

Jamaica Mangroves Plus: Protection and Sustainable Management of Jamaica's Mangrove Ecosystems and Biodiversity

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GEF ID

10653

Project Type

MSP

Type of Trust Fund

GET

CBIT/NGI

CBIT **No**

NGI **No**

Project Title

Jamaica Mangroves Plus: Protection and Sustainable Management of Jamaica's Mangrove Ecosystems and Biodiversity

Countries

Jamaica

Agency(ies)

FAO

Other Executing Partner(s)

Forestry Department of Jamaica

Executing Partner Type

Government

GEF Focal Area

Biodiversity

Taxonomy

Forest and Landscape Restoration, Forest, Focal Areas, Agriculture, Forestry, and Other Land Use, Climate Change Mitigation, Climate Change, Livelihoods, Climate Change Adaptation, Ecosystem-based Adaptation, Climate resilience, Sea-level rise, Small Island Developing States, Disaster risk management, Carbon stocks above or below ground, Land Degradation Neutrality, Land Degradation, Community-Based Natural Resource Management, Sustainable Land Management, Restoration and Rehabilitation of Degraded Lands, Sustainable Livelihoods, Ecosystem Approach, Sustainable Forest, Integrated and Cross-sectoral approach, Threatened Species, Species, Biodiversity, Tourism, Mainstreaming, Forestry - Including HCVF and REDD+, Mangroves, Biomes, Wetlands, Natural Capital Assessment and Accounting, Financial and Accounting, Community Based Natural Resource Mngt, Protected Areas and Landscapes, Productive Landscapes, Terrestrial Protected Areas, Coastal, International Waters, Mangrove, SIDS : Small Island Dev States, Fisheries, River Basin, Freshwater, Aquaculture, Nutrient pollution from all sectors except wastewater, Pollution, Transform policy and regulatory environments, Influencing models, Demonstrate innovative approach, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Awareness Raising, Communications, Stakeholders, Education, SMEs, Private Sector, Capital providers, Large corporations, Financial intermediaries and market facilitators, Non-Governmental Organization, Civil Society, Community Based Organization, Academia, Local Communities, Consultation, Type of Engagement, Participation, Information Dissemination, Sex-disaggregated indicators, Gender Mainstreaming, Gender Equality, Gender-sensitive indicators, Beneficiaries, Capacity Development, Gender results areas, Access to benefits and services, Participation and leadership, Knowledge Generation and Exchange, Innovation, Capacity, Knowledge and Research, Learning, Knowledge Exchange, Knowledge Generation

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 1

Climate Change Adaptation

Climate Change Adaptation 1

Duration

48 In Months

Agency Fee(\$)

156,620.00

Submission Date

8/20/2020

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
BD-1-1	GET	419,652.00	2,569,205.00
BD-1-3	GET	104,913.00	660,115.00
BD-2-7	GET	1,124,065.00	6,818,180.00
Total Project Cost (\$)		1,648,630.00	10,047,500.00

B. Indicative Project description summary

Project Objective

To support the implementation of the National Mangrove Management Plan for promoting a biodiversity-positive approach towards sustainable management of mangrove ecosystems

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
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Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
1. National mangrove policy strengthening to support implementation of National Mangrove Management Plan	Technical Assistance	1.1 Strengthened policy enabling environment for successful implementation of the National Mangrove Management Plan	1.1.1 NMMP implemented including policy recommendations	GE T	299,757.00	1,818,182.00
			1.1.2: Assessment of land ownership (individuals and business) to inform different pathways for mangrove management, positive incentives and policy recommendations			
		1.2 Ecosystem-based mangrove management, with emphasis in resource users and livelihoods, mainstreamed into land use planning processes.	1.2.1. National Forest Management and Conservation Plan (NFMCP) - Collaborative Implementation Framework informed by mangrove ecology science[1] for inclusive land use planning.			
		<i>GEF Core Indicator 4.1: 7,600 hectares of mangrove landscapes under improved management to benefit biodiversity (excluding protected areas)</i>	1.2.2. Mangrove socio-economic livelihood assessment conducted, integrating gender equality, in at least three priority sites to inform local land use decision making.			
			<i>[At least three assessments; Potential sites include Morant Bay, Falmouth, and Port Royal]</i>			
			1.2.3 Mangrove ecosystem services assessments, including economic valuation of key mangrove habitat biodiversity, in at least two priority sites to inform land use decision making.			

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
2. Mangrove ecosystem restoration for improved ecosystem services and protection of key biodiversity	Technical Assistance	2.1 Restored health of priority mangrove habitats to improve associated biodiversity and mangrove ecosystem services, including support to marine ecosystems and fisheries.	2.1.1. Site specific ecosystem- and hydrologic-based restoration activities. <i>[At least three priority mangrove habitats]</i> 2.1.2 Demarcation and biodiversity education signage erected in at least three priority mangrove habitats. <i>[# of signs erected]</i>	GE T	1,049,121.00	6,387,386.00
		<i>Potential sites include:</i>				
		<i>St. Andrew ? Palisades (190 Ha);</i>				
		<i>St. Thomas ? Morant Bay (1395 Ha and Area 2 53 Ha);</i>				
		<i>Hanover ? Negril (1322 Ha);</i>				
		<i>Trelawny ? Falmouth (823 Ha)</i>				
		<i>St. Catherine ? Goat Island (242 Ha)</i>				
		<i>Core Indicator 3.4: 4,027 hectares of</i>				

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
3. Knowledge management and project monitoring and evaluation	Technical Assistance	3.1 Improved management and dissemination and awareness of Jamaica mangrove habitat knowledge	<p>3.1.1 A central mangrove knowledge repository established for Jamaica.</p> <p>3.1.2 Five policy briefs tailored to specific sectors (Port and Coastal Infrastructure, Tourism, Climate Change and Environment, Waste Management, Agriculture and Fisheries) that raise awareness on the value of mangrove ecosystems and biodiversity.</p> <p>3.1.3 Targeted knowledge dissemination conducted, (e.g. awareness campaigns, consultations, etc) for respective private sector and government stakeholder audiences from Output 3.1.2</p> <p>3.2.1 Project monitoring system established and implemented.</p> <p>3.2.2 Independent project terminal evaluation completed.</p>	GE T	149,877.00	932,841.00
		3.2 Effective project management and evaluation to inform adaptive management				

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
				Sub Total (\$)	1,498,755.00	9,138,409.00
Project Management Cost (PMC)						
		GET	149,875.00		909,091.00	
		Sub Total(\$)	149,875.00		909,091.00	
		Total Project Cost(\$)	1,648,630.00		10,047,500.00	

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

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Forestry Department	In-kind	Recurrent expenditures	5,000,000.00
Recipient Country Government	National Environment & Planning Agency (NEPA)	In-kind	Recurrent expenditures	2,600,000.00
Recipient Country Government	Urban Development Corporation (UDC)	In-kind	Recurrent expenditures	700,000.00
Recipient Country Government	National Fisheries Authority (formerly Fisheries Division), Ministry of Agriculture and Fisheries (MAF)	In-kind	Recurrent expenditures	700,000.00
Other	University of the West Indies (UWI) (Center for Marine Science and Port Royal Marine Lab)	In-kind	Recurrent expenditures	900,000.00
Civil Society Organization	Caribbean Coastal Area Management Foundation (C-CAM)	In-kind	Recurrent expenditures	50,000.00
Civil Society Organization	The Nature Conservancy (TNC)	In-kind	Recurrent expenditures	50,000.00
GEF Agency	FAO	In-kind	Recurrent expenditures	47,500.00
Total Project Cost(\$)				10,047,500.00

Describe how any "Investment Mobilized" was identified

Not Applicable

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

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
FAO	GET	Jamaica	Biodiversity	BD STAR Allocation	1,648,630	156,620	1,805,250.00
Total GEF Resources(\$)					1,648,630.00	156,620.00	1,805,250.00

E. Project Preparation Grant (PPG)

PPG Required **true**

PPG Amount (\$)

50,000

PPG Agency Fee (\$)

4,750

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
FAO	GET	Jamaica	Biodiversity	BD STAR Allocation	50,000	4,750	54,750.00
Total Project Costs(\$)					50,000.00	4,750.00	54,750.00

Core Indicators

Indicator 1 Terrestrial protected areas created or under improved management for conservation and sustainable use

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
2,000.00	0.00	0.00	0.00

Indicator 1.1 Terrestrial Protected Areas Newly created

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
2,000.00	0.00	0.00	0.00

Name of the Protected Area	WDP A ID	IUCN Category	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
Akula National Park Crown Lands transitioned	125689	SelectHabitat/Species Management Area	2,000.00			

Indicator 1.2 Terrestrial Protected Areas Under improved Management effectiveness

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
0.00	0.00	0.00	0.00

Name of the Protected Area	W DP A ID	IUCN Category	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)	METT score (Baseline at CEO Endorsement)	METT score (Achieved at MTR)	METT score (Achieved at TE)
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Indicator 3 Area of land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
4027.27	0.00	0.00	0.00

Indicator 3.1 Area of degraded agricultural land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 3.2 Area of Forest and Forest Land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 3.3 Area of natural grass and shrublands restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 3.4 Area of wetlands (incl. estuaries, mangroves) restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
4,027.27			

Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
7600.00	0.00	0.00	0.00

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
7,600.00			

Indicator 4.2 Area of landscapes that meets national or international third party certification that incorporates biodiversity considerations (hectares)

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Indicator 4.3 Area of landscapes under sustainable land management in production systems

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4.4 Area of High Conservation Value Forest (HCVF) loss avoided

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Documents (Please upload document(s) that justifies the HCVF)

Title	Submitted

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)	1152654	0	0	0
Expected metric tons of CO ₂ e (indirect)	0	0	0	0

Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)	1,152,654			

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (indirect)				
Anticipated start year of accounting				
Duration of accounting	20			

Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO ₂ e (direct)				
Expected metric tons of CO ₂ e (indirect)				
Anticipated start year of accounting				
Duration of accounting				

Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)				

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	200			
Male	200			
Total	400	0	0	0

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

*The relevant calculations from the EX-ACT methodology (Management Degradation and Coastal Wetlands) have been provided as Annex E. The total reported carbon-balance of -1,152,654 tCO₂e is based on the project's spatial targets noted as GEF Core Indicators, including: a) 2,000 ha of newly established protected areas (Core Indicator 1) as the result of project Outcome 1.3; b) 4,027 ha of mangrove area restored (Core Indicator 3) as a result of project Component 2, and; c) 7,600 ha of mangroves under improved management practices (Core Indicator 4) as a result of project Outcome 1.3. This is a total of 13,627 ha, of which 6,027 ha (a + b above) is part of the EX-ACT Management Degradation tab resulting in -718,094 tCO₂-eq, and 2,000 ha (c above) part of the EX-ACT Coastal Wetlands tab resulting in -434,560 tCO₂-eq. These calculations assume 10% of the 2,000 ha of mangroves from Core Indicator 4 are excavated for development purposes without the project and is forecasted over a recommended 20-year duration (4 years of implementation and 16 years of capitalization) aligned with GEF Indicator and STAP guidance. The project will revisit and more detail to these calculations during the PPG phase to ensure the most accurate calculations by the project's start.

Part II. Project Justification

1a. Project Description

Jamaica Environmental Context

With a total landmass of 10,991 km², Jamaica is the third largest island in the Caribbean. Situated about 145 km south of Cuba, Jamaica is home to a population of approximately 2.7 million people, of which more than 70% live within the coastal zone along approximately 1,022 km of coastline. Several mountain ranges run across Jamaica, with the highest point rising over 2,256 m in the Blue Mountains. Jamaica's tropical climate is heavily influenced by the Northeast Trade Winds and a predominately limestone bedrock with mountainous orographic features that serve as important watershed area for more than 120 rivers flowing from the central ridge towards the wetland areas along the coast.

Jamaica's 2016-2021 National Biodiversity Strategy and Action Plan (NBSAP) reports that while wetlands represent only 2% of Jamaica's total surface area, they comprise a large part of the densely populated coastal zone. Vast areas of wetlands in Jamaica are characterized by mangrove forests found along 290 km of the coastline. Jamaica is home to four types of mangroves that play important ecosystem and socio-economic roles. Moving seaward towards land, the four types of mangroves are found in ecozones that transcend from the Red Mangrove (*Rhizophora mangle*) (closest to the sea) to the Black Mangrove (*Avicennia germinans*) and then the White Mangrove (*Laguncularia racemose*), and the Button Mangrove (*Conocarpus erectus*). The red and black mangrove are the predominant species found in Jamaica.

Jamaica became a signatory to the Convention of Wetlands (Ramsar Convention) on February 7, 1998. Currently four wetlands with a total surface area of 37,847 hectares have been designated under the Ramsar Convention on Wetlands of International Importance, including: 1) Black River Lower Morass; 2) Palisadoes-Port Royal Wetlands; 3) Portland Bight Wetlands and Cays, and; 4) Mason River Protected Area in Clarendon Parish. These areas support a high abundance of diversity as they provide food, shelter and protection for many terrestrial, aquatic and marine organisms. The largest areas of wetlands are found in the Black River Lower Morass (approximately 6,000 ha) and the Negril Great Morass (approximately 2,300 ha). The Black River Lower Morass represents the largest mangrove dominated freshwater ecosystem not just in Jamaica, but also in the wider Caribbean. These wetlands together represent 70% of wetland cover in Jamaica and contain not only large areas of mangrove forest, but also swamp forests and marshlands.

The coastal zone includes both tidal and non-tidal wetlands. The tidal wetlands consist primarily of a mangrove fringe along the shoreline, and offshore cays, some of which are ringed by mangroves. Some near-shore inland areas have a basic flow of fresh water but are also subject to intermittent tidal inundation or overwash. Other areas, such as basin wetlands, are transitional between salt and freshwater wetlands, but support mangroves as a result of inundation during exceptionally high tides. Although all mangroves require protection against willful destruction through filling, other needs vary. Overwash wetlands are the most marine oriented and intertidal mangrove ecosystems and predominantly consist of red mangroves that experience daily overwashing by tidal action. These mangrove ecosystems are important habitat for marine species and are the last line of defense for absorbing wave energy along the coast. Fringe wetlands are also predominately red mangroves found along lower energy marine and brackish environments of rivers, lagoons and canal shorelines. Fringe wetlands are highly productive in nutrient output and an excellent habitat for wildlife and for shellfish production but are more susceptible to alterations of hydrological flows. Riverine wetlands are also mostly made up of red mangroves, but white and black mangroves can also occur, flourishing in saline portions of river flood plains. These mangrove ecosystems play an important role in controlling water quality, protecting against flooding and providing wildlife habitat and are an area of high productivity. Scrub wetlands are often comprised of slow growing red and black mangroves that survive in hypersaline soils devoid of other plant life. In scrub wetlands, mangroves play a critical role stabilizing the soil. Finally, basin wetlands are the most inland of wetland types in Jamaica, characterized by inundation only during exceptionally high tides and predominated by black and buttonwood mangroves. Basin wetlands are important nutrient traps and vulnerable to changes to upstream and coastal hydrological conditions. The foregoing wetland types have decidedly different characteristics, values and locational proclivities. In order to design site-specific management programmes for mangrove and coastal wetlands, information on vegetative types, condition, and current use is needed.

Mangrove Ecosystem Biodiversity

Jamaica has been ranked fifth among islands of the world in terms of endemic plants. There is also a high level of endemism for many species of animals. Jamaican mangrove habitats are known to host a vibrant community of other flora and fauna, including several additional halophytic plant species. Of the 284 Key Biodiversity Areas (KBAs) in the Caribbean, 21 are in Jamaica. At least 13 of KBAs include areas of coastline all around Jamaica that include wetland mangrove ecosystems or are directly adjacent and ecologically connected to wetland areas. The largest KBAs that include areas in the coastal zone are the Portland Blight Protected Area and Negril.

Threatened species: Jamaican mangroves ecosystems provide habitat for many important species, including the West Indian manatee (*Trichechus manatus*) listed as Endangered on the IUCN Red List and the West Indian Whistling Duck (*Dendrocygna arborea*) and the American Crocodile (*Crocodylus acutus*) that are listed as Vulnerable on the IUCN Red List and listed in Appendix I of the Convention

on International Trade in Endangered Species (CITES). The majority of American crocodile populations in Jamaica inhabit the mangrove swamps and marshes along the southern coast of the island, including the Black River Great Morass and Milk River, but with a few isolated populations on the north coast in the parishes of Hanover and Trelawny.

One of the most important endemic species to Jamaica is the Jamaican Iguana (*Cyclura collei*). The Jamaican iguana

is known to live in low-lying dryland ecosystems and marshlands that are adjacent to and highly connected to mangrove ecosystem health. The Jamaican Iguana was once widely distributed across Jamaica, but now only a small population survives in the Hellshire Hills, located on the south-central part of the Jamaica and within the Portland Bight Protected Area. The Jamaican iguana was previously thought to be extinct but was rediscovered in the 1990s. The Jamaican Iguana is currently listed as critically endangered and habitat restoration efforts are being discussed on Goat Islands, part of the Portland Bight Protected Area (PBPA) in south-central Jamaica

Mangrove habitats support a large group of animals belonging to a range of taxonomic groups. Many of these animals live in association with the prop roots of the red mangrove or may be found on the benthos of the mangrove lagoon and are taken in trawls or easily seen where the lagoon waters are clear enough. Yet others live in the mangrove forest, occupying forest floor or canopy. More common mangrove species identified by studies conducted by the University of West Indies include: a) cnidaria (anemone and jellyfish), b) annelida (worms); c) crustaceans (lobster, crab, shrimp, oysters, barnacles, clams, conch, snails, urchins, sand dollars, sea stars and brittle stars, and sea cucumbers), and; d) and many types of vertebrata. Jamaican mangroves are home to many local and migratory birds, including the Green Heron (*Butorides virescens*), Great Egret (*Ardea alba*), Mangrove Cuckoo (*Coccyzus minor*), Brown Pelican (*Pelecanus occidentalis*), and rare migratory species such as the West Indian whistling duck (*Dendrocygna arborea*).

Fisheries: Jamaica's National Environment and Planning Agency (NEPA) notes that mangroves provide home and shelter for many fish species and that the sustainability of Jamaica's artisanal, recreational, and commercial fisheries are directly dependent upon mangrove ecosystems. These include both fish species that spend part of their lifecycle in wetlands during breeding and spawning. Mangroves also serve as a nursery for juvenile fish. Commercially important species of fish found in Jamaican mangrove ecosystems include parrotfish, snapper, grunt, snook, tarpon, and jack. The reef fish of major economic importance in Jamaica include representatives from the families: Mullidae (goatfish), Haemulidae (grunt), Serranidae (grouper), Acanthuridae (doctorfish), Lutjanidae (snapper), Carangidae (jack), Holocentridae (squirrelfish), Holacanthidae (angelfish), Balistidae (triggerfish), and Scaridae (parrotfish). Several popular finfish species also rely on mangrove habitats at early stages in their life history that later in life provide a valuable socio-economic service. For example, a marlin

tournament in Portland Parish has been an extremely popular event for over 50 years. Mangroves are also important breeding grounds for several species of fresh and brackish water shrimps.

Moving inland from Red, Black, White, to Bottom mangrove species, the focus of many of Jamaica's most degraded landscapes and threatened biodiversity exist in inland regions outside of the intertidal and aquatic zones. Thus, while recognizing the importance of mangrove ecosystems for fisheries, mangroves as a forest ecosystem, are primarily managed through Jamaica's Forestry Department. Additional benefits of local mangrove ecosystem conservation that benefit fisheries are achieved in coordination with the National Fisheries Authority (NFA) and NEPA. For the proposed project, there are multiple different entry points where fisheries and marine conservation are featured, especially including site-specific socio-economic and ecosystem services assessments (Outputs 1.2.2 and 1.2.3), employing a holistic ecosystem-based mangrove restoration approach (Component 2), and through knowledge management and dissemination efforts with an aquaculture and fisheries policy brief (Output 3.1.2) and a mangrove ecosystem marine biodiversity report (Output 3.1.3). Further, through the implementation of the NMMP, the project will also raise awareness of the multiple functions mangrove ecosystem can provide to local communities with local and national management authorities, as well as improve coordination and integration of key government agencies, such as stronger engagement of NEPA and NFA into land use planning and biodiversity protection.

Mangrove Ecosystem Services:

Mangrove ecosystems are often considered globally significant ecosystems because they provide multiple ecosystem services, including supporting the resource base of several economic and subsistence livelihood activities. Mangroves provide an array of benefits to coastal communities, including wood and non-wood forest products and environmental services encompassing coastal hazard protection, erosion control, water filtration and biodiversity conservation in addition to their role as nursery habitats for a variety of fish species. Mangroves are also recognized as valuable to climate change mitigation efforts due to the outsized amounts of carbon contained in above and below ground mangrove biomass and trapped within the soils between mangrove root systems.

Because of their submerged root system, mangroves retard water movement and trap suspended materials and the remains of organisms associated with the mangroves. The accumulation of this organic material contributes to raise the soil level. Continued accumulation of soil, particularly by sea fringing mangrove stands, builds the shoreline seaward. In the course of this process, the rich protected substrata provide a habitat for a large variety of organisms that serve as food for marine fauna, including oysters and crabs, which are a harvestable source of protein. Mangrove ecosystem also store

up to four times the amount of carbon than terrestrial forests.[1]¹ The conservation and restoration of mangroves significantly contributes to the reduction of greenhouse gasses.

Mangrove ecosystem threats

Jamaica's mangrove ecosystems are currently experiencing several key direct and indirect threats. Collectively these threats have resulted in a significant decline in the area of mangrove and associated wetland ecosystem, resulting in a major decline in ecosystem services that have had an immediate impact on both local communities and a national economy that relies heavily on nature-based tourism.

Infrastructure development: Of the many identified direct threats to mangrove ecosystems in Jamaica, the most significant are often identified to include the direct clearing and reclamation of mangrove habitat for coastal development through cutting mangrove trees and dredging and filling the wetland areas to construct buildings, roads, and other types of infrastructure. This has been particularly driven by tourism and associated services and housing, especially where hotels and restaurants seek land as close to the coastline as possible driven by tourist preferences. With the growth of Kingston on the south coast, and Montego Bay, Ocho Rios and Port Antonio on the north, much of Jamaica's original mangroves and coastal wetlands have been destroyed by coastal development and rapidly urbanizing tourist areas are threatening many of the remaining areas. Also expanding of marine terminals and warehouses, freeport sites for industry, and residential subdivisions have also built over many coastal wetlands, particularly in estuarine locations. The greatest destruction has occurred in the larger estuaries now used for harbor facilities such as along Hunt's Bay and the Kingston waterfront. In many areas, shoreline hardening using artificial structures and developing coastlines with hard barriers has preventing landward mangrove migration, resulting in a process commonly known as 'coastal squeeze'. In many instances, the inland Black, White, and Button mangroves species are more threatened by these development practices as they can often be more sensitive to upstream watershed hydrological changes as compared with the highly salt tolerant Red mangrove that thrives in intertidal and aquatic zones.

Unsustainable harvesting: While less severe, mangroves are also directly threatened by the unsustainable harvesting. Mangrove forests have played an important historical and traditional role in many Jamaican coastal communities with services such as wood supplies for construction, daily-use and artisanal products, small-scale farming, firewood (charcoal) and subsistence fishing in canals and rivers. As a result, these forests are threatened in some areas due to over-exploitation of resources.

Pollution: Mangroves are also increasingly facing threats from marine litter, especially in lagoon and riverine areas where trash is directly dumped or is flushed into coastal waters through storm drains. Mangrove prop roots and soils can be covered in plastic and other litter, preventing uptake of important gasses and nutrients. Mangrove roots also are excellent at trapping and collecting litter into localized areas, having a major impact on the mangrove ecosystem biodiversity.

Environmental threats: Perhaps the most pronounced indirect threat to mangroves ecosystems in Jamaica is the numerous ways in which the hydrological conditions have been altered that then significantly impact the health of mangrove ecosystems. Among the many ways this can occur include the alteration of river flows for irrigation for large-scale sugarcane and banana agriculture and more localized aquaculture, to impacts on surface and watertable levels and salinity due to road and housing construction, unsustainable pumping, and illegal settlements and unchecked urban sprawl. Mangroves are further indirectly threatened by the introduction of several invasive species, including several plant species like hydrilla (*Hydrilla verticillata*) and cattail (*Typha domingensis*) and numerous land and marine animals, including feral goats, green mussels, ship worms, and lionfish. While less impactful, mangroves ecosystems are also subject to water quality issues due to excessive upstream nutrient loading as a result of poor or no sewage management, agriculture and industrial effluent, and increases in water turbidity and sediment loading due to upstream land development. Mangroves tend to trap and concentrate pollutants. The extent to which various types of pollutants, other than oil and sediments, contribute to mangrove destruction is uncertain. However, it is known that in mangrove-fringed estuaries, the concentration of pollutants, and/or temperature and salinity changes, tends to upset the delicate balance of microscopic life, drastically altering the entire coastal ecosystem.

Unsustainable natural resource management and climate change: The private ownership of mangroves represents a further indirect threat, in the context of the inherent difficulties and challenges about incentivizing owners to prevent fragmentation, destruction and degradation and undertake implement positive management actions. A last recognized threat, especially to overwash and intertidal mangroves ecosystems, is the impacts of climate change. Sea level rise and more intense storms and associated storm surges is leading to increasing wave energy uprooting mangrove trees, accelerating shoreline erosion, and making natural repopulation and replanting efforts more unsuccessful. Increases in wave energy have also been further exacerbated due to the decline in health of seagrass and coral reef ecosystems that naturally attenuate wave energy before reaching mangrove ecosystems.

The 2016-2021 NBSAP identifies several important factors that contribute to the loss of biodiversity in Jamaica, including poverty, population growth, lack of public awareness about the importance of conserving biodiversity. The main threats to biodiversity in Jamaica include habitat loss, climate change, resource over-exploitation, invasive alien species and pollution. The loss in habits is largely

seen as a result of population growth, coupled with subsistence use, agricultural, industrial, and commercial expansion, which resulted in intense competition for land, leading to encroachment and fragmentation of natural habitat. It is further stressed by natural processes and events such as erosion and hurricanes, the effects of which were often exacerbated by human activities and practices and climate change considered as being likely to further increase the negative impacts of these natural events.

Barriers:

Overall the identified barriers identified by the NBSAP preventing solutions to address the loss of biodiversity in Jamaica include: a) lack of political will; b) limited public awareness; c) conflicting policy/limited inter-Agency collaboration; d) unwillingness to share data/information; e) limited scientific information; f) limited information on biological resources and natural heritage; g) low revenue/funding; h) limited expertise in areas such as taxonomy; i) poor socio-economic planning; and k) weak law enforcement. For Jamaica's mangrove ecosystems, the most significant barrier is the numerous policy gaps that exist in current laws and regulations that continue to allow many of the above biodiversity threats to exist, often based on an incomplete knowledge of Jamaica's mangrove ecosystems. This has led to very limited incentives to protect mangrove ecosystems, both from many government agencies beyond Forestry, and especially on private lands. Further, the current policies are outdated, often lacking the latest scientific research, leading to weak disincentives. For example, private developers are increasingly opting to offset reclamation of primary mangrove areas with replanting mangrove seedlings, but with little regard for the long-term survival rate of the mangroves nor to restore lost ecosystem services from the original mangrove area. This "no net loss" approach has become a relatively simple way for land developers to pay their way out of environmental issue but fails to consider an ecosystem-based approach. Further, the lack of economic valuation of mangroves and incorporation of the value into land use planning and other resource decision making processes, has incentivized short-term profits, largely from tourism, over long-term revenue generate by the multitude of ecosystem services provided by mangrove ecosystems, especially the protection of important biodiversity and coastal ecosystem health that underpins Jamaica's tourism sector as well as consideration of impacts to local livelihoods like fishing communities. The private ownership of mangroves also represents a major policy barrier. Private land ownership leads to inherent difficulties and challenges with regard to incentivizing owners to prevent fragmentation, destruction and degradation and undertake implement biodiversity-positive management actions. Thus, the overall main project barriers include gaps in policy and incomplete mangrove ecosystem knowledge and awareness that are allowing resulting in multiple and site-specific drivers of mangrove ecosystem degradation.

Mangrove Habitat Status:

There is not yet an authoritative catalogue of Jamaica's mangrove and coastal wetlands. Historical estimates of mangrove area and degradation are described in what follows. In 1997 the extent of mangrove forest was estimated through an aerial survey and estimated to be 17,700 hectares. The 2013 National Land Use/Cover Change Assessment Report estimated that only 2% of Jamaica's land cover is mangrove forest, totaling nearly 22,000 ha. The lack of a definitive estimate has made it difficult to assess the rate of mangroves ecosystems being lost. According to a 2005 study conducted by FAO, 30% of Jamaica's mangroves have been lost. The more recent 2013 National Land Use/Cover Change Assessment Report showed that more than 770 hectares of mangroves have been lost in Jamaica over the past two decades (1996 to 2016), with at least 20 hectares lost to informal settlement since 2010. With over 94.53% of Jamaica's adjacent swamp forest estimated to have been lost, the threat of significant loss to Jamaica's limited mangrove ecosystems is very high.

Evidence strongly suggests there is an overall declining trend in Jamaica's mangroves, however losses and gains across the island are not spatially uniform and the main drivers of loss vary. Northern parish mangrove loss is more often associated with tourism and residential development, while port and industrial development have been a main driver in southern parishes. Of the seven south coast parishes, five showed an increase in wetland coverage between 2005 and 2011 suggesting renewed possibility for successful mangrove restoration. Assessing historic mangrove loss and current mangrove extents is important for understanding where future restoration may be most feasible. In a recent global assessment, although an estimated 770 hectares of mangroves have been lost in Jamaica between 1996 and 2016, more than 70% of these mangroves could be potentially restorable.

There is very limited high-quality national data on the spatial extents of Jamaica's mangroves. Mangroves in Jamaica are typically classified and counted together with fresh-water 'swamp' forests and only recently have mangrove extents been recorded separately. Additionally, though data on individual wetlands exist, there is little documentation of long-term trends in the extent, status and health of Jamaica's mangroves. Due to its location across common management responsibilities, there is no government agency leading the monitoring of mangroves nor any standard procedures for recording the loss. No statistical data exist for rates of mangrove wetland conversion, past or present. Many of the current assessments of mangrove loss rely heavily on baseline data determined from old black-and-white aerial photography. Recent spatial analysis has relied heavily on coarse resolution and publically available satellite imagery. With much of mangrove ecosystem change occurring on small plot sizes, detecting the change of spatial extent has been a major challenge. In the absence of more standardized approaches, anecdotal information from local communities has served as a major source of information to track the loss of mangrove ecosystems.

Like the monitoring of mangrove habitats, there is equally no monitoring of biodiversity in mangrove ecosystems outside a select few well managed protected areas. The main sources of mangrove

ecosystem biodiversity often come from Environmental Impact Assessments, many of which occur in areas that are ultimately developed.

The Government of Jamaica has begun to take steps towards addressing these barriers. Since 2005, multiple mangrove sites have been placed under protection across the island. There are currently just over 6,000 ha of mangroves that are protected in Jamaica, located in national parks and other protected areas, such as forest reserves and forest management areas. The recent 2016-2026 National Forest Management and Conservation Plan (NFMCP) explicitly recognizes mangrove restoration as a priority for national climate adaptation plans.

2) Baseline Scenario and Associated Baseline Projects

A recently published 2019 report by NEPA and the World Bank assessing mangrove ecosystem valuation in Jamaica concluded that: *“there is a serious need for preservation of Jamaica’s mangrove ecosystems considering that majority of the country’s economy and business is from these coastal areas.”* Despite an increasingly accepted view that mangrove ecosystems and the biodiversity contained within are important both to Jamaica’s tourism-based economic and the livelihoods of local communities, the conservation and restoration of mangrove ecosystems and associated biodiversity has largely been unsuccessful. The main barriers preventing addressing the largest threats to mangrove ecosystems are recognized to include a lack of coordination and science-based decision making in land-use planning and poorly supported by inconsistent policy and regulatory gaps (see Barriers subsection above for more details).

National Mangrove Management Plan (NMMP)

There are several major baseline initiatives related to mangrove ecosystem conservation currently in Jamaica, of which the most important is the ongoing development of a National Mangrove Management Plan (NMMP), led by the Jamaica Forestry Department as part of the 11th European Development Fund Budget Support Program titled *“Addressing Environmental and Climate Change Challenges through Improved Forest Management for Jamaica.”* This four-year programme began in 2018 and is expected to be completed by the end of 2022. Among the multiple objectives of this programme area several key baseline initiatives for this GEF project. These include:

- a) strengthening the policy and legislative framework of the forest sector;

- b) improving watershed management planning within targeted forest estates;
- c) supporting Convention on Biological Diversity target compliance through detailed mapping of Mangrove and Swamp Forests leading to the Production of a National Mangrove Management Plan (NMMP);
- d) improving the National Forest Database to target privately owned closed broad leaf and mangrove forests;
- e) upscaling gender-sensitive alternative livelihoods to support the sustainable utilization of forest resources for local communities;
- f) accelerating the Boundary Verification Programme for sustainable and inclusive Forest Management; strengthening gender-sensitive public education and awareness programmes to increase knowledge of climate change mitigation and forest conservation issues;
- g) and improving the Biophysical assessment programme to include carbon stock monitoring.
- h) Strengthen and deliver existing general public awareness/education, forest fire-related, school education and outreach programmes for private forest owners improving these (where appropriate) to better embrace gender-transformative modules

When completed, the NMMP will be the main government document to guide mangrove management in Jamaica. Based on the National Forest Management and Conservation Plan (described in detail below), the NMMP functions as a technical guidance document that provides direction for a national comprehensive, consistent, and science-based approach for the management of mangrove habitats. The NMMP will not be a legal or policy document, nor will it include site specific management details. Under Forestry Department leadership, the NMMP will provide the minimum scientific and technical data, information, and management best practices, which will allow an enabling environment for long-term and sustainable management of mangrove habitats. **The main objective of this GEF project is to support the implementation of the NMMP to promote a biodiversity-positive approach towards sustainable management of mangrove ecosystems.**

The development of the NMMP was informed by an 18-month mangrove ecosystem field assessment led by the Forestry Department. This field assessment is the most comprehensive nation-wide assessment of mangrove ecosystems and associated biodiversity for Jamaica. The information collected from the field assessment will serve as the baseline for future monitoring efforts incorporated into the NMMP. As of January 2021, critical elements of the NMMP, including mangrove data collection, on-ground assessments, stakeholder consultations, and consensus for locations for management and rehabilitation are underway. The NMMP is scheduled to be completed by June 2022, with initial drafts of the document anticipated by December 2021. The finalization of the NMMP will ideally overlap with the full development of this GEF project, providing critical stakeholder engagement opportunities

across both initiatives and informing this full project development. The NMMP will serve as the main science-based advisory document to guide the Government of Jamaica on mangrove ecosystem management. The NMMP will build on several important existing legislation, management plans, past reports, and draft government documents, each of which have some aspect that directly or indirectly relates to mangrove management. These key documents are presented in the following table (Table 1):

Document Name	Organization	Document Type
Vision 2030 Jamaica National Development Plan	GoJ	National Development Plan
Forest Policy of Jamaica (2017)	Forestry Department	Policy
Forest Act (1996) and Forest Regulations (2001)	Forestry Department	Legislation
National Forest Management and Conservation Plan (2016 ? 2026) (NFMCP)	Forestry Department	Management Plan
Natural Resources Conservation Authority (NRCA) Act (1991), which oversees: i) Wildlife Protection Act; ii) Beach Control Act; iii) Watersheds Protection Act, and; iv) Endangered Species (Protection, Conservation and Regulation of Trade) Act	NRCA / NEPA	Legislation
Protected Areas System Master Plan (2013 ? 2017)	NEPA	Management Plan
Mangrove Ecosystem Services Assessment Report & Manual (2019)	NEPA	Assessment/report
Additional Documents		
a) National Biodiversity Strategy and Action Plan (2016 ? 2021)	NEPA	Management Plan
b) Fisheries Act (2018)	National Fisheries Authority	Legislation
c) Master Plan for Sustainable Tourism Development (2002)	Ministry of Tourism (MOT)	Development Plan
d) National Coastal Management and Beach Restoration Guidelines (2017)	NEPA	Guidelines

Table 1: Key documents informing development of the National Mangrove Management Plan (NMMP)

Forest Act (1996) and Forest Policy for Jamaica (2017)

The Forest Policy of Jamaica (2017) builds on the 1996 Forest Act, which is the primary legislation that governs the management of forests in Jamaica. The Forest Act established the Forestry Department as the lead government entity responsible for the management of forests located on Crown lands. The goal of the Forestry Department is to *“Manage and conserve the forest resources of Jamaica for the benefit of present and future generations?”*. The law mandated the Forestry Department to establish rules on directing and controlling the exploitation of forest resources, promoting reforestation, conducting research, developing and implementing public education and awareness programmes, and developing recreational initiatives in forests. The Government of Jamaica, as part of its Public Sector Modernization Programme, transformed the Forestry Department in 2010 into an Executive Agency thereby making it subject to the 2002 Executive Agencies Act. As an Executive Agency, the Forestry Department is required to deliver its services in a more efficient and effective manner to its clients, and to increase its contribution to national economic and development goals. The Forestry Department is required to maintain forest cover at not less than 40% of the country’s land mass. Its ability to achieve this goal is contingent on the allocation of financial resources from the Central Government as well as other sources of funding. The Forest Act established forested Crown lands under two gazette mechanisms - as Forest Reserves or as Forest Management Areas.

The Forestry Department manages forests on Crown lands in Jamaica, totaling approximately 116,862 hectares of land of which includes 99,504 ha are designated as Forest Reserves, with the remaining 17,357.99 ha not yet declared under the Act. The remaining forest lands are under private ownership with no comprehensive legislative framework to govern their protection. The vision of the Forest Policy of Jamaica (2017) is, *“By 2062, Jamaica’s forests and its biodiversity are sufficiently restored and sustainably managed, so once again the island can adequately be described as “the land of wood and water”, capable of meeting the social, economic and ecological needs of current and future generations.”* The Forest Policy of Jamaica is to be achieved through the implementation of three goals: Goal 1: Improved governance arrangements in relation to the management of the island’s forests; Goal 2: Increased forest ecological system conservation and protection, and Goal 3): Incorporation of socio-economic considerations into forest conservation and preservation

The Forest Policy of Jamaica addresses the activities that are deemed crucial to the maintenance of a vibrant forestry sector. These include, but are not limited to, the need for: i) the development of forest management plans; ii) mechanisms governing forest management data collection; iii) the demarcation of jurisdictional boundaries; and iv) the regulation of (1) activities on Crown and privately owned lands, (2) the forest sector, and (3) forest-based industries. Forests owned by the State or privately held can be imbued with a legislatively prescribed layer of protection under the Forest Act 1996 as (i) Forest Reserves, (ii) Forest Management Areas, and (iii) Protected Areas. Forested Crown lands have been gazetted as Forest Reserves and Forest Management Areas under the Forest Act, National Parks and

Protected Areas under the Natural Resources Conservation Authority Act 1991 and Game Sanctuaries under the Wildlife Protection Act 1945. The multiplicity of different classifications raises the possibility of uncertainty in relation to management goals, responsibilities, and permitted activities. The classification of the permitted uses for forest reserves versus forest management areas will be streamlined as follows:

Forest Reserves - forests which may only be utilized for the following purposes:

- ? Conservation of natural forests and biodiversity;
- ? Use for highly regulated eco-tourism and recreational activities; and
- ? Scientific research including research on sustainable management of forest resources.
- ? Sustainable management of forest resources

Forest Management Areas

Forests which may be utilized for the following purposes:

- ? Economic development of forest products on plantations for extraction or timber production;
- ? Generation of non-timber forest products;
- ? The preservation of landscape diversity including forests on steep slopes;
- ? The promotion of agro-forestry;
- ? Sustainable management of mangrove forests;
- ? Conservation of soil and water resources;
- ? Management of urban forests for the use of the public;
- ? Development of nature tourism and recreational amenities; and
- ? Extraction on a case by case basis of minerals under strict permit conditions

Building on the Forest Reserves and Forest Management Areas protection status mechanisms under the Forest Act, the Forest Policy of Jamaica aims to streamline the permitted uses for forest reserves versus forest management areas. This required that some areas currently gazetted as Forest Reserves are re-

designated as Forest Management Areas. With the updated forestry policies also came the removal of the designation of Protected Areas under section 23 of the Forest Act to reduce the likelihood of confusion with the more generic definition of protected areas adopted under the Protected Areas System Master Plan.

The Policy also addresses the activities that are deemed crucial to the maintenance of a vibrant forestry sector. These include but is not limited to the need for the development of forest management plans; mechanisms governing forest management data collection; the demarcation of jurisdictional boundaries; the regulation of (1) activities on Crown and privately-owned lands, (2) the forest sector, and (3) forest-based industries. Although the Forestry Department is the State Agency with the mandate to manage forests in Jamaica, it currently has limited jurisdiction over privately held land with forest cover. Given that the private interests own two-thirds of the forested lands in the country, it is clear that the mandate of the Forestry Department must be expanded to facilitate the regulation of these lands. In this regard, the new Forest Policy provides the basis on which necessary changes to the legislative and management framework can be instituted. The expansion of the Agency's jurisdiction over the remaining closed broad leaf forest, which is approximately 7.7% of Jamaica's land mass, in trust for the people of Jamaica.

Recognition and support of the role played by members of the public and private sectors, Non-government organizations, community-based organizations, Local Forest Management Committees (LFMCs) and special interest groups in the management of the island's forests, is also captured in the Policy. The need for transparent and collaborative approaches is one of the underpinning recommendations made to ensure continued sustainable management of Jamaica's forests. In the final segment of the Policy, fulsome attention is paid to the roles and responsibilities of each identified stakeholder. A Local Forest Management Committee (LFMC) is the institutional body created in watersheds management units to enable the participation of the communities in the co-management of forested areas (specifically those managed by the Forestry Department. The formation of Local Forest Management Committees (LFMCs) was established in the Forest Act and is an integral component of the Forestry Department's community participation strategy.

The preservation and where possible, expansion of Jamaica's forest cover benefits not only local and regional interests, but as is recognized in the various Treaties and Conventions signed by the Government of Jamaica, their retention has far-reaching implications on a global level. As one of the countries projected to be severely impacted by the effects of climate change, Jamaica has a vested interest in investing in the forestry sector which can contribute to the country's efforts to mitigate and / or adapt to the effects of climate change. This Policy focuses in many respects on the direct and indirect benefits to be derived from the sustainable management of the island's forest resources and outlines particular areas of intervention which require regulation or oversight at the national level.

National Forest Management and Conservation Plan 2016 - 2026

The Agency's National Forest Management and Conservation Plan (NFMCP) outlines the manner in which the GoJ will conduct activities to protect and manage the forests in Jamaica. The NFMCP was prepared to promote and improve the conservation and sustainable use of the forest resources of the country, to meet local and national needs by protecting, managing and restoring the resource for the benefit of present and future generations. The NFMCP provides a framework geared towards reducing rates of deforestation and addressing forest restoration as well as providing for the sustainable use of wood generated from forest plantations.

The NFMCP 2016-2026 was developed to ensure alignment to various key national policies geared at achieving national sustainable development objectives. In addition, its development comes against the background of Jamaica's international obligations for which the Forestry Sector plays a significant role, including the Vision 2030 Jamaica - National Development Plan, UN Sustainable Development Goals (SDG), United Nations Forum on Forests (UNFF), United Nations Framework Convention on Climate Change (UNFCCC), United Nations Convention on Biological Diversity (UNCBD), United Nations Ramsar Convention, and UNESCO World Heritage Sites.

The NFMCP forms part of the policy tools that guide the work of the Forestry Department and as such its vision statement is the same as presented in the Forest Policy for Jamaica 2017. Guided by its planning processes, the obligations under the UNFF and Vision 2030 Jamaica - National Development Plan, the Forestry Department has articulated the goal of NFMCP as, *"Sustainably manage and utilize Jamaica's forest resources to enhance social and economic development and contribute to building the country's climate resilience."* The NFMCP is achieving this goal through four Strategic Forest Management and Conservation Objectives (SOs):

1. **SO1:** Reverse forest degradation, deforestation and the loss of forest biodiversity, through conservation and sustainable forest management, as well as strengthening the legislative, policy and institutional framework of the sector.
2. **SO2:** Enhance economic, social and environmental benefits of forests through the sustainable utilization of forest resources.
3. **SO3:** Build the capacity within the Forestry Department, its partners and forest communities to manage, protect and conserve the forest resources.

4. **SO4:** Increase public education and awareness to protect, conserve, restore and manage Jamaica's forests.

The NFMCP builds on the 2010-2015 Strategic Forest Management Plan (SFMP) which sets targets by which the Agency's performance in relation to its management of Jamaica's state-owned forests is measured. Both the NFMCP and the SFMP provide a strategic framework for the implementation of the Forest Policy of Jamaica and continue to provide the basis for action by the Agency. The SFMP seeks to ensure implementation of Vision 2030 and includes a number of objectives and indicators including:

- ? Building the Forestry Department as an efficient and effective service delivery organization;
- ? Increasing participation of the private sector, community-based organizations, and non-government organizations in the sustainable management and conservation of Jamaica's forests;
- ? Increasing the level of public awareness regarding all issues related to forestry;
- ? Developing and implementing forest management plans; and
- ? Maintaining and restoring forest cover.

The NFMCP has incorporated in its actions plans to conduct research and manage mangrove habitats and restore mangrove forest cover. The present urgency of conserving and protecting Jamaica's mangrove forests, while now at a critical juncture due to the high biodiversity they support and their escalated rate of destruction, can also be linked directly to promoting the achievement of commitments made at both the national and international levels as it relates to the Sustainable Development Goals (SDG), our Voluntary National Contributions (VNC) and the Aichi Biodiversity Targets. The Aichi Biodiversity Targets 5 and 11 speak to reducing the pressure on biodiversity by reducing the loss of critical habitats by at least half and protecting at least 10% of Coastal and Marine Areas by the year 2020 respectively. There are also SDGs that are directly addressed by mangrove conservation but the main one in our national context is SDG#15.5 which speaks to the important link between reducing the loss of critical habits in a bid to halt the loss of biodiversity. The link between the protection critical habitats in a bid to maintain the high levels of biodiversity they support has been recognised at both the national and international levels.

Lastly, the NFMCP established important management mechanisms that the NMMP, and this the project, will rely on for successful implementation. To start, the project aims to leverage the establishment of the Collaborative Implementation Framework, an inter-sectoral working group

supporting the Forestry Department coordinating management of forest resources. The inter-sectoral composition of the Collaborative Implementation Framework consists of other government agencies, including National Environment & Planning Agency, Ministry of Economic Growth and Job Creation, University of West Indies Mona, National Land Agency, Jamaica National Heritage Trust, , and Meteorological Service of Jamaica. The project will also leverage the important NFMCP mechanism of Co-operative Management Agreements between Forestry and local NGO that detail joint management of key terrestrial and marine habitats in Jamaica.

Natural Resources Conservation Authority (NRCA) Act

The Natural Resources Conservation Authority (NRCA) Act is the main legislation for the protection of Jamaica's environment. The NRCA also oversees the Wild Life Protection Act, the Beach Control Act, the Watersheds Protection Act and the Endangered Species (Protection, Conservation and Regulation of Trade) Act. Implementation of the NRCA is led by the National Environment and Planning Agency (NEPA). The NRCA has been advised by several guidelines over the years for coastal management interventions and beach restoration. The NRCA Guidelines for the Planning, Construction and Maintenance of Facilities for Enhancement and Protection of Shorelines (1995); and the Draft Guidelines for the Relocation and Restoration of Jamaica's Coastal Resources: Corals, Seagrasses & Mangroves, A Guide for Developers (2010). More recently, the National Coastal Management and Beach Restoration Guidelines (2017) has also provided guidelines on the preservation of beaches, wetlands and beaches and coastal area (including mangrove wetland areas) restoration recommendations. The NRCA embraces a "no net loss" approach towards mangrove habitat management, with a specific focus on tree species and not the broader biodiversity within mangrove ecosystems. This no net loss approach has translated into a system where developers clear cutting mangrove land often opt to pay for mangrove replanting efforts in areas that are not conducive to replanting and lead to high mangrove seeding mortality.

2019 World Bank/NEPA Mangrove Ecosystem Services Assessment

The Program on Forests (PROFOR) funded "Assessment and Economic Valuation of Coastal Protection Services Provided by Mangroves in Jamaica" and accompanying "Mangroves Monitoring and Evaluation Manual for Jamaica" are the result of World Bank technical work started in 2017 at the request of the Government of Jamaica through the National Environment and Planning Agency (NEPA) and the Office of Disaster Preparedness and Emergency Management (ODPEM). The mangrove ecosystem service assessment and manual examined the current status and risks to mangrove habitats in Jamaica, identified and assessed ecosystem services - especially coastal protection - and looked at the costs and benefits of mangrove conservation. National level assessments on the coastal

protection provided by mangroves in Jamaica was carried out by a team from University of California Santa Cruz (UCSC), Instituto de Hidráulica Ambiental de la Universidad de Cantabria, and The Nature Conservancy (TNC).

As part of the assessment, mangrove ecosystem services valuation was conducted at three sites in Jamaica: 1) Bogue Lagoon (Montego Bay, St. James); 2) Salt Marsh (Falmouth, Trelawny), and; 3) Portland Cottage (Portland Bight, Clarendon). The assessments were led by a team from the UWI Mona for ecological, physical and socio-economic factors. The costs of mangrove restoration vary greatly due to many different factors, but in the wider Caribbean range from about US\$ 14,000 to US\$ 45,000 per hectare. Recent mangrove restoration projects in Jamaica had an average cost of US\$ 63,000 and US\$ 250,000 per hectare, which included the very high cost of barriers for solid waste management that other regional estimates did not. Mangrove restoration in Jamaica, and globally, is much cheaper than coastal protection structures. Of the multiple ecosystem services mangrove habitats provide, the assessment found that economically valuable role of Jamaican mangrove habitats provide towards fisheries, erosion control, ecotourism, carbon sequestration, and disaster risk reduction from tropical cyclones and flooding. The report demonstrates the tangible impact mangrove habitat conservation can have on poverty reduction.

Mangroves are particularly effective as nursery grounds for juveniles of species that later move offshore or to adjacent habitats such as coral reefs. Using a global estimate of US\$213 per hectare per year for mixed species fisheries, the estimated annual economic contribution of mangroves for Portland Cottage, Bogue Lagoon and Salt Marsh was US\$ 54,145, US\$ 14,101 and US\$ 5,218 respectively. There is also potential economic benefits from the development of a local-based, high-end recreational fishery focused on catch and release based on species associated with mangroves.

Using global estimates, the value of annual carbon sequestration for Jamaica is US\$ 179.9 million with Net Present Values (NPV) calculated for a 100-year time span, showing estimated values for keeping carbon sequestered at US\$ 17.8 billion. It should be noted that carbon value estimates are influenced by the choice of discount rate and represent the avoided costs to society of not releasing this stored carbon to the atmosphere.

Jamaica faces substantial flood risk from coastal storms and mangroves provide considerable flood risk reduction benefits. Annually, the value of Jamaica's mangrove forests for flood risk reduction to the nation's built capital is more than US\$2,500 per hectare per year. During these storms, mangrove forests protect 177,000 people, and nearly US\$ 2.4 billion or 50% of the total affected population and built capital. This translates to economic benefits of more than US\$186 million per hectare of

mangroves and represents a nearly 24% annual reduction in flood risk. The loss of Jamaica's mangroves would further result in a 10% increase in the total number of people flooded every year.

Mangrove benefits are most apparent for higher intensity storms events. The risk reduction benefits against tropical cyclones from mangrove forests can be significantly higher in more populated areas. For example, in Kingston's Hunts Bay, the average annual value exceeds US\$5,000 per hectare per year, which translates to avoided damages of more than US\$ 30 million in a one in 100-year storm. In general, mangroves reduce flooding extents and heights across all storm frequencies but are particularly important for the areas of Black River, Falmouth and the parish of Westmoreland. In other sites where mangroves are more coast aligned, the reduction of the flood height is less evident, with an average reduction of about 0.5 to 1 meter for the 50-year return period. Damages over built capital can be separated into different stock categories - residential, industrial and service. The annual protection offered by mangroves translates into a protection of US\$ 16.6 million over residential stock (50% of total stock protected), US\$ 4.5 million over industrial facilities (14% of total stock protected) and US\$ 11.4 million protection over services stock (35% of total stock).

Non-government baseline initiatives:

University of the West Indies

The University of the West Indies campus at Mona, Jamaica (UWI Mona) is the lead academic research institution for mangroves habitats in Jamaica. The majority of mangrove habitat research and conservation is led through the Centre for Marine Sciences (CMS) and the Port Royal Marine Laboratory. These UWI Mona facilities and faculty are also often engaged in environmental impact assessments related to development projects in mangrove habitats. Additional mangrove habitat restoration activities linked to improved social outcomes have been promoted by the UWI Solutions for Developing Countries (UWI SODECO).

CMS brings together marine scientists, based in diverse departments, as a multi-disciplinary group, able to work together on the complex environmental and social issues related to the development of coastal and marine resources. CMS conducts and facilitates research in the marine environment of Jamaica and the wider Caribbean, exploring the presence and status of coastal and marine species and resources while providing sound environmental advice to governments and non-governmental organizations. In an attempt to get island-wide coverage of marine and coastal issues, the Centre conducts research at new locations while continuing to monitor known sites using a balance of pure and

applied research. CMS has been an active partner in nearly all mangrove research in Jamaica, including the recent 2019 World Bank mangrove ecosystem services valuation report.

The UWI Port Royal Marine Laboratory maintains an active mangrove nursery that has supported multiple mangrove forest rehabilitation projects in Jamaica. One recent example includes the ongoing shore stabilization of the Palisadoes Road shoreline by the National Works Agency (NWA). Starting in 2015, the Port Royal Marine Laboratory raised and planting of over 5,000 mangrove saplings from its mangrove nursery to stabilize a coastal road. This restoration project offsets over 4,000 m² of mangrove forests that were removed during the construction of a harbor side roadway. The newly added mangrove seedlings have been outfitted with fencing to protect from the significant barrage of solid waste in Kingston Harbour. It is anticipated that the mangrove forests and associated ecosystems will be successfully restored and that this will benefit all stakeholders.

The University of the West Indies Solutions for Developing Countries (UWI SODECO) is a trans-discipline research entity pursuing solutions to medical and broader socio-economic problems affecting small and developing countries. UWI SODECO's Solutions for Society (SFS) programme is oriented towards solving socioeconomic problems and increase environmental resilience in line with the United Nations Sustainable Goals (SDGs). UWI SODECO SFS is currently focusing on rehabilitating and protecting coastal forests, especially mangrove habitats, that contribute greatly resilience to climate change as well as preservation and enhancement of livelihoods of individuals and communities. This includes recent mangrove restoration projects in Boggy Pond, Peake Bay, Clarendon, and Carlise Bay. UWI SODECO has just initiated the 'Blue Carbon Restoration in Southern Clarendon' project in partnership with the Inter-American Development Bank (IDB) that is designed to restore more than 1,000 hectares of degraded mangrove forests in Clarendon Parish, including working with private sector actors that include land owned by a sugar company. Additional opportunities to work with private landowners in mangrove ecosystem restoration will be explored further during the PPG phase.

Caribbean Coastal Area Management Foundation

The Caribbean Coastal Area Management Foundation (C-CAM) was established in 1997 to promote coastal conservation and sustainable development of the Portland Bight Protected Area (PBPA) along Jamaica's south coast in St Catherine and Clarendon Parish. At 187,615 ha the PBPA is by far the largest protected area in Jamaica. Its land area of 51,975 ha comprises nearly 5% of the island of Jamaica, and its 135,640 ha of marine area is a significant part of Jamaica's shallow shelf. More than half of the land area of the PBPA is in its natural state, with 21,025 ha of dry limestone forests, 8,200 ha of wetlands, and the remaining area cultivated for sugar cane or human settlement. About 50,000 persons live within the boundaries of the PBPA in about forty-four (44) residential communities. Of the

approx. 16,000 fishers in Jamaica, about 4,000 (about 25%) are based in the coastal communities of the PBPA, the highest concentration in Jamaica. The vast majority of the households in the PBPA fall at or below the poverty line. With substantial marine and terrestrial areas, hosting industry, commerce and human settlements in close proximity to wilderness ecosystems, the PBPA is a microcosm of an island state in urgent need of sustainable development.

C-CAM has successfully led multiple initiatives to ensure sound management of the PBPA. These include programmes related to biodiversity conservation (including the endemic Jamaican Iguana), climate change adaptation, fisheries management, and forest, wetland, and watershed management. This includes promoting sustainable use of forest resources, including the mangroves that fringe most of the PBPA coastline. C-CAM is directly working with local communities to address issues affecting the PBPA's forests including badly sited woodcutting, bush fires, and the establishment and expansion of rock quarries that can lead to long-term problems such as flash flooding and destruction of habitats for rare and endemic plants and animals. C-CAM is a strong proponent of the view that sound management of forest resources involve the promotion of biodiversity conservation and sustainable use with the participation of stakeholders.

C-CAM is involved in several outside funded projects. With support from NEPA, C-CAM is promoting alternative livelihoods in Salt River and Mitchell Town communities of Clarendon by training boat owners and community persons to support growing ecotourism interests, moving them away from unsustainable income activities like fishing and charcoal burning. This includes support for necessary permits, licenses, certification, training, insurance, retrofitting of boats and purchase of appropriate gear. The ecotours will be operated under CCAM Eco Tours. This project aims to improve PBPA ecosystem resilience while also supporting climate change adaptation and disaster risk reduction.

In 2018, C-CAM, with support from Caribbean Community Climate Change Center (CCCCC) and the German Development Bank (KfW), commissioned a preliminary status assessment of the coastal wetlands, primarily mangrove forest, and provide recommendations for priority management and restoration. The assessment supports C-CAM's overall climate change adaption goals in the Portland Bight Protected Area, including implementation of local level adaption measures to reduce vulnerability and increase resilience to the impacts of climate change and human impacts in PBPA. The commissioned report is a starting point to identify areas of concern, evaluate issues of vulnerability, consider management options, and launch future restoration projects that promote long-term sustainability and climate change resilience of the PBPA.

Additional Baselines

The Nature Conservancy (TNC) Jamaica, through its *Resilient Islands Initiative* is promoting ecosystem-based adaptation with local communities in Jamaica. *Resilient Islands* is a four-year initiative (2017-2021) to protect islands against the impacts of climate change by promoting the use of coastal habitats to reduce risks, and by helping governments, partners and communities implement sustainable development plans that prioritize nature. The Nature Conservancy and the International Federation of the Red Cross and Red Crescent Societies (IFRC) will work with communities and agencies to design innovative tools, train leaders, and implement demonstration projects within vulnerable coastal communities in the Dominican Republic, Grenada, and Jamaica. This project is part of the International Climate Initiative (IKI) and supported by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). In Jamaica, the project is working with the Jamaican Ministry of Economic Growth and Job Creation to align activities with the National Development Plan for Jamaica: Vision 2030 (2009), which includes a National Outcome of 'Hazard Risk Reduction and Adaptation to Climate Change'. In 2019, the project conducted vulnerability assessments using the Vulnerability Capacity Assessment (VCA) and Strategic Targeting Methodology (STM) to identify vulnerable communities, the hazards they face, potential nature-based actions to reduce risks, and develop community action plans. Additionally, the initiative also developed a pipeline of ecosystem-based adaptation (EBA) projects for select coastal communities. Moving forward through 2021, the project aims to implement nature-based projects at select sites to demonstrate how key natural resources, such as coral reefs and wetlands, are critical to meet development needs by providing sustainable food sources, economic development and physical protection from flooding and erosion.

The project will also build on technical mangrove baseline activities by FAO through its Sustainable Forest Management (SFM) Toolbox^[2]. The SFM Toolbox provides tools, case studies, e-learning opportunities, and other guidance on restoration and management of forested landscapes, including mangrove ecosystems. Additionally, the project will leverage specific FAO silviculture expertise supporting restoration and management activities for NMMP implementation.

3) Proposed alternative scenario with brief description of expected outcomes and components of the project;

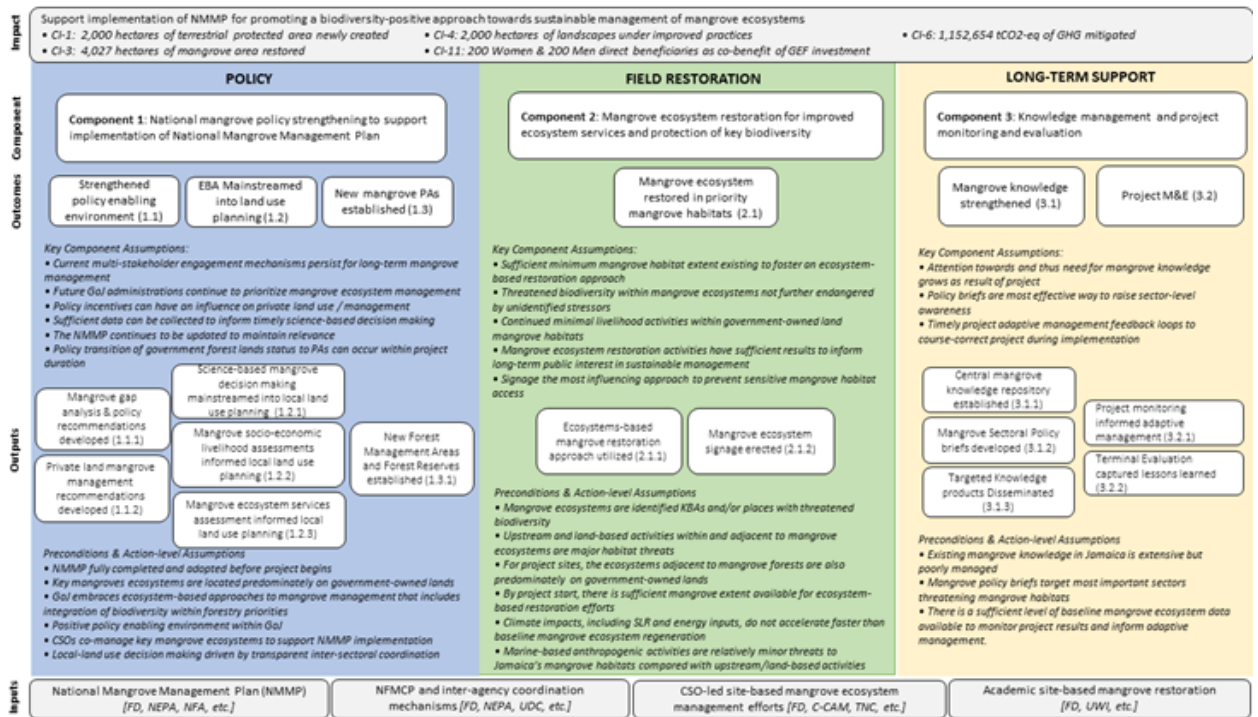


Figure1: Project Theory of Change

Figure 1:

The overall objective of the project is to support the government of Jamaica with the implementation of the National Mangrove Management Plan (NMMP) to promote a biodiversity-positive approach towards sustainable management of mangrove habitats. The project will achieve this objective through three project components that collectively are designed to address the direct drivers of mangrove ecosystem degradation and threatening important biodiversity. The project's design follows a logical theory of change that aims to address the main identified threats to mangrove habitats and associated biodiversity, including an incomplete mangrove policy environment, immediate mangrove forest degradation and associated threats to biodiversity due to a larger decline in ecosystem health, and a lack of mangrove knowledge to inform sound local and national decision making. The first project component is focused on supporting national mangrove policy strengthening to support implementation of NMMP, thereby addressing the current policy gaps that are allowing development in mangrove and adjacent ecosystems to continue unmanaged. The second project component is supporting the immediate need for on-ground restoration of mangrove ecosystems for an improved flow of ecosystem services and protection of important biodiversity. These two technical components are supported by a third project component targeting project knowledge management and project monitoring and

evaluation. Collectively, the theory of change aims to improve the management of at least 8,000 ha of mangrove ecosystem, as reflected by at least five GEF Core Indicators.

The project is designed on a Theory of Change (see Figure 1 and Annex D) that makes several key assumptions. To start, the proposed project design assumes the NMMP will be fully completed and adopted by the time the project begins to ensure the policy and field restoration activities are guided following national priorities. Currently, the NMMP is progressing significantly, with required field data collection completed, and stakeholder discussions and engagement underway with a completion date no later than June 2022. This timing allows the NMMP to be drafted concurrently with this project's full development both led by the Forestry Department, leading to direct coordination and refinement of project activities. Another key assumption of the project's design includes the role of private landowners in mangrove management. With only a small fraction of Jamaica's coastline home to mangroves ecosystems, the Forestry Department's initial analysis shows that the majority of mangrove ecosystems are located on government-owned land. The project will simultaneously focus on government owned and managed lands through declaration of new protected areas, as well as work at the national and local level to better integrate mangrove science into land-use decision making. Engaging with private landowners is a core part of the project's design through assessing baseline ownership, drafting policy recommendations and assessments to identify the best long-term opportunities to work with private landowners to become better stewards of mangrove ecosystems. One final key assumption of the project is the role mangrove data can serve to inform decision making. The project assumes that mangrove ecosystems and associated key biodiversity can be collected and synthesized in a timely manner so that it can inform local land use decision making as well as key project reports for broader sectoral and multi-sectoral knowledge dissemination. While mangrove science research is a growing field, there is still much to learn, and the project will make use of valuable knowledge, resources, and skills from critical project partners that include the University of the West Indies and local CSOs who support with site-level co-management of many critical mangrove ecosystems. Additional project design assumptions and project preconditions are noted in Annex D.

The project will strengthen the National Mangroves Management Plan (NMMP) by mainstreaming the mangrove ecology science approach, aimed to promote ecosystem restoration and biodiversity conservation. Outputs 1.2.2 and 1.2.3 (socio-economic and ecosystem services science), and 3.1.1 and 3.1.2 (knowledge repository and mangrove policy briefs) will apply the same focus. A participatory process will take place. Emergent recommendations will be critical to raise the importance of mangroves ecosystem restoration and biodiversity conservation within the Collaborative Implementation Framework, and dissemination of this mangrove knowledge among government agencies and non-government stakeholders.

Component 1: National mangrove policy strengthening to support implementation of National Mangrove Management Plan

The first project component will achieve the outcome of a strengthened policy enabling environment for successful implementation of the NMMP (Outcome 1.1) through two expected project outputs. The first project output (Output 1.1.1) will include policy recommendations in the NMMP to improve the protection status of mangrove habitats. This output will yield at least one legislative gap analysis and policy recommendations report. Additionally, because many mangrove habitats in Jamaica are on private lands, a second output (Output 1.1.2) will assess baseline land ownership of mangroves on private lands inform different pathways for mangrove management, positive incentives and policy recommendations as a key complement to the overall implementation of the NMMP.

A second outcome (Outcome 1.2) supports mainstreaming mangrove ecosystem-based management, with emphasis in resource users and livelihoods, into existing land use planning processes. This outcome will be achieved through a first output (Output 1.2.1) that leverages the Collaborative Implementation Framework of the existing NFMCP to enhance inter-sectoral promotion of mangrove ecology science for inclusive land use planning. Mangrove ecology science is understood in Jamaica as the holistic ecosystem-based approach towards habitat restoration and improved ecosystem resilience by focusing on the addressing the underlying biophysical landscape that encourages an improved enabling environment to allow more successful mangrove forests repopulation in degraded areas and increase habitats for biodiversity. This idea will build on the Ecosystem Approach as understood by the CBD: The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Application of the ecosystem approach will help to reach a balance of the three objectives of the Convention. It is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the essential processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of ecosystems (Ecosystem Approach (cbd.int)). This output will measure impact by targeting Collaborative Implementation Framework meetings that employ inclusive and science-based planning tools and processes. The outcome will serve as the main national decision-making venue for the dissemination of mangrove science. The science will initially be advised by the NMMP, and by an output (Output 1.2.2) where socio-economic livelihood assessments will be conducted in at least three priority sites to inform local land use decision making. Potential sites include Morant Bay in St. Thomas Parish, Falmouth in Trelawny Parish, and Port Royal in St Andrew Parish. The socio-economic livelihood assessments will include a focus on the role of woman in mangrove habitats and promoting existing Jamaican national gender policies and plans. The socio-economic assessments will also identify local linkages between site specific mangrove ecosystems and local fisheries and other natural resource users. A third output (Output 1.2.3) supports implementation of the World Bank mangrove ecosystem services valuation manual by conducting mangrove ecosystem services assessments in at least two priority sites to inform land use decision making, anticipated to overlap with the socio-economic livelihood assessments (Output 1.2.2). This output will stress economic valuation of key mangrove habitat biodiversity and yield at least two ecosystem services assessments reports. Collaborative Implementation Framework meetings supported by Output 1.2.1 will also be informed by additional knowledge products generated by the project, including the specific deliverables from Output 3.1.1 and Output 3.1.2 (knowledge repository and mangrove policy briefs). This outcome

supports GEF Core Indicator 4.1 by targeting at least 7,600 hectares of mangrove landscape under improved management to benefit biodiversity by the end of the project. A major goal for this outcome is to amplify the multiple and site-specific ways mangrove ecosystems support local communities and ensure these important but often marginalized stakeholder perspectives are part of local land use planning processes. This includes a particular focus on mangrove ecosystems and artisanal, recreational, and commercial fisheries and other marine nature resource users, as well as considerations on potential negative impacts of mangrove conservation on loss income and affected economic livelihoods. A stakeholder driven approach will be used in combination with safeguard policies to ensure all important local community perspectives and concerns are addressed and integrated into appropriate local and national management processes.

A third project outcome (Outcome 1.3) is entirely focused on establishing new mangrove protected areas. This will be accomplished by Output 1.3.1 that will support the government in declaring government owned mangrove habitats as Forest Management Areas and/or Forest Reserves. This outcome supports Core Indicator 1.1 by targeting approximately 2,000 hectares of newly created terrestrial protected area.

Component 2: Mangrove ecosystem restoration for improved ecosystem services and protection of key biodiversity

With an improved policy enabling environment under project component one, the second project component is focused on site-based mangrove ecosystem restoration to improve ecosystem services and protection of key biodiversity in at least three priority mangrove habitats. Given the limited available funding, this will be achieved through a single project outcome (Outcome 2.1) that is focused on restoring the health of priority mangrove ecosystems to improve associated biodiversity and mangrove ecosystem services, including support to marine ecosystems and fisheries. These site-based restoration activities are supported by an improved policy enabling environment and mangrove ecosystem services for local communities under the first project component. The first output of Component 2 (Output 2.1.1) is addressing the direct drivers of mangrove habitat degradation. The site-specific restoration activities will follow an ecosystem-based approach, especially taking into account both threats and drives to the entire land and marine components of mangrove ecosystems as well as information on the importance of site specific mangrove ecosystems for provisioning of ecosystem services and supporting local livelihoods, such as fishing communities. Costs associated with an ecosystem-based restoration approach may vary considerable, but an estimated \$200 ? 500 per hectare will be available given the funding amount for the component.

The restoration outputs will be supported by a second output (Output 2.1.2) that will erect demarcation and biodiversity education signage in the priority mangrove habitats to raise awareness and enhance co-management with local communities. These restoration activities will operate within the existing Co-operative Management Agreements with local NGOs. For example, within the Portland Bight Protected Area (PBPA) that includes the proposed project Goat Island restoration site, the project will build on past Memorandum of Understanding between Forestry and Caribbean Coastal Area Management Foundation (C-CAM). As the potential project sites are finalized during the PPG phase, local NGOs will be engaged based on these existing Co-operative Management Agreements with Forestry. Further, While the focus of the project's targeted restoration interventions with limited funds are on key mangrove ecosystems on government-owned lands, opportunities to engage with private landowners in adjacent lands will be explored during the PPG phase and is part also the goal of the policy recommendations from Output 1.1.2.

The mangrove habitat restoration activities identified in this project component will be finalized through an inclusive stakeholder engagement process during the full project development. The site selection will prioritize mangrove habitats identified as KBAs and for protection of key endemic biodiversity including the Jamaican Iguana, Whistling Duck, American Crocodile, and commercially important aquatic species. The priority mangrove habitat sites that are initially being identified include: i) St. Andrew ? Palisades (190.76 Ha); ii) St. Thomas ? Morant Bay (1395.74 and Area 2 53.15 Ha); iii) Hanover ? Negril (1322.52 Ha); iv) Trelawny ? Falmouth (823.10 Ha), and; v) St. Catherine ? Goat Island (242 Ha). The Goat Island site within the Portland Bight Protected Area and the Hanover site in Negril are identified KBAs. These sites collectively support GEF Core Indicator 3.4: through the restoration of 4,027 hectares of mangrove habitat.

Component 3: Knowledge management and project monitoring and evaluation

The two technical project components are supported by a third project component aimed at knowledge management and project monitoring and evaluation. The first outcome (Outcome 3.1) of this component aims to improve management and dissemination and awareness of Jamaica mangrove ecosystems and biodiversity knowledge. This will be achieved by three outputs.

The first output (Output 3.1.1) will address the current unorganized nature of mangrove knowledge in Jamaica by establishing a central mangrove knowledge repository for Jamaica to house in a single and accessible location the growing number of knowledge projects such as government reports, white papers, scientific research papers, and other documents. This knowledge repository will be modeled after and closely coordinated with the similar Jamaica biodiversity clearinghouse mechanism (jamaicachm.org.jm) that is focused on Taxonomical, Ecological, Policy, Legislation & Regulations,

Scientific Assessments, Educational Resource Material, Publications, Images, Activities and Events, as well as an electronic newsletter. The mangrove knowledge repository will not serve as a primary management space for original mangrove ecosystem data that is already managed by Forestry Department with existing data management systems. Collaboration and sharing with similar regional knowledge management systems in the Caribbean will be ensured through the existing regional leadership of the University of West Indies that is based in Jamaica and spans 16 additional English speaking countries and territories in the Caribbean. Additional project knowledge coordination will also be supported by FAO through project co-financing as well as seeking further opportunities for the Forestry Department to engage on data and knowledge sharing throughout project execution.

A second output (Output 3.1.2) will develop and disseminate at least five policy briefs that are tailored to specific key sectors to raise awareness on the benefits of mangrove ecosystems. The five sectors are identified as government, non-government, an private sector stakeholders with actions that directly or indirectly impact mangrove habitats, including: 1) port and coastal infrastructure; 2) tourism; 3) climate change and environment; 4) waste management, and; 5) agriculture and fisheries. Each policy brief will also incorporate estimated valuation and costs of mangroves and mangrove ecosystem services, including the cost to the economy of losing mangroves due to the respective economic activities of within each policy brief. The policy briefs will additionally feature the important associated terrestrial and marine biodiversity, including specific identification of KBAs where possible, to the relevant targeted stakeholders. As possible, the policy briefs will also be informed by the socio-economic and ecosystem services assessments from Outcome 1.2.3 and 1.2.3, respectively.

Lastly, Output 3.1.3 will focus on a targeted knowledge dissemination of project knowledge documents, with a focus on the policy briefs from Output 3.1.2, but also to include the socio-economic and ecosystem services assessments from Outputs 1.2.2. and 1.2.3 as well as other relevant mangrove knowledge curated by the knowledge repository established by Output 3.1.1. The targeted knowledge dissemination will include awareness campaigns, consultations, and other modes to be further defined during the PPG phase. The main audience of the knowledge dissemination of Output 3.1.3 will be the key stakeholders identified in Output 3.1.2 as well as private landowners, bank/finance, and insurance sector actors.

A second project outcome (Outcome 3.2) will support the overall project with effective project management and evaluation to inform adaptive management. This will be achieved with a first output (Output 3.2.1) that established and implements a project-specific monitoring system, and a second output (Output 3.2.2) that supports an independent project terminal evaluation.

4) Alignment with GEF Focal Area Strategies;

GEF funding for this project is coming from Jamaica's Biodiversity STAR. The project is directly aligned to support the Government of Jamaica with meeting key priorities aligned with the Convention on Biological Diversity (CBD) through the GEF-7 Biodiversity Focal Area. More specifically, the project is aligned with three GEF-7 BD focal area objectives. Project Component 1 supporting the policy enabling environment for implementation of the NMMP is linked with BD 1-1: *Mainstream biodiversity across sectors as well as landscapes and seascapes through biodiversity mainstreaming in priority sectors* and BD 1-3: *Mainstream biodiversity across sectors as well as landscapes and seascapes through Natural Capital Assessment and Accounting*. Project Component 2, with a focus on restoration of targeted mangrove areas is aligned with BD 2.7: *Address direct drivers to protect habitats and species and Improve financial sustainability, effective management, and ecosystem coverage of the global protected area estate*. Collectively the project will yield results that support at least four GEF Core Indicators. This includes placing a total of 8,027 hectares of mangrove ecosystem restored or under new and improved management, including approximately 2,000 ha of newly created terrestrial protected areas that included mangroves (GEF Core Indicator 1), 4,027 hectares of mangroves restored in identified project sites (GEF Core Indicator 3), and 7,600 ha of mangrove landscape under improved management that benefits biodiversity (GEF Core Indicator 4), for an estimated total of 1,152,654 tCO₂-eq of avoided emissions (GEF Core Indicator 6). The project will also support gender equality through activities that will yield co-benefits to approximately 200 men and 200 women (GEF Core Indicator 11).

5) Incremental Cost Reasoning and expected contributions from the baseline, the GEFTF, and co-financing;

Mangrove habitats are among the most important ecosystems in Jamaica but currently receive the least amount of protection as the coastal ecosystem often falls under multiple and varying local and national management regimes. With an economy heavily reliant on healthy coastal ecosystems to support a booming tourism industry, the decline in mangrove habitats is not just a threat to important terrestrial and marine biodiversity, but also a major threat to Jamaica's national economy. Mangrove ecosystems are also an important source of economic livelihoods for local communities, especially fishing communities.

The current baseline scenario for mangrove ecosystem management in Jamaica is one of siloed and uncoordinated efforts by multiple government and non-government actors. These efforts are significantly undermined by outdated national policies that contain gaps and legal loopholes. The current development of the NMMP by the Forestry Department presents an important window of opportunity for leverage with GEF-7 Biodiversity Focal Area funding. Under a business as usual scenario, the NMMP will be completed but will join the growing list of management plans and

mangrove assessments without a cohesive plan for implementation on the ground. The NMMP will be further hampered by continued poor awareness of mangrove knowledge and the important roles of mangrove ecosystems for local Jamaican communities. Mangrove ecosystems will continue to be managed by their siloed components, with many biodiversity and local community issues falling through the policy gaps altogether. And perhaps most concerning, windows of opportunity to advance ecosystem-based management approaches are lost, which for an ecosystem that spans terrestrial and marine ecosystems and impacted by climate change, will only become increasingly complex. This GEF project takes advantage of this unique window to leverage the completion of the NMMP to promote a biodiversity-positive approach towards sustainable and integrated ecosystem-based management of mangrove ecosystems, and the local communities that directly and indirectly rely on them.

The proposed alternative scenario with GEF support follows a logical theory of change that directly addresses the main identified barriers and threats to mangrove habitats and associated biodiversity, including gaps in policy, site-specific drivers of mangrove ecosystem degradation, and low levels of mangrove ecosystem knowledge and awareness. More specifically, the incomplete mangrove policy environment is addressed through targeted interventions under project Component 1 that include strengthening the enabling environment for successful implementation of the NMMP. Immediate drivers of mangrove ecosystem degradation and associated threats to biodiversity and decline in ecosystem services are addressed through site-specific mangrove restoration efforts in project Component 2 that demonstrate ecosystem-based approaches that replace current and largely unsuccessful replanting efforts. Finally, the inconsistent and outdated mangrove knowledge to inform local and national decision making will be strengthened with targeted knowledge management efforts under Component 3 that aim to both improve current mangrove awareness and capture important knowledge generated by the project. These three project components have been carefully designed to ensure an ecosystem-based approach is taken toward mangrove ecosystem management through implementation of the NMMP. In doing so, local community perspectives will be prioritized, amplified, and captured with data to inform local land use planning and national management, thereby advancing vertical and horizontal integrated management approaches of mangrove ecosystems with unique management challenges that place value on terrestrial and marine ecosystem

Collectively the project is designed to have a direct and tangible impact for the conservation of mangrove ecosystems and associated biodiversity. This includes the restoration of 4,027 hectares of mangrove habitat, the establishment of at least 7,600 hectares of newly created terrestrial protected area, and an additional 2,000 hectares under improved management. The three project components will further serve as examples of integrated ecosystem-based management approaches by bringing together key government agencies for a coordinated and integrated implementation of the NMMP. In doing so, the project will have added benefits from the improvement of local community livelihoods and promotion of marginalized groups including women and children, as well as key stakeholders such as fisherfolk and other mangrove ecosystem resource users.

6) Global Environmental Benefits (GEFTF);

Mangrove forests in Jamaica are known to be important habitat for nationally and globally important terrestrial and marine biodiversity, including commercially important species that support Jamaica's food and economic security. The project has been designed to meet not only national priorities of Jamaica, but also to yield global environmental benefits aligned with the GEF Secretariat and the Convention on Biological Diversity. The project is specifically aligned with GEF-7 Biodiversity Focal Area objectives that promote specific global environmental benefits. The project will more specifically support: a) conservation of globally significant biodiversity, and; b) sustainable use of the components of globally significant biodiversity. This includes protection of mangrove habitats and associated ecosystems that host important species, including the Jamaican Iguana, Whistling Duck, American Crocodile, and several species of sea turtles. As documented in Table F, the project anticipates supporting at least 8,027 hectares of mangrove ecosystems. These include the restoration of 4,027 hectares of mangrove habitat (GEF core indicator 3), the establishment of at least 2,000 hectares of newly created terrestrial protected area (GEF core indicator 1), and an additional 7,600 hectares under improved management (GEF core indicator 4). As a direct benefit of the improved management of over 8,000 ha is an estimated avoided emission of 1,152,654 tCO₂-eq (GEF core indicator 6). The project also anticipates that at least 400 direct beneficiaries will be receiving co-benefits of the GEF investment, including at least 200 women and 200 men (GEF Core Indicator 11). Women are mostly involved in the processing and commercialization of crabs, fishes and other small crustaceans collected by men in the mangroves. The conservation and restoration of mangrove ecosystems will also anticipate yielding multiple additional benefits in other GEF focal areas, including carbon sequestration, and strengthened management of marine ecosystems following an integrated ecosystem-based approach. A gender livelihoods assessment will be conducted during the PPG with focus on gender-sensitive activities and participation of women in biodiversity-sensitive and livelihoods interventions.

7) Innovation, Sustainability and Potential for Scaling Up.

The project has been designed to ensure a sustained and long-term impact can be achieved, including the potential for an impact to be scaled after the project is completed. Further, the project has embraced innovative approaches that take advantage of the best available science, technology, and knowledge on mangrove habitat management.

Innovation: The project is taking advantage of several innovative approaches that build on the latest knowledge for mangrove habitat management. This specifically includes drawing from over a decade of lessons learned with mangrove restoration efforts in Jamaica. The project is embracing an ecosystem-based restoration approach, with a focus on restoring the baseline hydrological conditions

necessary for mangrove ecosystem recovery. Restoration efforts will also make use of local communities, especially incorporating and prioritizing knowledge generated from the socio-economic and ecosystem services assessments (Output 1.2.2 and 1.2.3) and knowledge captured under Component 3. The inclusion of these socio-economic and environmental factors lead towards an innovative approach that differs from traditional mangrove seedling replanting efforts that persist in Jamaica and are notorious for low survival rates and poor restoration results. The project also aims to find innovative policy solutions to mangrove management, including the particularly difficult task of identifying incentives for strengthened management of mangrove habitats on private land. Opportunities to expand on additional innovative approaches will be taken advantage where possible. This is made possible by the close working relationship the Government of Jamaica, including Forestry Department and NEPA have with world class research faculty, resources, and data at UWI Mona as well as technological support from FAO, such as inclusion of the Collect Earth tool to improve geospatial analysis.

Sustainability: The project has been designed to ensure its results can persist, and potentially grow, after the project concludes. Most critical to this approach is Jamaica's strong commitment to scientific research, both within government agencies like the Forestry Department as well as academic partners like the University of West Indies Mona and local NGOs. In addition to the project's specific knowledge deliverables from Output 1.2.2, 1.2.3, 3.1.2, and other project knowledge that will be housed in the newly established mangrove knowledge repository (Output 3.1.1), the country continues to be a leader in mangrove scientific research. After the project ends, science-based mangrove knowledge in Jamaica will continue to grow to inform mangrove ecosystem management not just in Jamaica. This science-based knowledge has also informed the project's design to ensure longer-term survival rates of mangroves species (as compared to traditional replanting efforts) by taking a more holistic ecosystem-based approach towards restoration of mangrove habitats. For example, the project's focus on the hydrology of mangrove habitats will promote improved ecosystem health, not just improving the likelihood of mangrove forests to thrive and repopulate degraded areas, but also promote important biodiversity. This holistic approach, when done correctly and well-managed, will lead to a much more resilient ecosystem. Further, the restored areas will also build on existing joint-management approaches with local NGOs that already work closely within their communities to educate and protect mangrove areas, thus serving as an important node for additional knowledge dissemination at the most local of levels. Moreover, the lessons and experiences from the project restoration efforts will inform future mangrove restoration efforts led by the Forestry Department under the new NMMP. The project will lastly ensure sustainability of project results through the important focus on filling national mangrove policy gaps that have emerged over time from indirect support to mangroves. Through Output 1.1.1 filling critical policy gaps, the policy enabling environment for the NMMP will improve its implementation success, leading to first ever dedicated management of Jamaica's mangroves ecosystems. And because the NMMP is an extension of the NFMCP and the many years of past experience with its ongoing implementation, the NMMP is poised to have immediate and long-term impacts for the sustainable management of Jamaica's mangroves.

Potential for Scaling Up: The project is focusing on leveraging immediate opportunities for Forestry Department to implement the NMMP, which provides a initial focus on improved mangrove habitat management on Crown lands identified under the Forest Act. With successful project results in strengthen mangrove policies and promoting science-based integrated land management practices, there will be many additional opportunities for the project to scale up these results to non-Crown lands after the project is over. This is especially true of improved management of mangrove habitats on private lands as a result of specific incentives identified under the activities of Output 1.1.2. Further, the improved knowledge base and associated awareness raising of mangrove habitat uses and mangrove habitat biodiversity will result in increased government and general public understanding of the importance of mangroves or not just environmental goals, but also social and economic development goals. Ideally this can include more educated decision making of private coastal developer meeting the strong demand for Jamaica's beach and ocean-based tourism.

[1] Donato, D. C., Kauffman, J. B., Murdiyarso, D., Kurnianto, S., Stidham, M. and Kanninen, M. (2011) *Mangroves among the most carbon-rich forests in the tropics?*, *Nature Geoscience*, 4(5), pp. 293-297

[2] <http://www.fao.org/sustainable-forest-management/toolbox/en/>

1b. Project Map and Coordinates

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

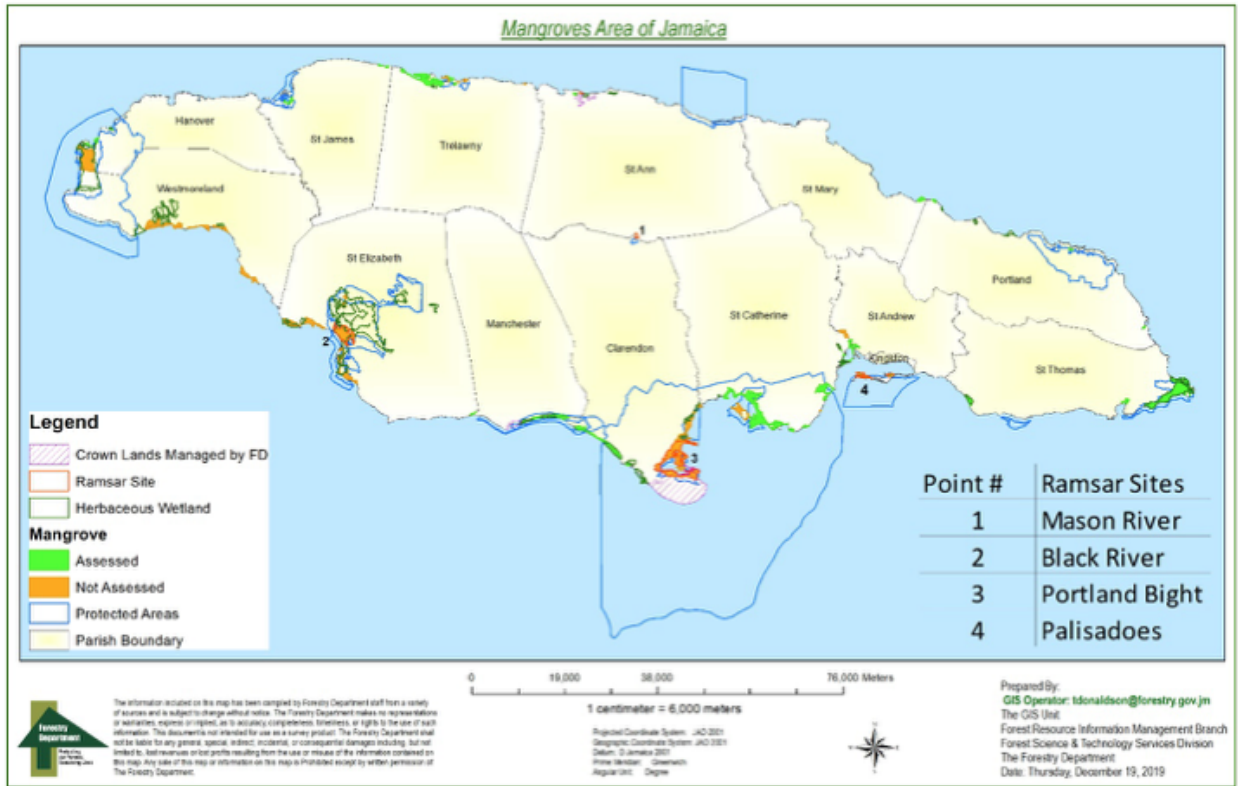


Figure 2: Map of Jamaica with mangrove forest locations and management and protected areas locations, including Crown Lands managed by the Forestry Department.

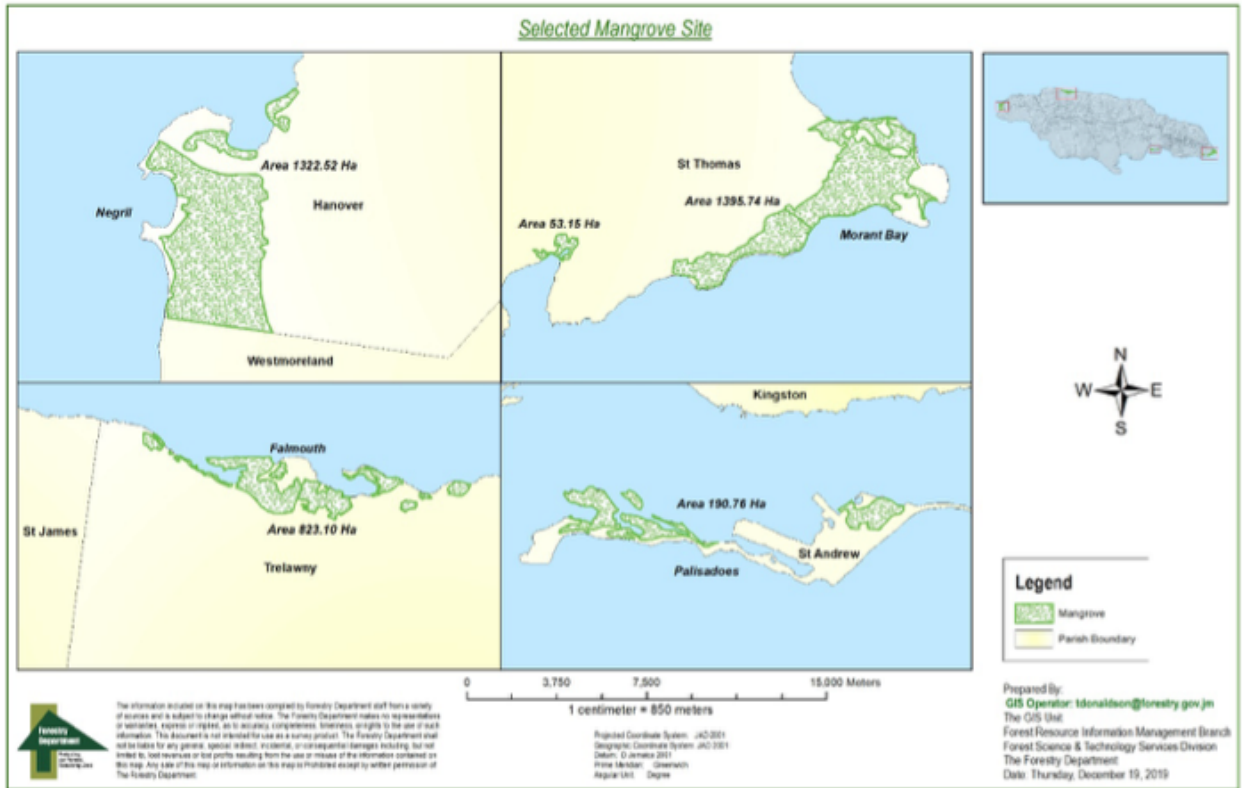


Figure 3: Potential project restoration site locations and surface area estimates

Approximate Geographic Coordinates Potential Project Restoration Sites:

Parish	Location Name	Area (Ha)	Latitude	Longitude
Hanover	Negril	1,322.52	18 19' 23" N	78 19' 25" W
St. Thomas Area	Morant Bay	1,395.74	17 55' 04" N	76 12' 24" W
St. Thomas Area	Area 2	53.15	17 53' 40" N	76 18' 56" W
Trelawny	Falmouth	823.1	18 29' 38" N	77 40' 25" W
St. Andrew	Palisades	190.76	17 56' 36" N	76 49' 39" W
St. Catherine	Goat Island	242.00	17 52' 38" N	77 03' 37" W

2. Stakeholders

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

Indigenous Peoples and Local Communities Yes

Civil Society Organizations Yes

Private Sector Entities Yes

If none of the above, please explain why:

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement

The project embraces the 2017 Guidelines for the Development of National Policies. The Guidelines provide a robust stakeholder engagement process, including a five-step process that prioritizes public participation. This includes: a) Inform; b) Consult; c) Involve; d) Collaborate, and; e) Empower. These Guidelines will serve particular importance during the development of policy recommendations under Outcome 1.1.

As the project aims to have an impact both at the national and local level, multiple different stakeholder groups have been and will continue to be engaged. Of these groups, local civil society organizations (CSO) play an important role in management of terrestrial and marine managed areas in Jamaica. For example, the Caribbean Coastal Area Management Foundation (C-CAM) promotes sustainable development and conservation of the natural environment in the Portland Bight Protected Area (PBPA) on behalf of the government. C-CAM is an instrumental partner connecting over 44 local communities in Clarendon Parish. C-CAM's approach to natural resources management is based on the maximum involvement of communities through co-management based on the best available scientific and social information. Similar CSO roles exist with the Alligator Head Foundation and the East Portland Special Fishery Conservation Area (also called the East Portland Fish Sanctuary) and the Montego Bay Marine Park Trust and three Marine Protected Areas (MPAs): the Montego Bay Marine Park, the Bogue Island Lagoon Special Fishery Conservation Area (Bogue Lagoon) and the Montego Bay Marine Park Special Fishery Conservation Area (Airport Point). These areas encompass over 15 square kilometers of mixed-use coast habitat, and benefit from comprehensive legal protection that regulates acceptable use.

The following stakeholder have already been engaged in the development of this Project Identification Form (PIF). These stakeholders and additional partners will be significantly more engaged during the full development of the project document.

April 2019 Stakeholder Meeting Facilitated by Forestry Department (April 9 & 12)

Stakeholder Organization	Stakeholder Type	Engagement Method	Potential Role in Project
Forestry Department	Government Agency	Meeting & workshop	Anticipated lead project executing agency
Forrest & Partners Environmental Consultants	Civil Society Organization	Meeting & workshop	Supporting project partner with possible role in project execution/implementation

October 2019 FAO Mission (October 17 ? 18, 2019)

Stakeholder Organization	Stakeholder Type	Engagement Method	Potential Role in Project
Forestry Department	Government Agency	Meeting & workshop	Anticipated lead project executing agency

Public Investment Management Secretariat (PIMSEC)	Government Agency	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination
Mines & Geology Division	Government Agency	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination
Northern Rio Minho (Local Forest Management Committee (LFMC))	Civil Society Organization	Meeting & Workshop	Supporting project partner with possible role in project execution/ implementation
Dolphin Head (LFMC)	Civil Society Organization	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination
Forrest & Partners Environmental Consultants	Civil Society Organization	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination
National Environment and Planning Agency (NEPA)	Government Agency	Meeting & Workshop	Core project partner likely responsible for supporting execution of project activities
Caribbean Coastal Area Management Foundation (C-CAM)	Civil Society Organization	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination
Water Resources Authority (W.R.A)	Government Agency	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination
National Land Agency (NLA)	Government Agency	Meeting & Workshop	Core project partner likely responsible for supporting execution of project activities
United Nation Forum on Forest (UNFF)	Intergovernmental Organization	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination
Ministry of Economic Growth and Job Creation (MEGJC)	Government Agency	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination
Urban Development Corporation (UDC)	Government Agency	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination

University of the West Indies (UWI) ? Centre for Marine Sciences	Academic Institution	Meeting & Workshop	Core project partner likely responsible for supporting execution of project activities
National Fisheries Authority (NFA)	Government Agency	Meeting & Workshop	Supporting project partner with anticipated advisory role to ensure project coordination

November 2019 FAO Mission (November 5 ? 16, 2019):

Stakeholder Organization		Engagement Method	Potential Role in Project
Forestry Department	Government Agency	Meetings and Workshop	Anticipated lead project executing agency
National Environment and Planning Agency (NEPA)	Government Agency	Meeting	Core project partner likely responsible for supporting execution of project activities
National Fisheries Authority (NFA)	Government Agency	Meeting	Supporting project partner with anticipated advisory role to ensure project coordination
University of the West Indies (UWI)? Port Royal Marine Lab University of the West Indies -Mona- Center for Marine Science	Academic Institution	Meeting	Core project partner likely responsible for supporting execution of project activities
Caribbean Coastal Area Management Foundation (C-CAM)	Civil Society Organization	Meeting	Core project partner likely responsible for supporting execution of project activities
Urban Development Corporation (UDC)	Government Agency	Meeting	Supporting project partner with anticipated advisory role to ensure project coordination
The National Conservancy (TNC) Jamaica	Civil Society Organization	Skype	Supporting project partner with anticipated advisory role to ensure project coordination

Stakeholder Engagement:

The project will undertake an extensive stakeholder engagement strategy for full project development during the PPG phase and throughout project implementation. During the PPG phase, the project will follow a highly inclusive stakeholder engagement approach aligned with GEF, FAO, and national policies and safeguard requirements, as necessary. This includes adherence with FAO's Environmental and Social Management Guidelines (ESMG) as discussed in the Risk section. Led by the Forestry Department, the core project partners providing indicative cofinancing (Table C) will be the most frequently engaged to ensure the baseline activities being leveraged by the project are well integrated into the final project strategy. Throughout the PPG phase, the project development team will also be engaging considerably with additional project stakeholders, especially those with potential roles in project execution or anticipated to be direct beneficiaries or impacted by the project. This will specifically include local community members and organization within and adjacent to final project sites for the restoration activities under Component 2. Where possible, the project will build on existing Co-operative Management Agreements between Forestry and local NGOs to both continued joint management of mangrove areas and to serve as a key conduit to local community members. Similarly, where relevant due to location of final project restoration sites, the project will likewise engage with existing Local Forest Management Committees (LFMC). Additionally, the project development team will be directly engaging with the NFMCP's Collaborative Implementation Framework to ensure adequate support is designed into the project. This will include engagement with other government agencies as well as other key non-government stakeholders, including National Environment & Planning Agency, Ministry of Economic Growth and Job Creation, University of West Indies Mona, National Land Agency, Jamaica National Heritage Trust, , and Meteorological Service of Jamaica. To ensure the project's final gender plan is aligned with national policies and goals, the project development team will also work directly with Jamaica's Bureau of Gender Affairs. Lastly, the project aims to engage with multiple private sector stakeholders during project development in direct support of finalizing the project design, especially for the targeted policy briefs (Output 3.1.2) , initially starting with engagement with responsible government entities including JAMPRO and UDC, and ideally moving to bilateral discussions to ensure successful knowledge dissemination (Output 3.1.3) and coordination and cooperation with any private actors (businesses or landowners) located adjacent areas to final project restoration sites. A careful documentation of all stakeholder engagements will be maintained by the project development team during the PPG phase and will be submitted as part of the request for GEF CEO Endorsement.

During project implementation, the project management unit and other key project execution partners will continue to expand the influence of project to additional targeted stakeholder audiences beyond those engaged during the PIF development and PPG Phases noted above. The project will also aim to expand its partnership with additional stakeholders, especially private sector actors that are directly and indirectly responsible for mangrove ecosystem degradation but not regularly engaged in mangrove ecosystem management decision making. In coordination with the responsible government agencies like JAMPRO and UDC, the targeted five policy briefs will be the main mechanism to be engaging with these private sector actors from five sectors: 1) Port and Coastal Infrastructure; 2) Tourism; 3)

Climate Change and Environment; 4) Waste Management, and; 5) Agriculture and Fisheries. Throughout each of these private sector engagements will strive to also include respective stakeholders from the finance, banking, and insurance industries that support each of these sectors. Lastly, private landowners will also be the target for direct engagement throughout project implementation on a case-by-case basis based on the importance of mangrove ecosystems in terms of biodiversity/KBAs and/or role of private lands adjacent to Crown-lands for overall improved mangrove ecosystem health.

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

Jamaica maintains a Bureau of Gender Affairs with an objective to enable women to recognize their full potential as individuals and to create avenues for their full integration in National Development. The three main functions of the Bureau are Research and Policy Development, Public Education and Training and Project Planning and Monitoring. The Bureau of Gender Affairs operates under the Minister of Culture, Gender, Entertainment and Sport and aims to mainstream gender issues across government engagement. The nation is further guided by the National Policy for Gender Equality (NPGE). The NPGE was designed to establish a framework for a more comprehensive and coordinated approach to fully integrate gender in every area of national life, with a goal of achieving equal treatment of woman and men in Jamaica. Gender equality requires equal enjoyment by women and men of the socially valued goods, opportunities, resources and rewards. Gender equity suggests that women and men have equal life chances. The NPGE aims to shift national policy-making and implementation from a gender neutral position which presumes that women and men always access all socially valued goods equally, to a gender aware position which acknowledges that barriers exist which prevent equal access and thus creates inequality.

The Vision 2030 Jamaica National Development Plan makes a national commitment to addressing long-term systemic discrimination against women, identifying and overcoming the limitations to the empowerment of women and men and ultimately creating a society that values gender balance, equality and equity. The Vision 2030 includes a specific Gender Sector Plan that outlines the goals for 2009-2030. The Gender Sector Plan recognizes discussions around gender and the sustainability of the environment suggest that there is need to examine gender differentiated activities as well as rights and responsibilities in the process of natural resource management. With respect to mangrove habitats, it is known that women living in poverty in Jamaica often earn money through charcoal production. Alternate and more sustainable livelihoods as well as more affordable fuel are needed in order to prevent this kind of interaction with the environment. The Forestry Department has been a leader among Jamaican government institutions on empowering woman in the workplace. Since

2001, Forestry Department has made specific efforts to establish a more gender sensitive organization that is fully equipped to incorporate gender issues in its operations, including promoting the recruitment of women into professional and technical levels. As of 2017, the Forestry Department employed 45% woman, including 40% of the technical and professional positions held by woman. Women are increasingly playing key decision-making roles within the Forestry Department, including a majority of women at the most senior management levels. These gender mainstreaming efforts with the Forestry Department have largely been guided mostly by the National Forest Management and Conservation Plan (NFMCP).

As Forestry Department implements specific activities from the NFMCP, gender dimensions front and centre. Currently on the Technical Advisory Committee which steers the NFMCP and the EU programme supporting the development of the NMMP, which includes a representative from the Bureau of Gender Affairs as a core member. Additionally, under the EU programme support, there is a focus on tracking targeted public education/awareness activities within identified forest dependent areas to support ?gender sensitive forest & climate change awareness programmes in schools? (EU programme Indicator # 8). Identification of similar gender sensitive indicators for this project will be explored further during full project development and further consultations with the NFMCP Technical Advisory Committee (see proposed gender-sensitive indicators below).

This project is designed to build on the national level efforts of the NPGE and Vision 2030 Gender Sector Plan as well as more directly supporting the mainstreaming of gender in the NFMCP, under the guidance of the Bureau of Gender Affairs that will be consulted at PPG stage. The project will support implementation of these national gender policies through direct engagement with the identified gender units and staff as part of NMMP implementation and strengthening policy under Component 1. Further, support for mainstreaming gender issues at the local level will be achieved through the socio-economic and ecosystem services assessments (Outputs 1.2.2 and 1.2.3, respectively). These assessments, as informed by further assessments during the full project development phase, will target the serve as the main mechanism to highlight the important roles women may have in site-specific mangrove ecosystems and management of these ecosystems in Jamaica and design specific interventions to protect and promote their situation. The project will also continue to identify additional opportunities to mainstream gender in mangrove restoration activities under Component 2. Lessons learned and knowledge on gender mainstreaming will be captured and disseminated under Component 3. The project will monitor gender mainstreaming with gender sensitive indicators, including enumerating the number of direct project beneficiaries as a co-benefit of the project.

A Gender Action Plan with gender sensitive indicators will be developed during the project preparation. The proposed indicators are related to the assessment of gender-disaggregated participation in livelihoods and income-generating activities and the participation in sustainable management and livelihood activities. Moreover, other suggested indicators refer to: Number of strategies, plans (e.g. management plans and land use plans) and policies derived from the project that include gender considerations; Number of men and women that received benefits (e.g. employment, income generating activities, training, access to natural resources, land tenure or resource rights, equipment, leadership roles) from the project.

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

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

improving women's participation and decision-making; and/or Yes

generating socio-economic benefits or services for women. Yes

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

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

Private sector actors are recognized to play an important role in long-term sustainable mangrove ecosystem management in Jamaica. The private sector can have a direct impact on mangrove degradation, such as coastal development. There are also key indirect private sector actors who finance and de-risk direct private sector actors threatening mangroves. Equally, well-informed private sector actors can be the largest advocates for mangrove protection. To this end, the project has been designed with a combination of direct and indirect stakeholder engagement pathways.

The project will directly engage with key private sector actors through two key outputs. First, the project will develop recommendations to address policy gaps with respect to incentives and disincentives of mangrove management on private lands (Output 1.1.2), including, as relevant,

informing engagement with private landowners adjacent to project restoration activities under Component 2. This Output 1.1.2 includes assessing essential baseline land ownership (including both individuals and business) to inform the best pathways to incentivize improved private sector management. The project will also directly target five key private sectors (Port and Coastal Infrastructure, Tourism, Climate Change and Environment, Waste Management, Agriculture and Fisheries) through policy briefs and direct dissemination of this information (Output 3.1.2 and 3.1.3). Indirectly, the project is also committed to disseminating mangrove knowledge to private sector project partners through the knowledge repository and with partner government agencies more directly responsible for engaging with private sector partners. This includes the Urban Development Corporation (UDC) and the Tourism Product Development Company (TPDCo). The UDC's remit is to hold, manage and develop real estate on behalf of the Government of Jamaica, with the overarching objective of spurring growth and improving the quality of life of Jamaicans. UDC's mandate includes transforming Jamaica's most viable urban centres and strategic rural towns, whilst preserving the natural environment, traditions and customs and spurring economic development. The UDC, through its development programmes, has significantly improved the coverage and quality of public infrastructure, in addition to introducing alternative patterns of urban settlement, including creative shelter solutions and the development of new townships. The Tourism Product Development Company Ltd. (TPDCo) is the central agency mandated by the Government of Jamaica to facilitate the maintenance, development and enhancement of the tourism product. TPDCo has been in operation since 1996 and is registered as a private company under the jurisdiction of the Ministry of Tourism. Members of TPDCo's Board are drawn from both the public and private sectors and include representatives of the Jamaica Hotel & Tourist Association (JHTA), the Jamaica Association of Villas and Apartments (JAVA) and each resort area. The project will engage with both UDC and TPDCo directly through multiple project activities identified in Outcome 1.2, including direct engagement with UDC as part of the existing inter-sectoral Collaborative Implementation Framework (Output 1.2.1). Through the Collaborative Implementation Framework, the project can disseminate mangrove knowledge to UDC, including the NMMP, mangrove socio-economic livelihood and ecosystem services valuation assessment reports (Outputs 1.2.2 and 1.2.3, respectively) and the mangrove policy briefs (Output 3.1.2). During the PPG phase, the project will lastly identify opportunities to additionally work with other government and private sector actors that indirectly support development activities that threaten mangroves, including foreign direct investment, finance and banking institutions, and insurance companies. This will likely include exploring opportunities to include government entities like Ministry of Finance, Development Bank of Jamaica, and JAMPRO into the targeted knowledge dissemination activities of Output 3.1.3.

5. Risks to Achieving Project Objectives

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

The project will provide considerations for Jamaica's attempts to address COVID-19 in the following areas:

? Stakeholder Engagement Process: In light of the ongoing global COVID-19 pandemic, all workshop gatherings will convene according to the guidance and instructions for gatherings in line with the rules and procedures set forth by Jamaica's Ministry of Health. If the Ministry of Health discourages meetings of this kind, then this project's activities will be executed remotely via use of virtual platforms where possible. If necessary, these workshops/activities may be leveraged to also disseminate information about COVID-19 measures, both broadly and/or with specific focus on pertinent measures related to any project outputs. These workshops may also be used for targeted messaging on COVID-19 to indigenous populations as it has been noted that they are particularly vulnerable given lack of access to health services and often excluded from messaging systems that seek to target mainstream society and culture. If needed, FAO will also undertake the FPIC process to help ensure this output is created in an equitable and fair manner.

? Availability of Technical Expertise and Capacity and Changes in Timelines: To limit the impact of the additional demand on stakeholders during PIF development the project will leverage existing government coordination mechanisms where possible, such as the Protected Areas Committee, for design activities. Analysis of baseline status of beneficiaries completed in the PPG stage will be reviewed in the initial stages of project mobilization to contribute to the effectiveness of project interventions. In the event that there are changes in capacity of the executing agency that may hinder project implementation, a management structure will be instituted with elements of redundancy. This will include the appointment of alternates and working groups of personnel for critical activities. In addition, the project will use adaptive management approaches informed by a dedicated monitoring and evaluation system which will identify changes (inclusive of those resulting from COVID-19) that should be effected to realize the results.

? Enabling environment: Acknowledging that the priority of the government is to deal with the immediate impact of COVID-19 and that this will dominate the national agenda for some time in the future, an engagement strategy would be developed for PPG development and project implementation with messaging to draw attention to the need to support the implementation of the National Mangrove Management Plan as a means to achieving national development goals in the present development context.

Potential Project Risk	Risk Rating	Proposed Mitigation
Low engagement in project activities from government agencies	L	The project will leverage existing government coordination mechanisms where possible, such as the Protected Areas Committee. Additionally, the project will continue to be co-designed with all key project partners during PPG stage to ensure that consider themselves as equal project partners and have ownership implementing national plans and meeting project's goals.

Impacts of climate change significantly impact project restoration efforts	M	<p><i>From FAO Climate Risk Screening:</i> Mangroves play an important part in protecting the coastline from erosion and protecting the hinterland from the devastating effects of hurricanes. Their protective value is often not understood or not regarded as important. Informing stakeholder and planning agencies about the importance of mangrove will increase the capacity of the landscape to adopt to climate change.</p> <p>Climate risk screening for this project is categorized as MODERATE given the vulnerability of mangrove ecosystems to climate change hazards including sea level rise, hurricanes and extensive flooding. Also, non-climate drivers such as unreported or non-authorized settlements or exploitations in mangrove areas exacerbates the risks and confirm need for mitigation actions as indicted in the ESS and section 5 of the PIF.</p> <p>Further, the project will mitigate climate impacts though the implementation of existing sector climate resilience plans and taking advantage of latest scientific information on mangrove restoration. Resilience will be promoted by adopting holistic restoration approaches that prioritize overall mangrove ecosystem health, such as addressing underlying hydrologic conditions that encourage natural mangrove regeneration.</p>
Lack of interest from private landowners and other private sector actors in mangrove management and restoration	M	Increasing awareness of the importance of mangroves will be key to engaging with private actors. The project will explore specific incentives for private landowners. For private sector actors, the project aims to provide a science-based approach to local land-use planning, including making socio-economic positions.
Delay in project activities due to COVID-19	M	Travel restrictions and prohibitions on face-to-face meetings and consultations will be addressed through implementing activities using a blend of face-to-face and virtual consultations. Travel will be limited to essential activities. Resources (GEF funded and partner input) will be used efficiently to address increased cost associated with COVID-19 pandemic. To facilitate the timely execution of the project, it is recommended to pair an experienced international consultant with a local consultant both contributing to the same activity or output.

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

FAO will be the GEF Implementing Agency, responsible for the implementation, monitoring and evaluation of the Project in compliance with FAO and GEF guidelines. The GEF Executing Agency (national implementing partner) will be the Forestry Department of Jamaica. The Project implementation arrangements will be further defined during the PPG phase.

Coordination with other relevant GEF- financed projects and other initiatives: The project will coordinate with other GEF-financed projects with the objectives of identifying opportunities and facilitate mechanisms to achieve synergies. This collaboration will be undertaken through: i) informal communications between GEF Agencies and executing partners of other programs and projects; ii) annual coordination meetings; iii) specific meetings on technical matters; iv) meetings and activities to exchange experiences and lessons.

There are currently two important land management GEF projects in Jamaica.

1) GEF-IADB (GEF ID 4454) *Integrated Management of the Yallahs River and Hope River Watersheds*. The project is complete a terminal evaluation in 2020. Main project objective was to improve the ecosystem service of two important watershed management units through improved sustainable land management, improved land husbandry practices and improved biodiversity. The project has made strides in the sensitization of persons on the objectives of the project through the implementation of its communication strategy and has trained over 500 farmers in good agricultural practices. The project experienced significant delays in completing other activities related to identification of sites for watershed interventions and in the reforestation of the upper watershed catchment areas. The lead executing entity for the project is NEPA.

2) GEF UNDP (GEF ID 9862) *Conserving Biodiversity and Reducing Land Degradation Using an Integrated Landscape Approach*. The project under development and will anticipated to begin implementation in 2020. The main project objective is to enhance conservation of biodiversity and ecosystem services through mainstreaming of biodiversity into planning policies and practices into Jamaica's productive landscapes and key sectors. The lead executing entity for the project is also NEPA.

As the NEPA is the lead government partner for the two ongoing GEF projects in Jamaica, coordination efforts between this mangrove project and other existing GEF projects will be channeled through existing relationships between Forestry Department and NEPA. Both government organizations coordinate already through important formal mechanisms, such as the Protected Areas Committee for the National Protected Area Systems, as well as the Technical Advisory Committee for the NFMCP.

GEF CAF FAO (GEF ID 10211) *BE-CLME+: Promoting National Blue Economy Priorities Through Marine Spatial Planning in the Caribbean Large Marine Ecosystem Plus*. This project is co-implemented by FAO, which together with CAF, is focused on adoption of national blue economy

priorities, including promoting marine spatial planning (MSP) to inform ecosystem-based fisheries including informing establishing and expanding marine protected areas (MPAs) and promotion of sustainable seafood value chains. The project will strongly complement Jamaica's commitments for mangrove ecosystem conservation and restoration by addressing the important linkages with commercial and artisanal fisheries. Coordination among the two projects will be ensured by both FAO and national-level government agency collaboration, including NEPA.

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions?

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

The project is consistent with the following national priorities that include broader sustainable development objectives and specific alignment with national commitments for the Convention on Biological Diversity, most notably Jamaica's National Biodiversity Strategy and Action Plan (NBSAP) and Protected Areas System Master Plan (PASMP).

Vision 2030 Jamaica ? National Development Plan.

Jamaica's Vision 2030 - National Development Plan is the country's roadmap to sustainable development. The Plan is aimed at positioning Jamaica to achieve developed country status by 2030. It acknowledges that protecting and managing Jamaica's natural resources will contribute to enhancing the quality of life for all Jamaicans. Vision 2030 specifically mandates best management practices for all forests, as well as recognizing the role it plays in ensuring adaptation to climate change, while leading reforestation efforts. This includes specific references to a healthy natural environment (Goal 4), and the sustainable management and conservation plan 2016 ? 2026 for use of environmental and natural resources (Outcome 13), and hazard risk reduction and adaptation to climate change (Outcome 14).

2016-2021 National Biodiversity Strategy and Action Plan

The updated 2016-2021 National Biodiversity Strategy and Action Plan (NBSAP) presents several activities to achieve the Aichi Targets which have been prioritized based on consultations with the main national stakeholders. The understanding of biodiversity as a critical asset for the Jamaican people and ensuring long term and sustainable economic activities are key to promoting the importance of biodiversity conservation across all economic sectors through public, private and civil sectors. The updated NBSAP seeks to provide activities which not only target the awareness and sensitization among groups but also foster engagement and buy-in to the strategic goals. It also has recognized the increasing challenge posed by climate change to biodiversity conservation and the need for the recovery of degraded ecosystems for environmental health and to building climate change resilience.

The current NBSAP has multiple strategic goals that project is actively supporting. These include the following Strategic Goals:

- A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- B. Reduce direct pressures on biodiversity loss and promote sustainable use
- C. Improve the status of ecosystems by safeguarding ecosystems, species and genetic diversity
- D. Enhance the benefits to all from biodiversity and ecosystem services
- E. Enhance the implementation through participatory planning, knowledge management and capacity building

8. Knowledge Management

Outline the knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

Knowledge management is specifically supported in Component 3 (Outcome 3.1). The project will establish a central mangrove repository. The project also aims to capture and disseminate mangrove knowledge across Jamaica through a series of targeted publications. These targeted publications will include at least four policy briefs to raise awareness about mangroves to key sectors including tourism, environment and climate change, waste management, and agriculture and fisheries. Further, specific biodiversity knowledge will be disseminated through two additional publications that raise awareness on the importance of Jamaican mangrove habitat biodiversity, with one publication focused on Jamaican mangrove habitat terrestrial biodiversity and the second on Jamaican mangrove habitat marine biodiversity. The project will also be generating knowledge in other project components that will be captured and disseminated through the mangrove repository. These additional knowledge products include the socio-economic assessments (Output 1.2.2), mangrove ecosystem service valuation reports (Output 1.2.3), and national mangrove policy improvements under Outcome 1.1. Collectively, these knowledge management actions will complement the targeted project interventions to create an overall increased understanding of the roles mangrove habitats and key biodiversity, including commercially important species, have in Jamaica communities and local and national development plans.

9. Environmental and Social Safeguard (ESS) Risks

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

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approval	MTR	TE
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Medium/Moderate

Measures to address identified risks and impacts

Provide preliminary information on the types and levels of risk classifications/ratings of any identified environmental and social risks and potential impacts associated with the project (considering the GEF ESS Minimum Standards) and describe measures to address these risks during the project design.

Environmental and Social Safeguards ? Risk screening at PIF stage:

In line with the FAO Environmental and Social Management Guidelines (ESMG), the implementing agency has conducted an Environmental and Social Safeguards (ESS) screening at PIF stage. A full environmental, social and climate risk analysis will be conducted during PPG.

As per the ESS checklist screening, the project has been classified as *Moderate risk*. The table below summarizes the Environmental and Social risks identified in relation to the proposed project:

Safeguard Triggered	Risk Identified	Answer	Risk Classification	Potential (negative) impacts	Mitigation measures (preliminary)

<p>2 (Biodiversity, ecosystems and natural habitats)</p>	<p>2.1 Would this project be implemented within a legally designated protected area or its buffer zone?</p>	<p>Yes</p>	<p>Moderate</p>	<p>Not foreseen. The project will enforce protection and sustainable management of mangrove ecosystems</p>	<p>The project supports strengthening management of Crown Lands already overseen by the Forestry Department, including Forest Reserves and Forest Management Areas plus moving 7,600 additional hectares under these two management regimes. This focus on strengthening existing management mechanisms of protected areas and government-owned land by government agencies with existing mandates ensures cooperation from local stakeholders, compliance with national policies, and mitigation of any potential negative impacts. Further, the project will maintain frequent monitoring and evaluation mechanism of results and impacts to ensures continuous feedback during the project and adaptive management responses as necessary.</p> <p>The Jamaica Forestry Department, as lead project executing partner, will work closely with FAO during project execution for compliance of any additional mitigation measures identified and incorporated into the project design during full project development.</p>
<p>4. Animal (livestock and aquatic) genetic resources for food and agriculture.</p>	<p>4.7 Would this Project be located in or near an internationally recognized conservation area e.g. Ramsar Or World Heritage Site, or other nationally important habitat, e.g. national park or high nature value farmland?</p>	<p>Yes</p>	<p>Moderate</p>	<p>To be further assessed during PPG stage</p>	<p>To be further assessed during PPG stage</p>

7. Decent work	7.7 Would this project involve sub-contracting?	Yes	Moderate	To be further assessed during PPG stage	To be further assessed during PPG stage
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Supporting Documents

Upload available ESS supporting documents.

Title	Submitted
RiskClassification	
ES Screening Checklist Jamaica Mangroves	

Part III: Approval/Endorsement By GEF Operational Focal Point(S) And GEF Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Gillian Guthrie	Senior Director	Ministry of Economic Growth and Job Creation	8/5/2020

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

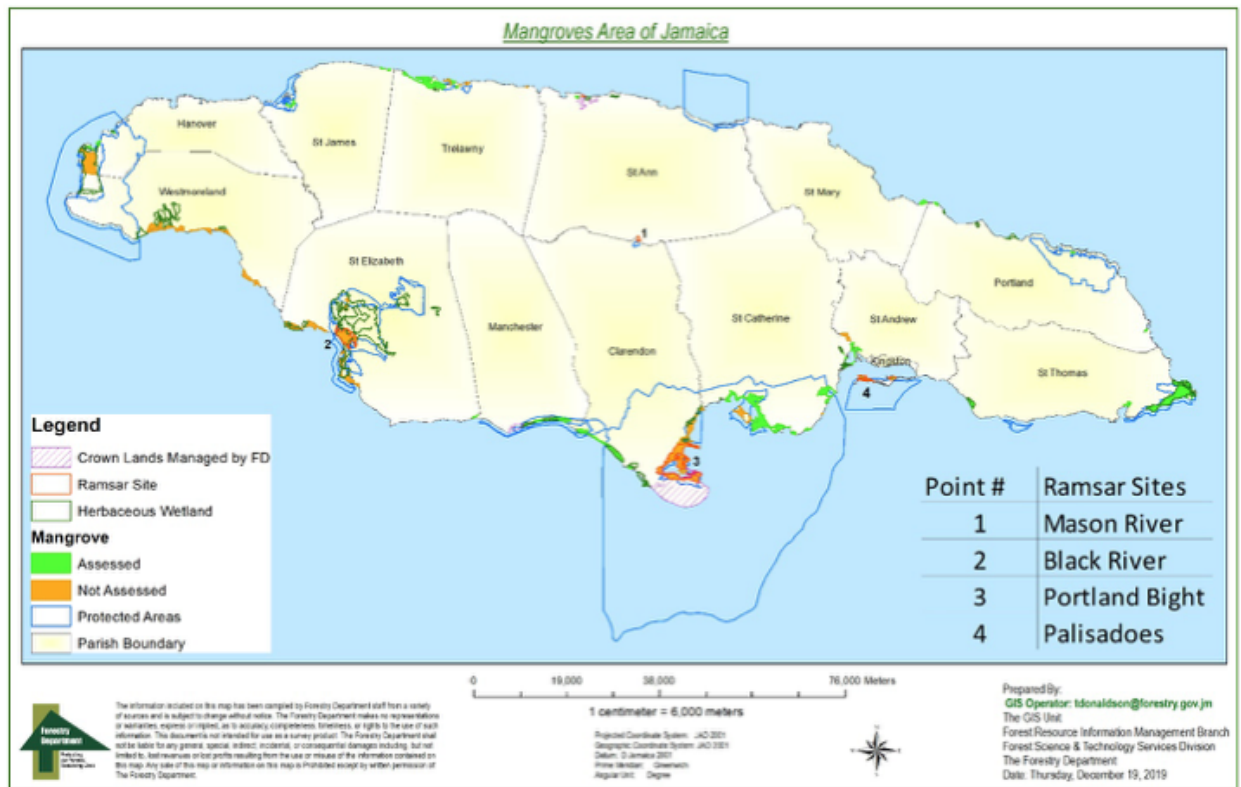


Figure 2: Map of Jamaica with mangrove forest locations and management and protected areas locations, including Crown Lands managed by the Forestry Department.

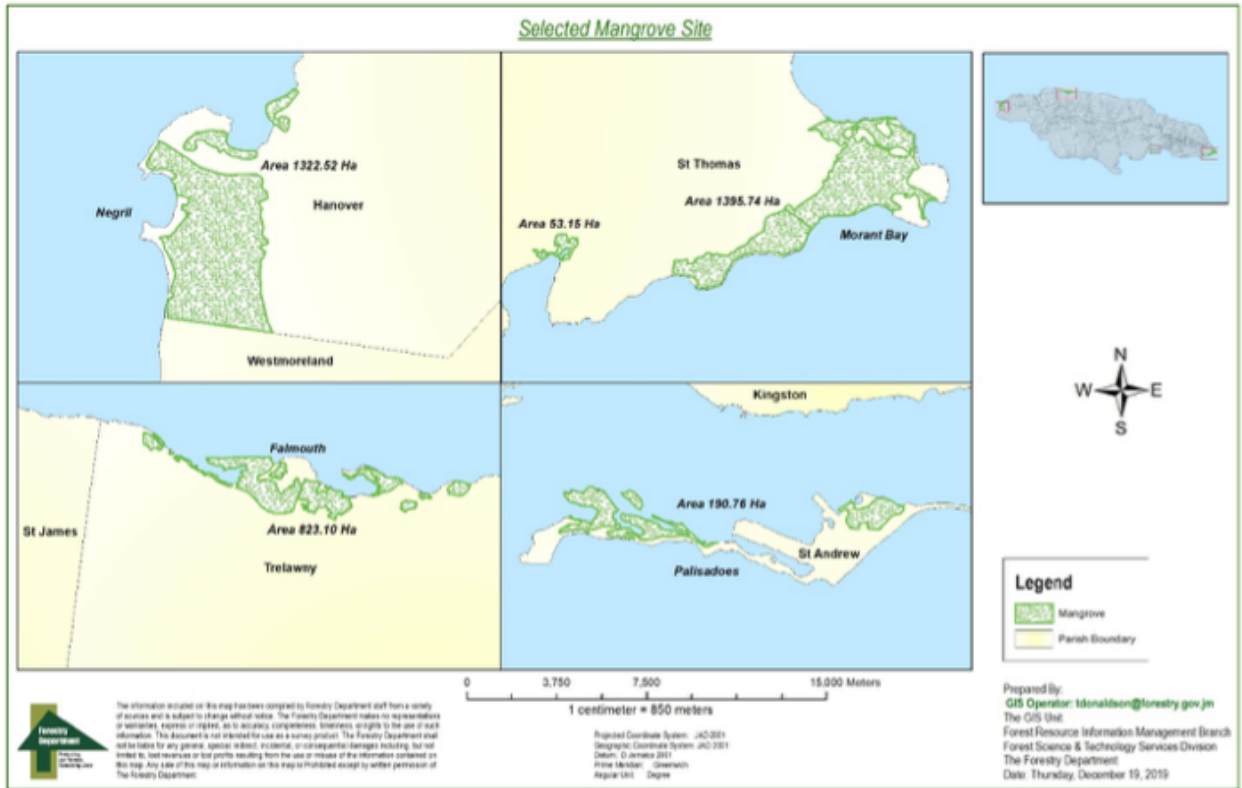


Figure 3: Potential project restoration site locations and surface area estimates

Approximate Geographic Coordinates Potential Project Restoration Sites:

Parish	Location Name	Area (Ha)	Latitude	Longitude
Hanover	Negril	1,322.52	18 19' 23" N	78 19' 25" W
St. Thomas Area	Morant Bay	1,395.74	17 55' 04" N	76 12' 24" W
St. Thomas Area	Area 2	53.15	17 53' 40" N	76 18' 56" W
Trelawny	Falmouth	823.1	18 29' 38" N	77 40' 25" W
St. Andrew	Palisades	190.76	17 56' 36" N	76 49' 39" W
St. Catherine	Goat Island	242.00	17 52' 38" N	77 03' 37" W