typically lasts about two to four months followed by two to four years of on-the-job training). As a result, the Project expects to increase the percentage of women working in the aviation sector, mainly in medium-skilled jobs, including air traffic controllers, supervisors, and public safety and security screening staff. Additionally, specific programs would be developed to significantly increase the share of female air traffic controllers and public safety and security screening staff.

72. **The Project recognized that infrastructure works could increase risk factors for Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) in the workplace.** A risk assessment was conducted using the gender-based violence (GBV) tool, and the Project ranks low for the GBV risk. The tool considers the country and project context to assess different GBV risk factors. According to data from the Demographic and Health Survey 2016-2017²⁵, prevalence of domestic sexual violence in women between 15-49 years old is above the regional average, and there is no legislation on domestic violence, marital rape, or sexual harassment. In terms of context-related risks, sexual violence, poverty, and gender inequality are critical for women's vulnerability to HIV/AIDs.²⁶ HIV/AIDS transmission rates are higher among transient communities, such as men who work in the construction industry and workers who regularly cross the border with the Dominican Republic.²⁷ The Haitian National Policy has a Sexual and Gender-Based Violence (SGBV) unit that remains under-resourced and understaffed. Thus, survivors of rape and other sexual violence face obstacles in seeking legal justice, as well as accessing protective services.²⁸ In terms of the Project-related risks, the infrastructure works related to the airport will happen in a delimited area, where there will be a high absorption capacity with easy access to monitor works; whilst the Project's response strategy will be linked to the GRM, where survivors will be able to register complaints in a confidential manner. The Project will complement the results from the GBV tool with information derived from the stakeholder consultation to define the final risk level.

V. GRIEVANCE REDRESS SERVICES

73. Communities and individuals who believe that they are adversely affected by a World Bank-supported project may submit complaints to existing project-level GRMs or the World Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project-affected communities and individuals may submit their complaint to the World Bank's independent Inspection Panel, which determines whether harm occurred, or could occur, as a result of World Bank noncompliance with its policies and

²⁵ Institut Haïtien de l'Enfance (IHE) et ICF. 2018. Enquête Mortalité, Morbidité et Utilisation des Services (EMMUS-VI 2016-2017) Pétiön-Ville, Haïti, et Rockville, Maryland, USA : IHE et ICF.

²⁶ Marchand, Hélène. 2011. "Violence, Inégalités de Genre et Vulnérabilité des Femmes au VIH/SIDA en Haïti." Mémoire présenté à la Faculté des Études supérieures de l'Université Laval dans le cadre du programme de maîtrise en santé communautaire pour l'obtention du grade de maître ès Sciences (M.Sc.).

²⁷ USAID. 2016. USAID/Haiti gender assessment. Washington, DC: USAID.

²⁸ Haiti 2018 Human Rights Report. <https://www.justice.gov/eoir/page/file/1159756/download>



procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and World Bank management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate GRS, please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank's Inspection Panel, please visit www.inspectionpanel.org.

VI. KEY RISKS

74. The overall project risk has been identified as Substantial due to the fragile political and governance context, as well as the weak implementation capacity of government counterparts. Key risks to achieving results and their respective mitigation measures are discussed below.

- (i) **Political and governance risk is rated “High.”** Political uncertainty and potential instability in Haiti have the potential to create bottlenecks and delays in implementation of the proposed Project. The country experienced serious social unrest in February, June, and September 2019, which virtually paralyzed economic activity for several weeks. Political and governance risk would be partially mitigated through dialogue and close collaboration with government entities, proactive engagement by the World Bank as issues arise, as well as periodic evaluations to adapt to changing context. The task team would provide close implementation support and adjust interventions and implementation strategies (including the use of third parties, ICT-based supervision, and M&E architecture) as needed.
- (ii) **Institutional capacity for implementation and sustainability risk is rated “Substantial.”** There is a shortage of skilled technical and managerial staff in the sector. The establishment of the MDOD/AMO to provide procurement and technical support, strengthened by international specialists, is intended to partially mitigate this risk. The MDOD/AMO is expected to be on board by the Grant's effectiveness. Further mitigation would be through the substantial capacity development, training program and technical assistance to strengthen the operational capacity of the PIU for project management and supervision. Furthermore, the Project would pay particular attention to maintenance requirements during the design of infrastructure and purchase of equipment in order to minimize sustainability risks. COVID-19 presents additional implementation challenges, such as smaller construction crews to carry out infrastructure works. These will be mitigated through: (i) the preparation of an organized and flexible works schedule to mitigate construction delays and ensure income generation in a safe and secure work environment; and (ii) ensuring best COVID-informed construction site practices, overall worksite safety management and enforcement of rules on use of personal protective equipment to reduce the incidence of COVID-19 transmission.
- (iii) **Fiduciary risk is rated “Substantial.”** The UCE-MTPTC already manages the fiduciary aspects of four other IDA-financed projects, but the increased volume of work with the proposed Project, would increase the financial management and procurement risks. Based on the current performance of the unit, the main risks include (i) insufficient FM and procurement staffing and constrained capacity; (ii) delays in finalizing the accounting system upgrade; and (iii) unsatisfactory or delayed documentation of expenditures from third parties. To mitigate these risks, the UCE-MTPTC would: (i) increase FM staffing; (ii) engage and train skilled FM and procurement professionals; (iii) address systemic FM issues; and (iv) set in place a more efficient mechanism for contract management.



VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Haiti

Caribbean Regional Air Transport Connectivity Project - Haiti

Project Development Objectives(s)

The objectives of the Project (PDO) are to: (i) improve operational safety and navigation efficiency of air transport in the Recipient's territory; and (ii) increase the climate and disaster resilience of associated infrastructure at the Recipient's international airports.

Project Development Objective Indicators

Indicator Name	DLI	Baseline	Intermediate Targets			End Target
			1	2	3	
Improve operational safety and navigation efficiency of air transport						
Targeted upgrade of air navigation systems achieved at CAP and PAP (Text)		Non-precision navigation system: No VSAT or ADS-B	Contract signed	ADS-B implemented	Navigation systems upgraded at CAP and PAP	Electronic navigation system in place (ADS-B implemented and operational)
PAP and CAP runways in compliance with ICAO SARPs (Yes/No)		No	No	No	Yes	Yes
Average Runway Occupancy Time (ROT) of airplanes at PAP (Minutes)		7.50	7.50	7.50	5.00	5.00
Increase the climate/disaster resilience of associated infrastructure at Haiti’s int'l airports						
Average number of days per year the discharge exceeds the capacity of the airport drainage system at PAP and CAP (Days)		20.00	20.00	10.00	0.00	0.00



Indicator Name	DLI	Baseline	Intermediate Targets			End Target
			1	2	3	
Average number of days per year the discharge exceeds the capacity of the airport drainage system at PAP (Days)		10.00	10.00	10.00	0.00	0.00
Average number of days per year the discharge exceeds the capacity of the airport drainage system at CAP (Days)		10.00	10.00	10.00	0.00	0.00

Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline	Intermediate Targets			End Target
			1	2	3	
Component 1: PAP and CAP operational safety and navigation efficiency investments						
Length of PAP taxiway system built (Meter(m))		0.00	500.00	1,000.00	1,200.00	1,460.00
Additional aircraft parking apron built at PAP (Square Meter(m2))		0.00	15,000.00	20,100.00	24,000.00	26,100.00
Length of CAP runway rehabilitated (Meter(m))		0.00	1,000.00	2,000.00	2,450.00	2,450.00
Airfield Ground Lighting (AGL) for the CAP runway is installed and operational (Yes/No)		No	No	No	Yes	Yes
PAP RESAs implemented and consistent with ICAO SARPs (Yes/No)		No	No	No	Yes	Yes
Constructed CAP Air Traffic Control Tower (ATCT) in compliance with		No	No	No	Yes	Yes



Indicator Name	DLI	Baseline	Intermediate Targets			End Target
			1	2	3	
ICAO SARPs (Yes/No)						
ADS-B for CAP and PAP installed and operational (Yes/No)	No	No	No	Yes	Yes	Yes
Share of infrastructure activities identified as climate resilient (Percentage)	0.00	100.00	100.00	100.00	100.00	100.00
Component 2: PAP and CAP airfield drainage system improvements						
Length of PAP drainage system (Meter(m))	3,850.00	3,850.00	3,150.00	2,450.00	2,450.00	2,450.00
New culverts built at CAP (Number)	0.00	0.00	2.00	4.00	4.00	4.00
Component 3: Institutional strengthening & Project Management						
Aviation sector strategy prepared (Yes/No)	No	No	Yes			Yes
Wildlife management plan prepared and implemented for PAP and CAP airports (Yes/No)	No	No	No	Yes		Yes
OFNAC safety inspectors trained by a certified agency (Number)	0.00	5.00	20.00	40.00	50.00	50.00
Rescue Coordination Center staff trained by a certified agency (Number)	0.00	5.00	20.00	40.00	50.00	50.00
Regional training programs attended by AAN and OFNAC (Number)	0.00	1.00	2.00	3.00	5.00	5.00
Grievances adequately responded to and/or resolved within the stipulated service standards (Percentage)	0.00	100.00	100.00	100.00	100.00	100.00
Share of women hired in medium-skill jobs by UCE-MTPC, OFNAC and	0.00	5.00	10.00	10.00	15.00	15.00



Indicator Name	DLI	Baseline	Intermediate Targets			End Target
			1	2	3	
AAN (Percentage)						
Share of women included in the medium-skills training (Percentage)		0.00	10.00	15.00	20.00	30.00
People with Enhanced Access to Transportation Services (Number)		0.00	0.00	1,900,000.00		1,900,000.00
Semi-annual meetings held with stakeholders to discuss their suggestions and related actions taken by the Project (Number)		0.00	2.00	4.00	7.00	12.00

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Targeted upgrade of air navigation systems achieved at CAP and PAP	Haiti currently has a non-precision navigation system (instruments) and is the only CATCOP participating country without an electronic navigation system. The project seeks to upgrade the navigation system by implementing Automatic Dependent Surveillance-Broadcast for Haiti's international airports	Semiannual	MDOD/AMO consultant's trimestral Project progress reports based on the Supervision consultant's monthly progress reports.	The MDOD/AMO Consultant will compile the information of the physical progress of the air navigation system's subcomponents that will be measured by the Supervision Consultant according to the methodology that will be determined as per	UCE



	(PAP and CAP), [including receiver antenna(s), consoles for each ATCT, and equipping Haiti-based aircraft], allowing continuous aircraft position reports and improving situational awareness for air traffic controllers and pilots.			its contract. The compiled information will be presented in their trimestral Project progress report.	
PAP and CAP runways in compliance with ICAO SARPs	The indicator measures implementation of the Runway End Safety Areas (RESAs) at PAP and rehabilitation of the CAP runway, including (a) milling and repaving the full length of the runway; and (b) installation of Airfield Ground Lighting (AGL) for the runway. Construction of ICAO-required Runway End Safety Areas (RESAs) for both PAP runway ends would improve operational safety and comply with ICAO SARPs. Rehabilitation of the CAP runway will help comply with ICAO SARPs for runway pavement conditions.	Once (Upon completing the project investment)	MDOD/AMO Consultant's quarterly project progress reports based on the Supervision consultant's monthly progress reports. OFNAC (the regulator) will assess the compliance of the infrastructure with ICAO SARPs.	The MDOD/AMO Consultant will compile the information of the physical progress of the runways improvements that will be measured by the Supervision Consultant according to the methodology that will be determined as per its contract. The compiled information will be presented in their quarterly project progress report. OFNAC (the regulator) will assess the compliance of the infrastructure with ICAO SARPs.	UCE



Average Runway Occupancy Time (ROT) of airplanes at PAP	ROT means the amount of time that each aircraft occupies the runway. The target is to reduce the PAP average Runway Occupancy Time (ROT) per arrival-departure cycle by at least 2.5 minutes. Construction of additional taxiways and aircraft parking apron will reduce ROT thereby increasing runway capacity, reduce delays (and GHG emissions), and improve PAP's ability to handle post-disaster spikes in air traffic volume.	Semiannual	Information from the airport traffic control center (AAN)	The MDOD/AMO Consultant will assess on a semiannual basis the ROT at PAP based on the traffic data provided by the AAN's traffic control. AAN will ensure the daily collection of this data through a specific internal process. They will report it in their quarterly Project Progress report.	UCE
Average number of days per year the discharge exceeds the capacity of the airport drainage system at PAP and CAP	The capacity of a drainage system is defined by the cross section of the drainage channels, the slope, the alignment, possible structures, and the revetment. If the actual discharge exceeds the capacity, inundation follows. The function of a drainage system is to discharge water in a controlled manner. The availability of the discharge system is defined by the rate (or the number of days	Annual	AAN information on the drainage system for each airport.	The MDOD/AMO Consultant will assess on an annual basis the average number of days per year the discharge exceeds the capacity of the airport drainage system for each airport, based on the data provided by the AAN. AAN will ensure the collection of this information through	UCE



	per year for both PAP and CAP) the capacity is sufficient to discharge water in controlled manner.			a daily field observation and report in their quaterly Project progress report.	
Average number of days per year the discharge exceeds the capacity of the airport drainage system at PAP	The capacity of a drainage system is defined by the cross section of the drainage channels, the slope, the alignment, possible structures, and the revetment. If the actual discharge exceeds the capacity, inundation follows. The function of a drainage system is to discharge water in a controlled manner. The availability of the discharge system is defined by the rate (or the number of days per year) the capacity is sufficient to discharge water in a controlled manner.	Annual	AAN information on the drainage system for PAP.	The MDOD/AMO Consultant will assess on an annual basis the average number of days per year the discharge exceeds the capacity of the airport drainage system for PAP, based on the data provided by AAN. AAN will ensure the collection of this information through a daily field observation and report in their quaterly Project progress report.	UCE
Average number of days per year the discharge exceeds the capacity of the airport drainage system at CAP	The capacity of a drainage system is defined by a.o. the cross section of the drainage channels, the slope, the alignment, possible structures, and the revetment. If the actual	Annual	AAN information on the drainage system at CAP	The MDOD/AMO Consultant will assess on an annual basis the average number of days per year the discharge exceeds the capacity of the airport	UCE



	discharge exceeds the capacity, inundation follows. The function of a drainage system is to discharge water in a controlled manner. The availability of the discharge system is defined by the rate (or the number of days per year) the capacity is sufficient to discharge water in controlled manner.			drainage system for CAP, based on the data provided by AAN. AAN will ensure the collection of this information through a daily field observation and report in their quaterly Project progress report.	
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Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Length of PAP taxiway system built	The indicator measures the construction of a partial parallel taxiway and two additional exit taxiways. They would significantly improve aircraft flow and enhance reduce aircraft (Runway Occupancy Time)	Semiannua l	Supervision consultant's monthly progress reports	Physical progress of the taxiway system construction will be measured by the Supervision Consultant, according to the methodology that will be determined as per its contract.	UCE
Additional aircraft parking apron built at PAP	The indicator measures construction of additional aircraft parking apron that together with the additional	Semiannua l	Supervision consultant's monthly progress	Physical progress of the additional aircraft parking apron will be measured by the	UCE



	taxiways would eliminate significant bottlenecks and inefficiencies in aircraft movements, reduce aircraft CO2 emissions, improve aircraft operating safety, and would allow to accommodate spikes in relief flights (passenger and cargo) in post-disaster periods.		reports	Supervision Consultant according to the methodology that will be determined as per its contract.	
Length of CAP runway rehabilitated	The indicator tracks the progress of milling and repaving the full length of the runway and helps comply with ICAO standards for runway pavement conditions. The runway pavement at CAP is deteriorated and is becoming increasingly unsafe.	Semiannua l	Supervision consultant's monthly progress reports	Physical progress of the runway rehabilitation will be measured by the Supervision Consultant according to the methodology that will be determined as per its contract.	UCE
Airfield Ground Lighting (AGL) for the CAP runway is installed and operational	The indicator measures the installation and operational status of the AGL for the CAP runway that will be implemented with the runway rehabilitation. The AGL is a system of runway lighting that provides an	Semiannua l	Supervision consultant's monthly progress reports	Physical progress of the AGL installation will be measured by the Supervision Consultant according to the methodology that will be determined as per its contract.	UCE



	enhanced visibility for the aircrafts in their approach for landing and allows the airport to operate at night. The installation of AGL will highly improve the safety of operations at CAP.				
PAP RESAs implemented and consistent with ICAO SARPs	The indicator measures the construction of RESAs at PAP. The ICAO SARPs require a 150-m RESA including a 60-m paved strip starting from the end of the runway, and a 90-m surface surrounding the runway, suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.	Semiannua l	Supervision consultant's monthly progress reports.	Physical progress of the RESAs construction will be measured by the Supervision Consultant according to the methodology that will be determined as per its contract.	UCE
Constructed CAP Air Traffic Control Tower (ATCT) in compliance with ICAO SARPs	The indicator measures the Construction of a new CAP ATCT in a location and height to provide unobstructed visibility for the full length of the CAP runway. The ATCT can accommodate instruments for air control but must also provide good visibility conditions to the controller.	Semiannua l	Supervision consultant's monthly progress reports	Physical progress of the ATCT construction will be measured by the Supervision Consultant according to the methodology that will be determined as per its contract.	UCE



ADS-B for CAP and PAP installed and operational	The indicator measures the installation of ADS-B at CAP and PAP. The Automatic dependent surveillance—broadcast (ADS-B) is a surveillance technology in which an aircraft determines its position via satellite navigation and periodically broadcasts it, enabling it to be tracked. Such a system brings many benefits for operation and safety. It will notably enhance navigation efficiency and improve pilots and controllers' visibility. I will also increase operational capacity at the airport by providing many operational features that will help maximize the use of the runway infrastructure. Moreover by allowing a more efficient operation, it allows to reduce flight times and thus contributes in reducing fuel consumption and pollution.	Semiannua I	Supervision consultant's monthly progress reports.	Physical progress of the installation and commissioning of the ADS-B will be measured by the Supervision Consultant according to the methodology that will be determined as per its contract.	UCE
Share of infrastructure activities identified as climate resilient	The indicator will track that all the project activities that will improve the airport	Semiannua I	Supervision consultant's progress	During the conception phase of each infrastructure compone	UCE



	infrastructure will integrate climate-resilient measures and that these measures will be completed during the work phase. The following activities will be tracked with this indicator: (a) PAP taxiway, (b) PAP apron, (c) PAP RESAs, (d) PAP paved stopways, (e) CAP ATCT, (f) CAP drainage system, (g) PAP drainage system, (h) CAP runway.		reports.	nt, the MDOD/AMO Consultant will review the proposed designs and specifications to ensure that all infrastructure components integrate adequate climate resilience measures. Completion of all designs with climate resilience measures will represent a value of 50% of the indicator. Within this 50%, the MDOD/AMO will establish a ponderation of each component in order to track the progress of the integration of climate resilience measures in each component design. During work phase, the MDOD/AMO Consultant will review the Supervision consultant's monthly reports and lead periodic field inspections to	
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				guarantee that the climate resilient measures are correctly integrated. Completion of civil works with climate resilience measures will represent a value of 50% of the indicator. Within this 50%, the MDOD/AMO will establish a ponderation of each component in order to track the progress of integration of climate resilience measures in each component realization. The MDOD/AMO will inform UCE about this specific indicator in its trimestral project progress reports.	
Length of PAP drainage system	The current PAP drainage system does not have an optimal configuration. The Project would improve the water evacuation route by constructing a direct connection to the evacuation point. This	Semiannual	Supervision consultant's monthly progress reports.	Physical progress of the drainage system improvement at PAP will be measured by the Supervision Consultant according to the methodology that will be determined as per	UCE



	optimization will, therefore, result in a reduction in total length of the current drainage system.			its contract.	
New culverts built at CAP	The indicator will track the realization of new culverts at CAP in order to improve the existing drainage system: 3 existing culverts (1 east, 1 west, 1 north) will be replaced by 4 larger culverts (2 east, 1 west, 1 north).	Semiannual	Supervision consultant's monthly progress reports	Physical progress of the construction will be measured by the Supervision Consultant according to the methodology that will be determined as per its contract.	UCE
Aviation sector strategy prepared	An Aviation Sector Strategy guiding sector priorities and investments for the next 20 years. This strategy will form an essential framework for institutional strengthening activities.	Semiannual	MDOD/AMO Consultant's trimestral project progress reports.	The MDOD/AMO Consultant will monitor the implementation of this activity and determine the methodology to measure the physical progress, as part of the overall project schedule management. They will inform the UCE through the quarterly project report. The indicator will take the value "yes" once the deliverable has been formally accepted.	UCE



Wildlife management plan prepared and implemented for PAP and CAP airports	The indicator measures the preparation and implementation of the Wildlife Management Plan, which will leverage established practices and lessons learned at existing CATCOP airports, as well as international best practices. Wildlife Management Plan will be elaborated with a focus on reducing runway incursions by wildlife and reducing bird strikes by aircraft on landing and takeoff, which was raised as a critical operational safety concern. The indicator will follow the preparation and implementation of the Plan, which will leverage established practices and lessons learned at existing CATCOP airports, as well as international best practices. At the completion of the indicator, the following actions will have been implemented: - Wildlife management risk analysis	Semiannual	MDOD/AMO Consultant's trimestral project progress reports.	The MDOD/AMO Consultant will monitor the elaboration of the Wildlife Management Plan and determine the methodology to measure the physical progress of this activity, as part of the overall project schedule. They will inform the UCE through their quarterly project report. The indicator will be considered as "yes" once the implementation of physical measures is fully completed.	UCE
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	- Identification and design of mitigation measures - Implementation of the Plan - Training of AAN and OFNAC staff on Wildlife Management Plan Implementation				
OFNAC safety inspectors trained by a certified agency	OFNAC safety inspectors require periodic certified training from Boeing and Airbus. The indicator measures the number of OFNAC inspectors trained.	Annual	Trimestral project progress reports and OFNAC training plan.	UCE and OFNAC will establish a training plan for OFNAC staff. They will monitor the implementation of this plan and report through their quarterly project report.	UCE
Rescue Coordination Center staff trained by a certified agency	The indicator measures number of staff trained for the operation of the Rescue Coordination Center.	Annual	MDOD/AMO Consultant's project progress reports and ANN and OFNAC training plan.	The MDOD/AMO Consultant will establish a training plan for OFNAC and ANN staff. They will monitor the implementation of this plan and report through their quarterly project report	UCE
Regional training programs attended by AAN and OFNAC	The indicator measures the participation of ANN and OFNAC in regional capacity building trainings. Indicator target based on an	Annual	MDOD/AMO Consultant's project progress reports and	The MDOD/AMO Consultant will establish a training plan for OFNAC and ANN staff. They will monitor	UCE



	hypothesis of at least one training per year during the implementation.		ANN and OFNAC training plan.	the implementation of this plan and report through their quarterly project report.	
Grievances adequately responded to and/or resolved within the stipulated service standards	The indicator will track the correct operation of the Grievance Redress Mechanism.	Trimestral	Supervision consultant's monthly progress reports	In its monthly reports, the Supervision consultant will inform on the grievances received, the appropriate response given and the response time. The Stakeholder Engagement Plan stipulates the services standards for the GRM. The MDOD/AMO will verify in the supervision consultant monthly reports that the GRM is correctly functioning, according to these requirements. The expected value for the indicator is 100% once the GRM is in place. The MDOD/AMO consultant will report on this indicator in their quarterly report.	UCE



Share of women hired in medium-skill jobs by UCE-MTPC, OFNAC and AAN	The project will analyze recruitment, retention and promotion barriers for women to participate in the aviation sector. Women will be part of a training program to get skills as traffic controllers, supervisors, and public safety and security screening staff and to improve their potential for being hired at UCE-MTPC, OFNAC and ANN. 100% of the women trained and accredited as traffic controllers will be employed to perform within OFNAC.	Annually	UCE trimestral project progress reports	As stipulated in the Operation Manual of the Project, the UCE will establish trimestral report to inform the Bank on the project progress. This report will include a section on Human Ressources. The UCE will inform in this section on the progress of this indicator.	UCE
Share of women included in the medium-skills training	The project will finance training by a certified agency for ANN and OFNAC capacity building for development of medium skills, including those related to air traffic controllers, supervisors, and public safety and security screening staff. The indicator will measure how many women will participate in this training.	Semiannua l	MDOD/AMO	The MDOD/AMO Consultant will establish a training plan for OFNAC and ANN staff. They will monitor the implementation of this plan, disaggregating the share of women participating in the medium-skills training, and report through their quarterly	UCE



				project report.	
People with Enhanced Access to Transportation Services	Number of passengers per year that experience improved access to aviation infrastructure and services that have been built or rehabilitated through the project.	at the end of the project	AAN database: Number of passengers per year	Airlines & OFNAC database	OFNAC
Semi-annual meetings held with stakeholders to discuss their suggestions and related actions taken by the Project	Number of meeting minutes documenting the discussion on decisions and/or actions taken based on stakeholders' focus group's feedback.	Semi-annual	Minutes of the stakeholders meetings which will be shared with the public on UCE's website.	Collected as part of project M&E.	UCE-MTPTC



ANNEX 1: Implementation Arrangements and Support Plan

COUNTRY: Haiti

Caribbean Regional Air Transport Connectivity Project - Haiti

Project Institutional and Implementation Arrangements

1. Project implementation would be the responsibility of MTPTC. All Project activities would be implemented by UCE-MTPTC. The technical, fiduciary, and safeguards team at UCE-MTPTC has significant experience in the implementation of World Bank-financed operations. The unit currently has a project coordinator, two procurement specialists, one financial management specialist, four technical staff, five safeguards specialists, and an assistant project coordinator/M&E specialist. UCE-MTPTC also has a local office in Cap-Haïtien that is currently supporting the implementation of the MDUR Project. As previously outlined, given the nature and technical scope of the Project, an MDOD/AMO would complement UCE for the implementation of Components 1 and 2, and for coordinating the activities for Component 3, under the oversight of UCE-MTPTC, AAN, and OFNAC.
2. **MDOD/AMO.** The MDOD/AMO is expected to be contracted by effectiveness. The MDOD/AMO would complement the PIU's capacity with the specialized technical skills necessary to help procure and control the quality of the provision of works, goods, and studies to be financed under Components 1, 2, and 3. For those activities, the MDOD/AMO would be delegated the responsibility of preparation of the procurement process and for monitoring the activities, under the oversight of UCE-MTPTC. The MDOD/AMO is thus expected to support the PIU in the areas of procurement, contract management, reporting, safeguards, and M&E. The MDOD/AMO would include an appropriate number of pavement engineers, aviation specialists, navigation experts, and experienced air traffic technicians to ensure the effective management and monitoring of the activities to be financed under the Project. The MDOD/AMO would be selected based on the eligibility criteria and selection process agreed with the World Bank, which are described in detail in the POM.
3. **Strengthening of UCE-MTPTC capacity.** To be able to correctly absorb Project activities, UCE-MTPTC capacity would need to be strengthened by hiring additional technical and supervision staff as further outlined below. The following staffing needs have been identified as required to be able to absorb the technical, safeguards, and fiduciary needs of the Project: (i) Project team leader; (ii) accountant (central office); (iii) a procurement assistant; and (vi) M&E and communication specialist. An additional environmental and social specialist would be hired.

Financial Management

4. A Financial Management (FM) assessment was conducted in accordance with OP/BP for IPF and in line with the Financial Management Manual for World Bank Investment Project Financing (IPF) Operations (OPCS5.05-DIR.01, issued February 10, 2017).
5. The FM risk for this Project is deemed "Substantial." The FM function would be carried out by an existing coordination unit, UCE-MTPTC, under the Ministry of Public Works, Transport, and Communications, which currently undertakes this function in other IDA-financed projects, as mentioned above. The increased volume of work related to new projects assigned to this unit without adjusting their capacities poses challenges that would affect the ability to maintain acceptable FM arrangements. An institutional capacity diagnostic has been carried out by UNOPS to identify current and future obstacles to the implementation of the World Bank portfolio and to set out relevant mitigation



measures and recommended actions.

6. Overall fiduciary responsibility would rely on UCE-MTPTC. UCE-MTPTC would need to put in place adequate supervision and monitoring procedures for delegated activities to ensure that Project activities and investments are satisfactorily implemented and accounted for.

7. As a result of this assessment and based on the current performance of the PIU, the main FM risks include: (i) insufficient FM staffing; (ii) accounting software is not up-to-date and financial reports are prepared in auxiliary systems (Excel datasheets); and (iii) operationalizing the recommendations included in the institutional capacity diagnostic prepared by UNOPS.

8. In order to manage the FM risks, the following measures need to be taken: (i) recruit an additional accountant dedicated to the Project; (ii) update the accounting software to allow reporting according to the World Bank's format; and (iii) implement an action plan that addresses recommendations included in the institutional capacity diagnostic prepared by UNOPS.

Financial Management Arrangements

9. **Organization and Staffing.** FM staff currently include one FM specialist and three accountants, all of them supporting all World Bank projects implemented by UCE-MTPTC. Two of these three accountants were hired in August 2019. An additional accountant would need to be recruited to help manage the additional workload. An FM training is expected to take place once this additional staff is incorporated to reinforce knowledge of the World Bank's policies and procedures.

10. **Budgeting Arrangements.** The Project would be financed entirely with IDA grant proceeds, without government counterpart funding. UCE-MTPTC would be responsible for planning Project activities and preparing the annual operational plan and budget, to be approved by the World Bank before the end of the fiscal year and monitored periodically through the overall and fiduciary supervision and Project progress and financial reports (biannual interim unaudited financial reports and annual audits). The budget process is detailed in the POM. The annual operational plan and budget would be prepared specifying activities by Project components and subcomponents, and would also include detailed information on operational costs, which would also be reviewed and approved by the World Bank.

11. **Accounting System.** UCE-MTPTC uses the ACCPAC accounting system for the accounting of the IDA projects under implementation. However, this system has not been updated in prior years and has limited functionality, specifically in terms of financial reporting. The actual version of the system does not allow for the preparation of financial reports according to the World Bank's requirements. These reports are prepared using an auxiliary system (Excel datasheets). Once the new version of the system is in place, the PIU would need to ensure that relevant users are trained to keep track of and report the proposed Project's expenditures in accordance with the World Bank's FM requirements.

12. **Financial Reporting.** For existing projects implemented by UCE-MTPTC, interim unaudited financial reports (IFRs) are not regularly prepared and transmitted on a timely basis to the World Bank. The recruitment of an additional FM specialist would alleviate this problem. IFRs would be prepared and submitted biannually to the World Bank no later than 45 days after the end of each fiscal semester. Format and content are detailed in the POM under terms acceptable to the World Bank. IFR would allow the World Bank to monitor disbursements, financial, and budgetary project information.



13. **Internal Control and Auditing.** As part of the overall implementation arrangements, a POM has been prepared and adopted by UCE-MTPTC, and describes, among other things, specific financial management arrangements and internal control procedures. Specific mechanisms to control and safeguard the proposed Project's financial information and assets has been incorporated in the POM, including detailed eligibility criteria and procedures to select and engage the MDOD/AMO. Adequate supervision and monitoring procedures for delegated activities under Components 1 and 2 is also included in this manual to ensure that Project activities and investments are timely and satisfactorily implemented and accounted for.

14. **External Audit.** Annual audits on Project financial statements and eligibility of expenditures would be performed in accordance with World Bank policy, under terms of reference and by an independent auditor acceptable to the World Bank.

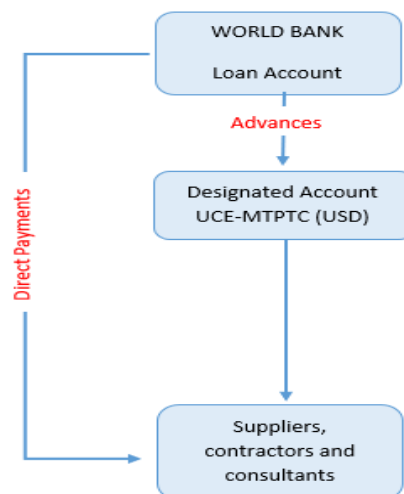
15. **FM Supervision.** The World Bank would conduct at least two FM supervisions per year. FM performance and compliance would also be monitored through the review of biannual IFR and yearly audit reports.

Disbursements

16. The main disbursement method used by the proposed Project would be the advance of funds. Project funds would be advanced in US dollars to a designated dedicated account at the Central Bank of Haiti (Banque de la République d'Haïti, BRH) and it would be managed by UCE-MTPTC. Advanced funds would be documented by UCE-MTPTC to account for grant proceeds and replenish the designated account using Statement of Expenditure (SOE), as agreed upon with the World Bank (Figure 1A.1).

17. The reimbursement method, payment disbursements, and special commitments would be available for the Project and included in the Disbursement and Financial Information Letter.

Figure 1A.1. Funds Flow and Disbursement Arrangements



*The reimbursement method will also be available



Procurement

18. Procurement for works, goods, non-consulting, and consulting services to be financed by the credit would follow the procedures specified in the “World Bank Procurement Regulation of Goods, Works and Non-Consulting Services” under “World Bank Procurement Regulations for Borrowers under Investment Project Financing” dated July 1, 2016, revised August 1, 2018, and the World Bank’s Anti-Corruption Guidelines: “Guidelines on Preventing and Combatting Fraud and Corruption,” revised in June 2016.
19. The procuring entity as well as bidders, and service providers, i.e., suppliers, contractors, and consultants shall observe the highest standard of ethics during the procurement and execution of contracts financed under the Project in accordance with paragraph 3.32 and Annex IV of the Procurement Regulations.
20. The Recipient shall prepare and submit to the World Bank a General Procurement Notice (GPN) and the World Bank would arrange for publication of the GPN on the United Nations Development Business (UNDB) online and on the World Bank’s external website. The Recipient may also publish it in at least one national newspaper.
21. The STEP system would be used to prepare, clear, and update the Procurement Plans and for procurement transactions. This textual part, along with the Procurement Plan tables in STEP, constitute the Procurement Plan for the Project.
22. The Recipient shall publish the Specific Procurement Notices (SPN) for all goods, works, non-consulting services, and the Requests for Expressions of Interest on their free-access websites, if available, and in at least one newspaper of national circulation in the Recipient’s country, and in the official gazette. For open international procurement selection of consultants using an international shortlist, the Recipient shall also publish the SPN in UNDB online and, if possible, in an international newspaper of wide circulation; and the World Bank arranges for the simultaneous publication of the SPN on its external website.
23. The World Bank’s standard procurement documents would be used for all contracts that are subject to international competitive procurement. For procurement in the national market, the GoH’s procurement procedures may be used in accordance with the National Procurement Arrangements (paragraph 5.3) of the Procurement Regulations. This would be specified in the Procurement Plan tables in STEP. When the GoH uses national open competitive procurement arrangements, as set forth in the 2009 law specifying the general rules relating to public contracts and public service concession agreements, such arrangements would be subject to paragraph 5.4 of the Procurement Regulations and the conditions included in the Grant Agreement. National procurement arrangements, other than national open competitive procurement arrangements applied by the GoH, would be subject to paragraph 5.5 of the Procurement Regulations.
24. The recruitment of civil servants as individual consultants or as part of the team of consulting firms would abide by the provisions of paragraph 3.23 (d) of the Procurement Regulations.
25. **Procurement Assessment:** The Project Implementation Unit in the MTPTC, UCE-MTPTC, would have the overall responsibility of carrying out procurement activities. A procurement capacity assessment of the UCE has been conducted and revealed that the UCE has strong experience in the World Bank and GoH’s procedures for implementing World Bank-financed projects. The unit has a manual of procedures in place that need to be revised and used for this Project. UCE-



MTPTC is currently implementing four projects financed by the World Bank, and in addition to the CATCOP-Haiti, UCE-MTPTC is implementing the recently approved CHUD. The two new projects would bring considerable additional workload to the already existing one. For many years, UCE-MTPTC was staffed by only one experienced procurement specialist who is also acting as deputy coordinator. Recently, UCE-MTPTC hired a second procurement specialist who, although new to the World Bank's procedures, has some experience with IDB projects. The two procurement specialists would share the workload and work closely to share experience. In addition, the assessment found the following weaknesses: (i) delays in the implementation of and poor quality of reporting; (ii) absence of an appropriate filing system; (iii) noncompliance with the procurement framework; and (iv) no internal or external oversight of procurement activities. To mitigate the risks, the following measures are proposed: (i) appoint a procurement assistant to help on the administrative tasks and filing; (ii) strengthen the technical team with an MDOD/AMO; (iii) prepare a comprehensive and detailed procurement plan; (iv) use MDOD/AMO to complement the preparation of procurement packages and, in particular, advise on technical requirements and conduct the evaluation of bids/proposals for activities; (vi) conduct a procurement audit annually during the Project's life; and (vii) train the procurement specialists and technical experts on the World Bank's Procurement Regulations and contract management.

26. **Operational Costs.** Operational costs financed by the Project would be incremental expenditures, including office supplies, vehicle operation and maintenance costs, communication costs, rental expenditures, utilities expenditures, consumables, transport and accommodation, per diem, supervision costs, and salaries of locally contracted support staff. Such services' needs would be procured using the procurement procedures specified in the POM accepted and approved by the World Bank.

27. **Filing and Record Keeping.** The Procurement Procedures Manual sets out the detailed procedures for maintaining and providing readily available access to Project procurement records, in compliance with the loan agreement. The implementing agency would assign one person who would be responsible for maintaining the records. A logbook of contracts with a unique numbering system shall be maintained.

28. **Contingent Emergency Response Component.** The procurement arrangements applicable under Component 4, the Contingent Emergency Response Component, shall be described in the Emergency Operation Manual, which shall be prepared by the Recipient and agreed with the World Bank in due time to ensure that it is in place before the occurrence of any potential emergency that would require using this subcomponent.

29. **Project Procurement Strategy for Development.** To determine the adequate and optimal procurement strategy for the best market response, the Borrower has prepared the PPSD with the support of the World Bank and a summary has been added in Annex 3.

30. **Procurement Methods and Thresholds.** Thresholds for procurement methods and prior review are shown below.

Table 1A.1. Thresholds for Procurement Methods and Prior Review

Expenditure Category	World Bank Prior Review or as Indicated in the Procurement Plan
1. Works	All contracts estimated at US\$5,000,000 and above
2. Goods and non-consultant services	All contracts estimated at US\$1,000,000 and above
3. Consultant services	All Terms of Reference
	All contracts estimated at US\$500,000
	All contracts for individual consultant estimated at US\$200,000 and above



31. **Procurement Risk Rating.** The proposed Project's Procurement Risk prior to the proposed mitigation measures is "High." The risk can be reduced to a residual rating of "Substantial" upon consideration of successful implementation of the mitigation measures. The risks and mitigation measures are listed in the table below.

Table 1A.2. Procurement Risks and Mitigation Measures

Risk Description	Description of Mitigation	Risk Owner
Heavy workload and delays in Project implementation	Appropriate share of workload between the two procurement specialists Hire a procurement assistant to help on administrative tasks and filing Strengthen the technical team of UCE in Port-au-Prince	UCE/MTPTC
Poor quality of deliverables of contractors and consultants	Train the procurement staff and technical experts on contract management Use a MDOD/AMO to support the procurement processes	UCE-MTPTC and WB
Loss of documents - Archiving system	Provide detailed descriptions on documents filings File hard copies and use STEP procurement for electronic filing	UCE/MTPTC
Noncompliance with the procurement framework	Train the procurement staff and technical experts on the procurement framework Annual procurement audit	UCE-MTPTC and WB

32. **Procurement Plan.** The procurement plan has been prepared and would be updated in agreement with the World Bank team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

Implementation Support Plan

33. The implementation support plan is built around extensive implementation support provided by the World Bank's technical and operational support staff, including experts in aviation, airport management, and hydraulic and pavement engineers with a strong background in building resilient infrastructure. It would consist of regular missions jointly with the Recipient, video-conference meetings as well as periodic fiduciary compliance reviews.

34. Given the fragile and volatile institutional context in which the Project would be implemented, the Project would require dedicated implementation support and continuous assessment of whether the changing circumstances in the national and local context call for adjusting project implementation arrangements and/or design, including the use of third parties, ICT-based supervision. An MTR would be conducted after approximately 36 months of implementation to review performance in depth, based on progress and studies commissioned for the MTR, and to make any adjustments to the Project. In addition to the MTR, the team would conduct yearly reviews of the Project's progress to assess whether any adjustments of the Project design or implementation models are needed.

35. It is projected that a total of 22 implementation support missions would be required over the life of the proposed Project. Beyond the startup of the proposed Project, these are intended to take place every four months. Key areas of focus for the first months of Project implementation include:

- a. Monitoring of procurement for: (i) the MDOD/AMO estimated to be contracted by Project effectiveness; (ii) the design contract for the major activities under Components 1 and 2, including contracts for the



construction of the taxiway at PAP and the rehabilitation of the runway at CAP to be signed by December 2020; and (iii) the contract for the ADS-B equipment at both airports to be signed by January 2021.

- b. Ensuring that UCE-MTPTC will hire a procurement assistant (the ToRs are being finalized and the contracts are expected to be signed by project approval).
- c. Ensuring that all Project implementation requirements needed to allow for disbursements are in place (for example, establishment of designated account and specimen of signatures).
- d. Conduct all required training to ensure that newly recruited staff is knowledgeable of World Bank fiduciary and ESF requirements.
- e. Enhancing UCE capacity for adapting to a COVID-19 environment, including trainings for best COVID-informed construction site practices and overall worksite safety management both at the ministerial level and for Haitian construction contractors
- f. Coordination with main partners (IDB) to ensure synergies with other planned and ongoing projects.

36. A coordination committee between CATCOP participating countries is expected to be put in place to oversee the implementation and harmonization of trainings to be carried out under the Project. The coordination committee would be formed as soon as CATCOP projects are approved for all participating countries.

37. The following mix of skills and resource needs are estimated:

Table 1A.3. Implementation Support (for the duration of the Project)

Skill Needs	Number of Staff Weeks	Number of Trips	Comments
TTL	70	Based in country	8 implementation support missions during the first year; 6 the following years + technical visits to solve bottlenecks, as needed.
Co-TTL	70	15	4 implementation support missions during the first year; 3 the following years + technical visits to solve bottlenecks, as needed.
Aviation specialist	25	12	Twice-a-year missions, routine support, as needed.
Airport specialist	30	8	Twice-a-year missions, routine support, as needed.
Procurement	50	Based in country	Twice-a-year missions, routine support, as needed.
Hydraulic engineer	30	12	Twice-a-year missions, routine support, as needed.
Financial management	50	Based in country	Twice-a-year missions, routine support, as needed.
Pavement engineer	30	12	Twice-a-year missions, routine support, as needed.
Environmental safeguards	50	15	Twice-a-year missions, routine support, as needed.
Social safeguards	50	8	Twice-a-year missions, routine support, as needed.
Program assistant	30	Based in country	Support as needed for mission planning, etc.
Legal	2	0	Staff weeks if needed
Disbursement	2	0	

Monitoring and Evaluation

Joint supervision missions by the GoH and the World Bank would monitor the status of Project outcomes, safeguards, and legal covenant compliance. A dedicated monitoring and evaluation (M&E) staff would be located in the UCE-MTPTC. A dedicated Project M&E system that would be strengthened would capture Project outputs and outcomes, communication and awareness raising activities, environmental and social safeguards activities, and the activities of the



Grievance Redress Mechanism (GRM). Detailed progress reports would be prepared by the UCE-MTPTC on a semiannual basis and submitted to the World Bank no later than 45 days after the end of the period. These detailed progress reports should indicate the progress made under the different components of the proposed Project and measure performance against the results indicators established in the Results Framework.



ANNEX 2: Detailed Project Description

COUNTRY: Haiti

Caribbean Regional Air Transport Connectivity Project - Haiti

1. The proposed Project would include four components: (i) PAP and CAP operational safety and navigation efficiency investments; (ii) PAP and CAP airfield drainage system improvements; (iii) institutional strengthening and project management; and (iv) contingent emergency response. Total Project cost is estimated at US\$84 million.
2. **Component 1: PAP and CAP operational safety and navigation efficiency investments (Total Cost: US\$58 million).** Component 1 would support infrastructure and equipment at Haiti's two key (international) airports—PAP and CAP—with the aim of enhancing the safety of air transport operations in compliance with international standards (ICAO SARPs and OFNAC requirements), and airfield capacity standards to accommodate air traffic, including in post-disaster relief efforts. This component would finance inter alia:
 - (i) Civil works, including: (i) PAP taxiway and apron expansion; (ii) CAP runway rehabilitation and airfield ground lighting installation; (iii) PAP RESAs construction; and (d) CAP ATCT replacement;
 - (ii) Purchase and installation of equipment to upgrade and modernize air traffic monitoring and control capacity in compliance with international standards and requirements and with the regional air navigation plans: (i) Automatic Dependent Surveillance-Broadcast (ADS-B), and (ii) communication and surveillance technology for the new CAP ATCT; and
 - (iii) Consulting and non-consulting services for corresponding supervision activities, associated technical studies as needed, including for relevant social and environmental safeguards instruments.
 - (iv)
3. The civil works to be financed under Component 1 would integrate climate/disaster resilience measures to the maximum extent practicable (for example, through appropriate choice of materials and design of enhanced drainage features). Likewise, for all equipment purchases, the investments would incorporate resilient designs to the maximum extent practicable (for example, elevated power generator and storm-resistant tower cab for the new CAP ATCT). As such, Component 1 would contribute to the overall climate/disaster resilience and sustainability of Haiti's two primary airports. With the exception of one or more ADS-B antenna(s), all Component 1 investments would be located within the perimeter of each airport. The civil works will also be implemented according to best COVID-19-informed construction site practices and overall worksite safety management.
4. **CAP runway rehabilitation:** Rehabilitating the CAP runway is a high-priority project due to the runway's poor and deteriorating condition. There are numerous cracks evident along the entire length of the runway and airlines have complained about deteriorating and weak pavement, especially in the touchdown zone on the Runway 5 end. As such, to comply with ICAO standards for runway pavement conditions and improve aircraft operational safety (by reducing risk of damage to the aircraft undercarriage associated with weak and cracked pavement conditions), the following investments are anticipated: (a) milling and repaving the full length of the runway; and (b) installation of Airfield Ground Lighting (AGL) for the runway.
5. **PAP taxiway and aircraft parking apron expansion:** The construction of additional taxiways and aircraft parking apron would eliminate significant bottlenecks and inefficiencies in aircraft movements, reduce aircraft CO₂ emissions, improve aircraft operating safety, and allow PAP to better accommodate major air traffic demand surges associated with



post-disaster relief flights. Specifically, this subcomponent would finance (a) the construction of a partial parallel taxiway of approximately 1,100 meters in length (the width of the existing aircraft parking apron) at a 172.5-meter centerline-to-centerline separation from the runway, (b) three additional connector taxiways linking the aircraft parking apron to the runway and the new parallel taxiway, and (c) reparation and new aircraft parking apron with approximate dimensions of 90 x 290 meters. See below for a conceptual illustration and additional discussion of these improvements.

6. **Constructing PAP RESAs:** Construction of ICAO-required Runway End Safety Areas (RESAs) for both PAP runway ends would improve operational safety and comply with ICAO SARPs. The new RESA for each runway end would contribute to mitigate the risk to aircraft and of potential associated fatalities associated with runway excursions by providing 60 meters of paved stopway from the runway end and reinforcing the grounds for at least another 90 meters (for a total of 150 meters from the runway end). These improvements would contribute to reduce the risk of aircraft fire or other damage in case of undershooting or overshooting the runway during a landing or overshooting during an aborted takeoff.

7. **Constructing a CAP Air Traffic Control Tower (ATCT), replacement and installation of communication and surveillance technology:** Deployment of a replacement ATCT at CAP would enhance the safety of aircraft operations by replacing the current temporary ATCT, which does not currently provide full line of sight to both runway ends. A new ATCT that is both location and height compliant with ICAO SARPs would be financed along with the installation of associated communication and surveillance technology. According to ICAO SARPs, an ATCT must provide unobstructed visibility to both runway ends, the aircraft movement areas, and ideally to most of the security perimeter. The Project aims to finance a basic ATCT, including associated installation of communication and surveillance technology, in a location and at a height required to meet the ICAO visibility requirements. Implementation would also contribute to Haiti's efforts to abide by the POS signed in 2014. The existing temporary ATCT would be maintained until the full completion of the work. The new ATCT would be equipped with portable power generators to ensure continuous operation, including during power outages. To improve the resilience of the ATCT during flooding events, these power generators would be placed securely on an elevated platform rather than at ground level where flooding events could render them inoperable. Additionally, the ATCT cab would incorporate storm-resistant features to the maximum extent practicable.

8. **ADS-B for PAP and CAP:** Implementing Automatic Dependent Surveillance-Broadcast for PAP and CAP, including receiver antenna(s), consoles for each ATCT, and equipping Haiti-based aircraft would contribute to improving aircraft operations safety by allowing continuous position reports of most aircraft thereby greatly improving situational awareness for air traffic controllers and pilots.

9. **Component 2: PAP and CAP airfield drainage system Improvements (Total Cost: US\$14 million).** These investments seek to reduce the risk of airfield flooding associated with the annual rainy season, hurricanes, and climate change at PAP and CAP and thus improve their climate/disaster resilience. This component would finance inter alia:

- (i) Civil works, including: (a) CAP drainage system improvement; and (b) PAP airfield drainage improvements and flood management. Investments would be located within the perimeter of both airports, and
- (ii) Consulting and non-consulting services for corresponding supervision activities, associated technical studies, as needed, including for relevant social and environmental safeguards instruments.

10. **PAP airfield drainage improvements:** Implementing airfield drainage improvements by leveraging the civil works associated with the new taxiway system and RESAs would improve PAP's climate resilience. This would include, but is not limited to, expanded drainage canals, overflow retention ponds in areas distant from airfield pavements, and sump

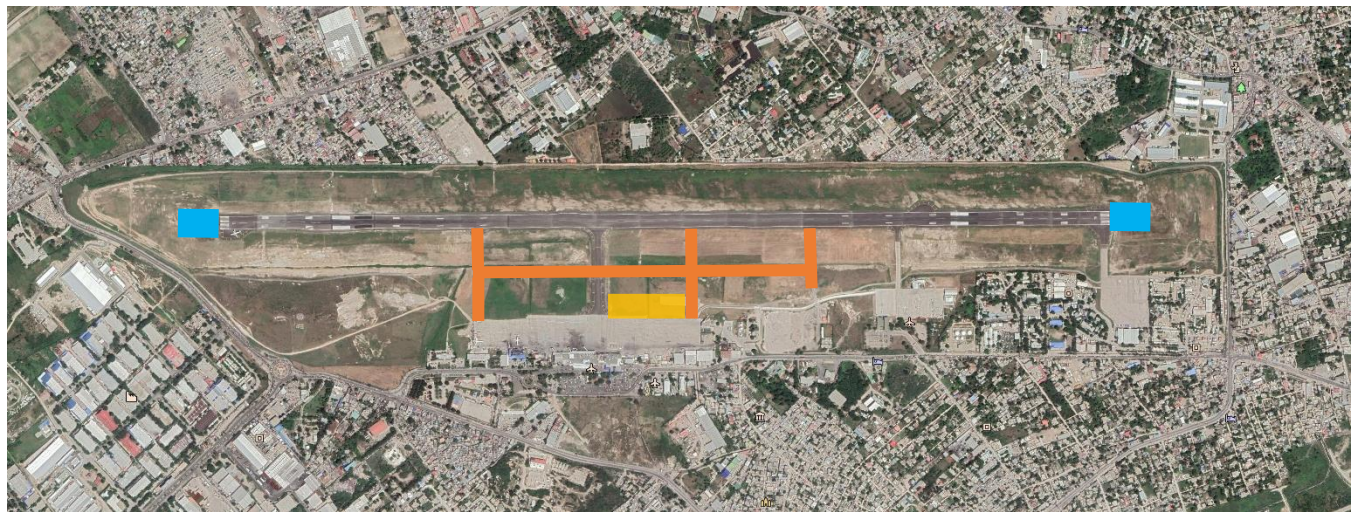


pumps in critical locations.

11. CAP drainage system improvement:

- Improvement of the East-West River System (US\$1.7 million):
 - Deepening and widening the existing ditch (up to 1 meter below current bottom level and up to 20 meters wide);
 - Dredging a new ditch (~15 meters wide) between the entrance of river Any to the drainage system parallel to the runway;
 - Replacing the existing fences in river Any at the eastern entrance and western exit of the airport by larger versions;
 - Replacing the existing culvert under the maintenance road east of the runway by two large culverts. One culvert would be connected to the east-west ditch, the other culvert to the new ditch and the drainage system parallel to the runway; and
 - Replacing the existing culvert under the maintenance road west of the runway with a larger version.
- Improvement of the South-North Drainage System (US\$4.7 million):
 - Deepening and widening the existing ditch (~2 meters below surface level and ~15 meters wide), and connecting the abovementioned new ditch to it;
 - Deepening and widening the existing 350-meter long canal north of the runway (~2 meters below surface level and ~15 meters wide); and
 - Replacing the current culvert of the maintenance road north of the runway by a larger version (~15 meters wide).

Image 1A.1. Conceptual Illustration of PAP Airfield Safety and Capacity Investments



New taxiways ■

New aircraft apron ■

Paved Runway Strip (1st 60 meters) and Runway End Safety Area (additional 90 meters) ■



Image 1A.2. Conceptual Illustration of CAP Airfield Safety and Capacity Investments



Existing Air Traffic Control Tower (to be replaced) —

Runway rehabilitation —

12. **Component 3: Institutional strengthening and project management (Total Cost: US\$12 million).** This component aims to: (i) strengthen the institutional capacity of the MTPTC, AAN, and OFNAC to manage, operate, and oversee airport operations and their development through a combination of TA activities and training; (ii) provide TA to assess the capabilities, needs, and opportunities for the use of Unmanned Aircraft Systems (UAS) in Haiti, to define the associated legal framework as well as to launch a pilot operational framework; and (iii) finance Project implementation support. With respect to institutional capacity, the focus would be on enhancing: (i) aircraft operational safety and associated air transport sector regulatory oversight; (ii) the quality of airport management, operations, and maintenance; and (iii) capacity for improving climate/disaster resilience and gender diversity in the aviation sector. In support of this, the Project would finance consulting and non-consulting services plus the provision of goods.

13. **Institutional strengthening activities would include:** (i) a gap analysis of OFNAC regulatory oversight; (ii) a gap analysis of AAN operations and financial management; (iii) OFNAC aviation safety inspector training; (iv) Rescue Coordination Center equipment upgrades and staff training; (v) implementation of an Airport Operations Center with joint AAN/OFNAC staffing; (vi) preparation of an aviation sector strategy to guide Haiti's aviation sector investments and management priorities for the next 10 years; and (vii) TA to improve airspace regulation and legal framework in order to



ensure safe UAS-based transport operations (for example, drones). The proposed Project would also support: (i) ICAO SARP's compliance screening for all CATCOP airports at the beginning and end of the Project; (ii) air traffic control skills enhancement training; (iii) Crash Fire Rescue skills enhancement training; (iv) climate/disaster resilience best practices and skills training; (v) wildlife management plan development and implementation for all CATCOP airports; (vi) analysis of recruitment, retention, and promotion barriers for women to participate in the aviation sector; (vii) development of gender action plans, accompanied by organizational gender diversity training and programs development for all airport operators and regulators (including programs targeted at significantly increasing the share of female air traffic controllers and public safety and security screening staff); and (iv) capacity building for adapting to a COVID-19 environment, including trainings for best COVID-informed construction site practices and overall worksite safety management both at the ministerial level and for Haitian construction contractors.

14. **Project Management:** Project implementation activities would include supporting the overall management, supervision, fiduciary control, and monitoring and evaluation (M&E) of the Project, and the associated staff within the Project Implementation Unit (PIU). This would include financing to: (i) hire specialized staff or consultants for Project implementation; (ii) carry out the Project's M&E activities; (iii) carry out Project reporting and audits; (iv) conduct capacity building activities (including the MDOD/AMO) linked to project implementations in areas such as procurement, safeguards, M&E, communication, citizen engagement, technical and financial management; and (v) cover operating costs.

15. **Component 4: Contingent emergency response (Total Cost: US\$0 million).** Due to the high risk of catastrophic events in Haiti, the proposed Project would include a contingent component for rapid response in the event of an eligible emergency, subject to the request of the GoH. This component would provide immediate response to an eligible emergency, as needed. Such components, which include triggers and conditions for the use of funds, are included in most investment projects in Haiti, in keeping with the recommendations of the *2011 World Development Report: Conflict, Security, and Development*, and with the World Bank's operational experience in Haiti when responding to natural catastrophic events.



ANNEX 3: Executive Summary for Procurement Plan and PPSD

COUNTRY: Haiti

Caribbean Regional Air Transport Connectivity Project - Haiti

1. The CATCOP-Haiti Project in the amount of US\$84 million can be broken down into four components: (i) PAP and CAP operational safety and navigation efficiency investments (US\$58 million), (ii) PAP and CAP airfield drainage system Improvements (US\$14 million), (iii) Institutional Strengthening and Project Management (US\$12 million), (iv) contingency emergency interventions (US\$0). The major activities and contracts of the Project are part of Components 1 and 2. These activities mainly consist of works and equipment purchases. These components total US\$70 million, or 87 percent of the Project's CATCOP-Haiti budget.
2. To determine the adequate and optimal procurement strategy for the best market response, a PPSD has been prepared to adequately consider, among others, the operational context, past experiences, and market situation. As a result, the following assessments and decisions were made:
 - The operational context related to political instability, administrative and decision-making procedures, natural hazards, and exchange rate fluctuations may have a significant impact on the implementation of activities and/or their cost. Part of these risks can be mitigated through the experience that the Project Implementation Unit—the Unité Centrale d'Exécution (UCE)—has acquired over time in the implementation of World Bank-financed projects.
 - The UCE has limited capacity to implement the CATCOP-Haiti Project. It would, therefore, be reinforced by a TA to expand its capacity to manage the technical complexity of the planned interventions and the tight schedule ahead. To do so, the UCE would recruit a Delegated Implementing Agencies model (Maîtrise d'Ouvrage Déléguée or Assistance à Maîtrise d'Ouvrage MDOD/AMO), which would have a proven international track record in airport management.
 - Market analysis has highlighted the limited capacity of local companies for the implementation of works and the supply of specialized equipment. Works and equipment contracts would, therefore, be opened to international tenders.
3. In addition, the PPSD identified three activities with significant risk-budget profiles, estimated at around US\$54.5 million. These activities are: (i) the construction of a new taxiway system and aircraft parking apron expansion, drainage, and construction of runway end safety areas (RESA) at PAP; (ii) runway rehabilitation and installation of Airfield Ground Lighting (AGL), including generator for AGL, and improvement of the existing drainage system at CAP; and (iii) the design and construction of a fully equipped Air Traffic Control Tower (ATCT), including generator, at CAP. To mitigate procurement risks associated with these contracts, it is envisaged to use turnkey contracts for each of these activities (design-build contracts). This would, among other things, improve compliance with norms and standards in the sector.



ANNEX 4: Detailed Economic Analysis

COUNTRY: Haiti

Caribbean Regional Air Transport Connectivity Project - Haiti

1. The improved safety and resilience at Haiti's two major international airports would clearly deliver substantial economic benefits to the country as any material enhancement or degradation of air services for island nations like Haiti would have significant and rapid economic and social consequences given air transport is their primary means of economic and cultural connectivity to the rest of the world. Accordingly, failure to adequately address the operational safety deficiencies at Haiti's international airports would likely result in a steady withdrawal of both domestic and international air services. The economic costs that a loss of such connectivity would entail would impact the entire Haitian economy, not just the regions of Port-au-Prince and Cap-Haïtien. The loss of or curtailment of airline services would affect the entire society throughout Haiti, including the flows of tourism, remittances, labor, goods, services, knowledge, and investments.

Major economic benefits of the project

Capacity increase at PAP

2. The Project would enhance PAP's ability to serve as the country's primary port of entry/exit in the immediate aftermath of disasters when humanitarian and other relief flight activity dramatically increases. After the 2010 earthquake and Hurricane Matthew in 2016, PAP was unable to accommodate the surge in flight activity due to inadequate runway and aircraft parking capacity. This resulted in many flights being diverted to other countries or cancelled altogether. In some situations, inadequate runway capacity was the critical factor preventing aid flights from landing, while in others it was lack of parking space for aircraft. Accordingly, the Project would address this by: (a) constructing a new taxiway system (i.e., a partial parallel taxiway and two additional perpendicular taxiways connecting the runway to the aircraft apron) that would reduce runway occupancy times thereby increasing runway throughput; and (b) constructing additional aircraft parking apron to allow more aircraft to simultaneously load/unload passengers and cargo.

3. In the short term, these investments would contribute to: (a) reduced airline operating costs through lower fuel burn and crew costs associated with reduced aircraft taxiing time and arrival/departure queuing (also reduced carbon emissions) on a daily basis; and (b) reduced risk of airline service reductions during apron rehabilitation by providing new remote apron area. In the long run, these investments would significantly improve PAP's ability to fill its critical and unique role as the primary (and perhaps only) gateway for movement of people and goods in/out of the country in a post-disaster scenario and reduce a risk of loss of life and human suffering post disaster by accommodating surges in humanitarian and other relief flight activity.

Runway rehabilitation at CAP

4. The Project would address the greatest concern expressed by airport management and the airlines—the poor and deteriorating condition of the runway. This concern, if not quickly addressed, may soon result in air service reductions or elimination by airlines serving international destinations (for example, American Airlines' service to Miami) given the safety risks associated with aircraft landing or departing on a runway with poor pavement quality (for example, the risk of loose pavement debris entering a jet engine or damage to aircraft landing gear). If not addressed in the longer term, the runway could reach a point of failure necessitating closure of the runway (and, therefore, the airport) for a period of weeks or months while emergency repairs are made. In both scenarios, the economic consequences would be substantial



for Cap-Haïtien, as well as for Haiti overall given it is the country's second-largest city.

5. The support provided by the proposed Project would reduce: (a) risk of aircraft accidents/incidents and associated loss of life; and (b) risk of airport closure due to major pavement failure and associated economic loss to the region and country.

Resilience improvement at PAP and CAP

6. The proposed Project would also address another significant concern at CAP and PAP—the risk of severe flooding resulting in airport closure—through the improvement of the drainage systems at both PAP and CAP. The Project would reduce the probability of severe airfield flooding and the duration of such an event. The improvement of the existing drainage systems and river passage through the airport is part of a greater strategy to enhance the economic and social development of Cap-Haïtien. Increased resiliency for Cap-Haïtien, especially with respect to flood risk reduction, is critical to the development of the city.

7. In the short term, this investment would reduce the risk of airport closure for both PAP and CAP due to airfield flooding risk reduction, and would eventually contribute to enhanced national and regional resilience to natural disasters and reduce the risk of loss of life and human suffering post disaster by ensuring the availability of functional airports during emergency operations.

Air traffic safety enhancement

8. The benefits of the abovementioned investments (PAP taxiway improvements, PAP and CAP drainage improvements, CAP runway rehabilitation) are expected to be significantly complemented by safety improvements from the rest of investments planned under the Project, which are focused on enhancing operational safety at targeted airports. These include: (i) the construction of RESAs; (ii) the replacement of CAP Air Traffic Control Tower (ATCT); and (iii) the ADS-B installation. These would contribute to further reduce the risk of aircraft accidents/incidents and associated loss of life.

9. The table below summarizes the proposed Project's direct impacts as well as the associated economic benefits.

Table A4.1. Project's Direct Impact and Economic Benefits

Outputs	Direct Impact	Economic Benefits
Component 1: PAP and CAP Air Transport Safety and Navigation Efficiency Investments PAP: Taxiway & apron expansion, RESAs, ADS-B CAP: Runway rehabilitation, Replacement ATCT, ADS-B	PAP - Improved aircraft operational safety by reducing the risk of aircraft incidents or crashes through RESAs and improving situational awareness for controllers and pilots through ADS-B - Improved capacity to accommodate air traffic surges associated with post-disaster relief flights through: (a) an expanded taxiway system to reduce runway occupancy times; and (b) increasing aircraft parking apron capacity to allow more simultaneous unloading of aircraft - Reduced aircraft taxiing distances and associated arrival/departure delays and carbon emissions by implementing an expanded	PAP - Reduced loss of life associated with natural disasters through increased ability to accommodate surges in humanitarian and other relief flight activity - Reduced airline operating costs through lower fuel burn and crew costs associated with reduced aircraft taxiing time and arrival/departure queuing (also reduced carbon emissions) - Reduced risk of short-term airline service reductions during apron rehabilitation by providing new remote apron area - New AAN revenue opportunity associated with airlines parking aircraft overnight at the new remote apron positions



	taxiway system which would reduce runway occupancy times - Facilitated needed repairs/upgrades to existing aircraft parking apron by providing remote aircraft parking positions during the construction period - Increased airline confidence in serving PAP by increasing compliance with ICAO SARPs, improving aircraft operational safety, improving efficiency of airfield operations, and improving airfield climate resilience (Component 2) <u>CAP</u> - Improved aircraft operational safety at CAP by reducing the risk of aircraft incidents or crashes through improving runway pavement conditions; providing an ICAO-compliant Air Traffic Control Tower (ATCT) with improved equipment and runway visibility; and improving situational awareness for controllers and pilots through ADS-B - Increased airline confidence in serving CAP and reduce the risk of airlines curtailing service by resolving high-profile concerns about poor runway pavement conditions and increasing compliance with ICAO SARPs - Improved the ability of CAP to continue providing air services after a natural disaster through: (i) airfield drainage/resilience enhancements and associated reduced risk of airfield flooding (Component 2); and (ii) enhanced climate/disaster resilience of the ATCT	- Reduced risk of aircraft accidents/incidents through investments in an improved taxiway system, RESAs, ADS-B, and improved wildlife management (Component 3) - Reduced risk of long-term airline service reductions and improve odds of airline service growth by increasing compliance with ICAO SARPs, improving aircraft operational safety, improving efficiency of airside operations, improving airfield climate resilience (Component 2), and improving airport management/operations (Component 3) <u>CAP</u> - Reduced risk of aircraft accidents/incidents through improved runway pavement, new ATCT, ADS-B, and improved wildlife management (Component 3) - Increased ability to accommodate humanitarian and other relief flight activity in the immediate aftermath of natural disasters - Reduced risk of a short to medium-term airport closure due to sudden catastrophic runway pavement failure through a preventative full runway rehabilitation - Reduced risk of temporary airport closures due to ATCT damage through improving its resilience - Reduced risk of airline service reductions due to concerns about runway pavement conditions - Improved odds of airline service growth by resolving high-profile concerns about poor runway pavement conditions, increasing compliance with ICAO SARPs, and improving airport management/operations (Component 3)
<u>Component 2:</u> <u>PAP & CAP Airfield Drainage Improvements</u> PAP: Upgraded airfield drainage CAP: Rehabilitated and expanded airfield drainage	<u>PAP</u> - Improved airport climate/disaster resilience through airfield drainage enhancements and associated reduced risk of airfield flooding <u>CAP</u> - Improved airport climate/disaster resilience through airfield drainage enhancements and associated reduced risk of airfield flooding - Improved Cap-Haïtien climate/disaster resilience (by integrating and coordinating on-airport and off-airport drainage improvement projects)	<u>PAP</u> - Reduced risk of airport closure due to airfield flooding <u>CAP</u> - Reduced risk of airport closure due to airfield flooding - Enhanced economic development potential for Cap-Haïtien by helping address high-profile flooding risks for the city
<u>Component 3:</u> <u>Technical Assistance</u> AAN/OFNAC Capacity Building; Aviation Sector Strategy;	- Improved AAN/OFNAC management and operational skills through capacity building investments - Improved decision-making focus and quality of AAN/OFNAC through preparation of an Aviation Sector Strategy	- Improved airport financial performance due to enhanced AAN and OFNAC management and operational skills and improved decision-making focus and quality - Reduced risk of aircraft accidents/incidents through preparation of a Wildlife Management Plan - Improved climate/disaster resilience of airports



Wildlife Management Plan	- Improved aircraft operational safety through preparation of a Wildlife Management Plan - Improved the integration of climate/disaster resilience into planning, design, and operation of airports	
Gender Action Plan	Improved gender inclusion among airport operators and regulators	Improved gender inclusion in air transport sector

Cost-Benefit Analysis

10. The analysis follows a standard incremental cost-benefit analysis (CBA) methodology in compliance with World Bank Operational Policy (OP) 10.04. The analysis focuses on the benefits associated with the PAP taxiway improvements as well as the benefits associated with the CAP runway rehabilitation. The PAP taxiway improvements would deliver substantial and quantifiable economic benefits on reduced airline operating costs through lower fuel burn and crew costs associated with reduced aircraft taxiing time and arrival/departure queuing. The detailed methodology is summarized below. The benefits from reduced airport closures in CAP due to (i) flooding and (ii) runway repairs that interrupt the flight schedule, result directly from the proposed runway rehabilitation.

PAP taxiway improvements

11. The PAP taxiway improvements yield two key benefits: (i) reduced aircraft taxiing distance and time for arrivals and departures due to the two additional runway entrance/exit taxiways and associated reduced back-taxiing on the runway; and (ii) reduced aircraft delays due to the runway capacity enhancement gains from reducing average runway occupancy time (ROT). The ROT is estimated to be reduced by 2.8 minutes for arrivals and 0.5 minutes for departures, which translates to a capacity gain of almost 10 operations per hour (from 16 to 25.5 operations per hour). At current demand levels, this translates to delay savings of approximately 1.5 minutes per aircraft turnaround. The following tables summarize the expected aircraft operating time savings (delay and taxiing) associated with the CATCOP-Haiti taxiway improvements.

Table A4.2. Departure Runway Occupancy Time Analysis

	Baseline	With Project	Unit
Taxi distance	1,280	1,075	meters
Taxi speed	24	24	kph
Taxi time	3.20	2.69	minutes
Runway clearance time	0.67	0.67	minutes
Total	3.87	3.35	minutes
Saving		0.51	minutes

Table A4.3. Arrival Runway Occupancy Time Analysis

	Baseline	With Project	Unit
Taxi distance	1,130	204	meters
Taxi speed	24	24	kph
Taxi time	2.83	0.51	minutes



Landing rollout time	0.83	0.83	minutes
Total	3.66	1.34	minutes
Saving		2.32	minutes

Table A4.4. Average Operational Time Saving per Flight

	Time (minutes)
Aircraft arrival savings	4.0
Airspace delay	1.2
Taxiing	2.3
Aircraft departure savings	0.8
Departure delay	0.3
Taxiing	0.5
Aircraft turnaround	4.3

12. These operational time savings translate in a monetary term as airline cost savings and passenger time savings. The following assumptions are used:

- Airline direct operating cost per block minute of US\$74.20²⁹
- Passenger time value of US\$49 per hour³⁰
- Annual airport operation of 26,112 (both arrival and departure)
- Average 66 passengers per flight

13. With the above assumptions, the taxiway improvement would generate the following annual economic benefits:

Table A4.5. Annual Economic Benefits of Taxiway Improvement

Airline cost savings (US\$)	3.8 million
Passenger time savings (US\$)	3.0 million
Total annual savings (US\$)	6.8 million

CAP runway rehabilitation

Airport closure days

14. Based on recent experience, the airport closure due to flooding is assumed to be on average one day per year without the Project. Rehabilitating the runway is expected to reduce this airport closure by half a day.³¹ In the with-Project scenario, the benefit of limiting airport closure due to flooding from one day to half a day per year is accounted for after Project completion (from 2025 onwards).

²⁹ Airlines for America. U.S. Passenger Carrier Delay Costs (database). <https://www.airlines.org/dataset/per-minute-cost-of-delays-to-u-s-airlines/>.

³⁰ Airlines for America. U.S. Passenger Carrier Delay Costs (database). <https://www.airlines.org/dataset/per-minute-cost-of-delays-to-u-s-airlines/>.

³¹ In previous years, flooding has led to CAP closing for up to a week, but this was partially due to flood consequences outside of the runway.



15. The current condition of the runway would need continuous repairs. Without the project, starting in 2024, an airport closure of one full day per year would be needed to repair the runway from overuse. This number is expected to increase annually, by one day, reaching 20 days of airport closure due to runway repairs by 2043. Given the current condition of the runway, this assumption is very conservative.

Airport closure costs

16. For the purpose of this analysis, the airport closure costs for passengers and cargo flights have been considered. The client provided passenger and cargo data for the years 2018 and 2019, and the team conservatively assumed these numbers to remain stable over the Project evaluation horizon.

17. The daily shutdown cost for passengers was calculated by multiplying the daily passenger numbers by the total cost per passenger of US\$112. This value has been established based on several individual studies and includes the passengers' value of time (based on average wage rates) as well as the cost for missed appointments and resulting financial losses (possibly carried by insurance companies).³²

18. The daily shutdown costs related to delayed pickup and delivery of cargo were calculated by multiplying daily cargo volumes with the cost of delay of US\$0.83 per kg per hour. This value by kilogram is as a weighted average of a typical cargo load of varying priorities.³³

Table A4.6. Inputs for Calculation of Airport Closure Costs Due to Flooding and Runway Repairs

Year	Passenger Costs			Cargo Costs		Airport Closure ³⁴	
	Passengers per day	Cost per passenger per day (USD)	Passenger cost per day (USD)	Cargo per day (kg)	Cargo cost per day (USD)	With Project (days)	Without Project (days)
2020	507	112	56,933	139	916	1	1
2021	507	112	56,933	139	916	1	1
2022	507	112	56,933	139	916	1	1
2023	507	112	56,933	139	916	1	1
2024	507	112	56,933	139	916	1	1
2025	507	112	56,933	139	916	1	2
2026	507	112	56,933	139	916	0.5	3
2027	507	112	56,933	139	916	0.5	4
2028	507	112	56,933	139	916	0.5	5
2029	507	112	56,933	139	916	0.5	6
2030	507	112	56,933	139	916	0.5	7

³² DeLanghe, K.S., et al. "Economic effects and costs of a temporary shutdown of an airport—Review and case study." Proceedings of the 13th World Conference on Transportation Research Society, Rio de Janeiro, Brazil. 2013 (accessed February 11, 2020), <http://www.wctrs.leeds.ac.uk/wp/wp-content/uploads/abstracts/rio/general/1621.Pdf>.

³³ Liu, Yulin, Mogeng Yin, and Mark Hansen. 2016. "Estimating Costs of Flight Delay for Air Cargo Operations." Institute of Transportation Studies, University of California, Berkeley. http://www.icrat.org/icrat/seminarContent/2016/presentations/67/ICRAT_2016_Presentation_file_67.pdf

³⁴ Total airport closure days are the sum of airport closure days due to flooding and due to runway repair, as described in section "Airport closure" above.



2031	507	112	56,933	139	916	0.5	8
2032	507	112	56,933	139	916	0.5	9
2033	507	112	56,933	139	916	0.5	10
2034	507	112	56,933	139	916	0.5	11
2035	507	112	56,933	139	916	0.5	12
2036	507	112	56,933	139	916	0.5	13
2037	507	112	56,933	139	916	0.5	14
2038	507	112	56,933	139	916	0.5	15
2039	507	112	56,933	139	916	0.5	16
2040	507	112	56,933	139	916	0.5	17
2041	507	112	56,933	139	916	0.5	18
2042	507	112	56,933	139	916	0.5	19
2043	507	112	56,933	139	916	0.5	20

Results

19. The results show that the economic benefits of the PAP taxiway improvement and CAP runway rehabilitation surpass the total investment cost and prove that the project is economically feasible. Considering the whole Project cost of US\$84 million and the quantified benefits of the PAP taxiway improvement and the CAP runway rehabilitation, the Project has a net present value (NPV) of US\$3 million and an internal rate of return (IRR) of 7 percent.

20. The NPV and IRR have been calculated with the above savings and the following assumptions:

- Discount rate of 6 percent
- 20-year project period based on useful life of taxiway investment (i.e., 20 years of operation until major maintenance required)
- ICAO-required aircraft-aircraft separations remain the same over the period of the Project
- PAP aircraft fleet mix and overall demand levels remain consistent over the period of the Project
- CAP passenger and freight volumes remain consistent over the period of the Project

21. While the economic benefits of the PAP taxiway improvement and the CAP runway rehabilitation already show that the entire Project is economically feasible, the other investments would further provide additional benefits and make the Project more viable. However, quantifying the full economic benefits resulting from the Project is exceedingly difficult given that it is not easy to quantify a reduced risk associated with aircraft operational safety, climate change/disaster resilience due to the limited availability of the data. Also, it is almost impossible to estimate benefits of enhanced connectivity between Haiti and other regions as well as availability for humanitarian functions such as medical evacuation, air-sea rescue operations, or humanitarian relief.

Table A4.7. Annual Flows of Costs and Benefits (US\$)

Year	Costs	Benefits	Net
2020	-	-	-
2021	2,000,000	-	(2,000,000)



2022	5,250,000	-	(5,250,000)
2023	26,000,000	-	(26,000,000)
2024	29,250,000	6,909,844	(22,340,156)
2025	21,500,000	6,967,692	(14,532,308)
2026	-	7,025,541	7,025,541
2027	-	7,083,389	7,083,389
2028	-	7,141,237	7,141,237
2029	-	7,199,085	7,199,085
2030	-	7,256,933	7,256,933
2031	-	7,314,781	7,314,781
2032	-	7,372,630	7,372,630
2033	-	7,430,478	7,430,478
2034	-	7,488,326	7,488,326
2035	-	7,546,174	7,546,174
2036	-	7,604,022	7,604,022
2037	-	7,661,870	7,661,870
2038	-	7,719,719	7,719,719
2039	-	7,777,567	7,777,567
2040	-	7,835,415	7,835,415
2041	-	7,893,263	7,893,263
2042	-	7,951,111	7,951,111
2043	-	8,008,960	8,008,960
Total	84,000,000	149,188,038	65,188,038
NPV	63,796,383	66,774,677	2,978,294
IRR			7%



ANNEX 5: Country Risk Profile to Natural Hazards and Climate Change

COUNTRY: Haiti

Caribbean Regional Air Transport Connectivity Project - Haiti

1. Haiti ranks as one of the countries in the world with the highest exposure to multiple natural hazards. With 96 percent of its population living at risk,³⁵ the most intense natural hazards are seismic (for example, earthquakes, landslides) and hydro-meteorological (for example, cyclones, flooding, droughts). Seismic hazards are associated with the interaction of the Caribbean and North American tectonic plates, which converts Haiti into a seismically active zone. Hydro-meteorological hazards are related to the precipitation caused by northern polar fronts, tropical cyclones, and waves, the Inter-Tropical Convergence Zone, and convective-orographic activity. El Niño/El Niño-Southern Oscillation episodes have tended to delay the arrival of the rainy season, create drought conditions, and increase the number and intensity of cyclones. Other secondary hazards impacting Haiti include landslides, torrential debris flows, soil liquefaction, and tsunamis.
2. High levels of poverty together with severe environmental degradation and the presence of settlements in low-lying areas and floodplains are key contributing factors toward the country's vulnerability. According to the 2014 Poverty Assessment, almost 70 percent of Haiti's population is either poor or vulnerable to falling into poverty, and nearly 75 percent of households are economically impacted by at least one shock each year.³⁶ This translates into precarious living conditions for the majority of the population, drastically decreasing their coping abilities and resilience to the impact of adverse natural events, further enhancing the vicious circle of poverty, environmental degradation, rapid urbanization, and vulnerability. Currently, more than 60 percent of Haiti's population live in urban areas. The high population density (average up to 35,400/km² in Haiti, and higher in Port-au-Prince) coupled with unregulated construction, weak social and economic public infrastructure, lack of land-use planning, and unstable governance, further aggravates the extensive social vulnerability.
3. Additionally, Haiti suffers from significant governance issues that further increase its vulnerability to natural hazards. Haiti's long history of political instability has greatly weakened its institutions and governance mechanisms which contributes to, among other things, serious fiscal, regulatory, and planning issues. The lack of political stability has a significant impact on the continuity and effectiveness of the National System for Disaster Risk Management (Système National de Gestion des Risques et des Désastres, SNGRD), in particular, its risk management components. Even though the 2001 National Plan for DRM established the SNGRD, the country still lacks the necessary legal framework and norms to effectively reduce risk and manage disasters at the national and local levels. The National Plan set up the basis for handling emergency and preparedness operations under the Technical Directorate of the Civil Protection. However, no line ministry is officially responsible for managing risks, such as identifying and reducing risks. Finally, this critical lack of norms, responsibility, and understanding of risks triggers inadequate resource allocations; the very limited resources are allocated only at the national level, leaving the regional and local level without any means to prepare for, or respond to, disasters or to reduce and manage risk.
4. The combined effects of exposure to natural hazards, high vulnerability, institutional fragility, and weaknesses and

³⁵ Dilley, Maxx, Robert S. Chen, Uwe Deichmann, Arthur L. Lerner-Lam, Margaret Arnold, Jonathan Agwe, Piet Buys, Oddvar Kjevstad, Bradfield Lyon, and Gregory Yetman. 2005. *Natural disaster hotspots: A global risk analysis (English)*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/621711468175150317/Natural-disaster-hotspots-A-global-risk-analysis>.

³⁶ World Bank. 2014. *Investing in people to fight poverty in Haiti: Reflections for evidence-based policy making (English)*. Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/222901468029372321/Reflections-for-evidence-based-policy-making>.



the lack of adequate resources invested in the sector have often resulted in catastrophic impacts of natural hazards in Haiti. Between 1971 and 2013, Haiti's economy was subjected to climate disasters almost every year which had adverse effects on growth. The country has a higher number of disasters per square kilometer than the average smaller Caribbean country (see Table A5.1).

5. Recent disasters in Haiti confirm an increasing level of vulnerability facing its hard-won development gains. On average, based on the analysis of historical data from 1976 to 2012, annual losses and damages associated with hydro-meteorological events are estimated at an amount equivalent to 1.95 percent of the GDP. However, as assets are created and concentrated, losses associated with adverse natural events are increasing. This was demonstrated in August and September of 2008 with the passage of Hurricanes Fay, Gustav, Hanna, and Ike (herein referred to as FGHI) during a three-week period, resulting in damage and losses equivalent to 15 percent of the country's GDP. Less than two years later, on January 12, 2010, an earthquake killed 220,000 people, displaced 1.5 million people, and triggered damages and losses equivalent to 120 percent of GDP. In 2016, Hurricane Matthew hit the southern peninsula causing damages and losses equivalent 32 percent of GDP.

Table A5.1. Frequency and Impact of Natural Disasters, 1971-2014 in Selected Countries³⁷

Frequency and Impact of Natural Disasters, 1971-2014 Country/Group	Number of Natural Disasters	Disasters/Year	Disasters/Land Surface (thousand square km)	Disasters/Population (millions)	Deaths/Population (millions)	Total Damage/GDP (ratio)
Haiti	137	3.1	5.0	13	23,427	1.78
Haiti (excluding 2010 earthquake)	136	3.1	4.9	13	1,855	0.22
Dominican Republic	60	1.4	1.2	6	311	0.05
Jamaica	34	0.8	3.1	13	102	—
Nicaragua	66	1.5	0.5	11	2,363	0.33
Honduras	70	1.6	0.6	9	3,298	0.40
El Salvador	51	1.2	2.5	8	687	0.34
Guatemala	82	1.9	0.8	5	1,754	0.12
Costa Rica	58	1.3	1.1	12	72	0.04
Panama	46	1.0	0.6	12	80	0.01
Other Caribbean States	129	2.9	0.3	30	86	0.19

6. Climate change is expected to exacerbate the risk of hydro-meteorological hazards by increasing the frequency and/or intensity of extreme events, further increasing Haiti's vulnerability. Climate projections for the Caribbean estimate that temperatures could rise from 1.2°C to 2.3°C by 2100, with a median increase of 2.0°C during the 21st century.³⁸ In addition to claiming human lives, climate-related hazards may also take a heavy toll on all sectors of the Haitian economy and set back hard-won development gains.

³⁷ EM-DAT: The OFDA/CRED International Disaster Database 2015.

³⁸ Dilley et al, Global Hotspot Study, World Bank, 2005.



ANNEX 6: Regional Approach for and Benefits of Developing Air Transport Systems in the Caribbean Region

COUNTRY: Haiti

Caribbean Regional Air Transport Connectivity Project

1. CATCOP is a SOP which aims to improve Caribbean region air transport connectivity by enhancing air transport sector operational safety, oversight, and climate/disaster resilience. The SOP approach is based on basic criteria to participate in the Program, including: (a) agreement and commitment to elevate compliance with international safety standards (for example, ICAO SARPs) and regional air transport agreements such as the POS Declaration and/or CARICOM Multilateral Air Services Agreement (MASA); (b) adequate leadership to move forward the regional air transport connectivity and climate/disaster resilience enhancements proposed under the Program; (c) commitment to support and participate in the common regional training activities; and (d) commitment to support the common regional procurement activities. In addition to Haiti, three other countries—St. Lucia, Dominica, and Grenada—have agreed to participate in the SOP. While each country participating in CATCOP has its own unique challenges and priorities, given the inherent regional nature of air transportation and the similar characteristics of Caribbean nations, there are many common problems and goals across the countries (see Annex 7). CATCOP has been structured to allow each participating country to address its unique situation using appropriately customized delivery/contractual mechanisms under a framework that is still regional in nature.

2. **Regional Activities of CATCOP.** Given the common air transport challenges in the Caribbean region, several CATCOP activities would be handled in a regional manner, including:

- (i) Measuring improvements in compliance with operational safety standards would be handled in the same manner for each participating country using the same methodology and same team. ICAO SARPs compliance screening would be completed for each country at the beginning and end of the Project to provide a quantitative measure of safety enhancement at each airport and in each country.
- (ii) Air Traffic Control skills enhancement training would be conducted jointly for all CATCOP countries with special “breakout” training modules for any unique country-specific needs.
- (iii) Climate/disaster resilience best practices training and skills development would be conducted jointly for all English-speaking CATCOP countries (Dominica, Grenada, and St. Lucia). A separate French-language training course would be conducted in Haiti.
- (iv) CFR skills enhancement training would be conducted jointly for all English-speaking CATCOP countries (Dominica, Grenada, and St. Lucia). A separate French-language training course would be conducted in Haiti.
- (v) Wildlife management plans would be developed and implemented for each airport in CATCOP leveraging the existing practices already in place in St. Lucia and Grenada, and expanding to include state-of-the-art international best practices. A common approach to wildlife management in the region would facilitate sharing of best practices, training, and tools/technology. Wildlife management training would also be offered for all English-speaking CATCOP countries with a separate French-language course in Haiti.
- (vi) Gender diversity in recruitment and retention programs would be developed for each government agency participating in CATCOP using a common analytical framework and tailored action plans. At a minimum, programs would be developed to significantly increase the share of female air traffic controllers and public safety and security screening staff. Gender diversity training would be conducted jointly for all English-speaking countries with a separate French-language course in Haiti.



3. **Broader Regional Benefits of CATCOP.** Given the nature of air transportation and the planned improvements, there would be broader benefits for the entire region, including:

- (i) Improved capability of CATCOP countries to accommodate diverted flights and emergency landings due to operational safety and capability upgrades. This would provide pilots, air traffic controllers, and airlines more options when dealing with challenging weather or any type of emergency situation.
- (ii) Enhanced situational awareness for pilots of any ADS-B equipped aircraft flying in the vicinity of any of the CATCOP countries, even those not landing or taking off in one of the countries, due to ADS-B receiver antenna installations in each country.
- (iii) Improved capability of CATCOP countries to support post-disaster relief flights. This may be most relevant for Haiti supporting the Dominican Republic in the event of a natural disaster impacting its main airports. However, it could also be relevant for the islands neighboring Dominica, Grenada, and St. Lucia in the event of a natural disaster disabling their airport(s).
- (iv) Improved operating environment for regionally based airlines due to improved operational safety and capability at the CATCOP airports.
- (v) Regional training going beyond the CATCOP countries. Non-CATCOP countries in the Caribbean region would be permitted to participate in the CATCOP-sponsored training programs related to air traffic control, climate/disaster resilience best practices, CFR, wildlife management, and gender diversity in recruitment/retention.
- (vi) In the case of St. Lucia, Grenada, and Dominica, enhanced capacity of the regional civil aviation regulator (ECCAA). ECCAA skills/capacity would be enhanced through its participation in CATCOP activities, which would directly benefit the other OECS nations for which it serves as the civil aviation regulator.



ANNEX 7: Port of Spain Declaration of 2014

COUNTRY: Haiti

Caribbean Regional Air Transport Connectivity Project - Haiti

1. The “Port of Spain Declaration” (POS Declaration) of 2014 is one of the regional aviation-related agreements that clearly demonstrates the commitment of countries in the Caribbean region to work together to improve regional air transport connectivity. It resulted from the Fifth North American, Central American, and Caribbean Directors of Civil Aviation Meeting held in Port of Spain, Trinidad and Tobago, on April 28-30, 2014. The meeting was convened by the International Civil Aviation Organization (ICAO) North American, Central American and Caribbean Regional Office, with the participation of officials representing 34 states and overseas territories as well as nine international organizations.
2. The POS Declaration is a commitment by 34 states and territories, including all current CATCOP countries, to achieve a series of operational safety and air navigation improvement targets, including improving Effective Implementation (EI) of ICAO SARPs,³⁹ reducing fatality risk for aircraft accidents, increasing rates of airport certification, and reducing regional CO₂ emissions (see below for the full list of agreed targets). Haiti signed the POS Declaration and ECCAA signed it on behalf of Dominica, Grenada, and St. Lucia, as well as the other Organisation of Eastern Caribbean States (OECS) members for whom it serves as the civil aviation regulator.
3. The 2014 POS Declaration included a commitment to achieving the following goals:

Regional Safety Targets

- a. Safety Oversight
 - i. 80 percent Effective Implementation (EI) regional average by December 2016
 - ii. No state in the region to have EI of ICAO USOAP Critical Element 3 (CAA Staff) and Critical Element 4 (Inspector Competency) below 70 percent by December 2016
- b. Accidents
 - i. Using 2010 as the baseline, reduce fatality risk for accidents in the CAR Region for Part 121 or like commercial air transport operations by 50 percent by the year 2020
- c. Runway Excursions
 - i. Reduce runway excursions by 20 percent relative to the 2007-12 regional average by December 2016
- d. Aerodrome Certification
 - i. 48 percent of international aerodromes in the CAR Region to be certified by December 2016
- e. State Safety Programme (SSP)/Safety Management System (SMS) Implementation
 - i. 60 percent of states to have SSP—implemented, service provider SMS safety performance indicators accepted, and an initial Acceptable Level of Safety Performance (ALoSP) established by December 2016
 - ii. 60 percent of service providers to have Phase 1 of their SMS implemented with a minimum of Reactive Phase functional risk management procedures by December 2016

Regional Air Navigation Targets

- a. Approach: Performance-Based Navigation (PBN)
 - i. 80 percent of instrument approach runways to have Approach Procedures with Vertical Guidance (APV) with Barometric Vertical Navigation (Baro VNAV) implemented by service providers and users by

³⁹ Effective Implementation of ICAO SARPs measures the rate of implementation of ICAO SARPs.



December 2016

- b. Air Traffic Flow Management (ATFM)
 - i. 100 percent of Flight Information Regions (FIRs) within which all Area Control Centers (ACCs) to have ATFM measures available by December 2018
 - c. Aeronautical Information Management Transition (AIM)
 - i. 100 percent of Aeronautical Information Services (AIS) to implement AIM Roadmap—Phase 1 required elements by December 2016
 - d. Ground-Ground Digital Coordination/Transfer
 - i. 50 percent of FIRs within which all applicable ACCs to have implemented at least one interface to use Air Traffic Services Inter-Facility Data Communication (AIDC)/On-line Data Interchange (OLDI) with neighboring ACCs by December 2016
 - e. Environmental Benefit
 - i. Reduce regional CO₂ emissions by 40,000 tons per year through PBN implementation by December 2016
- While CATCOP's mission is more limited in scope and scale than the POS Declaration, it is aligned with the guiding principles of the POS (for example, the importance of a regional approach to improving air transportation) and its goals related to improving aircraft operational safety, air navigation efficiency, and environmental performance. Specifically, the following CATCOP investments are aligned with its goals:

Table A8.1. List of Investments for Each Participating Country

Investments	CATCOP Country (Airport)
ADS-B to improve navigation safety and contribute to a harmonized airspace	All countries
ILS to improve aircraft operational safety and environmental performance	Dominica (DOM), St. Lucia (UVF), Grenada (GND)
Runway pavement rehabilitation to improve aircraft operational safety and ICAO SARPs effective implementation (EI)	Haiti (CAP) and St. Lucia (UVF)
RESAs to improve aircraft operational safety and ICAO SARPs EI	Haiti (PAP), St. Lucia (UVF), Grenada (GND)
ATCT improvements to improve aircraft operational safety and ICAO SARPs EI	Haiti (CAP), Dominica (DCF)
Taxiway system expansion to improve aircraft operational safety and environmental performance (i.e., reduce GHG emissions)	Haiti (PAP)
CFR improvements to improve aircraft operational safety and ICAO SARPs EI	Dominica (DOM), St. Lucia (UVF), Grenada (GND)
CFR training to improve aircraft operational safety	All countries
ATC training to improve aircraft operational safety	All countries
Wildlife management programs and training to improve aircraft operational safety and ICAO SARPs EI	All countries
Aeronautical chart updates to improve aircraft operational safety and ICAO SARPs EI	St. Lucia (UVF), Dominica (DOM), and Grenada (GND)